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ROSEMONT COPPER WORLD PROJECT
GEOCHEMICAL IMPACTS ASSESSMENT

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°F	degrees Fahrenheit
ABA	acid-base accounting
ADEQ	Arizona Department of Environmental Quality
afy	acre-feet per year
AG	acid generating
atm	atmospheres
amsl	above mean sea level
AP	acid-generating potential
ARD	acid rock drainage
AWQS	Arizona Water Quality Standards
BADCT	Best Available Demonstrated Control Technology
bgs	below ground surface
CRF	chemical release function
ERA	ecological risk assessment
ET	evapotranspiration
ft	feet
ft/d	feet per day
GARD	Global Acid Rock Drainage
gpm	gallons per minute
HCT	humidity cell test
HLP	heap leach pad
Hr	hour
ICP	inductive coupled plasma
in/yr	inches per year
kt	kilotons
MAP	mean annual precipitation
MCL	maximum concentration limit
mg/l	milligrams per liter
Mt	million tons
MWMP	Meteoric Water Mobility Procedure
NAG	non-acid generating
NP	neutralizing potential
PAG	potentially acid generating
pE	redox condition, negative log of the concentration of electrons (e^-)
pH	negative log of dissolved protons (H^+)
PLS	pregnant leach solution
RRZ	reactive rock zone
SF	scaling factors
SI	saturation indices
SPLP	Synthetic Precipitation Leaching Procedure
s.u.	standard unit
TDS	total dissolved solids
TSF	tailings storage facility
WRF	waste rock facility
WRMP	waste rock management plan

EXECUTIVE SUMMARY

The geochemical impacts assessment for the Rosemont Copper World Project (Project) evaluates the geochemistry of materials associated with the Project's main facilities which include: six (6) open pits, two (2) tailings storage facilities, one (1) waste rock facility (WRF), and one (1) heap leach pad (HLP). The Project is situated across the Santa Rita mountains, with the Rosemont and Broadtop Butte Pits located east or straddling the ridgeline and the remaining pits (Peach, Elgin, Heavy Weight and Coper World) and other facilities located to the west of the ridgeline. Waste rock will backfill 3 of the open pits and be placed on both sides of the ridgeline. The mining sequence will run from west to east, beginning with the Peach and Elgin pits and ending with the Rosemont Pit. The deposit consists primarily of limestones and skarns (~51%), followed by igneous materials (~38%), and sedimentary material (~10%). The Rosemont Pit comprises approximately 75% of the overall tonnage mined.

Phase I and II geochemical sampling and characterization was performed from 2007 to 2017 with the collection of 358 Acid-Base Accounting (ABA) samples, 88 Synthetic Precipitation Leaching Procedure (SPLP) samples, 43 Meteoric Water Mobility Procedure (MWMP) samples, and 18 Humidity Cell Tests (HCT) from the Rosemont Pit. Phase I sampling results indicate the Rosemont deposit is largely non-acid generating (NAG), with minor components of potentially acid generating (PAG) and very little acid-generating (AG) material (<1%). This is consistent with the geology of the deposit. Only three (3) leach tests produced acidic leachate, the remaining 128 leach tests were circum-neutral. HCTs identified two samples that became acid-generating. Leachates from the remaining samples were circum-neutral through 35 weeks. Both acid-generating HCT samples were from the Bolsa quartzite, though of all ABA tested Bolsa samples only ~11% were classified as PAG. Based on the materials characterization, the likelihood for the bulk production of acid-leachate is low. Acid-generating materials are limited in quantity and can be managed for neutralization.

Leach and kinetic tests (MWMP, SPLP, and HCT) indicated that most samples generated leachates meeting Aquifer Water Quality Standards (AWQS). A minority of samples released elevated constituents, comprising less than 10% of rock materials. HCT testing indicated that the highest chemical release rates occurred during first flush. Leach tests and HCTs were used to develop representative chemical release functions used to model the geochemistry of mine facilities.

The WRF will be comprised predominately of NAG material. The composite NPR for the facility is 31, therefore the facility will be strongly net neutralizing. Most waste material will be derived from the Rosemont Pit (~83%). Seepage chemistry from the facility, if it develops, is anticipated to be circum-neutral and meet AWQS.

Cycloned tailings will be placed on native ground in two storage facilities. Tailings will be derived primarily from limestone and skarn ore. Tailing seepage chemistry was developed from tailings specific leach tests. Seepage is anticipated to be circum-neutral and possess high sulfate concentrations but meet AWQS.

The heap leach will be constructed on a lined pad (HLP). Therefore, pregnant leach solution (PLS) will be contained and managed during the project. PLS will be similar to other copper mine sites with characteristically low pH, high metal and sulfate concentrations.

Open pit mining will occur in six (6) pits across the Project. Three pits will be fully backfilled by waste rock materials and three pits will remain open to form pit lakes. Background groundwater ranges between Ca - SO_4 and Ca - HCO_3 type for the pits. Groundwater can have high sulfate concentrations but meets AWQS. A summary of closure conditions for open pits is summarized as:

- The Rosemont Pit will form a pit lake recovering to the 4,271 ft amsl elevation. A permanent hydraulic sink will form at the Rosemont Pit lake with an annual evaporation rate of ~274 gpm upon 95% recovery. Pit lake chemistry is expected to be circum-neutral and have low metal concentrations. Constituents will evapoconcentrate through time until mineral saturation is reached which will moderate lake chemistry (i.e. gypsum, calcite, gibbsite).
- The Broadtop Butte Pit, consisting of north and south sub-pits separated by a saddle, will be backfilled. The northern sub-pit is predicted to recover to the 4,971 ft amsl elevation after 200 years. Pore water backfill will be primarily comprised of infiltration. Groundwater outflow from backfill to surrounding bedrock is predicted to occur at rate of ~6.6 gpm. Pore water chemistry is expected to be circum-neutral and meet AWQS, owing to the NAG composition of backfill and wall rock. Concentrations are expected to decrease through time as outflow flushes and removes mass from backfill material.
- The Copper World Pit will be backfilled and contain two sub-pits with saturated backfill material. The northern sub-pit is predicted to recover to 4,540 ft amsl and the southern sub-pit to 4,620 ft amsl after 200 years. Groundwater outflow from backfill to surrounding bedrock is predicted to be very low, at rates of <0.5 gpm at both sub-pits. Pore water chemistry is expected to resemble background groundwater, being circum-neutral and meet most AWQS. Fluoride is the only element predicted to be temporarily elevated with respect to AWQS during the first 5 – 10 years of recovery. Concentrations are expected to decrease through time as outflow flushes and removes mass from backfill material.
- The Heavy Weight Pit will be backfilled. Water levels are predicted to recover to the 4,310 ft amsl elevation after 200 years. Groundwater outflow from backfill to surrounding bedrock is predicted to be very low, at rates of ~0.3 gpm. Pore water chemistry is expected to resemble background groundwater, being circum-neutral and meet most AWQS. Fluoride is the only element predicted to be temporarily elevated with respect to AWQS during the first 10 years of recovery.

- The Elgin Pit will form a small pit lake spanning ~7 acres at the 4,105 ft amsl elevation. Evaporation will be the principal outflow from the lake, with a minor amount of outflow to groundwater (~1.2 gpm). Pit lake chemistry is expected to be circum-neutral and have low metal concentrations. Fluoride is the only constituent predicted to be elevated with respect to AWQS. Constituents will evapoconcentrate through time.
- The Peach Pit will also form a small pit lake spanning ~6 acres at the 4,086 ft amsl elevation. Evaporation will be the principal outflow from the lake, with a minor amount of outflow to groundwater (1 gpm – 1.4 gpm). Pit lake chemistry is expected to be circum-neutral and have low metal concentrations. Fluoride is the only constituent predicted to be elevated with respect to AWQS. Constituents will evapoconcentrate through time.

A series of sensitivity analyses were performed for each facility to evaluate the changes in predicted chemistry with model inputs. The sensitivity analyses modified mass loading rates, meteorological inputs, groundwater inflows, thermodynamic inputs, and oxidation depths. Sensitivity analyses indicate that long term geochemical predictions tend to converge to the Base Case. Early-time pit filling exhibits greater variability among sensitivity simulations. A limited number of additional elevated constituents were predicted and are limited to generally the same constituents (antimony, cadmium, selenium, thallium). These elevated sensitivity constituents are related to applying much higher mass loading rates at different pit locations.

The overarching results from the study indicate the facilities are expected to produce circum-neutral waters that are generally low in metals and meet most AWQS. This is aligned with characterization of materials from the Project which are primarily NAG and generally did not leach high concentrations of constituents. Fluoride is the only element which is predicted to be elevated with respect to AWQS, in part because background fluoride concentrations in the Satellite pit area groundwater range from 1.27 mg/l - 2.96 mg/l. Predicted sulfate concentrations for facilities are generally in the range of background groundwater.

1 INTRODUCTION

This report describes an initial geochemical impacts assessment completed for the proposed Rosemont Copper World Project (Project) situated on privately held lands owned by the Rosemont Copper Company (Rosemont). The assessment includes a summary of geochemical characterization of mined rock and prediction of post-closure geochemical conditions for the principal mine facilities, including potential impacts to groundwater resources. This report meets guidance outlined in the following documents:

- "Arizona Mining Guidance Manual BADCT" (ADEQ, 2004).
- "Global Acid Rock Drainage Guide" (INAP, 2014).

1.1 Project Description

The Project site is located approximately 28 miles southeast of Tucson, Arizona in Pima County, in the Rosemont and Helvetia mining districts (Figure 1.1). The project consists of:

- Six (6) open pits. The Peach, Elgin, Heavy Weight, Copper World, and Broadtop Butte Pits are referred to as the "Satellite pits". The Rosemont Pit is the largest pit to be mined.
- Two (2) tailings storage facilities (TSF), consisting of cycloned tails;
- One (1) waste rock storage facility (WRF); and
- One (1) heap leach pad (HLP).

The Project will be developed as an open pit mine with a milling and processing plant for approximately 445 million tons (Mt) of sulfide ore. Operation of the sulfide processing plant will occur concurrently with heap leaching of approximately 215 million tons (Mt) of oxide ore. Tailings from the milling process will be deposited using cyclones at two storage facilities situated on the western edge of the project (Figure 1.2). Waste rock of up to 695 Mt will be generated as part of the mining operation. This will be placed in the waste rock facility (WRF) as well as used for backfill in the Heavy Weight, Copper World, and Broadtop Butte open pits. The three remaining open pits will not be backfilled (Rosemont, Peach, Elgin). Additionally, waste rock will be placed under the heap leach pad (HLP) as a base for the containment liner. Waste rock may also be used as a base for the plant areas, heap pond area, and haul roads or other access roads. Waste rock placement is also planned to be temporarily placed along the downgradient edge of the Rosemont Pit. This portion of the WRF would be removed during operations as the pit is expanded.

Ore grade materials are defined as having copper content greater than 0.1%. Materials with less than 0.1% copper content are to be routed to the WRF. Ore grade materials with soluble copper content of >50% will report to the heap for acid leaching, whereas remanent ore will be routed to the mill, tailings from which will be stored in the TSFs. The mining sequence is scheduled to occur from west to east, beginning at the Peach / Elgin Pits and ending with the Rosemont Pit. Very low stripping ratios in the satellite pits will contribute ~17% of the waste rock that is generated during the early phases of mining. The Rosemont Pit is the dominant source of waste rock to the WRF (~83% of the WRF).

The Rosemont Pit accounts for 75% of the total materials to be mined (~1,017 Mt). The Project's geochemical characterization program is therefore logically focused towards the Rosemont Pit. Broadtop Butte Pit is the next largest material source to the project (205 Mt), followed by Copper World, Heavy Weight, and the Peach / Elgin Pits. The estimated tonnages from each source pit to each mine facility are summarized in Table 1.1.

Table 1.1: Project material source and destination summary

Source Pit (s)	Heap Leach (Mt)	Mill (Mt)	Waste Rock Facility (Mt)	Pit Total (Mt)
Peach / Elgin	23	21	20	65
Heavy Weight	0	1	24	25
Copper World	13	14	16	42
Broadtop Butte	56	89	60	205
Rosemont	122	320	575	1,017
Total	**215**	**445**	**695**	**1,355**

The deposit is comprised primarily of limestone / skarn Paleozoic rocks with smaller components of volcanic / intrusive and sedimentary rocks units. Mesozoic magmatism formed batholiths and smaller intrusive bodies that were the genesis for copper mineralization in the Rosemont and Satellite pits. Most geologic units present in Satellite pits are found in the Rosemont Pit and the style of mineralization is broadly the same, although the Satellite pits are smaller and more structurally dissected (Piteau, 2022a).

1.2 Previous Studies and Data Sources

Previous geochemical investigations have involved ADEQ Phase I and Phase II testing to characterize waste rock, tailings and ore materials present within the Rosemont Pit area. These investigations were primarily associated with state and federal permitting applications for the

Rosemont Copper Project and provide the source laboratory static and kinetic geochemical dataset used to develop predictions for the Rosemont Copper World Project. Key differences between prior studies and the current assessment are:

- Expansion of mining towards the western side of the Santa Rita mountains (i.e. Peach, Elgin, Heavy Weight, Copper World Pits, and Broadtop Butte Pits).
- Application of cycloned tailings.
- The backfilling of several mine pits with waste rock (Heavy Weight, Copper World, and Broadtop Butte Pits).
- The reduced extent of the Rosemont Pit.

Geologic, hydrologic, and geochemical datasets were collected from multiple private and public data sources for use in this study. A summary of study reports and data sources is provided as follows and in Table 1.2.

- Baseline Geochemical Characterization. (Tetra Tech, 2007a).
- Geochemical Characterization Addendum 1 (Tetra Tech, 2007b).
- Infiltration, Seepage, Fate and Transport Modeling Report. Revision 2 (Tetra Tech, 2012).
- Geochemical Pit Lake Predictive Model (Tetra Tech, 2010a).
- Evaluation of Rosemont Geochemical Testing Results and Local Water Quality (Tetra Tech, 2009).
- Rosemont Geochemical Sample Selection (Tetra Tech, 2010b).
- Rosemont 2006-2008 Tailings Material Sample Sources (Tetra Tech, 2010c).
- Evaluation of Whole Rock Correlation with ABA (Geochemical Solutions, 2017).
- Rosemont Preliminary Geochemistry Review and Response to Comments (Tetra Tech, 2010d).
- Rosemont Tailings Characterization – Geochemical and Physical Testing. (Rosemont, 2014).

Table 1.2: Project geochemical assessment data sources

Component	Source	Description
Mine Plan and Designs	Rosemont Copper Company	
Static Acid-Base Accounting (ABA)	Tetra Tech, 2007a Tetra Tech, 2007b Tetra Tech, 2010c Geochemical Solutions, 2017 Rosemont, 2014	358 samples collected for waste rock, tailings, and ore.
Whole Rock Assay	Tetra Tech, 2007a Tetra Tech, 2007b Tetra Tech, 2010c Geochemical Solutions, 2017 Rosemont, 2014	189 samples with whole rock elemental chemistry.
MWMP and SPLP	Tetra Tech, 2007a Tetra Tech, 2007b Tetra Tech, 2010c Rosemont, 2014	43 samples tested using MWMP. 88 samples tested using SPLP.
Humidity Cell Tests (HCT)	Tetra Tech, 2007a Tetra Tech, 2007b	18 samples tested as HCTs.
Pit lake water balance	Current Study	All water balance components are dynamically simulated in GoldSim to generate inflow/outflows to the pit lake. Ground water flow components derived from 2022 groundwater model.
Meteorological Data	Piteau, 2022a	Monthly precipitation and evaporation pan data derived from surface water studies.
Geologic Block Model	Hudbay, 2021	Block model delivered August 28, 2021. Block model incorporated geochemical inputs for Ca, Mg, and S to assess materials characterization.
Pit wall surface areas	Current Study	Determined from mine shapes and block model.
Groundwater chemistry	Tetra Tech, 2010a; Rosemont, 2021; Piteau, 2022a	Water chemistry samples from monitoring wells.
Precipitation chemistry	NADP, 2021	Representative rainwater chemistry data obtained from NADP.
Thermodynamic data	minteq.v4 database	The minteq.v4 thermodynamic database supplied with version 3.3.8.11728 of PHREEQC.

Review of previous investigations indicate the following key geochemical findings:

- Ore rock and overburden from the Rosemont Pit is predominantly comprised of limestone / skarn materials, which is acid-neutralizing. Over 90% of all mined material possess a Neutralizing Potential Ratio (NPR) >3.0, which is classified as non-acid generating (NAG) material per the Arizona Department of Environmental Quality (ADEQ) Best Available Demonstrated Control Technology (BADCT). Low concentrations of leached metals are due to the neutralizing capacity of the rock.
- The Rosemont deposit generally contains low sulfur content, averaging ~0.39% for ore material and ~0.24% for waste, which meets ADEQ's sulfur cut-off of 0.3% for "inert" materials (ADEQ, 1998). The sulfur content of high-grade ore ranges from 2% to 3% within a small amount of rock materials. While the potential may exist for localized acid rock drainage (ARD) generation in small quantities, this will be mitigated by the abundance of neutralizing materials in the larger rock mass.
- Minor quantities of potentially acid-generating (PAG) materials are encountered, primarily in Bolsa, quartz monzonite porphyry (Qmp), Andesite, and Granodiorite rock materials.
- The Satellite pits comprise a minor component of the overall project tonnage (~25%). Rosemont Pit material will therefore be the primary control for WRF, TSF and HLP geochemical conditions.
- Most geologic units present in Satellite pits are found in the Rosemont Pit, which has met ADEQ sampling guidance (ADEQ, 1998). Phase I and II testing conducted on materials form the Rosemont Pit is evaluated in Section 3 to determine that the existing geochemical dataset spans the anticipated range of conditions to be encountered throughout all the pits, with minor outliers.

Given the predominantly limestone / skarn nature of the deposits, and the continuity of rock materials between the open pits, the overarching geochemical nature of Rosemont and Satellite pits pose low risk of production of ARD. An additional 40 samples were selected in Q3 2021 for supplemental geochemical characterization with an emphasis on rock units in the Satellite pits (i.e. Granodiorite, Glance, Qmp, Scherrer) and validating the existing geochemical dataset (Piteau, 2022c).

2 HYDROGEOLOGIC BACKGROUND AND CONCEPTUAL MODEL

2.1 Hydrographic Setting and Climate

Hydrographic Setting

The Project resides across the Santa Rita mountains, across the Upper Cienega Creek watershed to the east and the Upper Santa Cruz watershed to the west and north (Figure 2.1). Drainages in the Project area are ephemeral, flowing only during storm events.

Groundwater occurs primarily in structurally compartmentalized Mesozoic and Paleozoic bedrock materials across the Project. Hydrogeologic testing has indicated that the principal drainages correspond with fracture zones of increased bedrock transmissivity and groundwater flow. Bedrock materials otherwise possess very low transmissivity and storage properties. Larger groundwater resources are stored in the basin-fill deposits that occur beneath the floor of the Santa Cruz basin to the west and the upper Cienega basin to the east. These reservoirs serve as the principal aquifers which sustain agricultural activity in the basins.

Regional Climate Summary

The climate in the region is of an arid continental desert. Summer high temperatures are above 90 degrees Fahrenheit with significant cooling at night. Late summer is characterized by occasional and scattered monsoonal rainstorms that are often short but of high intensity. Winter is dry and mild with overnight temperatures typically above freezing. The region receives between 16 and 22 inches of precipitation per year (in/yr). Potential evaporation in the regional area is approximately 91 inches per year.

Precipitation and Evapotranspiration

Monthly precipitation data was sourced from the Helvetia Santa Rita NOAA station, which was located adjacent to Project (31° 52’N and 110° 47’E) at an elevation of 4,300 ft amsl. Precipitation and temperature records span a 34-year period from 1916 to 1950 (Piteau, 2022a). Average annual precipitation is 19.73 in/yr.

Evaporation data was taken from the Nogales Pan Station. Annual pan evaporation rates at the Nogales station are 91.2 in/yr. The Climate Engine web application was used to substantiate pan evaporation rates, identifying a potential evapotranspiration (PET) range of 89.3 in/yr – 101.1 in/yr across the Project area after a pan factor of 0.7 was applied (Climate Engine, 2021). Climatic variability is considered in the sensitivity analysis performed on pit lake analyses.

Average monthly precipitation and pan evaporation are listed in Table 2.1 and shown in Figure 2.2.

Table 2.1: Average monthly precipitation and pan evaporation

Month	Helvetia Precipitation. (in) (1916-1950)	Nogales Pan Evaporation. (in)
January	1.58	3.59
February	1.72	4.46
March	1.14	7.01
April	0.52	9.35
May	0.28	11.91
June	0.67	13.31
July	4.05	10.00
August	4.15	8.28
September	2.19	8.06
October	0.68	7.17
November	1.22	4.49
December	1.52	3.57
Total	**19.73**	**91.20**

Precipitation and Pan evaporation values provided by Piteau (2022a).

2.2 Surface Water

All Project mining areas and facilities are in the upper reaches of minor tributaries. There is very minimal contributing catchment up-slope of the site. Stream flows in the region are limited to rainfall runoff and are extremely variable. They range from zero during dry periods to short peaks of several tens of thousands of cubic feet per second (cfs) during monsoon events. The variability in stream flow coincides with the range of weather systems that occur in southern Arizona, including intense short-duration summer monsoonal storms, early fall cyclonic storms with wide-spread, high-intensity precipitation events, winter frontal storms, and runoff of winter snow melt.

At a broader regional level, the Project area general sits within two stream basins: the Rillito Basin to the east and the Upper Santa Cruz Basin to the west (Figure 2.3). The crest of the Santa Rita Mountains is the dividing line between these two basins. Within these basins, the principal surface drainages are the Santa Cruz River, Davidson Canyon Stream and Cienega Creek (Figure 2.3).

In the immediate vicinity of the Project area, the ground surface is cut by numerous named and unnamed dry washes, arroyos, gulches, and small canyons (Figure 2.4). Despite the variety of words used to describe to these features, they all are ephemeral drainages that convey surface water runoff resulting from higher intensity precipitation events. They are dry almost year-round.

2.3 Geology

The Project area contains a sequence of Proterozoic metasediments and intrusive rocks overlain by Paleozoic carbonate rocks, quartz sandstone, siltstone, Mesozoic sedimentary and igneous rocks, and Cenozoic Basin-Fill formations and igneous rocks. Granitic intrusive and felsic volcanic activity dominated the late Cretaceous and early Eocene period, which was associated with the emplacement of porphyry copper deposits of this region. Post-mineralization, low angle extensional faulting has been significant throughout this region. For example, the Rosemont deposit has been rotated and dismembered by post-mineral low angle detachment faulting, almost entirely obliterating the structural relationship between the mineralized hosts and the mineralizing stock.

A thorough discussion on the geology of the region surrounding the Project area is provided in Piteau (2022a). Regional and Project scale geologic maps are shown in Figures 2.5 through 2.7.

Geologic Units

The principal geologic units found in the open pits are shown on Figures 2.5 through 2.7 and described as follows:

- Younger Alluvium of Holocene age which occurs as unconsolidated sediments along the floodplains of the ephemeral washes that are actively being incised.
- Older Alluvium of Late Pleistocene age which occurs as weakly consolidated gravel terraces consisting of medium- to thick-bedded, sandy, pebble-cobble gravel with rare boulders.
- Gila Conglomerate of Pliocene-Miocene age which occurs as medium- to thick-bedded, conglomerate, pebbly sandstone, and sandstone with a calcareous matrix. The clasts consist of granitic rocks, quartzite, limestone, argillite, and rhyolite ash-flow tuff.
- Basin-Fill deposits of Quaternary and Tertiary age, which are poorly permeable in the Project area and moderately permeable toward the deeper parts of the Cienega and Upper Santa Cruz basins.
- Paleogene to Upper Cretaceous Intrusive and Extrusive Rocks. Intrusive stocks and porphyry cut Paleozoic – Mesozoic rocks and are associated with copper mineralization when adjacent to Paleozoic limestones (Anzalole, 1995).
    - Helvetia Granite (Paleocene) consisting of medium- to coarse-grained quartz diorite and medium- to coarse-grained granodiorite to quartz monzonite composition stocks.
    - Quartz-feldspar porphyry (Upper Cretaceous to Paleogene) consisting of felsic porphyry dikes and stocks.

- Andesite Porphyry (Upper Cretaceous to Paleogene) consisting of strongly altered, fragmental, fine-grained plagioclase porphyritic andesite or intrusive porphyry.

- Bisbee Group, Mesozoic sedimentary rocks (Lower Cretaceous). These sedimentary rocks unconformably overly Paleozoic rock on "an irregularly eroded surface" (Darton, 1925). These units are present east of the Santa Rita ridgeline and have been cut by complex northwest and northeast faulting and fracture systems.
  - Willow Canyon Formation consisting chiefly of poorly permeable felspathic sandstones and arkosic conglomerate with minor mudstone, silty limestone strata, and andesite flows.
  - Glance Conglomerate consisting of a pebble to boulder conglomerate, locally containing marble and quartzite.

- Paleozoic sedimentary rocks are generally exposed in the Project area near the ridgeline of the Santa Rita Mountains and include:
  - Rainvalley Formation (Permian) consisting of gray, medium- to thick bedded limestone with minor sandstone and siltstone.
  - Concha Limestone (Permian) consisting of medium- to thick-bedded, massive to planar-laminated, amalgamated limestone, and cherty limestone, grading to sandy and dolomitic near the base of the formation.
  - Scherrer Formation (Permian) consisting chiefly of light gray to pink, fine-grained, massive, silty quartzose sandstone with rare laminations.
  - Epitaph Formation (Permian) consisting of a mixed siliciclastic-carbonate unit. The carbonates consist chiefly of limestone, marble, dolomite with local gypsum or anhydrite. The siliciclastic units are thin- to medium-bedded siltstone and silty mudstone, and fine-grained, laminated sandstone.
  - Colina Limestone (Permian) consisting of medium- to thick bedded limestone, marble, dolomite originally consisting of micritic and skeletal wackestone.
  - Earp Formation (Permian-Pennsylvanian) A mixed siliciclastic-carbonate unit consisting of thin- to medium-bedded, planar-laminated siltstone, silty mudstone, and very fine-grained sandstone that is intercalated with light gray to pinkish gray, thick-bedded, micritic limestone and skeletal wackestone.
  - Horquilla Limestone (Pennsylvanian) consisting of thin- to thick-bedded silty limestone and dolomite with shale interbeds more abundant higher in the section.
  - Escabrosa Limestone (Mississippian) consisting of medium- to thick-bedded marble with dolomitic limestone present in the lower portion.
  - Martin Limestone (Devonian) consisting of dolomitic marble, tan sandstone, and shale.

- Abrigo Formation (Cambrian) consisting of thin- to medium-bedded laminated limestone with siltstone interbeds. Locally, the unit has partly been metamorphosed to calc-silicate hornfels that form resistant outcrops with recessive thin beds, lenses, and laminations (Darton, 1925).
- Bolsa Quartzite (Cambrian) consisting of medium- to fine-grained, thick- to medium-bedded quartzite or quartzose sandstone, arkosic sandstone, and quartzose conglomerate.

- Precambrian granitic intrusives including the Continental Granodiorite (local in the Project area) consisting of extensive masses of coarse-grained and porphyritic alkali granite, quartz monzonite, or granodiorite. Quartz monzonite of Precambrian age is exposed west of the Santa Rita ridgeline and extends beneath the Paleozoic rocks towards the east.

Geologic Structure

The structure of the Project area is very complex. Most of the host rocks at the Rosemont deposit dip steeply (approximately 55 to 65 degrees) to the east. The principal faults in the area include the nearly horizontal Flat fault and the younger north-striking Backbone fault system. The Flat fault places mostly Mesozoic sedimentary rocks over the older Paleozoic units. The post-mineral Backbone fault system defines the western boundary of the Rosemont ore deposit and separates the mineralized, Paleozoic limestone units on the east from the Proterozoic granodiorite and lower Paleozoic quartzite on the west. The Peach-Elgin deposit is underlain by a thrust fault that juxtaposes Paleozoic and Mesozoic sediments and late-Cretaceous-Paleocene quartz-latite porphyry over Precambrian granodiorite (Anzalone, 1995). The thrust fault has been largely or wholly eroded in the Heavy Weight, Copper World and Broadtop Butte deposits' areas.

No evidence exists in the Project area of recent fault activity that cross cuts Quaternary or Holocene talus, colluvium, alluvial fan, or terrace gravels; these alluvial formations typically mask the underlying, older fault contacts where faults are present (Ferguson et al., 2009).

2.4 Hydrogeology

Groundwater is found across the Project a few 10s to 100s of feet below ground surface (ft bgs). Groundwater flow regimes are aligned with hydrographic boundaries, with groundwater west of the Santa Rita ridge (Satellite pits, TSF, HLP) flowing towards the Santa Cruz river, and east of the ridge (Rosemont, Broadtop Butte Pits) towards Cienega Creek (Figure 2.8).

Principal controls on groundwater flow across the Project are the bedrock geologic framework, associated contacts, deformation and faulting. All the bedrock geologic units are poorly conductive and have low porosity. As such they are generally classified as aquitards. The contacts, deformation and faulting collectively combine to create additional discontinuity and compartmentalization of the bedrock system. The bedrock recharge regime is also very limited due to high runoff and very low infiltration capacity. Hence, the bedrock hydraulics, in combination with low recharge, results in limited bedrock groundwater. In the Project area there are local stringers of alluvium in the bases of the canyons. At the range front beyond the Project limits the Basin-Fill geology sequences gradually covers the bedrock and gradually thicken. The degree of interaction between bedrock and Basin-Fill is very small due to the limitations within the bedrock system described above.

Geologic formations that crop out in the Project area include Alluvial deposits, Basin-Fill deposits, Cretaceous to Tertiary extrusive and sedimentary rocks, Cretaceous to Tertiary intrusive granitic rocks, Mesozoic and Paleozoic sedimentary rocks, and Precambrian granitic rocks.

In localized zones of bedrock modest amounts of production in the Project area are occasionally experienced due to local conductive fractures that are open. These generally coincide with geologic contacts, deformation zones or faults. However, site hydraulic testing and the piezometer data collectively show that any conductive fracturing is localized and discontinuous.

A brief description of pit-scale hydrogeology is provided in the following sections. A thorough discussion on the hydrogeology of the Project area is provided in Piteau (2022a). A plan map showing the locations of hydrogeologic cross-sections is provided in Figure 2.9.

Peach and Elgin Pits

The rocks in the vicinity of the Peach and Elgin Pits include Granodiorite, Paleozoic sedimentary, and Qmp. Tertiary sedimentary units are present just west of each pit but are not expected to be exposed in the pit walls (Figure 2.10, Figure 2.11).

Granodiorite will be exposed in the bottom portion of Peach Pit in the southern portion of Elgin Pit. The Paleozoic sedimentary rocks that will be intercepted by the pits include Bolsa, Abrigo, Martin, Escabrosa, Horquilla, Epitaph, and Concha Formations. None of the geologic units are expected to produce significant groundwater during proposed mining. The Flat Fault and several unnamed lower order faults are found within the Peach and Elgin Pit areas. Any local scale groundwater occurrence would most likely coincide with some of these.

The proposed final floor of the Peach Pit is 3,950 ft amsl and the proposed bottom of the Elgin Pit is 4,050 ft amsl. The potentiometric surface at 20 monitoring locations in the Peach-Elgin area ranges from 4,107 to 4,324 ft amsl. It’s evident from the piezometer data that some of these levels are locally perched, decoupled and poorly interconnected. Groundwater gradients across the two pit areas is in the west-southwest to northwest direction. Horizontal gradients vary from 0.05 to 0.11

ft/ft. Vertical gradients range from essentially zero to 0.33 ft/ft directed downward. The variable piezometric levels and gradients reflect discontinuity, perched and de-coupled groundwater, compartmentalization, and lack of active groundwater movement in the system.

Heavy Weight Pit

The Heavy Weight Pit geology is relatively simple, consisting of Granodiorite in the bottom and southeast half of the pit and Qmp in the northwest half of the pit (Figures 2.12 and 2.13). The Qmp intrudes the other units. A thin sliver of Concha Limestone sits between the Granodiorite and the Qmp.

The proposed final floor of the Heavy Weight Pit is 4,350 ft amsl. Groundwater levels vary across the site reflecting the topographic grade and low bulk hydraulic conductivity of the system. Piezometer data indicate groundwater levels ranging from 4,626 ft amsl in up-gradient areas to 4,430 ft amsl in the local down-gradient areas toward the east. Horizontal gradients vary from essentially hydrostatic at the potentiometric high on the north side of Heavy Weight Pit to 0.25 ft/ft on the west side of the Copper World Pit. Vertical gradients range from 0.03 ft/ft to 0.35 ft/ft directed downward. As with other parts of the site, the variable gradients reflect discontinuity, compartmentalization, low bulk scale conductivity and district topography.

Copper World Pit

The units exposed in the Copper World Pit include Precambrian and Paleozoic sedimentary rocks (Figures 2.12 and 2.13). Granodiorite will be exposed in the bottom and west wall of the Copper World Pit. This unit underlies the Bolsa, Abrigo, Martin, Horquilla, Earp, Epitaph Formations that are present in the east wall of the proposed pit. The two major structures present in the Copper World Pit include the Leader Fault and the Backbone Fault. It is expected that any productive fracturing along the Backbone Fault zone if present, would be locally limited. However, if any connection along strike were present then a gradient toward the Rosemont Pit area may develop in the longer term.

The proposed final floor elevation of the Copper World Pit is 4,450 feet amsl to the north and 4,500 ft amsl to the south. The depth to water measured at 18 monitoring locations in and around the Copper World Pit and surrounding WRF area ranges from 31 to 422 ft bgs. The potentiometric surface elevation ranges from 4,331 to 4,740 ft amsl. Groundwater levels show discontinuity and are influenced by topographic grades, sub-vertical geologic fabric, associated barriers, low bulk conductivity and lack of recharge. The inferred gradient across the Copper World Pit is mainly toward the northwest. Horizontal gradients range from essentially zero at the potentiometric high on the north side of Heavy Weight Pit to 0.25 ft/ft on the west side of Copper World Pit. Vertical gradients range from 0.03 ft/ft to 0.35 ft/ft directed downward, again, influenced by topography, the elevated position of the mining area and geologic fabric.

Broadtop Butte Pit

The rock units exposed in the Broadtop Butte Pit include Precambrian intrusive rocks, Paleozoic sedimentary rocks, Mesozoic sedimentary rocks, and Tertiary intrusive rocks (Figures 2.14, 2.13 and 2.19). Granodiorite will be exposed in the bottom and west wall of the southern extensions of the Broadtop Butte Pit. This unit underlies the Paleozoic units. The Paleozoic sedimentary rocks that will be exposed in the pit include Bolsa, Abrigo, Escabrosa, Epitaph, and Scherrer Formations. These are present in the east wall of the southern pit and portions of the northern pit. These units dip steeply eastward.

Tertiary-aged Qmp is the dominant unit in the north extension of the Broadtop Butte Pit. It intrudes all other units, but is not present in the bottom of the pit. Mesozoic sedimentary rocks including the Willow Formation and the Glance Conglomerate, are found in the southern and eastern portion of the northern pit. These units dip moderately steeply eastward. Several major structures are associated with the Broadtop Butte Pit area including Gunsight Notch Fault, Backbone Fault, South Broadtop Fault, the Graben Fault, and Broadtop Footwall Thrust Fault.

The floor of the proposed Broadtop Butte Pit is 4,850 ft amsl in the north, and 5,200 ft amsl in the south. The depth to water measured at seven (7) monitoring locations in the Broadtop Butte Pit and surrounding WRF reflects the abrupt and steep topography, low bulk conductivity of the geologic units and the strong discontinuity created by the framework of contacts and faults. The range of groundwater levels illustrates the lack of connection and ability for groundwater movement or drainage in the area.

The potentiometric surface elevation ranges from 5,016 to 5,409 ft amsl. The upper ranges appear perched and de-coupled, based on comparison to deeper nearby piezometers. This is expected for the location. The more elevated groundwater levels to the north also appear to reflect an isolated and de-coupled compartment. Horizontal gradients in the Broadtop Butte Pit and WRF area reflect the above-described conditions. They range from essentially zero at the groundwater high in the north end of the pit to 0.23 ft/ft. Vertical gradients range from 0.30 to 0.76 ft/ft directed downward.

Rosemont Pit

The principal rock units in and surrounding the Rosemont Pit area are illustrated in Figures 2.15, 2.16 (plan map), and 2.17 and are summarized below as follows:

- Heavily folded and offset Paleozoic sedimentary rocks including Bolsa, Abrigio, Martin, Escabrosa, Horquilla, Earp, Colina, Epitaph, Scherrer, Concha and Rainvalley Formations.
- Mesozoic sedimentary rocks including the Willow Canyon Formation and the Glance Conglomerate.
- Tertiary andesite and Quartz Monzonite Porphyry underneath and intruding the Willow Canyon Formation and upper Paleozoic section.
- Gila Conglomerate, mainly in the shallower parts of the southeast pit sectors.

Geologic structure is dominated by the steep dipping Backbone Fault complex which forms a series of northwest striking features. A set of secondary major faults strike northeast and appear truncated by a strong set of east-west faults toward the north limits of the pit area. The northwest, northeast and east-west striking faults combine to create a strong set of bounding features at the margins of the open pit.

Hydraulic testing in the proposed pit area indicate generally low bulk hydraulic conductivity and minimal fracturing or interconnection over significant distance. The major bounding structures and the complex geometry of steep dipping geologic contacts within the mining footprint, will create strong compartmentalization and domain limitations, within the immediate open pit area. The structural system and broader geologic framework will further limit interconnection to the broader system.

The proposed final floor elevation for the Rosemont Pit is 3,650 ft amsl. Depth to groundwater measured at 16 monitoring locations in the proposed pit vicinity range from 11 to 338 ft bgs and the potentiometric surface elevation ranges from 5,017 to 5,179 ft amsl. Groundwater level variability reflects strong topographic grades, bedrock compartmentalization and low bulk hydraulic conductivity. Groundwater gradients across the pit are generally toward the east and west reflecting the lack of hydrogeologic catchment associated with the site and presence of a natural divide. Horizontal gradients in the pit area range from 0.21 ft/ft on the southwest side and essentially zero on the north side. The horizontal gradients away from the pit range from 0.07 ft/ft towards the northwest and 0.06 ft/ft towards the east. The gradients reflect significant discontinuity in the groundwater system in the open pit area.

3 GEOCHEMICAL DATA REVIEW

The geochemical sampling programs summarized in this report were reviewed in context of the geologic units present within the Project area and the distribution of calcium and sulfur abundances within the materials that will be mined. Based on the available information, which includes general geology (lithology, mineralization and alteration styles), few rocks in the proposed Project have the potential to produce ARD and they also occur in minor quantities. Exceptions may include localized non-calcareous portions of the arkose and andesite units of the Cretaceous Bisbee Group, higher sulfide portions of the porphyry, and rare lenses of massive sulfide skarn alteration. The deposits within the planned open pit areas consist of three general types of geologic materials:

1. ***Limestone / skarn units***. These geologic units possess high neutralization capacities several times greater than acid-generating potential (AP). Some localized skarn materials possess higher sulfur contents, but not to the extent to sustain ARD. Limestone / skarn geologic units comprise approximately 50% of mined materials and include the Abrigo, Concha, Earp, Epitaph, Escabrosa, Horquilla, Martin and Scherrer geologic units (Figure 3.1).
2. ***Sedimentary units***. These geologic units possess lower neutralization capacity than the limestones, but on a sitewide scale they remain net neutralizing. Minor localities of sedimentary units may produce ARD, with limited release of metals, but this is associated with low neutralizing potential (NP) rather than increased sulfide content. Sedimentary units comprise ~12% of the mined material and consist of the Arkose, Gila, Glance, and Bolsa Quartzite units.
3. ***Igneous units***. These geologic units also possess net neutralizing capacity despite their igneous origin. ABA derived NP quantities indicate that nearly every sample possesses measurable carbonate, with a median NP value of 46 ($tCaCO_3/kt$). These units consist of Andesite, Granodiorite, and Qmp and comprise ~38% of mined material.

The geochemical data collection program followed Phase I and Phase II characterization guidelines for rock materials, tailings, ore, and groundwater as outlined in the BADCT (Tetra Tech, 2007a; Tetra Tech 2007b; Tetra Tech, 2010c; Rosemont Copper Company, 2014; Geochemical Solutions, 2017). Sample collection and characterization occurred from 2006 through 2010 and was focused on materials within the Rosemont Pit. A total of 358 applicable samples were collected, of which 107 samples were subjected to further leachate analysis (MWMP or SPLP tests, note 24 samples were tested for both). Phase II kinetic testing, consisting of HCT and columns, emphasized PAG materials, such as Andesite, Bolsa Quartzite, and mineralized skarn units. Sample locations reside entirely in the Rosemont Pit, which was the only mining target of previous studies (Figure 3.2). A summary of samples and tests performed by geologic unit is provided in Table 3.1.

Table 3.1: Samples and testing by geologic units

Geologic Unit	Whole Rock Elemental Assay	ABA Testing	SPLP	MWMP	HCT	Column
ABRIGO	4	9	5	-		
ANDESITE	18	44	5	7	8	3
ARKOSE	70	103	9	9	3	
BOLSA	3	17	6	-	2	
COLINA	3	11	4	-		
CONCHA	1	6	1	1		
EARP	8	17	6	-	2	
EPITAPH	9	21	6	-	1	
ESCABROSA	4	11	4	-		
GILA	13	13	1	1	-	-
GLANCE	10	13	1	1		
GRANODIORITE	-	-	-	-	-	-
HORQUILLA	7	30	8	2		
MARTIN	7	12	4	-		
QMP	7	12	3	2		
SCHERRER	3	3	-	-	-	-
OVERBURDEN	4	9	2	2		
Leach Composites	1	1	1	1		
Tailings	17	19	17	14	2	
Unknown	5	7	5	3		1
Total	**194**	**358**	**88**	**43**	**18**	**4**

Source(s): Tetra Tech (2010a, c)

The ratio of NP to AP, the neutralization potential ratio (NPR), was used to classify geologic materials into geochemical units using the common moniker of NAG, PAG, or AG, which are further described in Sections 3.2 and 3.5. ABA testing indicates that all rock units are primarily non-acid generating, with only two (2) samples (0.6% of ABA tests) classified as AG. Source rock materials for Project facilities (i.e. waste rock, pit walls) were characterized using the site wide geologic block model to spatially project lithology and geochemical characteristics, as described in Section 3.1.

3.1 Surrogate AP and NP from Geologic Block Model

Estimates for AP and NP values for mined materials and future pit shells were derived using Hudbay's geologic block model. This approach is commonly applied during the mine planning phase to estimate bulk acid-generating potential of waste materials (INAP, 2014). During active mining, continuous static (ABA) sampling of waste materials validates AP and NP estimates and informs the placement of waste in accordance with the Rosemont waste rock management plan.

Sulfur and Calcium Block Model Estimation

A geologic block model is maintained by Hudbay to represent geologic units, mineralization, and elemental values across the resource. Block models for the Rosemont and Satellite pits are composed of 50’ x 50’ x 50’ cells, spanning both resources. Over 900 exploration boreholes (core holes) and 55,107 assay samples are used to interpolate elemental values across the resource domain (Hudbay, 2022). Exploration borehole locations are shown in Figure 3.3.

The block model uses multiple mineralization domains to krig elemental values for copper, iron, calcium, magnesium, sulfur, etc. across each cell. Each domain utilizes a unique semi-variogram to krig elemental values. Semi-variogram range values (corresponding to the distance of spatial correlation) are between 100 ft – 370 ft. This distance encompasses several block model cells, ensuring that the spatial correlation is applied. Low nugget values used in semi-variograms indicates low internal variability in rock properties, and that measured values are applied to cells.

A good correlation between exploration assay data and the block model’s kriged sulfur and calcium values is the first step in validating the geochemical block model. The block model’s validation between exploration assays and kriged elemental values are shown in Table 3.2. Statistical descriptions of the kriged and observed datasets (at 25 ft composites) are aligned. A visual comparison between the block model and exploration data is provided as cross section in Figure 3.4. Both elements correlate well across the range of observed values. Altogether, these results indicate that the block model accurately represents the distribution of elements within its domains.

Table 3.2: Block model validation for S and Ca

Sulfur

	Count	Min	Max	Mean	Variance
Main Rosemont - Skarn Mineralization (ENVLP = 5-11)					
25´Composites	3500	0.0	9.3	0.49	0.8
NN Model	125756	0.0	9.3	0.57	1.0
OK Model	125756	0.0	6.7	0.57	0.4
Peach & Elguin - Skarn Mineralization (ENVLP = 12)					
25´Composites	658	0.0	5.2	0.33	0.2
NN Model	23062	0.0	5.2	0.36	0.2
OK Model	23062	0.0	2.3	0.38	0.0
Peach & Elguin - Porrphyry Mineralization (ENVLP = 13)					
25´Composites	207	0.0	1.9	0.31	0.1
NN Model	3363	0.0	1.9	0.37	0.1
OK Model	3363	0.0	1.1	0.37	0.0
Copper World - Skarn Mineralization (ENVLP = 14)					
25´Composites	248	0.0	18.1	0.74	3.8
NN Model	6118	0.0	18.1	0.88	4.1
OK Model	5415	0.0	3.2	0.63	0.2
Broadtop Butte - Skarn Mineralization (ENVLP = 15)					
25´Composites	286	0.0	7.8	0.65	0.8
NN Model	5415	0.0	7.8	0.58	0.5
OK Model	5415	0.0	3.2	0.63	0.2
Broadtop Butte - Porrphyry Mineralization (ENVLP = 16)					
25´Composites	566	0.0	4.7	0.21	0.1
NN Model	7268	0.0	4.7	0.28	0.2
OK Model	7268	0.0	1.9	0.26	0.0
Bolsa - Porrphyry Mineralization (ENVLP = 17)					
25´Composites	250	0.0	16.3	0.33	2.1
NN Model	7961	0.0	16.3	0.53	5.2
OK Model	7961	0.0	15.4	0.61	1.8

Calcium

	Count	Min	Max	Mean	Variance
Main Rosemont - Skarn Mineralization (ENVLP = 5-11)					
25´Composites	3500	0.0	39.9	15.4	88.9
NN Model	125751	0.0	39.9	16.1	91.8
OK Model	125751	0.0	37.1	16.1	56.2
Peach & Elguin - Skarn Mineralization (ENVLP = 12)					
25´Composites	658	0.0	36.6	11.8	51.9
NN Model	23062	0.0	36.6	9.9	54.9
OK Model	23062	0.0	29.0	10.3	23.2
Peach & Elguin - Porrphyry Mineralization (ENVLP = 13)					
25´Composites	207	0.3	32.4	3.6	31.5
NN Model	3363	0.3	32.4	3.1	19.1
OK Model	3363	0.5	22.0	3.1	7.8
Copper World - Skarn Mineralization (ENVLP = 14)					
25´Composites	248	0.0	25.1	13.7	64.2
NN Model	6118	0.0	25.1	13.2	69.7
OK Model	6118	0.0	23.6	13.2	36.8
Broadtop Butte - Skarn Mineralization (ENVLP = 15)					
25´Composites	286	0.1	32.1	9.8	63.1
NN Model	5415	0.1	32.1	12.5	64.2
OK Model	5415	0.4	26.7	12.4	16.9
Broadtop Butte - Porrphyry Mineralization (ENVLP = 16)					
25´Composites	566	0.0	24.2	1.5	11.1
NN Model	7268	0.0	24.2	2.1	18.4
OK Model	7268	0.1	18.7	2.0	7.1
Bolsa - Porrphyry Mineralization (ENVLP = 17)					
25´Composites	250	0.0	25.1	7.0	55.8
NN Model	8114	0.0	25.1	9.9	67.4
OK Model	8114	0.0	23.2	9.7	42.0

NN: Nearest Neighbor interpolation
OK: Ordinary Kriging interpolation

AP and NP Block Model Estimation

Elemental sulfur and calcium from the block model are surrogates for AP and NP, respectively. AP is estimated by multiplying elemental sulfur by conversion factor of 31.25 to calculate AP, shown equation 3.1.

$$AP\left(CaCO_3\frac{T}{kT}\right) = S\% * 31.25 \qquad (3.1)$$

The AP calculation is predicated on the relationship between pyritic sulfur and acid-generating potential. However, the block model utilizes total sulfur and does not distinguish between sulfur species. Therefore, two questions should be satisfied when using the block model's elemental sulfur to estimate AP.

- How does elemental whole rock sulfur (ICP sulfur) correlate with ABA total sulfur?
- How does ABA total sulfur correlate with ABA pyritic sulfur?

Elemental whole rock sulfur strongly correlates to measure ABA total sulfur at the Project. A comparison of 100 ABA samples with corresponding elemental sulfur ICP data had a squared Pearson correlation coefficient (R^2) correlation coefficient of 0.992 (Figure 3.5).

ABA total sulfur is always equal to or greater than pyritic sulfur because it encompasses sulfate and non-extractable sulfur components. Therefore, applying total sulfur to calculate AP will tend to overestimate the actual acid-generating potential of rock materials. A comparison of ABA data confirms that although most sulfur speciation is pyritic, utilizing total sulfur is always greater across all rock types (Figure 3.5).

The NP calculation is estimated by multiplying elemental whole rock calcium by a conversion factor of 25, as shown in Equation 3.2.

$$NP\ (CaCO_3 \frac{T}{kT}) = Ca\% * 25 \tag{3.2}$$

The NP calculation is derived from the relationship between calcium and carbonate (calcite), and is subject to greater variability than sulfur. Calcium may be associated with alumino-silicate minerals (ie. feldspars) which have no carbonate input. Additionally, carbonate buffering can be a result of dolomite or other carbonate minerals (i.e., siderite) which are not measured by whole rock calcium. Therefore, the application of a calcium surrogate for NP needs site specific testing for validation. Questions which should be considered when using whole rock calcium as the NP surrogate include:

- How does elemental whole rock calcium correlate with measured NP?
- Is the elemental whole rock calcium relationship consistent across different rock materials (i.e. carbonates and silicate rocks)?

Because the Project consists primarily of limestone and skarn materials, whole rock Ca is anticipated to correlate with NP. The relationship for whole rock calcium and NP is shown in Figure 3.6. A good correlation for rock materials occurs across a broad suite of calcium percentages (R^2 = 0.91). Rock materials with lower calcium percentages still correlate with Equation 3.2 (R^2 = 0.73), although less well.

Evaluation of NP for limestones confirms a good correlation (R^2 = 0.77), and that the influence of dolomite may be present. The current calculation under predicts NP if dolomite occurs, potentially in the Martin formation. NP correlates well with intrusive and clastic rock types (R^2 = 0.97).

Block Model Summary

In summary, the correlation between ABA data and whole rock chemistry supports using the block model as a tool for estimating AP and NP. The block model is anticipated to overpredict AP because of its use of total sulfur and underpredict NP for limestone materials that may contain dolomite. A summary of AP and NP characteristics developed by the block model is provided in Table 3.3.

Table 3.3: Sulfur and Calcium summary of Project geologic units

Geologic Unit	Percent of Total Mined Material (%)	Average S (%)[1]	Estimated AP ($tCaCO_3/kt$)[2]	Average Ca (%)[1]	Estimated NP ($tCaCO_3/kt$)	Estimated NPR
ABRIGO	6	0.26	8.1	17.3	432.0	53.2
ANDESITE	20	0.23	7.2	3.2	81.2	11.3
ARKOSE	4	0.12	3.8	3.6	89.6	23.5
BOLSA	6	0.23	7.1	5.6	138.8	19.5
CONCHA	<1	0.51	15.9	8.7	217.5	13.7
EARP	5	0.30	9.5	16.3	406.4	43.0
EPITAPH	5	0.38	11.8	11.5	288.5	24.4
ESCABROSA	3	0.11	3.4	25.5	637.9	189.8
GILA	1	0.10	3.0	9.3	233.7	77.2
GLANCE	7	0.27	8.4	19.7	492.2	58.8
GRANODIORITE	6	0.22	6.8	3.1	78.0	11.4
HORQUILLA	14	0.32	10.0	20.2	505.6	50.5
MARTIN	4	0.26	8.3	20.3	507.3	61.5
QMP	11	0.56	17.6	4.2	105.6	6.0
SCHERRER	5	0.75	23.4	16.9	422.6	18.0

[1] Derived from Rosemont Copper World Project block model

[2] Assumes all sulfur content is pyritic sulfur

Rock materials mined from the Project are ~94% NAG, utilizing the block model classification. Each rock unit is anticipated to be characterized as NAG. Minor quantities of AG (<1%) and PAG (~ 6%), which are relatively small, are projected by the block model (Figure 3.7). Uncertainty in the block model's predictive capability for NP and AP is overshadowed by the overall abundance of calcium (and related carbonates) in the rock materials themselves. Minor variability in the block model is not expected to affect the overall nature of the deposits. Real time bench scale sampling should be conducted during mining to confirm the block model and ensure that the minor fraction of AG material is encapsulated according to the Rosemont waste rock management plan.

The breadth of the geochemical sampling program spanned NP and AP content across most rock units that occur in all six proposed pits (Figure 3.8). This indicates that sufficient samples have been taken to characterize NAG, PAG, and AG materials for each geologic unit.

Greater emphasis was placed on PAG materials (sedimentary and igneous units) which typically possess lower carbonate content. Andesite, Arkose, and Bolsa units were sampled extensively owing to their abundance and potential risk in the Rosemont Pit. In some instances, such as Granodiorite and Gila, these units were not sampled owing to the very minor volume found in the Rosemont deposit. The Gila comprises ~1% of all materials. At the time of the sampling plan

(2006-2010), Granodiorite comprised <1% of materials; in the current Rosemont Copper World Project it comprises ~6% (Tetra Tech, 2007a).

Some limestone geologic units were sampled less frequently owing to the geochemical similarity among the limestone / skarn materials. These include the Abrigo, Concha, and Scherrer units, which are all characterized as NAG materials (NPR >3) and share similar calcium distributions with other limestone units (Figure 3.8).

A detailed analysis comparing the geochemical dataset by rock type and pit location is provided in Appendix A.

3.2 ABA Data Summary

Each rock sample collected received ABA testing (Sobek et al, 1978) to compare the acid generating and acid neutralizing potential of the material as part of Phase I characterization (ADEQ, 1998). Acid generation is determined from the abundance of sulfide sulfur and the acid neutralization capacity (i.e. calcite content) is measured through consumption of carbonate by HCl addition and subsequent back-titration with NaOH to quantify the mass of carbonate consumed in the reaction.

State and industry guidance uses two metrics, neutralization potential ratio (NPR) and net neutralizing potential (NNP), to predict the acid-generating potential of materials through ABA tests. NPR is defined as the ratio of neutralizing potential / acid potential (Equation 3.3). NNP is defined as the difference between neutralizing potential and acid potential (Equation 3.4). When neutralizing potential and acid potential are equal, the NPR = 1 and NNP = 0. Applying the NNP criteria is helpful to constrain materials with low NP and AP values, such as igneous rocks, where fractions of neutralizing capacity and/or acid-generating minerals may be sequestered and unreactive.

$$NPR = {}^{NP}/_{AP} \tag{3.3}$$

$$NNP = NP - AP \tag{3.4}$$

Geologic materials are classified into three groups based on NPR and NNP as follows:

- **NAG (or net-acid consuming)**: These materials possess an NPR > 3.0 and an NNP > 20. They produce neutral leachates with constituent concentrations that are generally not above AWQS. Occasional constituents are elevated at first flush, but generally decline in concentrations with time (INAP, 2014). These materials provide neutralizing capacity to offset more acidic leachates. The State of Arizona has indicated that materials with high neutralization capacity and low sulfur content (<0.3%) are considered inert (ADEQ, 1998).
- **PAG**: These materials possess an NPR between 1.2 to 3.0 and an NNP between -20 to 20 $tCaCO_3$ / kt. They generally are not acid-generating, although materials with low

NP and AP values may produce some acidity, typically associated with lower metal release rates. These materials may not provide significant neutralizing capacity.

- **AG**: These materials possess an NPR < 1.2 and an NNP of < -20 $tCaCO_3$ / kt. These materials are most likely to be acid generating.

PAG materials occur within the Bolsa, Andesite, Qmp, and Arkose materials (Figure 3.9 and Figure 3.10). Only 2 individual rock samples meet AG criteria which are Andesite and Bolsa Quartzite (Table 3.4). Several samples of Andesite and Bolsa Quartzite may be considered AG based on NPR criteria alone but possess low quantities of NP and AP (Figure 3.9). If such materials produced acid leachate, the quantity would be limited by the amount of available sulfide to oxidize. Lower bound ratios of NP to AP in Andesite remains near 1:1 across the samples with measurable amounts of sulfides, which further supports the emplacement of carbonate minerals from surrounding skarn material associated with mineralization.

All the limestone / skarn samples are acid neutralizing, possessing very high NPR and positive NNP values.

The complete ABA dataset is provided in Appendix B.

Table 3.4: ABA Summary by geologic unit

Geologic Unit	Average Pyritic Sulfur	Average AGP	Average ANP	NAG (acid consuming)		PAG		AG	
	%	$tCaCO_3$ / kt	$tCaCO_3$ / kt	Count	%	Count	%	Count	%
ABRIGO	0.01	0.37	531.4	9	*100%*	-	-	-	-
ANDESITE	0.79	24.75	63.3	22	*50%*	21	*48%*	1	*2%*
ARKOSE	0.16	4.85	98.9	67	*65%*	36	*35%*	-	-
BOLSA	0.23	7.19	7.35	-	-	16	*94%*	1	*6%*
COLINA	0.33	10.46	403.4	10	*91%*	1	*9%*	-	-
CONCHA	0.01	0.30	650.2	6	*100%*	-	-	-	-
EARP	0.15	4.63	131.9	16	*94%*	1	*6%*	-	-
EPITAPH	0.05	1.64	539.4	20	*95%*	1	*5%*	-	-
ESCABROSA	0.01	0.33	630.6	11	*100%*	-	-	-	-
GILA	0.02	0.50	36.1	7	*54%*	6	*46%*	-	-
GLANCE	0.01	0.31	665.2	13	*100%*	-	-	-	-
GRANODIORITE	-	-	-	-	-	-	-	-	-
HORQUILLA	0.10	3.08	417.5	30	*100%*	-	-	-	-
MARTIN	0.05	1.41	678.9	12	*100%*	-	-	-	-
QMP	0.01	0.30	21.63	3	*25%*	9	*75%*	-	-
SCHERRER	0.01	0.31	400.3	2	*67%*	1	*33%*		-
OVERBURDEN	0.03	0.80	34.9	4	*44%*	5	*56%*	-	-
Leach Composites	0.06	1.90	53.7	1	*100%*	-	-	-	-
Tailings	0.09	2.97	408.9	17	*89%*	2	*11%*	-	-
Unknown	0.12	3.86	97.3	5	*71%*	2	*29%*	-	-
Average / Total	**0.12**	**3.68**	**314.2**	**255**	***71%***	**101**	***28%***	**2**	***1%***

3.3 MWMP/SPLP Data Summary

Phase I leachate testing was completed using a combination of meteoric water mobility procedure (MWMP) tests and synthetic precipitation leachate procedure (SPLP). The objective of MWMP and SPLP tests were:

- Evaluate the leachate chemistry produced from unweathered rock.
- Identify potential constituents with concentrations above AWQS (ADEQ, 2004).

Leachate chemistries are used to develop chemical release functions (CRF) to simulate mass release rates for geochemical modeling. Given the single rinse nature of the tests, MWMP and SPLP leachates represent first flush chemistry of geologic materials, weathered by products, and accumulated salts.

The MWMP is a leaching test used to evaluate the potential for dissolution and mobility of constituents from mine rock when exposed to meteoric water (ASTM, 2003). The MWMP applies deionized water (pH reduced to approximately 5.5 s.u.) to the solid rock phase at a 1:1 mass ratio in a single-pass column. The application occurs over a 24-hr period (but not longer than 48-hr), after which the leachate is filtered and analyzed.

The SPLP test uses a very weak sulfuric and nitric acid rinse with a pH of 5.0 s.u. to simulate the effects of natural precipitation and uses a water to rock ratio of 20:1. The solid sample and extraction fluid are combined into a sample vessel and agitated for 18 hours. After 24 hours an aliquot of the fluid is collected for testing. Because SPLP testing is conducted at a large water to rock ratio, the resultant concentrations are naturally diluted and may be less than those found under field conditions except for highly soluble and abundant elements. SPLP tests also tend to produce a high number of elements below detection limits. In this sense SPLP tests are better suited to represent surface runoff during precipitation events, where storm event precipitation is several times larger than the infiltration capacity of soils, producing a more dilute effluent.

A total of 43 MWMP tests and 88 SPLP tests were completed for the geochemical dataset (Tetra Tech 2007a; Tetra Tech 2007b; Tetra Tech 2010c; Rosemont, 2014). Resulting leachate chemistry is provided in Appendices C and D, respectively. Key results from leaching tests are discussed as follows:

- Nearly all samples generated circum-neutral pH. Only three samples had a pH <5.0 s.u. (Andesite Col. Leach, Qmp Col. Leach, 1461-01 [Escabrosa]). Both the Andesite Col. Leach and Qmp Col. Leach samples were leach grade ore samples and would be considered extreme representations of potential leachate (Tetra Tech, 2007b).
- Total metals released from MWMP tests were categorized as “high”, with most samples producing between 1 mg/l to 10 mg/l of metal elements (Figure 3.11). Tailings samples systematically had higher pH values. The materials with the highest metal releases were generally Andesite and tailings.
- Total metals released from SPLP tests were categorized between “low” and “high”, with most samples producing near 1 mg/l of metal elements (Figure 3.12). The materials with the highest metals release were tailings and limestone skarns (Horquilla, Martin, and Colina).
- The leachate concentration of major ions (sulfate, calcium, iron, fluoride, and magnesium) correlate with their corresponding whole rock composition (Figures 3.13 through 3.27). Leachate concentrations of these elements have little to no correlation with NPR. However, there are very few samples with NPR values below 1.2.
- Leachable concentrations of minor elements including aluminium, antimony, arsenic, beryllium, cadmium, iron, lead, manganese, and selenium do not correlate with their whole rock chemistry (Figures 3.13 through 3.27). Manganese and copper weakly correlates with NPR, whereas the other elements do not.
- Most samples produced leachates below AWQS. Values above AWQS were generally caused by leach grade ore samples (Andesite Col. Leach, Qmp Col. Leach), which were acidic, and tailings samples which leached sulfate. Discussion of values above AWQS is provided in Table 3.5 and discussed as follows:

- The laboratory detection limit for antimony was consistently above AWQS (Figure 3.17). Resampling performed by Tetra Tech indicated that antimony was below the detection limit of 0.006 mg/l, which was also confirmed by later testing of tailings materials (Tetra Tech, 2010d). Only two (2) samples were confirmed to be above AWQS.
- Fluoride was above AWQS in two (2) samples (leach grade ore and tailings).
- Arsenic was above AWQS in four (4) samples (2x Overburden samples, Arkose, and tailings).
- Beryllium was above AWQS in two (2) samples (2x each grade ore).
- Cadmium was above AWQS in five (5) samples (4x leach grade ore, Bolsa).
- Copper was above AWQS in four (4) samples (4x leach grade ore).
- Lead was above AWQS in eight (8) samples (4x leach grade ore, Arkose, Overburden, Glance, and unknown).
- Selenium was above AWQS in six (6) samples (4x Andesite, Horquilla, and tailings).

SPLP leachate concentrations are systematically lower than MWMP leachate, but not by a factor of 20, which is what would be expected from the difference in water: rock ratios. To account or the differences between SPLP and MWMP test procedures, SPLP leachates were adjusted prior to generating chemical release functions (CRFs) for geochemical mass models using the following approach:

- There were 24 samples where MWMP and SPLP tests were both performed. These samples were used to cross compare element concentrations between tests.
- The residual concentration difference was calculated for each element as:

  $$\left|\mathrm{Log}(X_{MWMP}) \quad - \; \mathrm{Log}(X_{SPLP}) \quad \right| = residual$$

  Logarithms of the concentrations were used to equalize major ions with minor ions. Non-detect values were omitted from the calculation.
- A multiplier was applied to SPLP leachates to normalize their concentrations with MWMPs and reduce the residual error. A least-squares regression fit was applied to minimize the sum of residual error. The overall best-fit multiplier was 4.33, meaning that on average SPLP concentrations are 4.33 times lower than MWMP. This is less than what can be attributed to dilution between the two methods (20:1 vs. 1:1). Lower SPLP solute concentrations are thus likely due to a combination of:
  - The difference in water to rock rinsing ratios
  - The residence time of fluids with rock materials
  - The abundance of readily soluble minerals in rock materials and

- Non-detect values were assigned one-half the typical laboratory detection limit.

A cross-plot of MWMP versus SPLP results (after the multiplier was applied) is provided in Figure 3.28. The scaling of SPLP data aligned measurable leachate concentrations to within +/- Log 15% of MWMP values and produced an R^2 value of 0.70.

Table 3.5: Summary of leach test results

Element	AWQS	Number of Samples Above AWQS	Percentage of Dataset
	%		%
Antimony	0.006	2	2%
Arsenic	0.05	0	0%
Barium	2	0	0%
Beryllium	0.004	2	2%
Cadmium	0.005	5	4%
Chloride	250	0	0%
Copper	1	4	3%
Fluoride	4	2	2%
Lead	0.015	8	6%
Mercury	0.002	0	0%
Nitrogen, Total as N	10	0	0%
Selenium	0.05	5	4%
Thallium	0.002	0	0%
Uranium	0.03	0	0%
TDS	500	13	10%
Zinc	5	1	1%

3.4 Kinetic Data summary

Kinetic testing is a part of ADEQ's Phase II characterization and consists of HCT and Column Tests (ADEQ, 2004). The objectives of kinetic testing are:

- Induce accelerated oxidation and weathering reactions to mimic field conditions.
- Provide a basis to evaluate rates of sulfide oxidation and metals leaching.
- Further characterize the acid-generating potential of PAG and AG rock materials following ABA testing.

HCTs are particularly applicable to active mining or post-mining environments where rock materials are freshly exposed to atmospheric oxygen and moisture. Laboratory conditions create an accelerated oxidizing environment by cycling exposures of dry and humid air before flushing with water. While leach tests are conducted over a short, fixed period of time, kinetic testing is conducted over a much longer period of time and across multiple flushing episodes of rock materials.

Humidity cell tests were conducted on 18 samples, primarily consisting of PAG or AG rock materials (Andesite, Bolsa, Arkose). HCTs were approximately 1 kilogram in weight and rinsed with ~ 0.75 L of water in accordance with industry standardized test procedures (ASTM, 1996). The tests were run on weekly cycles with dry and wet periods of three days each, followed by a leaching day. Leaching was conducted with a method-specified quantity of distilled water to insure removal of reaction products. The humidity cells were run for a maximum of 35 weeks. A summary of HCT results is provided in Table 3.6. Weekly chemistry summaries are provided in Appendix E. Key results from HCT testing are as follows:

- Only 2 of the 18 samples, both of which were Bolsa Quartzite (A780-02 Composite, A780-03 Composite) produced acid-leachate (Figure 3.29). These samples consisted of very low NPR values (0.1 and 0.33), primarily due to the absence of neutralizing minerals (NP = 1 and 3 ($tCaCO_3$ / kt) respectively). The maximum sulfate production from these samples was similar to other rock non acid-generating materials, and decayed to concentrations of ~10 mg/l to 20 mg/l by the end of testing (Figure 3.30). A780-02 Composite was the only HCT to produce consistent iron concentrations above MCLs during latter rinse weeks.
- HCTs followed the general trend of elevated first flush solute concentrations (weeks 0-2) followed by decay in weeks 2 – 8. Relatively steady release of solutes occurred after week 8. Leachate concentrations for select elements are provided in Figures 3.31 – 3.40.
- ARD production typically does not result in leachate solutions with excessive metal concentrations. The two acid-generating Bolsa Quartzite samples produced late term leachates with the following characteristics:
  - Fe: <0.03 mg/l to 2 mg/l
  - Cu: 0.4 mg/l to 1.5 mg/l
  - Al: <0.02 mg/l to 1 mg/l
  - Mn: 0.3 mg/l to 1.7 mg/l
  - Zn: 0.1 mg/l to 0.6 mg/l
- Selenium was released from above AWQS from four (4) HCTs (Figure 3.40). Selenium concentrations declined below AWQS concentrations for 3 HCTs, however 1 HCT continued to leach elevated concentrations through the test. All other HCTs did not produce measurable selenium concentrations.
- Antimony was consistently released above AWQS through HCT testing primarily in Andesite and Arkose rock units (Figure 3.35).

A series of seven (7) column tests were also performed but were not directly applicable to this investigation. Their results are available in the Baseline Geochemical Characterization Report (Tetra Tech, 2007a).

Table 3.6: HCT sample summary

Sample ID	Lithology	Pit	Total Weeks	Min pH (s.u.)	Max SO4 (mg/l)	Week of max SO4	Max Fe (mg/l)	Week of max Fe	NPR	Classification
AR2009-03	Andesite	Rosemont	35	7.24	456	0	0.07	0	1.55	PAG
AR2010-03	Andesite	Rosemont	28	6.60	79	0	0.29	20	0.51	PAG
AR2011-03	Andesite	Rosemont	28	6.66	418	0	0.03	16	0.79	PAG
AR2013-01	Andesite	Rosemont	28	7.24	1,880	0	0.04	8	1.23	PAG
AR2013-02	Andesite	Rosemont	28	7.31	573	0	0.07	0	2.12	PAG
AR2013-03	Andesite	Rosemont	28	7.44	421	0	0.06	0	2.48	PAG
AR2014-02	Andesite	Rosemont	28	7.09	317	0	0.04	8	0.85	PAG
AR2014-03	Andesite	Rosemont	28	7.51	528	0	0.03	16	2.41	PAG
AR2003-03	Arkose	Rosemont	28	7.18	199	0	0.03	16	1.51	PAG
AR2005-02	Arkose	Rosemont	28	7.24	781	0	0.02	0	1.16	PAG
AR2010-02	Arkose	Rosemont	35	7.42	316	0	0.03	16	1.28	PAG
A780-02 Composite	Bolsa	Rosemont	25	3.37	373	0	2.01	25	0.33	AG
A780-03 Composite	Bolsa	Rosemont	25	5.13	43	0	1.17	0	0.10	AG
AR2000-02	Earp	Rosemont	28	7.09	243	0	0.08	0	5.71	NAG
AR2014-05	Earp	Rosemont	28	7.40	159	0	0.04	8	10.40	NAG
AR2009-04	Epitaph	Rosemont	28	7.32	116	0	0.03	16	4.67	NAG
Tailings-022807	Tailings	Rosemont	20	7.62	59	0	0.03	16	1,106.67	NAG
Year 0-3 Tailings	Tailings	Rosemont	20	8.33	758	0	0.68	8	1,013.33	NAG

3.5 Whole Rock Analysis

Whole rock analysis is used to determine the elemental composition of a rock. This analysis provides an indication as to elements of environmental concern that are contained in a particular material; however, it does not provide information as to the mobility of these elements. This data is used in conjunction with other rock characterization test results (i.e., ABA tests, leachability tests), to provide an overall characterization of the rock material. The Global Acid Rock Drainage (GARD) guide suggests screening level comparison of elemental whole rock chemistry versus crustal averages. The geochemical abundance indices (GAI) are summarized in Table 3.7 for key elements. Whole rock chemistry distributions and crustal averages graphically shown in Figure 3.41.

Generally, the rocks found at the Project are near crustal averages, being slightly enriched in antimony, arsenic, cadmium, calcium, copper, molybdenum, silver and zinc. The rocks are depleted in aluminum, barium, chromium, nickel, potassium, and sodium. Leaching tests indicated that the release of some major elements are associated with increasing whole rock content, but that most minor elements did not correlate with whole rock content.

Table 3.7: GAI whole rock sample summary

Lithology	GAI Values[1]						
	Sb	As	Cd	Ca	Cu	Fe	S
Abrigo	2	1	1	1	4	0	3
Andesite	3	2	3	0	2	0	5
Arkose	2	2	2	0	1	0	2
Bolsa	3	1	0	0	2	0	4
Colina	2	0	2	1	3	0	NA
Concha	2	1	3	1	4	0	2
Earp	2	0	2	0	2	0	0
Epitaph	0	0	0	1	3	0	1
Escabrosa	0	0	2	2	4	0	2
Gila	5	5	1	0	0	0	0
Glance	3	3	3	2	3	0	4
Horquilla	0	1	1	2	2	0	0
Martin	3	2	0	2	0	0	2
Overburden	3	4	2	0	0	0	NA
Qmp	4	1	1	0	3	0	3
Tailings	0	2	0	1	3	0	NA
Average	**2**	**2**	**1**	**1**	**2**	**0**	**2**

1 GAI explanation (INAP, 2014)
GAI=0 represents <3 times median soil content
GAI=1 represents 3 to 6 times median soil content
GAI=2 represents 6 to 12 times median soil content
GAI=3 represents 12 to 24 times median soil content
GAI=4 represents 24 to 48 times median soil content
GAI=5 represents 48 to 96 times median soil content
GAI=6 represents more than 96 times median soil content
NA: Not measured

3.6 Geochemical Unit Classification

This section develops the basis for forming geochemical units, which agglomerate laboratory data for use in geochemical models.

Geochemical comparison among geologic units

There is geochemical similarity between geologic units, particularly among Paleozoic limestone / skarn units which share mineralogy and mineralization history. Although they are mapped as unique geologic units, their calcium and sulfur distributions suggest mineralogical similarity and comparable leachates. A comparison of the AP (sulfur surrogate), NP (calcium surrogate), and NPR cumulative distributions for geologic materials was completed to evaluate material variability (Figure 3.42 to Figure 3.44). Box and whisker plots showing comparative distributions were previously shown in Figure 3.8. Geologic units with comparable calcium, sulfur, and provenance may warrant combining into similar geochemical units.

- Overall AP content is low. The Concha, QMP, and Scherrer units possess higher end AP content, although their medians are similar to other units (Figure 3.42 and Figure 3.8). The correlation between geologic units is somewhat segregated between more mineralized units with higher mean AP, and less mineralized units with lower AP. Interestingly, this segregation occurs across geologic units with differing provenances, confirming the variability is associated with mineralization.
- NP content is more aligned with geologic provenance (limestone/skarn, intrusive, or sedimentary) which is intuitively logical. Intrusive units have measurable NP, with the median values between 40 $tCaCO_3/kt$ – 60 $tCaCO_3/kt$. Limestone / skarn units have much higher NP with median values ranging from 230 $tCaCO_3/kt$ – 720 $tCaCO_3/kt$.
- NPR distribution is similar among intrusive units particularly between Qmp and Granodiorite. Limestone and skarn units such as the Concha, Martin, Horquilla, Epitaph, Scherrer, Gila and Glance have similar distributions.

Similarity between AP and NP characteristics suggests that the limestone and skarn suite of geologic materials are largely similar, with the exception of the Escabrosa limestone which is less mineralized. The Gila and Glance sedimentary units are more geochemically aligned with limestones and skarns than with the Arkose or Bolsa.

Geochemical units

Unique geochemical units were developed for the Project to organize geologic materials into similar geochemical groups for management and modeling purposes. Geochemical units were based on the following criteria:

- Geology
- ABA classification:
  - NAG (NPR > 3.0)
  - PAG (1.2 < NPR < 3.0)
  - AG (NPR<1.2)

Each geologic unit was sub-divided into a unique ABA classification according to the calcium and sulfur distributions kriged from the block model. NPR was used as the sole ABA metric to classify materials because it more aggressively captures AG and PAG materials in low sulfur environments than using both NPR and NNP together. Each geochemical unit may not be present for some lithologies, for example there is no AG classification for Escabrosa material (NPR <1.2). This approach offers several advantages for the management and modeling of mined materials:

- Geochemically distinct materials which are small in volume, but potentially important (i.e. AG materials), are represented and modeled in their appropriate proportions. This approach provides better representation of these materials rather than lumping them together in the same lithology which may average out mass loading terms.
- Rock lithologies are broken into naturally recognized ABA classification schemes.
- Leachate testing spans the sitewide block model AP, NP, and NPR distributions for most lithologies across the site (Appendix A, Figure 3.8). Therefore, the appropriate samples can be allocated to AG, PAG, or NAG materials. Where sample gaps exist, geologically similar units can be substituted based on the geochemical comparison performed in Section 3.6.1.
- The abundance of AP and NP materials are spatially variable between pit locations. Defining geochemical units by ABA classification allows the appropriate leachate profiles to be represented and mixed appropriately.

A total of 33 unique geochemical units are defined across the Project. Average AP, NP, and NPR values derived from the sitewide block model are provided in Table 3.8.

Table 3.8: Project geochemical unit ABA summary

Geochemical Unit	ABA Sample Count	Relative Abundance (%)	Average AP (t $CaCO_3$/ kt)[1]	Average NP (t $CaCO_3$/ kt)[1]	NPR[1]
ABRIGO:<1.2	-	0.0%	147.6	133.5	0.89
ABRIGO:>3.0	9	5.7%	6.8	405.9	154.37
ABRIGO:1.2-3.0	-	0.0%	81.5	158.3	2.07
ANDESITE:<1.2	1	0.1%	45.6	41.2	0.92
ANDESITE:>3.0	22	19.4%	6.0	77.4	26.29
ANDESITE:1.2-3.0	21	0.8%	27.3	60.8	2.25
ARKOSE:<1.2	-	0.0%	6.0	6.3	0.95
ARKOSE:>3.0	67	4.3%	3.5	82.8	29.17
ARKOSE:1.2-3.0	36	0.1%	4.6	9.7	2.14
BOLSA:<1.2	1	0.1%	23.6	18.7	0.66
BOLSA:>3.0	-	5.4%	5.6	148.6	50.96
BOLSA:1.2-3.0	16	0.5%	16.6	33.3	2.07
CONCHA:>3.0	6	0.1%	15.6	208.5	42.98
EARP:>3.0	16	5.0%	9.4	392.5	111.83
EPITAPH:<1.2	-	0.0%	81.3	81.0	1.00
EPITAPH:>3.0	20	5.4%	11.5	282.9	57.37
EPITAPH:1.2-3.0	1	0.0%	61.6	140.9	2.33
ESCABROSA:>3.0	11	2.9%	3.3	619.7	291.11
GILA:>3.0	7	1.3%	3.0	228.0	97.58
GLANCE:<1.2	-	0.0%	19.6	22.8	1.17
GLANCE:>3.0	13	7.1%	7.9	491.1	188.82
GLANCE:1.2-3.0	-	0.1%	33.1	82.8	2.36
GRANODIORITE:<1.2	-	0.3%	56.7	26.4	0.51
GRANODIORITE:>3.0	-	4.7%	4.4	93.5	24.26
GRANODIORITE:1.2-3.0	-	1.0%	4.8	9.9	2.24
HORQUILLA:>3.0	30	14.0%	10.0	502.2	120.12
MARTIN:>3.0	12	4.1%	8.1	491.4	146.20
QMP:<1.2	-	0.2%	15.5	12.9	0.81
QMP:>3.0	3	8.3%	14.8	120.5	14.83
QMP:1.2-3.0	9	3.0%	24.8	59.0	2.23
SCHERRER:>3.0	2	4.6%	23.1	417.8	64.41
SCHERRER:1.2-3.0	1	0.0%	112.8	308.0	2.70

[1] Developed from site wide geologic block model

Chemical release functions

The release of chemical mass from rock materials follows a characteristic two-step pattern for all but the most strongly AG materials. The highest concentration of mass release occurred during the initial week 0 first flush, followed by an asymptotic decay in concentrations during weeks 2 to 8. By week 12 to 16 leachate concentrations had generally reached steady-state conditions, suggesting that reaction rates within the fraction of reactive material stabilized. These trends indicate that the majority of mobilized mass is derived from soluble mineral phases or sulfosalts which go into solution during early flushing (Maest & Nordstrom, 2017). Longer term mass loading is related to ongoing mineral weathering and sulfide oxidation. The molar release rate of Ca+Mg versus SO_4 that are greater than 1 indicate that greater carbonate mineral weathering is occurring than necessary to buffer sulfide oxidation. This occurs for all HCT samples except the two acid-generating Bolsa Quartzite samples (Figure 3.45).

Leachate chemistries from HCT, MWMP, and SPLP tests were assigned to each geochemical unit to calculate CRFs. CRFs were developed for a period of 35 weeks, matching HCT durations, which is equivalent to approximately 87.5 pore flushes. The approach for assigning leach samples to geochemical units for CRFs used the following rules:

- HCT and MWMP leachates were preferred over SPLP. This is because water: rock ratios were near 1 and thus provide a more conservative solution chemistry for mass loading.
- Where SPLP leachate was used, it was multiplied by a factor of 4.33 to normalize water: rock ratios with HCT and MWMPs leachates.
- When more than one sample was available for a geochemical unit, the CRF used the geometric mean of leachate concentrations, with pH calculated using the geometric mean of hydrogen proton concentrations.
- When no samples were available for a geochemical unit, a proxy sample was selected from a geochemically similar unit or a conservative estimate. For example, the Andesite Col. Leach sample was used as a surrogate for the AG classified CRFs because it produced the lowest pH and highest metal release of all samples.
- MWMP and SPLP concentrations were held constant when averaging over the 35-week CRF. This conservatively assigns first flush chemistries for the duration of the CRFs. In reality, leaching from the materials declines with subsequent pore flushes.
- The upper bound mass loading rates from acid-generating HCT samples were applied. This ensures that late-term acid-generation from HCTs will be applied in geochemical models. The Project does not have any samples which qualify for this consideration because the first flush chemistry of acid-generating samples produced higher concentrations than long-term mass production.

- Non-detect element concentrations were assigned to 50 percent of the detection limit. If all leachate samples had non-detect values, then a value of 10% of the detection limit was used.

Samples used to composite CRFs are shown in Table 3.9, with the first flush (week 0) chemistries provided in Table 3.10a to Table 3.10c. Tables of composited CRFs used in the geochemical model are presented in Appendix F. Graphical representations of HCT, MWMP, SPLP, and the composite CRF are provided in Appendix G. The abundances of geochemical units are described for each mine facility in subsequent sections.

Table 3.9: Samples assignments to CRFs

Geochemical Unit	Samples
Abrigo:<1.2	Andesite Col. Leach-MWMP
Abrigo:1.2-3.0	A860-02-SPLP; AR2009-04-HCT
Abrigo:>3.0	1561-01-SPLP; 1561-03-SPLP; 1916-02-SPLP; 1926-02-SPLP; A818-01-SPLP
Andesite:<1.2	AR2010-03-HCT; AR2011-03-HCT; AR2014-02-HCT; Andesite Col. Leach-MWMP
Andesite:1.2-3.0	AR2009-03-HCT; AR2013-01-HCT; AR2013-02-HCT; AR2013-03-HCT; AR2014-03-HCT
Andesite:>3.0	AR2017-05-MWMP; AR2025-03-MWMP; AR2030-05-MWMP; AR2038-04-MWMP; AR2038-06-MWMP
Arkose:<1.2	AR2005-02-HCT; AR2039-06-MWMP
Arkose:1.2-3.0	AR2003-03-HCT; AR2010-02-HCT; AR2017-07-MWMP
Arkose:>3.0	AR2001-01-MWMP; AR2025-04-MWMP; AR2030-04-MWMP; AR2036-03-MWMP; AR2038-05-MWMP; AR2042-04-MWMP
Bolsa:<1.2	A780-02 Composite-HCT; A780-03 Composite-HCT
Bolsa:1.2-3.0	AR2066-01-SPLP; AR2072-01-SPLP
Bolsa:>3.0	VABH0608-01-SPLP
Concha:>3.0	A808-02-SPLP; AR2042-05-MWMP
Earp:1.2-3.0	AR2019-03-SPLP
Earp:>3.0	A845-01-SPLP; AR2000-02-HCT; AR2014-05-HCT; AR2017-02-SPLP; AR2030-01-SPLP; AR2035-02-SPLP
Epitaph:<1.2	Andesite Col. Leach-MWMP
Epitaph:1.2-3.0	A860-02-SPLP; AR2009-04-HCT
Epitaph:>3.0	A847-01-SPLP; AR2002-03-SPLP; AR2034-02-SPLP
Escabrosa:>3.0	1461-01-SPLP; 1506-02-SPLP; A814-02-SPLP; A872-01-SPLP
Gila:>3.0	UAGH-GILA-01-MWMP
Glance:<1.2[1]	Andesite Col. Leach-MWMP
Glance:1.2-3.0[1]	A860-02-SPLP-HIGH; AR2009-04-HCT
Glance:>3.0	UAGH-GLANCE-01-MWMP, UAGH-GLANCE-01-SPLP
Granodiorite:<1.2[2]	Qmp Column Leach-MWMP, AR2036-04-MWMP
Granodiorite:1.2-3.0[2]	1926-01-SPLP; A815-02-SPLP; AR2036-04-MWMP
Granodiorite:>3.0[2]	1926-01-SPLP; A815-02-SPLP; AR2036-04-MWMP
Horquilla:>3.0	1596-03-SPLP; A842-01-SPLP; A866-02-SPLP; AR2000-04-MWMP; AR2004-04-SPLP; AR2039-07-SPLP; AR2042-03-SPLP; AR2042-06-MWMP; AR2043-03-SPLP
Martin:>3.0	1461-02-SPLP; A856-01-SPLP; A866-01-SPLP; A878-01-SPLP
Qmp:<1.2	Qmp Column Leach-MWMP, AR2036-04-MWMP
Qmp:1.2-3.0	1926-01-SPLP; A815-02-SPLP; AR2036-04-MWMP
Qmp:>3.0	1926-01-SPLP; A815-02-SPLP; AR2036-04-MWMP
Scherrer:1.2-3.0[1]	A860-02-SPLP; AR2009-04-HCT
Scherrer:>3.0[1]	A830-01-SPLP; A847-01-SPLP; A850-01-SPLP; AR2002-03-SPLP; AR2034-02-SPLP

[1] Substituted Epitaph CRF

[2] Substituted Qmp CRF

Table 3.10a: Week 0 CRF chemistry

Parameter	Units	Abrigo: <1.2	Abrigo: 1.2-3.0	Abrigo: >3.0	Andesite :<1.2	Andesite :1.2-3.0	Andesite :>3.0	Arkose: <1.2	Arkose: 1.2-3.0	Arkose: >3.0	Bolsa:<1.2	Bolsa: 1.2-3.0	Bolsa: >3.0	Concha: >3.0	Earp: 1.2-3.0	Earp: >3.0
pH	s.u.	3.34	7.35	8.95	6.68	7.80	7.63	7.69	7.51	7.87	4.60	9.55	8.00	7.21	9.55	7.65
Alkalinity, Total	mg/L	0.1	5.2	111.9	20.5	86.1	53.7	57.8	43.2	47.5	1.0	112.8	120.1	69.6	77.2	83.1
Aluminum	mg/L	71.4	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.9	0.0	0.0	0.1
Antimony	mg/L	0.0002	0.0002	0.0002	0.0034	0.0081	0.0002	0.0037	0.0024	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Arsenic	mg/L	0.004	0.003	0.003	0.006	0.018	0.013	0.015	0.007	0.010	0.000	0.000	0.022	0.000	0.000	0.004
Barium	mg/L	0.03	0.05	0.00	0.02	0.04	0.01	0.01	0.01	0.00	0.04	0.00	0.00	0.02	0.04	0.01
Beryllium	mg/l	0.029	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000
Boron	mg/l	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	mg/L	0.3770	0.0001	0.0001	0.0044	0.0001	0.0001	0.0001	0.0001	0.0001	0.0307	0.0001	0.0001	0.0001	0.0001	0.0001
Calcium	mg/L	526.0	456.9	25.1	102.8	154.9	11.9	68.6	53.0	9.3	32.8	16.5	3.3	13.7	40.7	36.3
Chloride	mg/L	7.0	11.8	2.4	5.3	7.6	3.1	6.7	3.1	2.6	18.1	2.3	4.0	1.8	2.7	4.0
Chromium	mg/L	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	mg/L	53.10	0.01	0.00	0.06	0.01	0.00	0.00	0.02	0.01	5.67	0.04	0.21	0.00	0.00	0.01
Fluoride	mg/L	6.38	0.37	0.99	2.94	2.69	0.63	0.92	0.90	0.56	1.01	0.93	1.60	0.09	2.42	1.30
Iron	mg/L	1.090	0.003	0.003	0.079	0.051	0.003	0.024	0.018	0.003	1.031	0.161	1.494	0.003	0.003	0.037
Lead	mg/L	0.0342	0.0004	0.0004	0.0068	0.0004	0.0074	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Magnesium	mg/L	187.0	23.7	2.3	29.2	44.9	2.2	13.4	8.8	1.4	6.8	2.6	0.8	3.2	6.1	3.0
Manganese	mg/L	31.10	0.02	0.00	0.17	0.05	0.00	0.01	0.04	0.00	3.26	0.01	0.00	0.00	0.00	0.00
Mercury	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Molybdenum	mg/L	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.34	0.01
Nickel	mg/L	0.734	0.001	0.001	0.017	0.001	0.001	0.001	0.001	0.001	0.144	0.001	0.001	0.001	0.001	0.001
Nitrogen, Total as N	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Potassium	mg/L	9.8	13.1	17.1	16.8	60.4	3.8	14.2	12.7	2.6	22.9	1.3	8.5	2.8	10.6	8.9
Selenium	mg/L	0.1300	0.0003	0.0003	0.0142	0.0688	0.0257	0.0324	0.0252	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0040
Silver	mg/L	0.017	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	10.3	18.4	6.8	18.2	53.3	14.3	37.5	13.9	8.9	7.0	20.0	39.5	4.3	25.5	17.5
Sulfate	mg/L	2500	862	13	402	642	22	244	179	10	126	9	4	6	123	42
Thallium	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
TDS	mg/L	3426	1392	180	599	1052	112	443	315	83	229	167	185	102	290	196
Uranium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Zinc	mg/L	21.50	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	2.44	0.00	0.00	0.00	0.00	0.00

Table 3.10b: Week 0 CRF chemistry cont.

Parameter	Units	Epitaph: <1.2	Epitaph: 1.2-3.0	Epitaph: >3.0[3]	Escabrosa: >3.0	Gila:>3.0	Glance: <1.2[1]	Glance: 1.2-3.0[1]	Glance: >3.0[1]	Granodiorite: <1.2[2]	Granodiorite: 1.2-3.0[2]	Granodiorite: >3.0[2]	Horquilla :>3.0	Martin: >3.0
pH	s.u.	3.34	7.35	9.47	8.19	8.05	3.34	7.70	8.01	5.53	7.41	7.41	8.50	8.92
Alkalinity, Total	mg/L	0.1	5.2	112.1	109.5	98.1	0.1	236	113	2.8	69.6	69.6	97.5	128.8
Aluminum	mg/L	71.4	0.0	0.004	0.0	0.0	71.4	0.004	0.004	0.7	0.501	0.501	0.1	0.0
Antimony	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Arsenic	mg/L	0.004	0.003	0.000	0.000	0.005	0.004	0.003	0.007	0.000	0.011	0.011	0.003	0.000
Barium	mg/L	0.03	0.05	0.027	0.01	0.06	0.03	0.05	0.00	0.01	0.022	0.022	0.00	0.01
Beryllium	mg/l	0.029	0.000	0.00	0.000	0.000	0.029	0.000	0.000	0.003	0.00	0.00	0.000	0.000
Boron	mg/l	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
Cadmium	mg/L	0.3770	0.0001	0.0001	0.0001	0.0001	0.3770	0.0001	0.0001	0.0092	0.0001	0.0001	0.0001	0.0001
Calcium	mg/L	526.0	456.9	33.4	25.3	30.5	526.0	456.9	35.7	19.5	10.1	10.1	33.6	23.1
Chloride	mg/L	7.0	11.8	1.58	3.5	1.4	7.0	11.8	3.5	1.4	2.83	2.83	7.5	4.7
Chromium	mg/L	0.04	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Copper	mg/L	53.10	0.01	0.00	0.00	0.00	53.10	0.01	0.00	0.67	0.04	0.04	0.00	0.00
Fluoride	mg/L	6.38	0.37	2.75	1.61	0.58	6.38	0.37	0.75	0.64	0.731	0.731	1.78	1.11
Iron	mg/L	1.090	0.003	0.003	0.003	0.003	1.090	0.003	0.003	0.117	0.090	0.090	0.003	0.003
Lead	mg/L	0.0342	0.0004	0.0004	0.0004	0.0004	0.0342	0.0004	0.0211	0.0133	0.0004	0.0004	0.0004	0.0004
Magnesium	mg/L	187.0	23.7	6.793	2.1	2.1	187.0	23.7	2.0	3.5	1.199	1.199	1.2	7.4
Manganese	mg/L	31.10	0.02	0.00	0.00	0.00	31.10	0.02	0.02	0.12	0.00	0.00	0.00	0.00
Mercury	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Molybdenum	mg/L	0.01	0.00	0.0	0.01	0.01	0.01	0.00	0.06	0.00	0.00	0.00	0.02	0.04
Nickel	mg/L	0.734	0.001	0.001	0.001	0.001	0.734	0.001	0.001	0.027	0.001	0.001	0.001	0.001
Nitrogen, Total as N	mg/L	0.1	0.1	0.050	0.1	0.1	0.1	0.1	0.1	0.1	0.050	0.050	0.1	0.1
Potassium	mg/L	9.8	13.1	7	2.3	3.7	9.8	13.1	1.0	1.3	5.2	5.2	2.7	12.3
Selenium	mg/L	0.1300	0.0003	0.0003	0.0003	0.0003	0.1300	0.0003	0.0003	0.0003	0.0003	0.0003	0.0040	0.0003
Silver	mg/L	0.017	0.000	0.00	0.000	0.000	0.017	0.000	0.000	0.004	0.000	0.000	0.000	0.000
Sodium	mg/L	10.3	18.4	10	8.5	7.4	10.3	18.4	5.8	5.2	15	15	8.9	10.8
Sulfate	mg/L	2500	862	52	11	22	2500	862	9	53	7	7	17	17
Thallium	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
TDS	mg/L	3426	1392	226	164	166	3426	1621	171	89	112	112	170	205
Uranium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Zinc	mg/L	21.50	0.00	0.00	0.00	0.00	21.50	0.00	0.00	0.16	0.00	0.00	0.00	0.00

[1] Surrogate from Epitaph
[2] Surrogate from Qmp
[3] Only one report pH value available

Table 3.10c: Week 0 CRF chemistry cont.

Parameter	Units	Qmp:<1.2	Qmp:1.2-3.0	Qmp:>3.0	Scherrer:1.2-3.0[1]	Scherrer:>3.0[1]
pH	s.u.	5.53	7.41	7.41	7.35	9.47
Alkalinity, Total	mg/L	2.8	69.6	69.6	5.2	112.1
Aluminum	mg/L	0.7	0.501	0.501	0.0	0.004
Antimony	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002
Arsenic	mg/L	0.000	0.011	0.011	0.003	0.002
Barium	mg/L	0.01	0.022	0.022	0.05	0.027
Beryllium	mg/l	0.003	0.00	0.00	0.000	0.00
Boron	mg/l	0.00	0.000	0.000	0.00	0.000
Cadmium	mg/L	0.0092	0.0001	0.0001	0.0001	0.0001
Calcium	mg/L	19.5	10.1	10.1	456.9	33.4
Chloride	mg/L	1.4	2.83	2.83	11.8	1.58
Chromium	mg/L	0.01	0.00	0.00	0.00	0.00
Copper	mg/L	0.67	0.04	0.04	0.01	0.00
Fluoride	mg/L	0.64	0.731	0.731	0.37	2.751
Iron	mg/L	0.117	0.090	0.090	0.003	0.003
Lead	mg/L	0.0133	0.0004	0.0004	0.0004	0.0004
Magnesium	mg/L	3.5	1.199	1.199	23.7	6.793
Manganese	mg/L	0.12	0.00	0.00	0.02	0.00
Mercury	mg/L	0.000	0.000	0.000	0.000	0.000
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.0
Nickel	mg/L	0.027	0.001	0.001	0.001	0.001
Nitrogen, Total as N	mg/L	0.1	0.050	0.050	0.1	0.050
Potassium	mg/L	1.3	5.2	5.2	13.1	7
Selenium	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003
Silver	mg/L	0.004	0.000	0.000	0.000	0.00
Sodium	mg/L	5.2	15	15	18.4	10
Sulfate	mg/L	53	7	7	862	52
Thallium	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001
TDS	mg/L	89	112	112	1392	226
Uranium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002
Zinc	mg/L	0.16	0.00	0.00	0.00	0.00

[1] Surrogate from Epitaph

3.7 Groundwater Chemistry

Groundwater in the Project area ranges between Ca - SO_4 and Ca - HCO_3 type (Figure 3.46). Dominant cations are mainly calcium and magnesium, which is aligned with the limestone / skarn bedrock aquifers found throughout the district. Anions are mainly composed of sulfate and bicarbonate which span a wide range of composition. Very little sodic groundwater is found in the Project area.

Ambient groundwater chemistry possesses circum-neutral pH, with values ranging between 7.1 s.u. – 8.3 s.u. Wells located in the Santa Rita range generally have higher TDS and major ion concentrations (Figure 3.47). Deeper screened wells, in settings where two wells have been twinned, generally possess higher TDS; suggesting longer flow paths from recharge sources. Water quality sampling has not indicated values above AWQS. Average water chemistry of monitoring wells is provided in Table 3.11 and individual sample chemistry is provided Appendix I.

Table 3.11a: Project groundwater chemistry profiles

Parameter	Units	AWQS	PC-1	PC-2	PC-3	PC-4	PC-5	PC-6	PC-7	PC-8	HC-1A	HC-1B
Number of samples			*1*	*3*	*1*	*1*	*6*	*4*	*4*	*3*	*1*	*5*
pH, Lab	s.u.	-----	7.75	8.30	7.66	7.76	7.45	7.21	7.43	7.31	7.54	7.37
Alkalinity, Total	mg/L	-----	175	147	101	216	132	168	106	190	244	206
Aluminum	mg/L	-----	0.03	0.02	0.02	0.04	0.00	0.00	0.00	0.00	0.02	0.02
Antimony	mg/L	*0.006*	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	*0.05*	0.003	0.015	0.004	0.002	0.004	0.001	0.001	0.002	0.001	0.002
Barium	mg/l	*2*	0.02	0.01	0.06	0.18	0.01	0.03	0.02	0.02	0.07	0.00
Beryllium	mg/l	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	-----	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	*0.005*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	-----	82.2	75.5	192.0	59.6	84.4	202.4	237.0	60.5	62.1	53.4
Chloride	mg/L	-----	8.0	11.9	5.0	12.0	8.6	8.3	6.0	7.7	12.5	12.6
Chromium	mg/L	*0.1*	0.005	0.005	0.005	0.005	0.001	0.001	0.001	0.001	0.005	0.001
Copper	mg/L	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01
Fluoride	mg/L	*4*	0.80	1.22	1.20	0.40	0.81	0.64	0.78	0.60	1.40	1.94
Iron	mg/L	-----	0.01	0.01	0.43	0.96	0.05	0.90	0.60	0.06	0.21	0.02
Lead	mg/L	*0.05*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Magnesium	mg/L	-----	9.5	20.0	33.4	17.9	11.6	21.5	41.0	11.4	16.0	16.0
Manganese	mg/L	-----	0.05	0.05	0.67	0.57	0.01	0.12	0.10	0.01	0.02	0.01
Mercury	mg/L	*0.002*	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000
Nickel	mg/L	*0.1*	0.005	0.005	0.005	0.005	0.006	0.010	0.001	0.001	0.020	0.006
Nitrogen, Total as N	mg/L	*10*	0.7	0.1	0.1	0.6	0.3	0.6	0.3	1.1	0.7	0.4
Potassium	mg/L	-----	1.90	2.33	5.00	4.10	1.88	3.30	3.86	2.17	1.70	1.64
Selenium	mg/L	*0.05*	0.002	0.004	0.001	0.001	0.002	0.002	0.004	0.002	0.000	0.000
Silver	mg/L	-----	-	-	-	-	0.001	0.001	0.001	0.001	0.005	0.001
Sodium	mg/L	-----	10.7	14.3	56.3	32.9	11.9	32.0	24.4	8.6	27.3	27.0
Sulfate	mg/L	-----	30	127	610	50	63	442	649	6	6	8
Thallium	mg/L	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Uranium	mg/L	-----	0.002	0.004	0.016	0.006	0.002	0.005	0.003	0.003	0.005	0.005
Zinc	mg/L	-----	0.35	0.06	0.56	0.61	0.00	0.01	0.01	0.09	0.01	0.01
TDS	mg/L	-----	300	369	1040	320	342	880	1086	227	290	262

Indicates values above AWQS

Table 3.11b: Project groundwater chemistry profiles cont.

Parameter	Units	AWQS	HC-2A	HC-2B	HC-3A	HC-3B	HC-3C	HC-4A	HC-4B	HC-5A	HC-5B	RP-4A	RP-4A
Number of samples			*1*	*1*	*1*	*1*	*1*	*1*	*1*	*5*	*1*	*1*	*1*
pH, Lab	s.u.	-----	7.66	7.57	7.12	7.40	7.65	7.22	8.08	7.08	8.30	7.80	7.8
Alkalinity, Total	mg/L	-----	184	208	238	236	154	296	235	209	88	159	159
Aluminum	mg/L	-----	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02
Antimony	mg/L	*0.006*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	*0.05*	0.002	0.001	0.010	0.003	0.007	0.003	0.001	0.016	0.000	0.003	0.003
Barium	mg/l	*2*	0.07	0.05	0.04	0.03	0.03	0.01	0.02	0.01	0.02	0.02	0.02
Beryllium	mg/l	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	-----	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	*0.005*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Calcium	mg/L	-----	33.3	33.8	91.1	76.1	43.8	73.1	28.6	124.9	85.2	35.3	35.3
Chloride	mg/L	-----	23.5	12.1	20.3	18.7	7.2	10.7	12.0	13.4	60.0	8.4	8.4
Chromium	mg/L	*0.1*	0.005	0.005	0.005	0.005	0.005	0.010	0.005	0.001	0.005	0.005	0.005
Copper	mg/L	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fluoride	mg/L	*4*	0.50	0.40	0.40	0.40	0.50	0.30	0.50	1.41	3.00	0.30	0.30
Iron	mg/L	-----	0.04	0.32	0.03	0.18	0.16	0.26	1.94	0.01	2.43	0.02	0.02
Lead	mg/L	*0.05*	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Magnesium	mg/L	-----	7.8	7.0	17.6	18.8	5.5	17.0	7.7	32.2	21.9	6.9	6.9
Manganese	mg/L	-----	0.06	0.08	0.01	0.29	0.03	0.03	0.10	0.00	0.21	0.04	0.04
Mercury	mg/L	*0.002*	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001
Nickel	mg/L	*0.1*	0.010	0.030	0.005	0.010	0.010	0.005	0.005	0.008	0.005	0.010	0.010
Nitrogen, Total as N	mg/L	*10*	0.8	0.4	0.2	0.1	0.1	0.7	0.0	0.4	0.0	0.8	0.8
Potassium	mg/L	-----	1.30	2.30	2.00	2.50	2.40	1.50	2.90	2.42	2.70	0.80	0.80
Selenium	mg/L	*0.05*	0.000	0.000	0.002	0.001	0.001	0.001	0.000	0.001	0.000	0.000	0.000
Silver	mg/L	-----	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.005	0.005
Sodium	mg/L	-----	73.2	81.9	18.5	34.1	67.9	41.3	82.7	16.9	360.0	34.0	34.0
Sulfate	mg/L	-----	43	48	51	56	90	8	16	204	850	6	6
Thallium	mg/L	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Uranium	mg/L	-----	0.003	0.019	0.004	0.032	0.035	0.003	0.002	0.002	0.000	0.002	0.002
Zinc	mg/L	-----	0.02	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.01	0.02	0.02
TDS	mg/L	-----	320	320	360	360	330	340	300	586	1480	190	190

Indicates values above AWQS

Table 3.11c: Project groundwater chemistry profiles cont.

Parameter	Units	AWQS	GH2021-01	GH2021-07	GH2021-10	GH2021-11	GH2021-17	GH2021-22	GH2021-25	Pit2021-08	RNW-HB-091	RNW-HB-108
Number of samples			*3*	*3*	*3*	*3*	*1*	*3*	*3*	*1*	*3*	*3*
pH, Lab	s.u.	-----	7.43	7.67	7.43	7.47	8.00	7.97	7.50	7.90	7.50	7.59
Alkalinity,	mg/L	-----	196	173	560	203	170	137	210	190	200	270
Aluminum	mg/L	-----	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.15	0.00	0.00
Antimony	mg/L	*0.006*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Arsenic	mg/L	*0.05*	0.005	0.013	0.001	0.001	0.001	0.001	0.004	0.007	0.000	0.006
Barium	mg/l	*2*	0.04	0.01	0.17	0.10	0.17	0.07	0.02	0.03	0.04	0.02
Beryllium	mg/l	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	-----	0.60	0.56	0.12	0.05	0.12	0.09	0.05	0.03	0.10	0.05
Cadmium	mg/L	*0.005*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	-----	183.1	103.2	81.3	52.7	54.0	51.3	45.7	61.0	152.0	78.9
Chloride	mg/L	-----	32.4	33.2	26.0	17.6	14.0	13.0	10.2	13.0	13.3	16.5
Chromium	mg/L	*0.1*	0.002	0.003	0.003	0.003	0.000	0.003	0.003	0.000	0.003	0.003
Copper	mg/L	-----	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.16	0.00	0.00
Fluoride	mg/L	*4*	1.83	1.27	1.56	2.67	1.70	1.48	2.96	1.30	2.06	2.65
Iron	mg/L	-----	0.03	0.03	0.03	0.03	0.15	0.03	0.03	0.15	0.37	0.03
Lead	mg/L	*0.05*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Magnesium	mg/L	-----	57.0	19.3	21.0	9.7	9.6	8.6	11.0	8.1	34.5	25.8
Manganese	mg/L	-----	0.80	0.00	0.39	0.25	0.50	0.09	0.33	0.04	0.38	0.08
Mercury	mg/L	*0.002*	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001
Nickel	mg/L	*0.1*	0.002	0.000	0.001	0.000	0.005	0.000	0.000	0.001	0.001	0.001
Nitrogen, Total as N	mg/L	*10*	0.0	2.8	0.0	0.0	0.1	0.0	0.0	0.8	0.0	0.0
Potassium	mg/L	-----	0.50	0.50	3.21	0.50	2.50	0.50	0.50	2.50	7.13	0.50
Selenium	mg/L	*0.05*	0.003	0.006	0.001	0.000	0.001	0.000	0.000	0.002	0.003	0.001
Silver	mg/L	-----	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	-----	39.7	20.3	58.6	34.3	42.0	37.0	43.6	26.0	133.3	63.8
Sulfate	mg/L	-----	550	185	122	34	85	113	45	46	561	143
Thallium	mg/L	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Uranium	mg/L	-----	0.012	0.004	0.003	0.046	0.020	0.006	0.005	0.003	0.005	0.023
Zinc	mg/L	-----	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.02	0.00	0.00
TDS	mg/L	-----	1100	550	562	293	360	323	317	320	1115	601

Indicates values above AWQS

4 MODELING APPROACH

Geochemical models were developed to predict water chemistry from waste rock seepage, tailings facility seepage, heap leach drain down, and impounded waters in open pits. Characterization of the future geochemical conditions meets the following objectives:

- Quantify the geochemical composition of facilities and assign representative chemical profiles to determine facility leachate.
- Characterize the geochemical nature of inflows to the closed facility and geochemical reactions likely to occur given the mineralogical and environmental setting.
- Quantify the post-closure water balance consisting of dynamic pit inflow and outflow rates, infiltration, evaporation, water level recovery, equilibrium water level to pits.
- Predict future water chemistry with a geochemical mass loading model of natural waters and site appropriate geochemical reactions.
- Evaluate constituents that are above AWQS.
- Develop a sensitivity analysis of input assumptions to assess the potential range of facility seepage chemistries and/or pit lake chemistries.

This section describes the modeling approach for predicting resultant water chemistry from mine facilities.

4.1 Laboratory Test Data Scaling

Laboratory leachate and HCT tests are scaled to adjust for the change in physical properties between laboratory and field conditions. Scaling mass release from laboratory to field conditions encompasses several physical differences such as: water to rock ratio, grain size distribution; rock surface area; water content and flushing rates; temperature; oxidation conditions; and chemistry of the rinsing solution (Morin, 2013, Lappakko, 2015, Kempton 2012). Typical ranges for scaling factors are from 0.05 – 0.6, although higher site-specific scaling factors have been noted to matched observed values (Morin, 2013, Lappakko, 2015). This study assumes two scaling factors; sample specific surface area and water to rock ratio (developed via grain size distribution). Other laboratory factors which tend to accelerate most chemical reactions (higher relative humidity, moisture content and average temperatures) are conservatively omitted.

Field scale mass loading rates were calculated by multiplying laboratory HCT water chemistry results by the specific surface and water to rock scaling factors (SF), shown in Equation 4.1 and 4.2.

$$Field\ chemistry\ \left[\frac{mg}{l}\right] = Lab\ chemistry\ \left[\frac{mg}{l}\right] * SF_{sp.surface\ area} * SF_{water:rock} \tag{4.1}$$

$$Field\ loading\ rate\ \left[\frac{mg}{kg-rock}\right] = Lab\ loading\ rate\ \left[\frac{mg}{kg}\right] * SF_{sp.surface\ area} * SF_{water:rock} \tag{4.2}$$

Scaling for specific surface area was performed by calculating the ratio between field and laboratory conditions using Equation 4.3.

$$SF_{sp.surface\ area} = \left[\frac{(Field\ sp.surface\ area)}{(Lab\ specific\ surface\ area)}\right] \tag{4.3}$$

The program MDAG Grain 3.0 was used to determine specific surface area of backfill based on grain size distribution from coarse mine waste rock. Laboratory samples are estimated to have a specific surface area of 17.7 m^2/kg based on an average porosity of 30 percent (MDAG Grain 3.0, 2008).

Field samples of insitu wall rock were estimated to have a specific surface area of 0.7 m^2/kg. Wall rock specific surface area is estimated from literature and based on experience at other sites. Transport estimates from tracer experiments in fractured granite estimated specific surface areas ranging from 0.0006 m^2/kg to 0.004 m^2/kg (Abelin et. al., 1991). MEND reviewed four closure cases where wall rock surface area ratios (reactive surface area per unit of wall rock surface area) ranged from 27:1 m^2/m^2 to 736:1 m^2/m^2 (MEND, 1995). Assuming a 1 m thick rind (a conservative estimate from the MEND report) and a rock density of 2400 kg/m^3, this translates to specific surface areas ranging from 0.01 m^2/kg to 0.31 m^2/kg. Such literature values are less than that utilized in this study, primarily on the basis that material sloughing will collect on benches.

An average fractured rock porosity of 5% for wall rock is applied based on the numerical model calibration and previous experience.

Scaling for the water to rock ratio was performed by adjusting for the ratio of HCT effluent or HCT porosity by HCT mass to the ratio of field porosity to field build density (Equation 4.4 and 4.5). This was done in the following steps:

1. Divide the volume of laboratory effluent (or laboratory porosity) by the sample mass; this produces a laboratory water: rock ratio.
2. Divide field porosity by wall rock bulk density; this produces a field scale water: rock ratio.
3. The resulting ratio indicates how one week of laboratory HCT results scales to field parameters.

The scaling factor applied for precipitation runoff along pit wall materials is calculated by Equation 4.4. This scaling factor is applicable for geochemical terms that assigns a concentration to the water balance.

$$SF_{water:rock} = \frac{Water{:}Rock_{\ Lab}}{Water{:}Rock_{\ Field}} = \left[\frac{Vol\ Effluent_{Lab}}{Mass_{Lab}} \Big/ \frac{\theta_{Field}}{\rho bulk_{Field}}\right] \tag{4.4}$$

A slightly modified scaling factor is applied to submerged pit wall materials that are flushed upon inundation to account for the differences between laboratory and field porosity (Equation 4.5). This scaling factor is applicable to geochemical terms that are added directly to the mass balance.

$$SF_{water:rock} = \frac{Water{:}Rock_{\ Lab}}{Water{:}Rock_{\ Field}} = \left[\frac{Porosity_{Lab}}{Mass_{Lab}} \Big/ \frac{\theta_{Field}}{\rho bulk_{Field}}\right] \tag{4.5}$$

Scale factors and inputs used in the geochemical model for pit wall runoff and backfill material were developed in Table 4.1.

Table 4.1: Scaling Calculations

Parameter	Units	Wall Rock Submergence	Pit Wall Runoff
Lab Sample Mass	kg	1	1
Lab porosity	-	0.30	n/a
Effluent volume	liter	n/a	0.72
Lab bulk density	kg/L	1.85	1.85
Field porosity	-	0.05	0.05
Field bulk density	kg/L	2.6	2.6
Water-Rock Scaling Factor[1]		**15.6**	**37.4**
Lab specific surface area	m^2/kg	17.7	17.7
Field specific surface area	m^2/kg	0.7	0.7
Specific Surface Area Scaling Factor[1]		**3.9×10^{-2}**	**3.9×10^{-2}**
Overall Scaling Factor[1]		**0.62**	**1.48**

[1] Indicates calculated scaling factor
[n/a] Not applicable to this calculation

The overall scaling factors for pit wall runoff and wall rock submergence were slightly greater than typical comprehensive scaling factors that range between 0.05 - 0.6 (Morin, 2013). This is accepted as a conservative approach for reactive mass released into the pits. This study did not apply a scaling factor to waste rock effluent, recognizing that this would be a conservative assumption for very coarse material. No scaling factor was applied to the TSF effluents, because laboratory samples used to develop the CRF were processed tailings and are considered equivalent to materials to be stored in the TSF.

The aforementioned parameter values for laboratory samples and insitu rock were identified through a combination of:

- Literature values for wall rock bulk density and porosity from work performed by Siskind and Fumanti (Siskind and Fumanti, 1974), Morin (Morin, 2013), and Kempton (Kempton, 2012); and
- Groundwater model calibration for bedrock material of approximately 1% - 2% percent specific yield (i.e. porosity). Therefore, rock in the blasted damaged rock zone (DRZ) of the pit wall is anticipated to range between 2% to 5% percent porosity.

4.2 Waste Rock / Tailings Facility Methodology

The seepage chemistry from any of the unlined mine facilities will reflect the interaction of rock materials with the atmosphere and meteoric water infiltration. Weathering products of waste rock and tailings materials are anticipated to be rinsed by mildly acidic meteoric water which percolates into the facility (Figure 4.1). Precipitation which exceeds infiltration capacity will result in surface water runoff. The resultant seepage out the bottom of the facility will be the product of mixed rock materials, stacked during mining; thus, conceptually the facility will behave as a well-mixed or composite cell.

The modeling approach for both waste rock and tailings facilities are the same and is summarized in Figure 4.2 and using the following steps:

- Identify the relative abundances of each unique geochemical unit for the facility. The composite composition of AP and NP materials from the sitewide block model is used to calculate the abundances of geochemical units for the WRF. Whereas for the TSF the sitewide block model is used to define the composition of source geologic material but cannot define final ABA characteristics.
- Develop a composite chemical release function. The facility CRF is the weighted product of the CRF for each unique geochemical unit, previously described in Section 3.5. Leachates from tailings samples are weighted by source rock material in order to develop a CRF for the TSF. For example, a hypothetical tailings material whose source material is 70% skarns and 30% clastic materials would weight the leachates from a representative skarn tailings sample by 70% and a clastic tailings sample by 30%. First flush (week 0) leachates are utilized for the facility leachate.
- Equilibrate the composite CRF with atmospheric conditions. This step equilibrates the CRF with an atmospheric partial pressure for O_2 (g) of 0.21 atm and a soil partial pressure for CO_2 (g) of 0.0032 atm using PHREEQC.
- Mineral precipitation. A list of common minerals with reactions controlling pit lake chemistry was summarized by Eary and Nordstrom and Alpers (Eary, 1999; Nordstrom

and Alpers, 1999). The mineral list and observed saturation indices are used precipitate minerals common to mining environments (Table 4.2).

Resulting leachate chemistries represent the chemical composition of seepage from the facility. Facility specific leachate modeling is described for the WRF and TSFs in Sections 5 and 6, respectively.

Table 4.2: Mineral precipitation phases

Mineral Phase	Saturation Index (SI)	Source
Barite	0.5	Eary, 1999
Calcite	0.5	Eary, 1999
CO2(g)	-2.5	Eary, 1999
Ferrihydrite	0.2	Eary, 1999
Fluorite	0	Eary, 1999
Gibbsite	0	Eary, 1999
Gypsum	0	Eary, 1999
H-Jarosite	0	Eary, 1999
K-Jarosite	0	Eary, 1999
Na-Jarosite	0	Eary, 1999
O2(g)	-0.67	Eary, 1999
Otavite	0	Eary, 1999
Malachite	0	Eary, 1999
Rhodochrosite	0	Eary, 1999
Tenorite	0	Eary, 1999
Zincite	0	Eary, 1999

4.3 Heap Leach Facility Methodology

The seepage chemistry from the heap leach pad (HLP) will reflect the interaction of rock materials with an acid lixiviant. The heap leaching process rinses ore materials to liberate metal ions from their mineral phase and deliver pregnant leach solution (PLS) for processing. The lixiviant solution must remain sufficiently acidic to keep metal ions in solution, thus sufficient acidity must be added to consume the neutralization potential of ore materials.

The HLP will be constructed as a zero discharge facility with liners, drains, and leak detection systems to capture PLS. Ancillary HLP facilities will be constructed as follows:

- HLP: constructed with single liner and overliner drainage system
- PLS Pond: constructed with a double liner and leak detection
- Raffinate Pond: constructed with a double liner and leak detection
- HLP stormwater ponds: constructed with a single liner

The objective of simulating the geochemical composition of PLS is i) to assess the treatment requirements of PLS upon closure and drain down of the facility, ii) to evaluate potential groundwater impacts in case of a leak in the facility liner.

The modeling approach combines two methods to represent PLS chemistry. First, the concentrations of sulfate, iron, and copper in the PLS will be a function of the quantity of sulfuric acid required to consume the ore's neutralizing potential and the quantity of sulfide minerals present in ore rock. The sitewide block model was used to inform the mineralogical abundance of reactive sulfides and neutralizing carbonates in ore materials, and HLP leachate was simulated by reacting these minerals with a sulfuric acid lixiviant. However, the sitewide block model is less informed with regard to other elements and their mineralogical composition of ore rock. Therefore, a second method used two leach samples (which produced acidic leachate) as a proxy for the remaining ion concentrations (Tetra Tech, 2007b). This represented bulk seepage chemistry for most dissolved elements from the HLP. This modeling approach provides a realistic, mineralogical based estimate for several key ions of importance, and applies a reasonable proxy in the absence of more specific mineralogical control for minor elements.

The modeling approach for drain down from the HLP is summarized as follows:

1. Identify the relative abundances of sulfur, copper, and NP for HLP materials. These elements were assumed to correspond to the abundance the following mineral phases:
2. All copper composition is assumed to reside in either the chalcopyrite ($CuFeS_2$) or chalcocite (Cu_2S) phases. The distribution between the two mineral phases is solved using least-squares regression linear combination allocating the molar abundances of Cu and S.
3. Any remaining sulfur composition is assumed to be pyrite (FeS_2).
4. All NP is assumed to be calcite ($CaCO_3$).
5. Create a hypothetical lixiviant solution comprising of water reacted with sulfuric acid (H_2SO_4) which is capable of consuming all NP minerals in the HLP. Sulfuric acid can consume 1 mole of calcite per 1 mole H_2SO_4.
6. Mix the H_2SO_4 PLS solution with the site-specific composite HLP seepage chemistry derived from Andesite Col. Leach Composite and Qmp Col. Leach Composite.
7. Equilibrate the resulting PLS leachate solution with the available moles of calcite, chalcopyrite, chalcocite, pyrite, and the list of common mineral phases provided in Table 4.2. This geochemical reaction should consume all the moles of calcite, chalcocite, chalcopyrite, and pyrite; liberating their molar abundances into the resultant leachate solution.

HLP modeling and results are described in Section 7.

4.4 Pit Lake Methodology

The conceptual pit lake model incorporates water balance and geochemical mass loading from reactive wall rock in a dynamic limnological setting. The conceptual elements of pit lake filling are shown in Figure 4.3 and described by the water balance that follows the conservation of mass continuity equation:

$$P + R_{pit\ wall} + Pit_{inflow} + GW_{inflow} - GW_{outflow} - Pit_{outflow} - E = \frac{\Delta V_{pit\ lake}}{\Delta t} \quad (4.6)$$

Where:

P	= Direct precipitation
$R_{pit\ wall}$	= Pit wall run-off
Pit_{inflow}	= Inflows from adjacent pit
GW_{inflow}	= Groundwater inflow
E	= Pit lake evaporation
$Pit_{outflow}$	= Outflow to adjacent pit or pumped lake water
$GW_{outflow}$	= Groundwater outflow
$\frac{\Delta V_{pit\ lake}}{\Delta t}$	= Change in pit lake water volume over time

Equation 4.6 accounts for all inflows and outflows to the pit lake where the difference results in a change of pit lake storage. It is anticipated that some terms in Equation 4.6 will have zero values and not be applicable for all pits within the Project. It is assumed that all pits will divert overland runoff and that there will be no initial volume of water; these components are excluded from Equation 4.6.

The mass balance for pit lakes applies geochemical profiles to water balance components and adds mineral reactions of submerged wall rock or backfill. Conceptual pit lake mass balance is calculated by the following equations:

$$(P * C_P) + (R_{pit\ wall} * C_{R_{pitwall}}) + (Pit_{inflow} * C_{adjacent\ pit}) + (GW_{inflow} * C_{GW_{inflow}}) + M_{pit\ wall\ submergence} + M_{backfill\ submergence} - (GW_{outflow} * C_{pit}) - (Pit_{outflow} * C_{pit}) = \frac{\Delta M_{pit\ lake}}{\Delta t} \quad (4.7)$$

and

$$C_{Pit} = \frac{M_{pit\ lake}}{V_{pit\ lake}} \quad (4.8)$$

Where:

C_P	= Precipitation concentration (mg/L)
$C_{Rpit\ wall}$	= Pit wall run-off concentration (mg/L)
$C_{GWinflow}$	= Groundwater inflow concentration (mg/L)
C_{pit}	= Pit concentration (mg/L)

$C_{adjacent\ pit}$	= Concentration of adjacent pit (mg/L)
$M_{pit\ wall\ submergence}$	= Mass introduced from pit wall submergence (mg/d)
$M_{backfill\ submergence}$	= Mass introduced from backfill submergence (mg/d)
$\frac{\Delta M_{pit\ lake}}{\Delta t}$	= Change in pit mass over time (mg/d)
$M_{pit\ lake}$	= Total mass in the pit lake at time of interest (mg)
$V_{pit\ lake}$	= Total volume of water in the pit lake at time of interest (L)

Equation 4.7 accounts for all mass coming in and out of the pit lakes where the difference results in a change of mass stored. Note that evaporation is not included in Equation 4.7, as no solute mass is removed from the system due to evaporation (assuming pure water evaporates). Evaporation is included when calculating resulting concentrations in the pit using Equation 4.8 when dividing total mass stored in the pit by total volume of water.

The pit lake geochemical modeling process couples individual water and mass balance components and simulates their resulting chemistry through a series of dynamic solution mixing, chemical reactions, and mineral surface adsorption. A schematic relating the workflow of the geochemical model is provided in Figure 4.4. Key steps during the geochemical model are summarized as:

- Develop a dynamic water balance from the groundwater flow model simulating the inflows, outflows, and storage of water in each pit. As water levels rise, inflows and outflows dynamically change until equilibrium is reached. Groundwater outflow between pits, if any, is dynamically calculated as a separate water balance component.
- Assign individual, charge-balanced water chemistries to inflow components. Charge balance is achieved by adjusting chloride/sodium concentrations because sodium and chloride do not greatly affect resulting geochemistry. Charge balancing required minimal modification, such that solution ionic strengths were not significantly altered.
- Develop scaled CRFs for representative geochemical units to represent field parameters of pit wall rock. CRFs are dynamically assigned to pit wall runoff in proportion to exposed geochemical units. CRFs are developed as previously described in Section 3.6.
- Add constituent load representing accumulated weathering products from mineral dissolution and sulfide oxidation upon the submergence of wall rock and backfill (if present). A mass loading rate (mass constituent / unit mass rock) derived from CRFs is applied to submerged components of wall rock, again in proportion to exposed geochemical units and depth of the reactive zone. For this study, a reactive rock zone (RRZ) of 18 ft into the wall rock was considered.

- Remove pure water from the open pit lake to account for evaporation in quantities estimated from the water balance. Fully backfilled pits will not have an evaporation component.
- Remove outflow water balance components from the mass balance according to the mixed concentration at the specified time step.
- Select appropriate time steps that represent different stages of water-level rise within the post-closure backfill, including a time step that represented equilibrium conditions, or at least 95 percent pit lake recovery.
- Evaluate lake turnover and assign appropriate atmospheric and redox conditions to the epilimnion and hypolimnion of the pit lake. Where turnover is frequent, such as in arid-climate pit lakes, the lake is expected to be oxygenated and pE values are assigned a value of 4 s.u. Submerged backfill is isolated from oxygenated conditions and therefore pE is decreased to -4 s.u.
- Equilibrate pit lake water with common mineral phases expected to precipitate. Only mineral precipitation is allowed to occur. Mineral phases were assumed to have saturation indices (SI) of 0 except for calcite and barite (SI = 0.5), which are often shown to be supersaturated in mine pit lakes (Eary, 1999). Carbon dioxide partial pressure is set to slight oversaturation (pCO2 = $10^{-2.5}$ atm) based on elevation and observations at existing pit lakes (Eary, 1999).
- Simulate adsorption of specific species (antimony, arsenic, barium, lead, cadmium, copper, nickel, calcium, phosphate, zinc, beryllium, and sulfate) onto precipitated ferrihydrite using the model of Dzombak and Morel (1990). The mass of available ferrihydrite is limited to that precipitated by the geochemical model (i.e., no additional sorption sites that may be available from pit walls, backfill, or aerosols is included). Additional sorption onto other oxides or mineral phases (manganese oxides, aluminium oxides, calcite, organic carbon, backfill substrate) are not included in the adsorption model, adding conservatism in the geochemical model.

A unique geochemical model consisting of a coupled water and mass balance was developed for each pit lake. Water and mass balances were performed using the Dynamic Systems Model (DSM) GoldSim (GoldSim, 2021). GoldSim software simulates transient system fluxes and reservoir storage in dynamically changing systems, i.e. pit lakes. Accumulated mass from all source terms (runoff, groundwater, precipitation, reactive pit walls, etc.) was divided by the pit lake's volume at each time step to generate a unequilibrated concentration of mass through time. Adjustments to the chemistry of the mechanically mixed waters are then made to account for potential chemical reactions in the lake water column and atmosphere. This is done using the aqueous-speciation code PHREEQC with the MINTEQ-4 thermodynamic database (Parkhurst and Appelo 1999).

The geochemical model is constructed to represent lake/pore water conditions during filling and under equilibrium elevation conditions. Time steps to evaluate pit lake chemistry were selected to capture early pit filling and throughout a 200-year post-closure period. A summary of geochemical model time steps is presented in Table 4.3.

Table 4.3: Geochemical model time step assignments.

Closure Alternative	Time Steps (Years Post-Closure)
Proposed Action	1, 2, 3, 5, 10, 20, 30, 50, 75, 100, 125, 150, 175, 200

The effects of evapoconcentration, mineral precipitation, and sorption are simulated as instantaneous reactions following mixing at the conclusion of each time step. Mineral precipitation was applied using a universal set of minerals and equilibrium saturated indices (SIs) at all simulated pits (Table 4.2).

The processes to remove mass were limited to select mineral precipitation, adsorption onto precipitated ferrihydrite, and groundwater outflow. Additional processes that are known pathways for mass removal from solution (i.e. solid solutions, chemisorption, adsorption to suspended colloids or backfill, and adsorption onto calcite) were not simulated because i) their conditions are highly variable and require site specific laboratory testing, and ii) to retain a conservative geochemical model. Once mass is removed via mineral precipitation or adsorption onto ferrihydrite, it has conceptually been removed from the water column. A sensitivity analysis was performed which inhibited mineral precipitation to evaluate the effect of mineral precipitation on water chemistry.

Seasonal lake mixing occurs when the density variation in the lake profile becomes small and cannot prevent the mixing of lake waters due to wind driven currents, evapoconcentration, and thermal variation. Existing lake water and inflows, such as precipitation and pit wall runoff, are completely mixed resulting in oxygenated conditions throughout the entire water column and in equilibrium with atmospheric gasses (Drever, 2002). The potential pit lakes which may form in the Project are anticipated to be fully mixed due to:

- Relatively small and shallow nature of most pits, corresponding to a relatively shallow epilimnion.
- Strong wind-driven currents and seasonal changes in temperatures.
- Climatic setting with a strong evaporation – precipitation deficit that is conducive to forming small density gradients between the epilimnion and hypolimnion (Jewell, 2009).

Redox conditions applied during pit lake modeling reflect the seasonally well mixed conditions because episodic mixing events homogenize the water column and reflect oxygenated conditions even after long periods (i.e. years) without turnover (Connor et al., 2019). The geochemical model assigns redox conditions as follows:

- Pit lakes are assigned redox values of pE = 4 (mildly oxygenated); and
- Backfilled pits were assigned initial redox values using a pE = 4, which declined to a pE = -4, reflecting the consumption of oxygen as the backfill is submerged.

Oxygen gas was the oxidizing agent used to modify redox conditions. Although lake conditions are anticipated to be well mixed, reducing redox conditions consistent with a stratified lake are considered in the sensitivity analysis. Such conditions would reflect deeper lake horizons in the hypolimnion.

Water Balance Inputs

Water balance components identified in Equation 4.6 were derived for each individual pit lake. Every water balance component is dynamically represented as a time-varying component. Water balance components were implemented in the DSM Goldsim model and coupled with a geochemical profile to simulate dynamically changing inflows, outflows, and storage within the pit. A summary of water balance inputs and sources are provided in Table 4.4.

Table 4.4: Water balance inputs

Water Balance Component	Units	Value	Source
Precipitation	in/yr	19.6	Meteorological Station (Piteau, 2022a)
Pit Wall Runoff	%	25%	Evaluated from surface water modeling (Piteau, 2022a)
Bedrock Inflow	gpm	n/a	Intrinsically calculated by numerical flow model
Bedrock Outflow	gpm	n/a	Intrinsically calculated by numerical flow model
Evaporation	in/yr	91.2	Nogales Pan Evaporation data (Piteau, 2022a)

Water balance components for groundwater inflows/outflow and inter-pit flows during lake recovery were intrinsically calculated from the Rosemont Copper World Project groundwater model (Piteau, 2022) using the high K, high storage methodology. Output from the groundwater model was used to formulate the groundwater components of flow in the DSM GoldSim model. Monthly precipitation and evaporation rates were applied to both historical and predictive models (Table 2.1). Output filling curves and recovery water from the groundwater model serve as a second check for predicted lake/backfill recovery results simulated by GoldSim.

Geochemical Input Data

Water balance components were assigned a geochemical profile derived from groundwater monitoring, pit lake monitoring, waste rock kinetic tests, or assigned a value based on literature. A summary of methodology for assigning geochemical profiles is provided in Table 4.5 and described in the following sections.

Table 4.5: Geochemical profile assignments

Water Balance Component	Source	Comments
Precipitation	NADP, 2021	Representative rainwater chemistry data from Chiricahua Mountains.
Pit Wall Runoff	Rock Characterization Program	HCT and leach test data is selected as surrogate geochemical source terms for exposed lithology in final pit wall. Data is scaled from laboratory to pit wall setting (Tetra Tech, 2007a; Tetra Tech, 2007b; Tetra Tech, 2007c; Rosemont, 2014)).
Pit Wall Submergence	Rock Characterization Program	Cumulative CRFs derived from HCT and leach test data is scaled for reactive wall rock mass loading terms to the pit lake.
Bedrock Groundwater	Environmental Monitoring	Bedrock groundwater chemistry from Project monitoring program. Groundwater chemistries are unique for each pit.
Evaporation	n/a	Evaporation is assigned geochemical profile of pure water.
Pit lake inflow/outflow	Geochemical model	Mass fluxes are intrinsically calculated.

Direct Precipitation

Precipitation was assigned a geochemical profile derived from the National Atmospheric Depositional Program (NADP) station located in the Chiricahua Mountains in Arizona (NADP, 2021). This is the nearest station to the Project that remains in operation. The data pulled from NADP were annual averages spanning from February of 1999 to December of 2020 which were averaged together to obtain a single value for each constituent. These concentrations are presented in Table 4.6. Precipitation rates were derived from the Helvetia Santa Rita meteorological station, whose average monthly precipitation rates are shown in Table 2.1.

Table 4.6: Precipitation chemistry assignments

Element	Unit	Value
pH	s.u.	5.32
Calcium	mg/l	0.21
Magnesium	mg/l	0.017
Potassium	mg/l	0.031
Sodium	mg/l	0.066
Total Nitrogen	mg/l	0.93
Chloride	mg/l	0.107
Sulfate	mg/l	0.566

Evaporation

Evaporation was assigned a geochemical profile of pure water.

Groundwater Inflows

Groundwater inflow chemistry was developed as a weighted average from adjacent monitoring wells for each individual pit. The weighting scheme utilized the proximity of the monitoring well to each pit's perimeter. Measured groundwater chemistry was presented in Section 3.7. Composite groundwater chemistry and weighting scheme is discussed for each individual pit in its respective sections.

Pit Wall Runoff

Precipitation which is in contact with wall rock can react with minerals and potentially mobilize constituents. Pit wall runoff is defined as the unsaturated portion of flow that occurs surficially or as interflow along the rind of the open pit to the lake (MEND, 1995). The geochemical composition of run-off depends on the exposure of rock in contact with water and the frequency of precipitation that rinses the rock exposure.

The geochemical modeling approach assigns chemical concentrations to runoff chemistry in a three-step process described as follows:

1. An analysis of the geochemical units exposed upon future pit walls was made to determine the exposed surface area of each geochemical unit. Percentages of each exposed geochemical unit were used to partition runoff water balance components between the several geochemical units exposed above the lake stage at each pit. The exposure of geochemical units is dynamically re-calculated during pit lake filling to reflect the remaining exposure of geochemical units. Wall rock distributions for are presented individually in their respective sections.

2. Develop unique CRFs for each geochemical unit found in the pit wall from weekly HCT leachates and leach tests. CRF development was discussed in Section 3.6.
3. Link CRFs to the geochemical model using pore volume flushes. Each week of laboratory HCT rinsing is equivalent to approximately 2.5 pore volumes. The number of pore volumes that rinsed the exposed pit wall by runoff was dynamically calculated in the pit lake water balance and correlated to individual weeks of testing. The geochemical model then assigns the appropriate chemistry to runoff, based on the pore volumes which have been rinsed between geochemical time steps. An example of the calculation is provided in Figure 4.5.

The runoff term of mass loading was calculated by multiplying composited geochemical HCT profiles by the flux of runoff for every time step according to Equation 4.9.

$$M_i = SF * CRF_i^{pv} \left[\frac{SA_i}{SA_t}\right] * q_{runoff} \quad (4.9)$$

Where:

M_i= Runoff mass loading rate of an individual geochemical unit in units of (mass / time).

SF= Total scaling factor, unitless.

CRF_i^{pv}= Chemical Release Function concentration of an individual geochemical unit (i) in units of (mass / length^3). The composite geochemical profile is a vector of individual elements. The values of composite geochemical profile concentration are varied through time according to proxy HCT data.

SA_i= Surface area of geochemical unit (i) of rock materials located above the current pit lake water level in units of (length^2).

SA_t= Total surface area above the current pit lake water level in units of (length^2).

q_{runoff}= Runoff flux in units of (length^3 / time).

Mass loading via runoff to the simulated pit lake is then multiplied by the time step size, which is 1 day in the DSM GoldSim model, to generate a mass loading term for solutes derived from runoff to the pit lake.

The composite geochemical profile concentrations are functionalized by pore volumes flushed to relate field runoff with laboratory weeks, as demonstrated in Figure 4.5. Pore volumes are tracked in the DSM by dividing the volume of runoff by the reactive rock zone (RRZ) volume above the pit lake at each time step (Equation 4.10). In this way the instantaneous concentrations of runoff mass are dynamically calculated through time using the CRFs of geochemical materials.

$$PV_i = PV_{i-1} + \frac{\sum(q_{runoff} * \Delta t)}{DRZ} \tag{4.10}$$

Where acid-generating material is located in the pit wall, the composite geochemical profiles are conservatively adjusted to reflect acid-generating leachates (i.e. equilibrium sulfide oxidation) and thus eliminate a potential time delay before acidity is added to the pit lake model. However, for potentially acid-generating materials within the Project, first flush leachates produce the greatest mass and acidity; thus, the CRFs include week 0 leachates.

Submerged Pit Wall Flushing

Geochemical processes of sulfide oxidation and mineral dissolution are associated with the reactive wall rock zone and capillary fringe that forms along the interface of the pit lake and pit wall. After inundation, the rate of sulfide oxidation practically ceases, owing to a lack of readily available oxygen capable of diffusing into wall rock. Thus, the partially saturated capillary fringe and overlying pit wall catchment are the primary reaction zones contributing pit lake mass loading. The geochemical model accounts for mass loading from the volume of newly submerged wall rock along the rind of the pit wall at each time step.

Pit wall deformation is known to be capable of extending deep into the rock mass at distances greater than 50 ft; however, readily available oxygen diffusion in arid climatic conditions is generally restricted to the shallow rind immediately behind the pit wall owing to decreasing fracture densities and moisture content further into the wall rock (Fennemore, 1998). Typically a reactive oxidizing rind of 5 ft – 50 ft represents this zone, referred to in this report as the reactive rock zone (RRZ). This geochemically reactive zone is adjacent to the atmosphere, capillary fringe, and the littoral zone of the lake which oxidize insitu minerals along fracture planes and in accumulated debris. A RRZ thickness of 18 ft was developed from previous studies and literature to account for sulfide oxidation and the flushing of sulfosalts solutes (Tetra Tech, 2010a).

Accumulated mass from the submerged wall rock / pit lake interface was simulated using a mass load rates which were derived from CRFs for wall rock lithologies to represent the flushing of constituents from weathered materials. Mass loading rates were calculated for samples used to generate CRFs (Table 3.12) by multiplying the effluent concentration by effluent volume and dividing it by the sample mass (which was normalized to 1kg) as shown in Equation 4.11. HCT samples used an average leachate of 0.72 liters to generate mass loading rates. The resultant mass loading rates, units of mg / kg rock material, are provided in Appendix G.

$$Mass\ Loading_i = CRF_i^{week\ 0} \frac{Effluent\ Volume}{Sample\ Mass} \tag{4.11}$$

Upon inundation, the accumulated weathering products within the RRZ are instantaneously added to the pit lake. Mass loading is simulated to occur continually as water levels oscillate across the littoral zone of the pit lake.

5 WASTE ROCK FACILITY GEOCHEMICAL MODEL

The WRF will be constructed directly on native soils and placed as backfill within the Heavy Weight, Copper World, and Broadtop Butte Pits. Groundwater impacts from the WRF can occur via two mechanisms, i) infiltration through the WRF may potentially affect groundwater quality depending on seepage chemistry and quantity; ii) weathering products from submerged backfill will mix with groundwater and discharge into the groundwater system. This section analyzes the potential of infiltration from the waste rock facility to impact groundwater quality. Potential groundwater impacts from submerged backfill are described for each backfilled pit in subsequent sections.

The WRF location is shown in Figure 5.1. The main WRF will be constructed as mining progresses from west to east. The facility's footprint will span an area of approximately 718 acres, straddling the hydrographic boundaries between the Upper Cienega Creek and Santa Cruz hydrologic basins. The facility is designed to contain 695 million tons of material. The overwhelming majority of waste rock will originate from the Rosemont Pit during the latter stages of mining (83% of materials). About 9% of waste will be generated from Broadtop Butte Pit, with the remaining Satellite pits comprising the remaining 8% of waste rock.

Run of mine waste rock materials are anticipated to be very coarse, with a d50 value ranging from 0.6 ft to 1.5 ft in diameter (CNI, 2012). Bulk physical properties for the WRF are summarized as follows:

- Average porosity: 0.25 (Rosemont, 2021)
- Bulk density: 125 lbs / ft^3 (Rosemont, 2021)
- D50: 0.6 ft to 1.5 ft (CNI, 2012)
- Cu: ~3.4 (CNI, 2012).

These physical properties suggest that material in the WRF will have very low water content and that if any infiltration occurs it will be along macropores or preferential pathways. The corresponding specific surface area available to react with contact waters will also be quite low, less than leachate tests performed in the laboratory.

5.1 Waste Rock Facility Seepage Chemistry Development

The bulk AP and NP composition characterize the WRF characterize as NAG, with a composite NPR of ~31. Taken on the whole, the WRF will not develop ARD and have capacity to neutralize any small pockets of AG material, only comprising ~0.5% of the facility. However, care should be taken to encapsulate the minority AG rock to the interior of the WRF, which may locally generate acidity (Rosemont, 2022). Material abundance and weighted average of AP and NP of Geochemical Units comprising the WRF materials are summarized in Table 5.1.

Table 5.1: Geochemical composition of WRF material

Geochemical Unit	Tons (Mt)	% Composition	Average AP ($tCaCO^3$/ kt)	Average NP ($tCaCO^3$/ kt)
ABRIGO:<1.2	0.02	0.0%	24.1	24.9
ABRIGO:>3	38.70	5.6%	5.7	423.7
ABRIGO:1.2-3	0.02	0.0%	12.1	28.6
ANDESITE:<1.2	1.15	0.2%	47.2	43.3
ANDESITE:>3	222.00	31.9%	6.2	73.3
ANDESITE:1.2-3	10.70	1.5%	27.4	60.9
ARKOSE:<1.2	0.08	0.0%	6.6	7.0
ARKOSE:>3	49.10	7.1%	2.5	66.4
ARKOSE:1.2-3	1.04	0.1%	4.7	9.6
BOLSA:<1.2	0.63	0.1%	8.4	4.3
BOLSA:>3	31.10	4.5%	3.6	139.9
BOLSA:1.2-3	4.39	0.6%	6.1	13.9
CONCHA:>3	0.92	0.1%	3.3	215.3
EARP:>3	17.40	2.5%	4.7	454.3
EPITAPH:>3	11.70	1.7%	6.4	327.0
ESCABROSA:>3	15.70	2.3%	2.1	695.1
GILA:>3	16.60	2.4%	3.0	227.5
GLANCE:>3	61.60	8.9%	4.1	565.7
GLANCE:1.2-3	0.02	0.0%	24.8	54.5
GRANODIORITE:<1.2	0.26	0.0%	15.7	9.7
GRANODIORITE:>3	40.80	5.9%	4.7	90.1
GRANODIORITE:1.2-3	5.67	0.8%	3.4	7.6
HORQUILLA:>3	25.10	3.6%	3.0	594.3
MARTIN:>3	43.10	6.2%	7.5	511.1
QMP:<1.2	0.02	0.0%	7.7	8.8
QMP:>3	60.50	8.7%	17.0	141.0
QMP:1.2-3	11.30	1.6%	41.9	105.9
SCHERRER:>3	19.10	2.7%	13.9	412.2
UNKNOWN:<1.2	0.09	0.0%	6.2	5.3
UNKNOWN:>3	5.60	0.8%	2.7	53.3
UNKNOWN:1.2-3	0.46	0.1%	4.8	10.5
Total	**695**	**100%**	**7.4**[1]	**231.9**[1]
Weighted NPR			**31.3**	

[1] Weighted value

5.2 Waste Rock Facility Seepage Chemistry Results

A composite CRF was developed for the WRF by multiplying the Week 0 (first flush) leachates of each Geochemical Unit by its relative abundance (Table 5.2). No scaling factor was applied to the composite CRF. The composite CRF was geochemically equilibrated with atmospheric conditions and mineral phases to precipitate a likely assemblage of minerals as described in Section 4.2. Final seepage chemistry from the WRF is provided in Table 5.2.

Table 5.2 WRF composite seepage chemistry

Parameter	Units	EPA I/II	AWQS	Composite Seepage Chemistry	Final Seepage Chemistry (Unscaled)
pH	s.u.	6.5-8.5	-----	8.05	7.43
Alkalinity, Total	mg/L	-----	-----	100	98
Aluminum	mg/L	0.2	-----	0.18	0.00
Antimony	mg/L	0.006	0.006	0.000	0.000
Arsenic	mg/L	0.01	0.05	0.009	0.005
Barium	mg/L	2.0	2.0	0.01	0.01
Beryllium	mg/l	0.004	0.004	0.000	0.000
Boron	mg/l	-----	-----	0.000	0.000
Cadmium	mg/L	0.005	0.005	0.000	0.000
Calcium	mg/L	-	-----	21	21
Chloride	mg/L	250	-----	3	3
Chromium	mg/L	0.10	0.10	0.00	0.00
Copper	mg/L	1.00	-----	0.025	0.017
Fluoride	mg/L	4.00	4.00	0.99	0.99
Iron	mg/L	0.3	-----	0.09	0.00
Lead	mg/L	0.015	0.05	0.004	0.002
Magnesium	mg/L	-----	-----	3.2	3.2
Manganese	mg/L	0.05	-----	0.0	0.000
Mercury	mg/L	0.002	0.002	0.0001	0.0001
Molybdenum	mg/L	-----	-----	0.01	0.01
Nickel	mg/L	-----	0.1	0.00	0.00
Nitrogen, Total as N	mg/L	10.0	10.0	0.05	0.05
Potassium	mg/L	-----	-----	6.3	6.3
Selenium	mg/L	0.05	0.05	0.010	0.010
Silver	mg/L	0.10	-----	0.000	0.000
Sodium	mg/L	-----		20	20
Sulfate	mg/L	250	-----	29	29
Thallium	mg/L	0.002	0.002	0.0000	0.0000
TDS	mg/L	500	-----	184	182
Uranium	mg/L	0.03	-----	0.000	0.000
Zinc	mg/L	5.00	-----	0.01	0.01

Indicates values above AWQS

Key results from the WRF geochemical modeling are as follows:

- WRF seepage chemistry is circum-neutral and possesses a calcium bicarbonate (Ca-HCO_3) type chemistry. Alkalinity is predicted to be the highest ion in the solution with low concentrations of metals and trace ions.
- Seepage is anticipated to meet AWQS and is within the range of observed values in background groundwater (TDS, SO4, F, Fe, Mn, etc.).
- The unequilibrated composite solution is super-saturated with regard to ferrihydrite, gibbsite, malachite, and pyrolusite under atmospheric conditions. These saturated mineral phases further reduce aluminium, arsenic, iron and manganese concentrations after mineral equilibration. Thus any WRF seepage is geochemically controlled and anticipated to be of good quality.
- Minor attendant metal ions can be removed via the mechanism of adsorption onto the substrates of colloids. As described previously in Section 4.2, the simulated removal of mass through adsorption excludes the potential sorption pathway of ions onto the substrates of WRF materials itself or onto other metal oxides which precipitate from solution (i.e. aluminium and manganese oxides). Predicted seepage chemistry is therefore considered to overpredict the concentrations of attendant metal ions.

5.3 Waste Rock Facility Sensitivity Analyses

A sensitivity analysis on inputs to the WRF seepage chemistry was performed to assess model uncertainty and to envelope realistic potential ranges in seepage chemistry. Key uncertainties regarding WRF leachate are:

- Abundance of AP material in the WRF.
- Representativeness of CRFs for WRF materials.
- Inhibition of geochemical reactions.
- WRF materials mined only from Satellite pits.

Four (4) sensitivity scenarios were developed to assess these uncertainties. The sensitivities deliberately erred on the side of conservativism (i.e. adding greater mass to the leachate solution).

- **10x AG materials in the WRF**: This sensitivity evaluated the conditions of the WRF leachate if the anticipated quantity of AG materials was increased by a factor of 10. The abundance of each AG geochemical unit was increased by an order of magnitude, and the corresponding volume was reduced from NAG or PAG geochemical units. Despite this increase, the bulk WRF was still strongly neutralizing in terms of ABA characteristics.

- **Standard deviation sensitivity (only NAG or PAG geochemical units)**: This sensitivity utilizes the elemental standard deviations of NAG or PA geochemical units. AG geochemical units are omitted from the standard deviation calculation because they provide a disproportionate influence on the standard deviations of metal and sulfate elements for the following reasons:
  - The same worst-case surrogate AG sample (Andesite Col. Leachate) was substituted for most geochemical units missing AG material.
  - Although the seepage chemistry of the AG material is more concentrated, there is order of magnitude greater neutralizing capacity of WRF materials, so leachates with high metal concentrations are prohibited from forming. Applying the standard deviation from AG would imply the formation of ARD, which is unlikely.

  Standard deviations and how they were added or subtracted to the composite seepage chemistry are provided in Table 5.3. For elements which were always below detection limits, a standard deviation of 0 was calculated.
- **Inhibition of mineral precipitation**: This sensitivity evaluates seepage chemistry where mineral precipitation is inhibited. Saturation indices of minerals are increased by a log factor of 1 (log +1.0) in PHREEQC (atmospheric partial pressures are not changed).
- **Satellite Pit Waste Rock**: This sensitivity evaluates seepage chemistry based on the abundance of waste rock mined from the Satellite pits, which constitute 17% of the overall WRF. Satellite pits will be mined first; therefore, this sensitivity assess the variability in the initial mine materials from materials mined later near the end of the planned mine life. Relative abundances of materials for the Satellite pits are provided in Table 5.4.

Table 5.3 WRF standard deviation

Parameter	Units	EPA I/II	AWQS	Standard Deviation (NAG or PAG Geochemical Units) σ	Standard Deviation Applied in Sensitivity
pH	s.u.	6.5-8.5	-----	0.79	- σ
Alkalinity, Total	mg/L	-----	-----	57	- σ
Aluminum	mg/L	0.2	-----	0.28	n/a
Antimony	mg/L	0.006	0.006	0.002	+ σ
Arsenic	mg/L	0.01	0.05	0.006	+ σ
Barium	mg/L	2.0	2.0	0.02	+ σ
Beryllium	mg/l	0.004	0.004	0.000	+ σ
Boron	mg/l	-----	-----	0.000	n/a
Cadmium	mg/L	0.005	0.005	0.000	n/a
Calcium	mg/L	-	-----	146.7	+ σ
Chloride	mg/L	250	-----	3.2	+ σ
Chromium	mg/L	0.10	0.10	0.000	n/a
Copper	mg/L	1.00	-----	0.04	n/a
Fluoride	mg/L	4.00	4.00	0.93	+ σ
Iron	mg/L	0.3	-----	0.30	+ σ
Lead	mg/L	0.015	0.05	0.00	n/a
Magnesium	mg/L	-----	-----	10.8	+ σ
Manganese	mg/L	0.05	-----	0.01	+ σ
Mercury	mg/L	0.002	0.002	0.0001	+ σ
Molybdenum	mg/L	-----	-----	0.016	+ σ
Nickel	mg/L	-----	0.1	0.00	+ σ
Nitrogen, Total as N	mg/L	10.0	10.0	0.0	n/a
Potassium	mg/L	-----	-----	11.8	+ σ
Selenium	mg/L	0.05	0.05	0.02	+ σ
Silver	mg/L	0.10	-----	0.000	n/a
Sodium	mg/L	-----		10.7	+ σ
Sulfate	mg/L	250	-----	300	+ σ
Thallium	mg/L	0.002	0.002	0.000	n/a
Uranium	mg/L	500	-----	0.00	n/a
Zinc	mg/L	0.03	-----	0.00	n/a

n/a indicates no elemental variation across leachate samples (i.e. all sample below detection limit for element).

Table 5.4: Geochemical composition of Satellite Pit Waste Rock sensitivity

Geochemical Unit	Tons (Mt)	% Composition	Average AP ($tCaCO^3$/ kt)	Average NP ($tCaCO^3$/ kt)
ABRIGO:<1.2	0.02	0.0%	24.1	24.9
ABRIGO:>3.0	7.94	6.6%	5.2	251.8
ABRIGO:1.2-3.0	0.02	0.0%	12.1	28.6
ARKOSE:>3.0	1.97	1.6%	2.5	275.9
BOLSA:<1.2	0.03	0.0%	12.6	8.3
BOLSA:>3.0	15.00	12.5%	4.5	284.2
BOLSA:1.2-3.0	0.09	0.1%	11.5	23.8
CONCHA:>3.0	0.92	0.8%	3.3	215.3
EARP:>3.0	3.15	2.6%	15.5	375.1
EPITAPH:>3.0	8.93	7.4%	6.8	358.7
ESCABROSA:>3.0	0.60	0.5%	3.7	450.3
GLANCE:>3.0	13.70	11.4%	4.8	451.0
GRANODIORITE:<1.2	0.07	0.1%	27.2	15.6
GRANODIORITE:>3.0	28.70	23.9%	5.9	124.9
GRANODIORITE:1.2-3.0	0.01	0.0%	0.8	2.3
HORQUILLA:>3.0	1.70	1.4%	4.6	470.5
MARTIN:>3.0	0.30	0.2%	3.9	449.2
QMP:<1.2	0.07	0.1%	2.2	2.5
QMP:>3.0	30.70	25.5%	9.4	113.1
QMP:1.2-3.0	3.81	3.2%	11.5	27.1
SCHERRER:>3.0	2.44	2.0%	6.1	450.9
Total	**120**	**100%**	**6.8**[1]	**224.9**[1]
Weighted NPR			**32.9**	

[1] Weighted value

Waste Rock Facility Sensitivity Analysis Results

Geochemical results from the sensitivity analysis are provided in Table 5.5. In general, the sensitivity analysis supports that, if seepage was to occur, it would not produce ARD leachate from the facility. Results for the sensitivity analysis is summarized as follows:

- The “10x AG” sensitivity yield very similar results as the base case seepage chemistry. The leachate was still circum-neutral with minor increases to most constituents. No constituents were predicted to be above MCLs. This sensitivity highlights the overwhelming neutralizing capacity of the WRF, and how uncertainties in the ABA characteristics of the waste rock are not anticipated to meaningfully affect seepage chemistry or degrade groundwater.
- The “Standard Deviation Sensitivity” has the greatest increase in seepage concentrations, particularly for sulfate, TDS, and selenium. Increased concentrations of selenium are predicted to remain below AWQS; however, it is noteworthy to identify that

selenium standard deviations are most heavily influenced by andesite rock materials, and in particular samples AR2013-03 HCT, and AR2014-03-HCT (representing ~13% of tested Andesite materials). Overall, this sensitivity indicates the natural variability of materials can have a minor effect on WRF leachate.

- The “SI +log 1” produces a seepage chemistry very similar to the base case shown in Table 5.3. Overall, the sensitivity indicates mineral precipitation has a minor effect on WRF seepage chemistry.
- The “Satellite Pits Waste Rock” sensitivity produces very similar leachate concentrations as the base case. Slightly higher iron is released in this sensitivity which has the effect of forming additional sorption sites to remove attendant metals from solution.

Table 5.4 WRF Sensitivity analysis results

Parameter	Units	EPA I/II	AWQS	10x AG Materials	Standard Deviation NAG or PAG Geochemical Units	SI + Log 1.0	Satellite Pit Waste Rock
pH	s.u.	6.5-8.5	-----	7.42	6.81	7.43	7.46
Alkalinity, Total	mg/L	-----	-----	95	26	98	106
Aluminum	mg/L	0.2	-----	0.00	0.01	0.01	0.00
Antimony	mg/L	0.006	0.006	0.000	0.002	0.000	0.000
Arsenic	mg/L	0.01	0.05	0.004	0.002	0.005	0.000
Barium	mg/L	2.0	2.0	0.01	0.03	0.01	0.01
Beryllium	mg/l	0.004	0.004	0.000	0.000	0.000	0.000
Boron	mg/l	-----	-----	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.005	0.005	0.001	0.000	0.000	0.000
Calcium	mg/L	-	-----	23	168	21	17
Chloride	mg/L	250	-----	3	130	3	3
Chromium	mg/L	0.10	0.10	0.00	0.00	0.00	0.00
Copper	mg/L	1.00	-----	0.028	0.038	0.017	0.027
Fluoride	mg/L	4.00	4.00	1.02	1.93	0.99	1.11
Iron	mg/L	0.3	-----	0.00	0.00	0.00	0.00
Lead	mg/L	0.015	0.05	0.003	0.004	0.003	0.001
Magnesium	mg/L	-----	-----	4	14	3.2	2
Manganese	mg/L	0.05	-----	0.0	0.0	0.0	0.0
Mercury	mg/L	0.002	0.002	0.0001	0.0001	0.0001	0.0000
Molybdenum	mg/L	-----	-----	0.01	0.03	0.01	0.01
Nickel	mg/L	-----	0.1	0.00	0.00	0.00	0.00
Nitrogen, Total as N	mg/L	10.0	10.0	0.05	0.05	0.05	0.05
Potassium	mg/L	-----	-----	6.6	18.1	6.3	6.1
Selenium	mg/L	0.05	0.05	0.010	0.025	0.010	0.000
Silver	mg/L	0.10	-----	0.000	0.000	0.000	0.000
Sodium	mg/L	-----		20	24	20	23
Sulfate	mg/L	250	-----	37	329	29	15
Thallium	mg/L	0.002	0.002	0.0000	0.0000	0.0000	0.0000
TDS	mg/L	500	-----	190	712	182	173
Uranium	mg/L	0.03	-----	0.000	0.000	0.000	0.000
Zinc	mg/L	5.00	-----	0.03	0.00	0.00	0.01

Indicates values above AWQS

6 TAILINGS FACILITY GEOCHEMICAL MODEL

Tailings waste from mining will be disposed of via cylcones in two TSFs located on the western piedmont of the Santa Rita Mountains (Figure 6.1). The TSF-1 facility footprint will span an area of approximately 304 acres, and the TSF-2 footprint will occupy and area of 856 acres. Approximately 445 million tons of tailings will be deposited between the two facilities. The majority of mined and milled material will be derived from limestone/skarn rock (67% of materials). A breakdown of geologic units comprising the TSFs is provided in Table 6.1.

The TSFs will be constructed directly on native soils and bedrock outcrop. Groundwater impacts can occur primarily via initial drain down and secondarily from long term meteoric water infiltration. Seepage from the TSFs will be greatest upon emplacement, when water content is high, and then asymptotically decrease to equilibrium rates. Groundwater quality may potentially be impacted depending on seepage chemistry and rates.

Table 6.1: Geologic composition of TSFs

Geologic Unit	Tons (MT)	% Composition
ABRIGO	13.60	3.1%
ANDESITE	9.71	2.2%
ARKOSE	7.11	1.6%
BOLSA	18.40	4.1%
CONCHA	0.53	0.1%
EARP	46.40	10.4%
EPITAPH	50.10	11.3%
ESCABROSA	13.40	3.0%
GILA	0.38	0.1%
GLANCE	30.90	6.9%
GRANODIORITE	13.80	3.1%
HORQUILLA	140.00	31.4%
MARTIN	6.76	1.5%
QMP	48.80	11.0%
SCHERRER	41.60	9.4%
UNKNOWN	3.65	0.8%
Total	**445.00**	**100.0%**

Bulk physical properties for TSF material are summarized as follows:

- Average porosity: 0.5 (Rosemont, 2021)
- Bulk density: 90 lbs / ft^3 (Rosemont, 2021)
- D50: 0.0021 in (0.053 mm) (Rosemont, 2021)
- Cu: ~3.4 (Rosemont, 2021).
- Saturated hydraulic conductivity: 2.4x 10^{-5} cm/s (Rosemont, 2014)

6.1 Tailings Facility Leachate Development

Tailings specific samples are more appropriate to characterize the TSF leachate because they have undergone the chemical and physical changes incurred by mining and milling. Tailings can be chemically depleted in metal ions due to the milling and extraction process, thus leaving materials that are less chemically reactive than native ore. However, mineral processing and crushing pulverizes materials to smaller grain sizes and greater specific surface areas than that of typical laboratory leachate samples for raw ore material.

Fourteen (14) tailings samples from 2007 to 2012 were submitted for leachate testing and used to develop the tailings CRF. Lithologic specific tailings samples for the major geologic materials were assigned to their respective units, including composite samples that wee predominantly a single lithologic unit, as in the case of Year 0-3 tailings (Horquilla). A mixture of composited tailings samples was assigned to the remaining geologic materials where no lithologic specific sample was available. The latest, 2012, composite tailings samples were used for these units because they represent composites in the closest proportions based on the mining sequence. These samples were prepared as part of the previous Rosemont Copper World Project. A summary of sample assignments is provided in Table 6.2.

Table 6.2: Samples assigned to tailings CRF

Tailings Group	Geologic Unit	% Composition	Leachate Sample Assignment
Limestone / Skarn	ABRIGO	3.1%	Epitaph-MWMP
	CONCHA	0.1%	Epitaph-MWMP
	EARP	10.4%	Earp-MWMP
	EPITAPH	11.3%	Epitaph-MWMP
	ESCABROSA	3.0%	Escarbosa-SPLP
	HORQUILLA	31.4%	Horquilla-MWMP, Year 0-3 Tailings-HCT
	MARTIN	1.5%	Epitaph-MWMP
	SHERRER	9.4%	Earp-MWMP
Volcanic / Sedimentary	ANDESITE	2.2%	2012 4-7 Year Composite-MWMP 2012 8-12 Year Composite-MWMP 2012 13-21 Year Composite-MWMP
	ARKOSE	1.6%	
	BOLSA	4.1%	
	GILA	0.1%	
	GLANCE	6.9%	
	GRANODIORITE	3.1%	
	QMP	11.0%	
	UNKNOWN	0.8%	

6.2 Tailings Facility Leachate Results

A composite CRF was developed for the TSFs by multiplying the Week 0 (first flush) leachates of each Geochemical Unit by its relative abundance (Table 6.2). The composite leachate was then geochemically equilibrated with the atmosphere and mineral phases per the discussion in Section 4.2. No scaling factor was applied to TSF leachate because the samples represent milled materials. Final seepage chemistry is provided in Table 6.3.

Table 6.3 TSF composite seepage chemistry

Parameter	Units	EPA I/II	AWQS	Composite Seepage chemistry	Final Seepage chemistry
pH	s.u.	6.5-8.5	-----	6.99	7.06
Alkalinity, Total	mg/L	-----	-----	47	47
Aluminum	mg/L	0.2	-----	0.01	0.00
Antimony	mg/L	0.006	0.006	0.002	0.002
Arsenic	mg/L	0.01	0.05	0.004	0.003
Barium	mg/L	2.0	2.0	0.02	0.02
Beryllium	mg/l	0.004	0.004	0.000	0.000
Boron	mg/l	-----	-----	0.000	0.000
Cadmium	mg/L	0.005	0.005	0.000	0.000
Calcium	mg/L	-	-----	281	281
Chloride	mg/L	250	-----	6	6
Chromium	mg/L	0.10	0.10	0.00	0.00
Copper	mg/L	1.00	-----	0.007	0.006
Fluoride	mg/L	4.00	4.00	1.20	1.20
Iron	mg/L	0.3	-----	0.03	0.00
Lead	mg/L	0.015	0.05	0.001	0.000
Magnesium	mg/L	-----	-----	28	28
Manganese	mg/L	0.05	-----	0.03	0.00
Mercury	mg/L	0.002	0.002	0.0000	0.0000
Molybdenum	mg/L	-----	-----	0.06	0.06
Nickel	mg/L	-----	0.1	0.00	0.00
Nitrogen, Total as N	mg/L	10.0	10.0	0.00	0.00
Potassium	mg/L	-----	-----	13.6	13.6
Selenium	mg/L	0.05	0.05	0.026	0.026
Silver	mg/L	0.10	-----	0.000	0.000
Sodium	mg/L	-----		27	27
Sulfate	mg/L	250	-----	808	808
Thallium	mg/L	0.002	0.002	0.0000	0.0000
TDS	mg/L	500	-----	1,213	1,212
Uranium	mg/L	0.03	-----	0.000	0.000
Zinc	mg/L	5.00	-----	0.00	0.00

Indicates values above AWQS

Key results from the TSF geochemical modeling are as follows:

- The TSF leachate is anticipated to be circum-neutral and of a calcium sulfate ($Ca\text{-}SO_4$) type chemistry. This is aligned with the bulk composition of ore rocks routed to the TSFs being ~67% limestone / skarns.
- No constituents are predicted to be above AWQS, although predicted sulfate concentrations are elevated.
- The composite leachate solution is super-saturated with respect to ferrihydrite, gibbsite, barite, and pyrolusite under atmospheric conditions. Trace amounts of these minerals precipitate owing to the already low concentrations of metals in tailings leachate.

6.3 Tailings Facility Geochemical Sensitivity Analysis

A sensitivity analysis on inputs to the TSF seepage chemistry was performed to assess uncertainty and to envelope realistic potential ranges in chemistry. Key uncertainties regarding tailings leachate are:

- Representativeness of tailings laboratory samples for the TSF.
- Tailings geochemical profiles assigned to intrusive and sedimentary ore materials.
- Inhibition of geochemical reactions.

Three (3) sensitivity scenarios were developed to assess these uncertainties. The sensitivities deliberately erred on the side of conservativism (i.e. adding greater mass to the leachate solution).

- **Standard deviation sensitivity**: This sensitivity evaluated the representativeness of tailings laboratory samples by calculating the standard deviation of each element and applying it to the composite seepage chemistry. Standard deviations and how they were added or subtracted to seepage chemistry are provided in Table 6.4. For elements which were always below detection limits, a standard deviation of 0 was calculated.
- **Volcanic / Sedimentary tailings surrogate**: This sensitivity considers the effect of the 2012 composite samples. Volcanic / Sedimentary tailings materials are replaced with Week 0 CRFs (utilized for pit lake modeling) for every geologic material comprising Volcanic / Sedimentary tailings (Table 6.2, comprise 29.8% of the TSF materials). Because CRFs were defined for NAG, PAG, and AG ABA characteristics, they were equally weighted for the individual geologic materials, as shown in Table 6.5.
- **Inhibition of mineral precipitation**: This sensitivity evaluates seepage chemistry where mineral precipitation is inhibited. Saturation indices of minerals are increased by a log factor of 1 (log +1.0) in PHREEQC (atmospheric partial pressures are not

changed). The chemistry is very similar to the composite seepage chemistry shown in Table 6.3.

Table 6.4 TSF Standard deviation

Parameter	Units	EPA I/II	AWQS	Standard Deviation (σ)	Standard Deviation Applied in Sensitivity
pH	s.u.	6.5-8.5	-----	1.49	- σ
Alkalinity, Total	mg/L	-----	-----	31.98	- σ
Aluminum	mg/L	0.2	-----	0.00	n/a
Antimony	mg/L	0.006	0.006	0.004	+ σ
Arsenic	mg/L	0.01	0.05	0.002	+ σ
Barium	mg/L	2.0	2.0	0.009	+ σ
Beryllium	mg/l	0.004	0.004	0.001	+ σ
Boron	mg/l	-----	-----	0.000	n/a
Cadmium	mg/L	0.005	0.005	0.000	n/a
Calcium	mg/L	-	-----	231.4	+ σ
Chloride	mg/L	250	-----	8	+ σ
Chromium	mg/L	0.10	0.10	0.00	n/a
Copper	mg/L	1.00	-----	0.00	n/a
Fluoride	mg/L	4.00	4.00	0.30	+ σ
Iron	mg/L	0.3	-----	0.04	+ σ
Lead	mg/L	0.015	0.05	0.000	n/a
Magnesium	mg/L	-----	-----	47.7	+ σ
Manganese	mg/L	0.05	-----	0.032	+ σ
Mercury	mg/L	0.002	0.002	0.0000	n/a
Molybdenum	mg/L	-----	-----	0.125	+ σ
Nickel	mg/L	-----	0.1	0.002	+ σ
Nitrogen, Total as N	mg/L	10.0	10.0	0.0	n/a
Potassium	mg/L	-----	-----	7.8	+ σ
Selenium	mg/L	0.05	0.05	0.043	+ σ
Silver	mg/L	0.10	-----	0.00	n/a
Sodium	mg/L	-----		32	+ σ
Sulfate	mg/L	250	-----	656.7	+ σ
Thallium	mg/L	0.002	0.002	0.000	n/a
Uranium	mg/L	500	-----	0.000	n/a
Zinc	mg/L	0.03	-----	0.00	n/a

n/a indicates no elemental variation across leachate samples (i.e. all sample below detection limit for element).

Table 6.5: Weighting scheme for Volcanic / Sedimentary surrogate sensitivity analysis

Geologic Unit	% Tailings Composition	AG %	PAG %	NAG %
ANDESITE	2.2%	0.7%	0.7%	0.7%
ARKOSE	1.6%	0.5%	0.5%	0.5%
BOLSA	4.1%	1.4%	1.4%	1.4%
GILA	0.1%	-	-	0.1%
GLANCE	6.9%	2.3%	2.3%	2.3%
GRANODIORITE	3.1%	1.0%	1.0%	1.0%
QMP[1]	11.8%	3.9%	3.9%	3.9%
Total[2]	**29.8%**	**9.8%**	**9.8%**	**9.9%**

[1] Unknown material added to Qmp

[2] Comprising total Volcanic / Sedimentary materials of TSF, shown in Table 6.2

Tailings Facility Sensitivity Analysis Results

Geochemical results from the sensitivity analysis are provided in Table 6.6. In general, the sensitivity analysis provides support that constituents above AWQS are unlikely to occur. There is a potential for values elevated above AWQS for selenium and cadmium; however, the probability is low because these exceedances are driven by one input leachate sample and not observed in multiple instances. Results for the sensitivity analysis is summarized as follows:

- The “Standard Deviation Sensitivity” has the greatest increase in leachate concentrations, particularly for sulfate, TDS, magnesium, and selenium. One new elevated values above AWQS, selenium, occurs in this sensitivity; however, this is due to one sample which exhibits very high selenium concentrations (Year 0-3 Tailings-HCT), with a first flush value 0.151 mg/l. Subsequent HCT weeks measured selenium below detection limits. MWMP results of the same sample did not produce detectable selenium. Given the anomalous nature of this measurement, selenium is not expected to be above the AWQS. Selenium should be considered as an element for potential adsorption, if attenuation testing of underlying vadose zone materials is performed.
- The “Volcanic / Sedimentary Surrogate” sensitivity predicted cadmium to be above the AWQS; however, this is a result of including seepage chemistry from the sample “Andesite Col. Leach -MWMP” which were leach grade ore samples. Including this sample adds conservatism to the CRFs, but in this case overestimates the potential concentration of cadmium. Omitting this sample reduces cadmium concentrations by an order of magnitude. Furthermore, cadmium readily adsorbs to iron and aluminium oxides found in the tailings and underlying soil mass. It is unlikely cadmium will be present in tailings seepage.

- The "SI +log 1" produces a seepage chemistry very similar to the base case shown in Table 6.3. Minor changes to attendant metal concentrations are shown. This indicates mineral precipitation does not have a significant effect on TSF seepage chemistry.

Table 6.6 TSF Sensitivity analysis results

Parameter	Units	EPA I/II	AWQS	Standard Deviation Sensitivity	Volcanic / Sedimentary Surrogate	SI +log 1
pH	s.u.	6.5-8.5	-----	6.54	7.13	7.06
Alkalinity, Total	mg/L	-----	-----	15	55	47
Aluminum	mg/L	0.2	-----	0.01	0.00	0.01
Antimony	mg/L	0.006	0.006	0.006	0.003	0.002
Arsenic	mg/L	0.01	0.05	0.005	0.001	0.003
Barium	mg/L	2.0	2.0	0.01	0.02	0.02
Beryllium	mg/l	0.004	0.004	0.000	0.000	0.000
Boron	mg/l	-----	-----	0.000	0.000	0.000
Cadmium	mg/L	0.005	0.005	0.000	0.010	0.000
Calcium	mg/L	-	-----	513	201	281
Chloride	mg/L	250	-----	156	5	6
Chromium	mg/L	0.10	0.10	0.00	0.00	0.00
Copper	mg/L	1.00	-----	0.010	0.049	0.006
Fluoride	mg/L	4.00	4.00	1.50	1.36	1.20
Iron	mg/L	0.3	-----	0.00	0.00	0.01
Lead	mg/L	0.015	0.05	0.000	0.003	0.000
Magnesium	mg/L	-----	-----	76	33	28
Manganese	mg/L	0.05	-----	0.00	0.00	0.00
Mercury	mg/L	0.002	0.002	0.0000	0.0000	0.0000
Molybdenum	mg/L	-----	-----	0.18	0.00	0.06
Nickel	mg/L	-----	0.1	0.00	0.02	0.00
Nitrogen, Total as N	mg/L	10.0	10.0	0.00	0.01	0.00
Potassium	mg/L	-----	-----	21.4	13.5	13.6
Selenium	mg/L	0.05	0.05	0.070	0.035	0.026
Silver	mg/L	0.10	-----	0.000	0.001	0.000
Sodium	mg/L	-----		66	42	27
Sulfate	mg/L	250	-----	1,466	665	808
Thallium	mg/L	0.002	0.002	0.0003	0.0003	0.0000
TDS	mg/L	500	-----	2,316	1,017	1,212
Uranium	mg/L	0.03	-----	0.000	0.000	0.000
Zinc	mg/L	5.00	-----	0.00	0.54	0.00

Indicates values above AWQS

7 HEAP LEACH PAD GEOCHEMICAL MODEL

The HLP will be constructed with a liner system to capture PLS and minimize seepage to bedrock. The facility's footprint will span an area of approximately 265 acres, located with the hydrographic Santa Cruz hydrologic basin (Figure 7.1).

The geochemical model estimates drain down chemistry from the HLP that will require management upon facility closure. PLS chemistry is acidic in order to liberate metal ions from their mineral phases. Sulfuric acid (H_2SO_4) is utilized to acidify the lixiviant and consume all neutralizing gangue minerals.

A review of similar copper skarn HLP leachates suggest the following characteristics of PLS:

- pH <3.5 s.u.
- Sulfate concentrations ranging from 7,000 mg/l to >100,000 mg/l.
- Elevated metal concentrations (aluminium, copper, iron, manganese, zinc).
- Elevated trace ion concentrations.

At the end of mining, the HLP is designed to contain 215 million tons of material. Ore materials with a soluble copper content of >50% are preferentially routed to the HLP. The composite ABA characteristics of ore rock routed to the HLP are projected to be neutralizing (Table 7.1). Major rock units comprising the HLP raw materials, per the geologic block model, will be the Abrigo, Andesite, Bolsa, Horquilla, and Qmp.

Table 7.1: Geochemical composition of HLP

Geochemical Unit	Tons (Mt)	% Composition	Average AP (tCaCO^3/ kt)	Average NP (tCaCO^3/ kt)	Average Cu%
ABRIGO:<1.2	0.07	0.0%	86.6	80.6	0.9
ABRIGO:>3	26.00	12.1%	2.8	378.2	0.3
ABRIGO:1.2-3	0.16	0.1%	82.0	170.2	0.7
ANDESITE:<1.2	0.02	0.0%	29.8	25.1	0.2
ANDESITE:>3	32.20	15.0%	2.7	95.7	0.2
ANDESITE:1.2-3	0.22	0.1%	22.9	53.3	0.2
ARKOSE:<1.2	0.00	0.0%			0.4
ARKOSE:>3	2.61	1.2%	9.5	141.4	0.3
ARKOSE:1.2-3	0.00	0.0%			
BOLSA:<1.2	0.18	0.1%	17.6	16.6	0.4
BOLSA:>3	25.70	12.0%	5.5	159.1	0.3
BOLSA:1.2-3	0.90	0.4%	24.5	51.6	0.3
CONCHA:>3	0.14	0.1%	7.9	121.8	0.6
EARP:>3	4.36	2.0%	1.9	437.3	0.3
EPITAPH:<1.2	0.00	0.0%			
EPITAPH:>3	11.10	5.2%	4.8	355.0	0.3
EPITAPH:1.2-3	0.00	0.0%			
ESCABROSA:>3	10.00	4.7%	3.6	508.0	0.2
GILA:>3	0.37	0.2%	2.6	306.6	0.1
GLANCE:<1.2	0.00	0.0%			
GLANCE:>3	5.67	2.6%	7.6	423.5	0.2
GLANCE:1.2-3	0.00	0.0%			
GRANODIORITE:<1.2	0.33	0.2%	33.7	21.3	0.3
GRANODIORITE:>3	14.50	6.7%	2.1	55.6	0.3
GRANODIORITE:1.2-3	4.71	2.2%	4.0	9.0	0.4
HORQUILLA:>3	24.70	11.5%	3.1	469.1	0.3
MARTIN:>3	6.02	2.8%	3.7	423.3	0.3
QMP:<1.2	0.46	0.2%	11.5	9.1	0.3
QMP:>3	26.20	12.2%	4.1	60.4	0.2
QMP:1.2-3	8.28	3.9%	8.2	17.4	0.2
SCHERRER:>3	2.35	1.1%	3.5	396.3	0.3
SCHERRER:1.2-3	0.00	0.0%			
UNKNOWN:<1.2	0.00	0.0%			
UNKNOWN:>3	7.21	3.4%	2.4	34.5	0.2
UNKNOWN:1.2-3	0.07	0.0%	86.6	80.6	
Total	**215**	**100%**	**4.1[1]**	**227.8[1]**	**0.26[1]**
Weighted NPR			**55.3**		**-**
Calculated Element Percentages			**Ca**	**S**	**Cu**
			9.1%[2]	**0.131%[3]**	**0.26%**

[1] Weighted average

[2] Conversion using 25 for NP to Calcium

[3] Conversion using 31.25 for AP to Sulfur

Development of the heap seepage chemistry followed the approach described in Section 4.3. Calculations for elemental mols and mineral abundance are provided in Table 7.2. Andesite Col. Leach Composite and Qmp Col. Leach Composite chemistry are provided in Table 7.3.

Table 7.2: Geochemical composition of heap material

Element	HLP Abundance (%)	Molar Abundance (Mols/kg)	Mineral Phase[1]	Molar Mineral Abundance (Mols/kg)
S	0.131	0.041	Pyrite (FeS_2)	0.0[2]
Cu	0.26	0.0414	Chalcopyrite ($FeCuS_2$)	0.0139
			Chalcocite (Cu_2S)	0.0136
Ca	9.1	2.27	Calcite ($CaCO_3$)	2.27

[1] Assumed mineral phase for entire element

[2] Molar abundance for pyrite was calculated from remaining sulfur available after copper bearing minerals were applied.

All sulfur within the heap material is anticipated to be associated with copper ores, either in the Chalcocite or Chalcopyrite mineral phases. No pyrite is anticipated because there are insufficient mols of sulfur that are unattached with copper ore. Neutralizing minerals, assumed to be calcite, will require approximately a 25% sulfuric acid solution by weight to be fully consumed (at a mixing ratio of 1 lixiviant :1 HLP material).

7.1 Heap Leach Pad Geochemical Results

Resultant heap seepage chemistry is provided in Table 7.3, which includes input geochemical profiles prior to mixing and mineral dissolution. Key results from the heap geochemical modeling are as follows:

- Heap chemistry is strongly acidic, as anticipated, and possesses elevated metal concentrations.
- Concentrations of copper, iron, and sulfate are within anticipated levels for acid leach solutions. Mineralogical controls providing the source for copper, iron, and sulfate are reasonable. Concentrations of other metal elements such as aluminium, manganese, and zinc are likely under predicted given the amount of mineral dissolution associated with heap leaching. However, this has little bearing on the overall classification of heap leachate solution as being poor quality and the method for leachate management.
- Concentrations of minor metals and ions (beryllium, cadmium, fluoride, selenium) are at reasonable concentrations given the geochemical conditions.
- Gypsum and barite are the only two mineral phases predicted to precipitate.

Table 7.3 HLP composite seepage chemistry

Parameter	Units	EPA I/II	AWQS	Andesite Leach Col.	Qmp Leach Col.	Composite Leachate[1]	Final HLP Seepage chemsitry[2]
pH	s.u.	6.5-8.5	-----	3.34	3.65	3.50	0.73
Alkalinity, Total	mg/L	-----	-----	-	-	-	<0
Aluminum	mg/L	0.2	-----	71.4	14	31.6	31.73
Antimony	mg/L	0.006	0.006	<0.02	<0.02	0.003	0.003
Arsenic	mg/L	0.01	0.05	0.0039	<0.003	0.0024	0.002
Barium	mg/L	2.0	2.0	0.027	0.042	0.034	0.01
Beryllium	mg/l	0.004	0.004	0.0291	0.0075	0.015	0.015
Boron	mg/l	-----	-----	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.005	0.005	0.377	0.085	0.179	0.180
Calcium	mg/L	-	-----	526	172	301	526
Chloride	mg/L	250	-----	6.97	2.8	4.4	4
Chromium	mg/L	0.10	0.10	0.04	0.014	0.023	0.02
Copper	mg/L	1.00	-----	53.1	90.1	69.2	2,703.7
Fluoride	mg/L	4.00	4.00	6.38	1.57	3.18	3.18
Iron	mg/L	0.3	-----	1.09	0.46	0.71	757.65
Lead	mg/L	0.015	0.05	0.034	0.045	0.039	0.039
Magnesium	mg/L	-----	-----	187	32	77.4	78
Manganese	mg/L	0.05	-----	31.1	6.78	14.6	14.6
Mercury	mg/L	0.002	0.002	<0.002	0.0004	0.0002	0.0002
Molybdenum	mg/L	-----	-----	0.009	<0.008	0.002	0.00
Nickel	mg/L	-----	0.1	0.73	0.14	0.32	0.32
Nitrogen, Total as N	mg/L	10.0	10.0	0.12	0.06	0.05	0.05
Potassium	mg/L	-----	-----	9.81	3.07	5.48	5.5
Selenium	mg/L	0.05	0.05	0.13	<0.04	0.051	0.051
Silver	mg/L	0.10	-----	0.017	0.007	0.011	0.011
Sodium	mg/L	-----		10.3	6.2	8.0	51
Sulfate	mg/L	250	-----	2500	772	1389	32,551
Thallium	mg/L	0.002	0.002	<0.015	<0.015	0.0010	0.0010
TDS	mg/L	500	-----	3890	1250	2205	36,738
Uranium	mg/L	0.03	-----	n/a	n/a	0.000	
Zinc	mg/L	5.00	-----	21.5	4.95	10.35	10.35

Indicates values above AWQS

[1] Composite for tested Andesite Leach Col. And Qmp Leach Col. samples

[2] Fully reacted HLP facility leachate

8 ROSEMONT PIT LAKE GEOCHEMICAL MODEL

8.1 Rosemont Pit Lake Configuration

The Rosemont Pit is the largest pit mined in the Project. It will also be the final pit in the mining sequence, with much of its waste material being routed to the WRF at Broadtop Butte. Rosemont Pit is located on the eastern slope of the Santa Ritas. Pit configuration as well as exposed geochemical units are provided in Figure 8.1. The lowest mining bench is 3,650 ft amsl, which is completed in Horquilla limestone, which is of an NAG geochemical character. The pit rim elevation ranges from ~5,000 ft amsl (on the east) to ~6,000 ft amsl (on the west). Stage/area/volume relationships for the pit are shown in Figure 8.2.

The overwhelming majority of the Rosemont Pit is composed of NAG and PAG materials, with <1% of the full pit wall possessing AG characteristics (Figure 8.3). AG exposures occur above the 4,400 ft amsl level, which is above the projected recovery level of the pit lake. Lower benches of the pit are composed of limestone units (Horquilla, Earp, Epitaph, and Scherrer). Upper benches possess a larger fraction of sedimentary and volcanic units, but limestone still accounts for approximately half of the rock exposure. Stage / Area / Lithology exposures for the pit are provided in Figure 8.3, and tabulated in Appendix J.

Groundwater chemistry was characterized from several monitoring wells in and adjacent to the pit footprint. The PC-series monitoring wells surround the Rosemont Pit perimeter and are screened across the mining interval. Water chemistry is of good quality, with no values above AWQS. A weighted average of groundwater chemistry was used to develop groundwater inflows chemistry for the pit lake geochemical model, summarized in Table 8.1 and shown visually in Figure 8.1.

Table 8.1: Rosemont Pit composite groundwater chemistry

Parameter	Units	EPA I/II	AWQS	PC-1	PC-2	PC-3	PC-4	PC-7	PC-8	Composite Groundwater
% of Perimeter				**20.0%**	**9.6%**	**9.1%**	**13.1%**	**30.3%**	**18.0%**	***100%***
Number of samples				*1*	*3*	*1*	*1*	*4*	*3*	
pH, Lab	s.u.	6.5-8.5	-----	7.75	8.30	7.66	7.76	7.43	7.31	*7.62*
Alkalinity, Total	mg/L	----	-----	175	147	101	216	106	190	*186*
Aluminum	mg/L	----	-----	0.03	0.02	0.02	0.04	0.00	0.00	*0.01*
Antimony	mg/L	0.006	*0.006*	0.000	0.001	0.000	0.00	0.000	0.000	*0.000*
Arsenic	mg/L	0.01	*0.05*	0.003	0.015	0.004	0.002	0.001	0.002	*0.003*
Barium	mg/l	2	*2*	0.02	0.01	0.06	0.183	0.02	0.02	*0.04*
Beryllium	mg/l	0.004	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	*0.000*
Boron	mg/L	----	-----							-
Cadmium	mg/L	0.005	*0.005*	0.000	0.000	0.000	0.0001	0.000	0.000	*0.000*
Calcium	mg/L	----	-----	82.2	75.5	192.0	59.6	237.0	60.5	*131.5*
Chloride	mg/L	250	-----	8.0	11.9	5.0	12.0	6.0	7.7	*8.0*
Chromium	mg/L	0.1	*0.1*	0.005	0.005	0.005	0.005	0.001	0.001	*0.001*
Copper	mg/L	1.3	-----	0.01	0.01	0.01	0.0	0.01	0.00	*0.00*
Fluoride	mg/L	4.0	*4*	0.80	1.22	1.20	0.400	0.78	0.60	*0.78*
Iron	mg/L	0.3	-----	0.01	0.01	0.43	0.96	0.60	0.06	*0.38*
Lead	mg/L	0.015	*0.05*	0.000	0.000	0.000	0.00	0.000	0.000	*0.000*
Magnesium	mg/L	150	-----	9.5	20.0	33.4	17.9	41.0	11.4	*23.7*
Manganese	mg/L	0.05	-----	0.05	0.05	0.67	0.60	0.10	0.01	*0.18*
Mercury	mg/L	0.002	*0.002*	0.0001	0.0001	0.0001	0.0001	0.0000	0.000 0	*0.0000*
Nickel	mg/L	----	*0.1*	0.005	0.005	0.005	0.005	0.001	0.001	*0.001*
Nitrogen, Total as N	mg/L	10	*10*	0.7	0.1	0.1	1	0.3	1.1	*0.5*
Potassium	mg/L	----	-----	1.9	2.3	5.0	4.10	3.9	2.2	*3.2*
Selenium	mg/L	0.05	*0.05*	0.002	0.004	0.001	0.000	0.004	0.002	*0.003*
Silver	mg/L	0.1	-----					0.001	0.001	*0.001*
Sodium	mg/L	----	-----	10.7	14.3	56.3	32.9	24.4	8.6	*21.9*
Sulfate	mg/L	250	-----	30	127	610	50.0	649	6	*277*
Thallium	mg/L	0.002	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	*0.000*
Uranium	mg/L	0.03	-----	0.002	0.004	0.016	00.006	0.003	0.003	*0.004*
Zinc	mg/L	5	-----	0.35	0.06	0.56	0.6	0.01	0.09	*0.23*
TDS	mg/L	500	-----	300	369	1040	320	1086	227	*621*

Indicates values above AWQS

8.2 Rosemont Pit Lake Water Balance Results

Water balance results are presented in Table 8.2 for the Rosemont Pit lake for a period of 200 years post-mining which corresponds to when the pit lake will have reached 95% recovery. Key results pertaining the water balance are as follows:

- The pit lake recovered to the 4,271 ft amsl elevation. Most of the pit lake recovery is anticipated to occur during the first 40 years-post closure, followed by slower recovery rates. Simulated lake recovery hydrographs are shown in Figure 8.4.
- The pit lake has an area of approximately 83 acres.
- The Rosemont Pit lake is a hydraulic sink relative to the surrounding groundwater system. The 4,400 ft amsl piezometric level functions as the down-gradient “spill point” above which outflow may occur. Predicted pit lake levels are well below this elevation (4,271 ft amsl). Simulated piezometric levels are provided in Figure 8.5.
- Pit wall runoff was the largest water balance component, followed by groundwater inflows and direct precipitation (Table 8.2 and Figure 8.6). Pit wall runoff remains relatively steady owing to the large pit wall area and contribution from upgradient areas. Runoff inflow comprise ~50% of pit lake waters (Figure 8.7).
- Evaporation was the only outflow component at an average annual rate of ~274 gpm.

Table 8.2: Rosemont Pit Lake water balance summary

Time (yr)	Stage (ft, amsl)	Precipitation (gpm)	Total Runoff (gpm)	Groundwater Inflow (gpm)	Evaporation (gpm)
0	3674	1.7	147.4	196.3	-2.7
1	3779	5.8	155.0	191.2	-17.4
2	3829	10.1	153.2	180.5	-31.9
3	3863	14.6	152.0	173.1	-47.0
5	3913	18.0	151.2	166.2	-58.2
10	3985	27.6	148.8	151.1	-89.4
20	4067	38.6	146.0	128.2	-125.5
30	4117	47.4	143.8	111.3	-154.0
50	4172	61.1	140.4	97.6	-198.6
75	4214	68.4	138.5	85.2	-222.5
100	4237	75.6	136.7	77.2	-245.8
125	4252	80.6	135.5	72.9	-262.1
150	4260	82.7	134.9	68.2	-269.1
175	4266	83.6	134.7	65.6	-271.9
200	4271	84.3	134.6	65.6	-274.2

8.3 Rosemont Pit Lake Geochemical Results

Simulated pit lake chemistry for the Rosemont Pit is provided during filling in Table 8.3. Key results from the geochemical model are:

- Predicted lake water is characterized as circum-neutral with ample alkalinity and low metal concentrations. Lake water is not anticipated to be above AWQS.

- Sulfate concentrations are anticipated to evapoconcentrate until equilibrium with gypsum is reached. Gypsum, and other sulfate evaporites, are undersaturated in the current geochemical simulation (Table 8.4). Major conservative ions such as sulfate, chloride, sodium, and magnesium are anticipated to evapoconcentrate through time until reaching mineral saturation. However, based on the mass loading rates geochemical equilibration will not occur for many hundreds of years.
- The abundance of alkalinity from wall rock and groundwater create conditions that are conducive to attenuating most metals, which will serve as a geochemical control on attendant metals. These conditions are anticipated to continue in perpetuity.
- Several minerals are predicted to precipitate and control lake chemistry including barite, calcite, ferrihydrite, fluorite, gibbsite, and malachite. Their simulated saturation indices are provided in Table 8.4. The effect of mineral precipitation on lake chemistry is evaluated in the sensitivity analysis.

Table 8.3: Rosemont Pit Lake water balance summary

Element	EPA I/II	AWQS	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont
Year			1	2	3	5	10	20	30	50	75	100	125	150	175	200
pH	*6.5-8.5*	-----	7.77	7.75	7.75	7.74	7.75	7.77	7.77	7.77	7.77	7.77	7.77	7.77	7.77	7.77
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity	-----	-----	233	224	220	217	221	234	234	234	235	236	237	237	238	239
Aluminum	*0.2*	-----	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Antimony	*0.006*	*0.006*	0.003	0.002	0.002	0.002	0.002	<0.0015	<0.0015	0.002	0.002	0.002	0.002	0.002	0.003	0.003
Arsenic	*0.015*	*0.05*	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Barium	*2*	*2*	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03
Beryllium	*0.004*	*0.004*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	-----	-----	0.002	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.001	0.001
Cadmium	*0.005*	*0.005*	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Calcium	-----	-----	112	110	109	109	112	118	119	122	125	129	133	136	140	144
Chloride	*250*	-----	11	11	10	10	10	10	11	12	14	16	18	20	22	43
Chromium	*0.1*	*0.1*	0.00	0.00	0.00	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Copper	*1*	-----	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.026	0.026
Fluoride	*4*	*4*	2.40	2.26	2.20	2.15	2.20	2.36	2.50	2.87	3.05	3.08	3.10	3.12	3.14	3.17
Iron	*0.3*	-----	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	*0.015*	*0.05*	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.006	0.006	0.006
Magnesium	*150*	-----	17	17	17	17	18	19	20	23	26	29	32	36	39	43
Manganese	*0.05*	-----	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003
Molybdenum	-----	-----	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12
Nickel	-----	*0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Nitrogen	*10*	*10*	1.17	1.03	0.96	0.88	0.85	0.87	0.91	1.06	1.23	1.44	1.67	1.90	2.12	2.35
Phosphorus	-----	-----	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Potassium	-----	-----	8.8	8.6	8.6	8.7	9.2	10.2	10.8	12.6	14.7	17.0	19.4	22.0	24.5	27.0
Selenium	*0.05*	*0.05*	0.012	0.011	0.010	0.010	0.010	0.010	0.011	0.012	0.014	0.016	0.018	0.020	0.022	0.024
Silver	*0.1*	-----	0.005	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004
Sodium	-----	-----	23	22	21	21	21	22	24	28	34	39	45	52	59	77
Sulfate	*250*	-----	192	193	194	197	205	218	227	252	282	315	352	389	427	464
Thallium	*0.002*	*0.002*	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
TDS	*500*	-----	600	587	584	583	600	636	649	689	735	786	842	898	955	1,043
Uranium	*0.03*	-----	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.005	0.006	0.006	0.007
Zinc	*5*	-----	0.14	0.14	0.15	0.15	0.15	0.16	0.16	0.18	0.19	0.21	0.23	0.26	0.28	0.30
0.00		Indicates values above AWQS														

Table 8.4: Rosemont Pit Lake simulated saturation indices

Mineral Phase	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont	Rosemont
Year	**1**	**2**	**3**	**5**	**10**	**20**	**30**	**50**	**75**	**100**	**125**	**150**	**175**	**200**
Percent Error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barite	0.35	0.35	0.36	0.37	0.40	0.45	0.48	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**
Calcite	0.49	0.45	0.43	0.42	0.44	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**
Ferrihydrite	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
Fluorite	-0.20	-0.26	-0.28	-0.31	-0.28	-0.21	-0.16	-0.05	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Gibbsite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Gypsum	-1.19	-1.19	-1.19	-1.18	-1.16	-1.13	-1.11	-1.07	-1.03	-0.99	-0.94	-0.91	-0.87	-0.84
H-Jarosite	-14.85	-14.78	-14.74	-14.71	-14.71	-14.75	-14.73	-14.64	-14.56	-14.48	-14.39	-14.32	-14.25	-14.19
K-Jarosite	-7.47	-7.42	-7.39	-7.36	-7.33	-7.31	-7.26	-7.11	-6.96	-6.82	-6.68	-6.55	-6.44	-6.34
Malachite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Na-Jarosite	-10.55	-10.52	-10.50	-10.48	-10.47	-10.47	-10.41	-10.26	-10.10	-9.95	-9.80	-9.67	-9.55	-9.38
Rhodochrosite	-0.48	-0.51	-0.52	-0.53	-0.50	-0.43	-0.43	-0.40	-0.37	-0.34	-0.31	-0.29	-0.26	-0.24
Pyrolusite	-9.87	-9.93	-9.95	-9.97	-9.93	-9.82	-9.82	-9.79	-9.76	-9.73	-9.71	-9.68	-9.66	-9.64
Tenorite	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59
Otavite	-1.19	-1.30	-1.35	-1.42	-1.45	-1.44	-1.48	-1.48	-1.49	-1.46	-1.44	-1.43	-1.42	-1.41
Zincite	-2.36	-2.38	-2.39	-2.40	-2.37	-2.32	-2.32	-2.29	-2.26	-2.23	-2.20	-2.17	-2.14	-2.12

0.00 Indicates mineral precipitation

8.4 Rosemont Pit Lake Geochemical Sensitivity Analysis

Sensitivity analyses were performed for the Rosemont Pit lake to understand the influence model parameters on chemistry. Multiple sensitivity scenarios were performed to identify trends in the geochemical model controlling predictions and understand the robustness of results. Sensitivity scenarios were selected to evaluate increasing solute mass loading or concentrations and thus were biased towards higher concentrations. For example, a sensitivity scenario considering a thicker RRZ adds greater solute mass to the solution, but a reciprocal sensitivity to evaluate a thinner RRZ was not performed.

Sensitivity parameters selected for are summarized as follows:

- **RRZ of 50 ft:** This sensitivity utilized a deeper reactive wall rock zone of 50 ft to represent a higher zone of mineral reaction.
- **Low pE:** This sensitivity reduced the available oxygen in the pit lake to a pE value of -4, mildly reducing. The precipitation of metal oxides was restricted in this sensitivity.
- **Increased scale factor:** This sensitivity doubled the scaling factors for runoff and wall rock (raised to 2.96 and 1.24 respectively). This results in greater mass released from runoff and submerged wall rock reactions.
- **Evaporation + 15%:** This sensitivity increased the open water evaporation rate by 15% (Table 2.1).
- **Evaporation - 15%:** This sensitivity decreased the open water evaporation rate by 15% (Table 2.1).
- **Groundwater inflow + 25%:** This sensitivity increased the groundwater inflow rate by 25% (Table 8.2).
- **Groundwater inflow - 25%:** This sensitivity decreased the groundwater inflow rate by 25% (Table 8.2).
- **Increased saturation indices by +1.0:** This sensitivity increased the saturation indices for mineral precipitation by +1.0, meaning that 10x greater concentration of ions would need to occur before mineral precipitation could occur.

The same suite of sensitivity analyses was conducted for each of the Project pits and are discussed in their respective sections. Backfilled pits utilized an “Infiltration +/- 25%” sensitivity in lieu of evaporation.

Rosemont Pit Lake Sensitivity Analysis Results

The Rosemont Pit lake sensitivity analyses indicated that pit lake chemistry is generally well constrained and continues to follow the trends identified in the Base Case scenario. The potential for values above AWQS were limited to a handful of elements (antimony and fluoride). Rosemont Pit remained a hydrologic sink during the sensitivities. Tabulated chemistry results from the sensitivities are provided in Appendix L. Key results from the sensitivity analysis are described as follows.

- The “Increased scale factor” and “RRZ of 50 ft” sensitivities released more mass into the pit lake during early time filling and thus produced modestly higher concentrations of most elements. For example, sulfate concentrations at 20 years post-closure were predicted to be 218 mg/l for the “Base Case”, 259 mg/l for the “Increase scale factor”, and 231 mg/l for the “RRZ of 50 ft”.
- The “Increased saturation indices by 1” sensitivity produced the highest concentrations of major ions in the pit lake during late time when mineral precipitation begins to control predicted pit lake chemistry. The suppression of mineral precipitation caused elevated concentrations of fluoride, alkalinity, and TDS relative to the Base Case. In reality, alkalinity and TDS are not anticipated to reach these concentrations because conditions will be suitable for carbonate mineral precipitation.
- Lowering redox conditions in the “Low pE” sensitivity inhibited the precipitation of ferrihydrite. Therefore iron and the ions with an affinity adsorb onto ferrihydrite remained in solution. This produced higher concentrations of iron and other attendant metals that adsorb onto ferrihydrite.
- Variation to evaporation affected the rate of evapoconcentration, which was more apparent during late-time pit lake filling.
- Adjusting groundwater inflow had minor effects on predicted pit lake chemistry.
- Box and whisker diagrams for sulfate, fluoride, and iron highlight the generally consistent range of element concentrations across sensitivities (Figure 8.8). Geochemical controls for iron and fluoride are evident from the convergence and plateauing of concentrations during late-time filling.

9 BROADTOP BUTTE PIT BACKFILL GEOCHEMICAL MODEL

9.1 Broadtop Butte Pit Backfill Configuration

The Broadtop Butte Pit is the second largest pit to be mined in the Project. The pit will be mined after the Copper World Pit and before Rosemont. It is located in the northeast portion of the project, straddling the Santa Cruz and Cienega hydrographic basins. The pit is composed of two smaller sub-pits, the north sub-pit is mined to a depth of 4,850 ft amsl whereas the south sub-pit is mined to a depth of 5,250 ft amsl (Figure 9.1). Post-mining water levels are anticipated to saturate backfill in the North sub-pit, but the South sub-pit will remain dry. Stage/area/volume relationships for the pit are shown in Figure 9.2.

Pit wall exposure is almost entirely comprised of NAG and PAG materials. Approximately 1% of the pit wall is comprised of AG material (Qmp<1.2 geochemical unit) which is exposed above the 5,250 ft amsl elevation. The pit floor is composed entirely of NAG Epitaph limestone, which will be a source of neutralization. Upper portions of the pit wall in the North sub-pit are primarily Glance and Qmp materials. Stage / Area / Lithology exposures for the pit are provided in Figure 9.3, and tabulated in Appendix J.

Groundwater chemistry has been characterized from three monitoring wells in and adjacent to the pit footprint. Water chemistry is generally of good quality, with no values above AWQS. Surrounding monitoring wells are completed across zones where groundwater inflow is expected during mining and closure. Monitoring well Pit 2021-08 is located in the North sub-pit pit floor. Because it is screened above the pit floor (5,323 to 5,423 ft amsl), additional wells (PC-6 and HC-5A) were used to develop representative water chemistry. A weighted average of groundwater chemistry was used to develop surrogate groundwater inflows for the pit lake geochemical model, summarized in Table 9.1 and shown visually in Figure 9.1.

Table 9.1: Broadtop Butte Backfill composite groundwater chemistry

Parameter	Units	EPA I/II	AWQS	PC-6	Pit 2021-08	HC-5A	Composite Groundwater
% of Perimeter				**36.2%**	**36.2%**	**27.2%**	***100%***
Number of samples				*4*	*1*	*5*	
pH, Lab	s.u.	6.5-8.5	-----	7.21	7.90	7.08	7.59
Alkalinity, Total	mg/L	----	-----	168	190	209	187
Aluminum	mg/L	----	-----	0.00	0.15	0.00	0.06
Antimony	mg/L	0.006	*0.006*	0.000	0.001	0.000	0.000
Arsenic	mg/L	0.01	*0.05*	0.001	0.007	0.016	0.007
Barium	mg/l	2	*2*	0.027	0.032	0.010	0.024
Beryllium	mg/l	0.004	*0.004*	0.000	0.000	0.000	0.000
Boron	mg/L	----	-----		*0.029*		0.029
Cadmium	mg/L	0.005	*0.005*	0.000	0.000	0.001	0.000
Calcium	mg/L	----	-----	202.4	61.0	124.9	129.9
Chloride	mg/L	250	-----	8	13	13	11
Chromium	mg/L	0.1	*0.1*	0.001	0.000	0.001	0.001
Copper	mg/L	1.3	-----	0.008	0.160	0.011	0.064
Fluoride	mg/L	4.0	*4*	0.6	1.3	1.4	1.1
Iron	mg/L	0.3	-----	0.90	0.15	0.01	0.38
Lead	mg/L	0.015	*0.05*	0.0001	0.0006	0.0010	0.0005
Magnesium	mg/L	150	-----	21.5	8.1	32.2	19.6
Manganese	mg/L	0.05	-----	0.119	0.038	0.004	0.058
Mercury	mg/L	0.002	*0.002*	0.0000	0.0001	0.0000	0.0000
Nickel	mg/L	----	*0.1*	0.010	0.001	0.008	0.006
Nitrogen, Total as N	mg/L	10	*10*	0.64	0.78	0.43	0.63
Potassium	mg/L	----	-----	3.3	2.5	2.4	2.8
Selenium	mg/L	0.05	*0.05*	0.002	0.002	0.001	0.002
Silver	mg/L	0.1	-----	0.001	0.000	0.001	0.001
Sodium	mg/L	----	-----	32.0	26.0	16.9	25.7
Sulfate	mg/L	250	-----	442	46	204	233
Thallium	mg/L	0.002	*0.002*	0.000	0.000	0.000	0.000
Uranium	mg/L	0.03	-----	0.005	0.003	0.002	0.004
Zinc	mg/L	5	-----	0.01	0.02	0.01	0.01
TDS	mg/L	500	-----	880	320	586	661

Indicates values above AWQS

9.2 Broadtop Butte Pit Backfill Water Balance Results

Water balance results are presented in Table 9.2 within the Broadtop Butte backfill over a period of 200 years. This period captures the highest levels of pore water concentrations and geochemical mass loading. Although water levels in the backfill continues to slowly recover, pore water concentrations decline through time. Key results pertaining the water balance are as follows:

- Water levels in the backfill slowly recover to the 4,971 ft amsl elevation. Simulated recovery hydrographs are shown in Figure 9.4.
- The extent of saturated backfill is small, less than 15 acres. Simulated groundwater gradients across the backfill are generally towards the north and northwest as shown in Figure 9.5.
- The Broadtop Butte Pit is anticipated to be a groundwater flow through system with a minor component of outflow (up to 6.6 gpm). Groundwater outflow is the only outflow from the backfill. Evapotranspiration is inhibited by backfill. At equilibrium groundwater outflow will equal inflow components.
- Infiltration of precipitation was the largest water balance component followed by groundwater inflows (Table 9.2 and Figure 9.6). Infiltration comprises 95% to 98% of the pore water (Figure 9.7).
- Infiltration was applied using the idealized assumption that the backfill water content has reached field equilibrium and can transmit water through the unsaturated zone. In reality, a wetting front will develop below the dump surface and migrate downward through unsaturated dump materials until it reaches the pit floor. The advancement of the wetting front will take time, delaying the formation of saturated backfill conditions and groundwater outflow.

Table 9.2: Broadtop Butte Pit Lake water balance summary

Time (yr)	Stage (ft, amsl)	Infiltration (gpm)	Total Runoff (gpm)	Groundwater Inflow (gpm)	Groundwater Outflow (gpm)
0	4850	7.0	0.0	0.5	-5.4
1	4853	7.4	0.0	0.5	-5.5
2	4855	7.4	0.0	0.5	-5.5
3	4857	7.4	0.0	0.5	-5.5
5	4861	7.4	0.0	0.5	-5.5
10	4872	7.4	0.0	0.5	-5.6
20	4892	7.4	0.0	0.4	-5.6
30	4905	7.4	0.0	0.4	-5.7
50	4918	7.4	0.0	0.2	-5.9
75	4932	7.4	0.0	0.1	-6.1
100	4944	7.4	0.0	0.1	-6.3
125	4953	7.4	0.0	0.1	-6.4
150	4960	7.4	0.0	0.0	-6.5
175	4965	7.4	0.0	0.0	-6.5
200	4971	7.4	0.0	0.0	-6.6

9.3 Broadtop Butte Pit Backfill Geochemical Results

Simulated pore water chemistry for the Broadtop Butte backfill is provided for the first 200-years of filling in Table 9.3. Key results from the geochemical model are:

- Predicted pore water is characterized as circum-neutral with low metal concentrations.
- Predicted TDS concentrations are within the range of observed values in background groundwater concentrations, and therefore would not degrade groundwater conditions.
- In general, pore water concentration are predicted to decrease after 20 years post-closure as groundwater outflow flushes backfill material and removes mass from the system. Infiltration becomes the primary long-term geochemical control on pore water chemistry.
- Predicted pore water chemistry resembles background groundwater chemistry. Major ions such as alkalinity, sulfate, calcium, sodium, and magnesium are consistent with the range of background groundwater chemistry.
- Several minerals are predicted to precipitate and modify backfill chemistry including barite, calcite, ferrihydrite, fluorite, gibbsite, and malachite. Their simulated saturation indices are provided in Table 9.4. The effect of mineral precipitation is evaluated in the sensitivity analysis.

Table 9.3: Broadtop Butte simulated pore water chemistry

Element	EPA I/II	AWQS	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte
Year			**1**	**2**	**3**	**5**	**10**	**20**	**30**	**50**	**75**	**100**	**125**	**150**	**175**	**200**
pH	*6.5-8.5*	-----	7.90	7.89	7.88	7.88	7.87	7.87	7.82	7.75	7.72	7.70	7.68	7.65	7.64	7.63
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity	-----	-----	307	299	296	293	290	288	256	214	197	187	178	168	162	158
Aluminum	*0.2*	-----	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	0.002	0.002	0.002	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Arsenic	*0.015*	*0.05*	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Barium	*2*	*2*	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02
Beryllium	*0.004*	*0.004*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	-----	-----	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium	-----	-----	62	64	65	66	68	68	59	46	40	38	35	32	31	30
Chloride	*250*	-----	8	7	7	7	7	7	6	5	5	5	5	4	4	4
Chromium	*0.1*	*0.1*	0.00	0.00	0.00	0.00	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Copper	*1*	-----	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.024	0.023	0.023	0.022	0.021	0.021
Fluoride	*4*	*4*	3.93	3.82	3.78	3.74	3.70	3.66	2.94	2.27	2.02	1.89	1.74	1.60	1.51	1.46
Iron	*0.3*	-----	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	*0.015*	*0.05*	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.005	0.004	0.004	0.004	0.004	0.004	0.004
Magnesium	*150*	-----	14	13	13	12	12	11	9	7	6	6	5	5	5	5
Manganese	*0.05*	-----	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	-----	-----	0.08	0.07	0.07	0.07	0.06	0.06	0.05	0.03	0.03	0.03	0.02	0.02	0.02	0.02
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Nitrogen	*10*	*10*	0.70	0.62	0.60	0.57	0.55	0.53	0.38	0.25	0.21	0.19	0.16	0.14	0.12	0.11
Phosphorus	-----	-----	0.04	0.04	0.05	0.05	0.04	0.04	0.04	0.02	0.01	0.01	0.01	0.01	0.00	0.00
Potassium	-----	-----	18.1	16.5	16.0	15.6	15.1	14.7	12.8	10.9	10.1	9.6	9.2	8.7	8.5	8.3
Selenium	*0.05*	*0.05*	0.019	0.018	0.017	0.017	0.017	0.016	0.015	0.014	0.014	0.013	0.013	0.012	0.012	0.012
Silver	*0.1*	-----	0.003	0.003	0.003	0.003	0.003	0.003	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Sodium	-----	-----	75	68	66	64	62	59	53	46	43	41	40	38	37	36
Sulfate	*250*	-----	124	115	113	112	111	108	89	67	58	54	50	46	43	41
Thallium	*0.002*	*0.002*	0.0006	0.0006	0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
TDS	*500*	-----	613	588	581	575	568	561	488	400	362	344	324	304	292	284
Uranium	*0.03*	-----	0.003	0.003	0.002	0.002	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.005
0.00		Indicates values above AWQS														

Table 9.4: Broadtop Butte backfill simulated saturation indices

Mineral Phase	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte	Broadtop Butte
Year	1	2	3	5	10	20	30	50	75	100	125	150	175	200
Percent Error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barite	0.36	0.29	0.27	0.25	0.23	0.21	0.06	-0.13	-0.23	-0.27	-0.33	-0.39	-0.44	-0.46
Calcite	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	0.36	0.13	0.02	-0.04	-0.11	-0.19	-0.24	-0.27
Ferrihydrite	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	-0.79	-2.01	-3.20	-4.33
Fluorite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	-0.23	-0.53	-0.67	-0.74	-0.84	-0.94	-1.01	-1.05
Gibbsite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Gypsum	-1.58	-1.59	-1.58	-1.58	-1.58	-1.58	-1.69	-1.88	-1.98	-2.02	-2.07	-2.14	-2.18	-2.21
H-Jarosite	-15.66	-15.68	-15.67	-15.67	-15.66	-15.66	-15.61	-15.53	-15.49	-15.46	-18.40	-22.03	-25.61	-28.97
K-Jarosite	-7.84	-7.90	-7.92	-7.93	-7.94	-7.95	-8.01	-8.06	-8.09	-8.10	-11.09	-14.75	-18.36	-21.74
Malachite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	-0.03	-0.19	-2.61	-4.69	-6.76	-8.82
Na-Jarosite	-10.72	-10.78	-10.80	-10.81	-10.82	-10.84	-10.89	-10.93	-10.95	-10.96	-13.95	-17.61	-21.21	-24.59
Rhodochrosite	-1.54	-1.56	-1.57	-1.58	-1.59	-1.61	-1.79	-2.14	-2.37	-2.45	-2.55	-2.76	-2.97	-3.10
Pyrolusite	-10.68	-10.72	-10.73	-10.75	-10.77	-10.81	-11.07	-11.56	-11.86	-15.98	-20.13	-22.38	-24.62	-26.77
Tenorite	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.60	-0.68	-1.89	-2.93	-3.97	-5.00
Otavite	-1.08	-1.16	-1.18	-1.20	-1.23	-1.25	-1.45	-1.71	-1.84	-1.91	-2.00	-2.10	-2.15	-2.19
Zincite	-3.23	-3.28	-3.29	-3.31	-3.33	-3.35	-3.48	-3.65	-3.74	-3.79	-3.85	-3.91	-3.95	-3.98

0.00	Indicates mineral precipitation

9.4 Broadtop Butte Pit Backfill Geochemical Sensitivity Analysis

Sensitivity analyses was performed for the Broadtop Butte backfill using a similar suite of sensitivities as described in section 8.4. Sensitivity scenarios are re-iterated below for convenience:

- RRZ of 50 ft
- Low pE
- Increased scale factor
- Groundwater inflow + 25%
- Groundwater inflow - 25%
- Increased saturation indices by +1.0

Two additional sensitivity scenarios evaluating the effect of infiltration were applied in lieu of evaporation sensitivities. They are described as follows:

- **Infiltration + 25%:** This sensitivity increases the infiltration rate by 25%. It is only applied to backfilled pits.
- **Infiltration - 25%:** This sensitivity reduces the infiltration rate by 25%. It is only applied to backfilled pits.

Broadtop Butte Pit Backfill Sensitivity Analysis Results

The Broadtop Butte sensitivity analyses indicate that long term pore water chemistry (i.e. >30 years post-closure) would resemble Base Case chemistry and meet AWQS. During early-time filling, fluoride could potentially be above AWQS. In each sensitivity fluoride exceedances are associated with increased mass loading to a small section of saturated backfill. Tabulated chemistry results from the sensitivities are provided in Appendix M. Key results from the sensitivity analysis are described as follows.

- Variation in pore water chemistry between sensitivities are greatest during early time filling but tend to converge during late-time.
- The “Increased scale factor” and “RRZ of 50 ft” sensitivities simulated the highest concentrations of major ions. These sensitivities demonstrate that under higher mass loading rates, pore water chemistry is anticipated to meet groundwater standards through time.
- Inhibiting mineral precipitation in the “Increased saturation indices by 1” and “Low pE” sensitivities produced higher concentrations of geochemically controlled elements. Iron was predicted to remain in solution in the “Low pE” sensitivity, which also increased predicted arsenic concentrations. Several elements such as aluminum, calcium, and

copper were predicted to have higher concentrations in the "Increased saturation indices by 1" sensitivity, owing to the inhibited mineral precipitation. However, this effect was minimized after 30-years post-closure.

- The "Infiltration – 25%" sensitivity produced lower concentrations of most elements. This result suggests that a delay in the wetting front reaches the saturated pore water will result in lower than predicted pore water chemistry.
- Increasing infiltration led to modest increases in pore water concentrations.
- Adjusting groundwater inflow had minor effects on most predicted concentrations.
- Box and whisker diagrams for sulfate, fluoride, and manganese in Figure 9.8. Sulfate converges to a narrow band during late time, representative of most major ions. Fluoride and manganese have broader variability, associated with geochemical controls, but follow the same general trends of declining concentrations through time.

10 COPPER WORLD PIT BACKFILL GEOCHEMICAL MODEL

10.1 Copper World Pit Backfill Configuration

The Copper World Pit will be the fourth pit mined in sequence. The pit will be mined after Heavy Weight and before Broadtop Butte. It is located in the central portion of the Project in the Santa Cruz hydrographic basins. The pit is composed of two smaller sub-pits, the north sub-pit (Copper World North) will be mined to a depth of 4,450 ft amsl whereas the south sub-pit (Copper World South) will be mined to a depth of 4,550 ft amsl (Figure 10.1). Two separate saturated backfills are expected to develop during closure; therefore, unique geochemical analyses were performed for each sub-pit. Stage/area/volume relationships for the Copper World North sub-pit and Copper World South sub-pit are shown in Figures 10.2 and 10.3, respectively.

The Copper World North Pit wall is composed primarily of Granodiorite and Bolsa rock units. Earp, Abrigo, Horquilla, and Martin limestone units are present along upper benches in the highwall but are not anticipated to be inundated. AG sections of Granodiorite are found along the western wall above 4,600 ft amsl. AG materials comprise approximately 12% of the ultimate pit wall, thus backfilling the pit with neutralizing waste rock is a best management practice to prevent ARD development.

The Copper World South Pit wall is also comprised primarily of Granodiorite on the west wall and Bolsa / limestone units on the east wall. The South sub-pit wall has less AG material exposed (~8%) and is primarily Granodiorite found above 4,700 ft amsl. The remaining pit wall exposure is mainly NAG or neutralizing material. Stage / Area / Lithology exposures for the North and South sub-pits are provided in Figures 10.4 and 10.5 respectively, and tabulated in Appendix J.

Groundwater chemistry has been characterized from three monitoring wells within and adjacent to the pit. Water chemistry is generally of good quality with high alkalinity. No values above AWQS have been measured. The groundwater chemistry from monitoring well RNW-HB-108 is used in place of Pit 2021-07, pending final lab results which will be incorporated in future analyses. A weighted average of groundwater chemistry was used to develop surrogate groundwater inflows for each sub-pit and are summarized in Tables 10.1, Table 10.2, and Figure 10.1.

Table 10.1: Copper World North Backfill composite groundwater chemistry

Parameter	Units	EPA I/II	AWQS	RNW-HB-108	Pit2021-07 (RNW-HB-108)	Composite Groundwater
% of Perimeter				**44%**	**56%**	***100%***
Number of samples				*1*	*1*	
pH, Lab	s.u.	6.5-8.5	----	7.90	7.90	***7.90***
Alkalinity, Total	CaCO3 mg/L	----	----	280	280	***280***
Aluminum	mg/L	----	----	0.004	0.004	***0.004***
Antimony	mg/L	0.006	0.006	0.000	0.000	***0.000***
Arsenic	mg/L	0.01	0.05	0.006	0.006	***0.006***
Barium	mg/l	2	2	0.028	0.028	***0.028***
Beryllium	mg/l	0.004	0.004	0.000	0.000	***0.000***
Boron	mg/L	----	----	0.05	0.05	***0.05***
Cadmium	mg/L	0.005	0.005	0.000	0.000	***0.000***
Calcium	mg/L	----	----	66	66	***66***
Chloride	mg/L	250	----	16	16	***16***
Chromium	mg/L	0.1	0.1	0.003	0.003	***0.003***
Copper	mg/L	1.3	----	0.001	0.001	***0.001***
Fluoride	mg/L	4.0	4.0	2.4	2.4	***2.4***
Iron	mg/L	0.3	-	0.03	0.03	***0.03***
Lead	mg/L	0.015	0.05	0.000	0.000	***0.000***
Magnesium	mg/L	150	----	21.0	21.0	***21.0***
Manganese	mg/L	0.05	----	0.079	0.079	***0.079***
Mercury	mg/L	0.002	0.002	0.00005	0.00005	***0.00005***
Nickel	mg/L	----	0.1	0.00	0.00	***0.00***
Nitrogen, Total as N	mg/L	10	10	0.0	0.0	***0.0***
Potassium	mg/L	----	----	0.5	0.5	***0.5***
Selenium	mg/L	0.05	0.05	0.001	0.001	***0.001***
Silver	mg/L	0.1	----	0.000	0.000	***0.000***
Sodium	mg/L	----	----	91.0	91.0	***91.0***
Sulfate	mg/L	250	----	150	150	***150***
Thallium	mg/L	0.002	0.002	0.000	0.000	***0.000***
Uranium	mg/L	0.03	----	0.018	0.018	***0.018***
Zinc	mg/L	5	----	0.00	0.00	***0.00***
TDS	mg/L	500	----	627	627	***627***

Indicates values above AWQS

Table 10.2: Copper World South Backfill composite groundwater chemistry

Parameter	Units	EPA I/II	AWQS	RNW-HB-108	RNW-HB-091	RNW-HB-108 (Pit2021-07)	Composite Groundwater
% of Perimeter				**1%**	**67%**	**32%**	***100%***
Number of samples				*1*	*1*	*1*	
pH, Lab	s.u.	6.5-8.5	----	7.90	7.50	7.90	***7.90***
Alkalinity, Total	CaCO3 mg/L	----	----	280	200	280	***227***
Aluminum	mg/L	----	----	0.004	0.004	0.004	***0.004***
Antimony	mg/L	0.006	0.006	0.000	0.000	0.000	***0.000***
Arsenic	mg/L	0.01	0.05	0.006	0.000	0.006	***0.002***
Barium	mg/l	2	2	0.028	0.047	0.028	***0.041***
Beryllium	mg/l	0.004	0.004	0.000	0.000	0.000	***0.000***
Boron	mg/L	----	----	0.05	0.094	0.05	***0.080***
Cadmium	mg/L	0.005	0.005	0.000	0.000	0.000	***0.000***
Calcium	mg/L	----	----	66	180.0	66	***142.1***
Chloride	mg/L	250	----	16	13.0	16	***14.0***
Chromium	mg/L	0.1	0.1	0.003	0.003	0.003	***0.003***
Copper	mg/L	1.3	----	0.001	0.001	0.001	***0.001***
Fluoride	mg/L	4.0	4.0	2.4	1.9	2.4	***2.0***
Iron	mg/L	0.3	-	0.03	0.03	0.03	***0.03***
Lead	mg/L	0.015	0.05	0.000	0.000	0.000	***0.000***
Magnesium	mg/L	150	----	21.0	43.0	21.0	***35.7***
Manganese	mg/L	0.05	----	0.079	0.590	0.079	***0.420***
Mercury	mg/L	0.002	0.002	0.00005	0.00005	0.00005	***0.00005***
Nickel	mg/L	----	0.1	0.00	0.004	0.00	***0.003***
Nitrogen, Total as N	mg/L	10	10	0.0	0.01	0.0	***0.01***
Potassium	mg/L	----	----	0.5	7.2	0.5	***5.0***
Selenium	mg/L	0.05	0.05	0.001	0.013	0.001	***0.009***
Silver	mg/L	0.1	----	0.000	0.000	0.000	***0.000***
Sodium	mg/L	----	----	91.0	140	91.0	***123.7***
Sulfate	mg/L	250	----	150	680	150	***504***
Thallium	mg/L	0.002	0.002	0.000	0.000	0.000	***0.000***
Uranium	mg/L	0.03	----	0.018	0.008	0.018	***0.011***
Zinc	mg/L	5	----	0.00	0.004	0.00	***0.004***
TDS	mg/L	500	----	627	1300	627	***1069***

Indicates values above AWQS

10.2 Copper World Pit Backfill Water Balance Results

Copper World North Pit

Water balance results are presented in Table 10.3 for the Copper World North backfill over a period of 200 years. This captures the period of geochemical mass loading when pore water concentrations are highest. Key results pertaining to the water balance are as follows:

- Very low inflows outflows are predicted for the backfill. These conditions are conducive to a slow recovery and minor impacts to the surrounding groundwater system.
- Backfill water levels recovered to the 4,540 ft amsl elevation. Recovery occurs relatively slowly and is still ongoing after 200 years. Simulated recovery hydrographs are shown in Figure 10.6.
- Minor groundwater outflow, approximately 0.2 gpm, is predicted to occur from the Copper World North sub-pit. This is because groundwater outflow is the only discharge from the system. Simulated groundwater gradients across the backfill are generally towards the northwest as shown in Figure 10.7.
- Groundwater inflow is the largest water balance component during the first 50 years of recovery. Infiltration becomes the primary water source after 50 years post-closure which is the control on long-term pore water chemistry (Table 10.3 and Figure 10.8). Infiltration comprises ~60% of the pore water after 200 years (Figure 10.9).
- Infiltration was applied using the idealized assumption that the backfill water content has reached field equilibrium and can transmit water through the unsaturated zone. In reality, a wetting front will develop below the dump surface and migrate downward through unsaturated dump materials until it reaches the pit floor. The advancement of the wetting front will take time, delaying the formation of saturated backfill conditions and groundwater outflow.

Table 10.3: Copper World North water balance summary

Time (yr)	Stage (ft, amsl)	Infiltration (gpm)	Total Runoff (gpm)	Groundwater Inflow (gpm)	Groundwater Outflow gpm)
0	4450	0.2	0.0	0.3	-0.2
1	4452	0.2	0.0	0.3	-0.2
2	4454	0.2	0.0	0.3	-0.2
3	4455	0.2	0.0	0.3	-0.2
5	4459	0.2	0.0	0.3	-0.2
10	4466	0.2	0.0	0.3	-0.2
20	4479	0.2	0.0	0.2	-0.2
30	4490	0.2	0.0	0.2	-0.2
50	4503	0.2	0.0	0.2	-0.2
75	4511	0.2	0.0	0.1	-0.2
100	4518	0.2	0.0	0.1	-0.2
125	4524	0.2	0.0	0.1	-0.2
150	4530	0.2	0.0	0.1	-0.2
175	4535	0.2	0.0	0.1	-0.2
200	4540	0.2	0.0	0.1	-0.2

Copper World South Pit

Water balance results are presented in Table 10.4 for the Copper World South backfill over a period of 200 years. Key results pertaining to the water balance are as follows:

- Very low inflows outflows are predicted for the South sub-pit backfill, as they were in the North sub-pit. These conditions are conducive to a slow recovery and minor impacts to the surrounding groundwater.
- Backfill water levels recovered to the 4,620 ft amsl elevation. Recovery occurs relatively slowly. Simulated recovery hydrographs are shown in Figure 10.10.
- A minor flux of groundwater outflow, approximately 0.3 gpm, is predicted to occur from the Copper World North sub-pit. Groundwater outflow is the only discharge from the sub-pit. Simulated groundwater gradients across the backfill are generally towards the northwest as shown in Figure 10.7.
- Infiltration is the primary water source during recovery which is the control on long-term pore water chemistry (Table 10.4 and Figure 10.11). Infiltration comprises ~80% of the pore water after 200 years (Figure 10.12). Again, infiltration is idealized to begin upon closure.

Table 10.4: Copper World South water balance summary

Time (yr)	Stage (ft, amsl)	Infiltration (gpm)	Total Runoff (gpm)	Groundwater Inflow (gpm)	Groundwater Outflow gpm)
0	4550	0.3	0.0	0.3	0.0
1	4552	0.3	0.0	0.3	0.0
2	4554	0.3	0.0	0.3	0.0
3	4556	0.3	0.0	0.3	0.0
5	4559	0.3	0.0	0.3	-0.1
10	4566	0.3	0.0	0.2	-0.1
20	4577	0.3	0.0	0.2	-0.2
30	4586	0.3	0.0	0.1	-0.2
50	4600	0.3	0.0	0.1	-0.2
75	4606	0.3	0.0	0.1	-0.2
100	4611	0.3	0.0	0.1	-0.2
125	4614	0.3	0.0	0.0	-0.2
150	4617	0.3	0.0	0.0	-0.3
175	4618	0.3	0.0	0.0	-0.3
200	4620	0.3	0.0	0.0	-0.3

10.3 Copper World Pit Backfill Geochemical Results

Copper World North Pit

Simulated pore water chemistry for the Copper World North backfill is provided for the first 200-years of filling in Table 10.5. Key results from the geochemical model are:

- Predicted pore water is characterized as circum-neutral with low metal and major ion concentrations.
- Pore waters are predicted to temporarily be above water quality AWQS for fluoride during the first 5-years post closure, but in the long term are expected to meet AWQS. Fluoride concentrations are attributed to mass loading from NAG Granodiorite materials along the pit floor and moderate concentrations in groundwater (2.4 mg/l, Table 10.1).
- Elevated TDS is related to alkalinity released from saturated backfill. In reality, backfill alkalinity maybe equilibrated with calcite and other carbonate mineral species than those calculated from the geochemical model that would lead to lower release rates.
- Predicted pore water chemistry resembles a mixture of background groundwater chemistry and infiltration. Major ions such as alkalinity, sulfate, calcium, sodium, and magnesium are consistent with the range of background groundwater chemistry. These

ion concentrations decline with time as groundwater outflow removes mass from the system.

- Predicted chemistry results are consistent with the low inflow geochemical system, where the principal contact rock materials are NAG waste rock, Granodiorite and Bolsa.
- Only ferrihydrite was predicted to precipitate. Simulated saturation indices are provided in Table 10.6. The effect of mineral precipitation is evaluated in the sensitivity analysis.

Table 10.5: Copper World North simulated pore water chemistry

Element	EPA I/II	AWQS	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North
Year			**1**	**2**	**3**	**5**	**10**	**20**	**30**	**50**	**75**	**100**	**125**	**150**	**175**	**200**
pH	*6.5-8.5*	-----	8.01	7.99	7.99	7.99	7.98	7.97	7.97	7.95	7.94	7.93	7.93	7.92	7.92	7.91
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity	-----	-----	397	387	383	379	373	366	360	347	336	330	326	323	320	318
Aluminum	*0.2*	-----	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Antimony	*0.006*	*0.006*	0.004	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	<0.0015	<0.0015	<0.0015
Arsenic	*0.015*	*0.05*	0.022	0.020	0.020	0.020	0.019	0.018	0.018	0.016	0.014	0.014	0.013	0.013	0.012	0.012
Barium	*2*	*2*	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.05	0.04	0.04	0.04	0.04	0.04	0.03
Beryllium	*0.004*	*0.004*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	-----	-----	0.032	0.032	0.031	0.031	0.029	0.027	0.026	0.023	0.021	0.020	0.019	0.018	0.017	0.017
Cadmium	*0.005*	*0.005*	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium	-----	-----	40	42	43	43	44	45	46	49	51	52	53	54	55	55
Chloride	*250*	-----	20	19	19	18	18	17	16	14	13	12	12	12	11	11
Chromium	*0.1*	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	<0.003
Copper	*1*	-----	0.026	0.026	0.026	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Fluoride	*4*	*4*	**4.49**	**4.25**	**4.17**	**4.07**	3.91	3.73	3.58	3.26	2.99	2.84	2.74	2.65	2.57	2.51
Iron	*0.3*	-----	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	*0.015*	*0.05*	0.010	0.009	0.009	0.009	0.008	0.008	0.008	0.007	0.006	0.006	0.006	0.005	0.005	0.005
Magnesium	*150*	-----	19	19	19	19	18	17	16	15	14	13	13	12	12	11
Manganese	*0.05*	-----	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mercury	*0.002*	*0.002*	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001
Molybdenum	-----	-----	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.05	0.05	0.05	0.05	0.05
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.005	<0.005	<0.005	<0.005
Total Nitrogen	*10*	*10*	1.14	0.99	0.94	0.90	0.85	0.79	0.75	0.63	0.52	0.47	0.43	0.41	0.39	0.37
Phosphorus	-----	-----	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05
Potassium	-----	-----	21.4	19.6	19.0	18.3	17.4	16.5	15.9	14.5	13.1	12.5	12.0	11.7	11.4	11.2
Selenium	*0.05*	*0.05*	0.022	0.021	0.020	0.020	0.019	0.019	0.018	0.017	0.016	0.016	0.016	0.015	0.015	0.015
Silver	*0.1*	-----	0.006	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.003	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Sodium	-----	-----	141	134	132	129	125	119	114	104	96	91	88	85	82	80
Sulfate	*250*	-----	146	143	141	139	134	127	121	112	105	100	97	93	91	88
Thallium	*0.002*	*0.002*	0.0011	0.0009	0.0009	0.0009	0.0008	0.0008	0.0007	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
TDS	*500*	-----	790	769	762	751	734	712	694	660	632	616	604	594	585	577
Uranium	*0.03*	-----	0.010	0.010	0.010	0.010	0.010	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.006	0.006
Zinc	*5*	-----	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.00		Indicates values above AWQS														

Table 10.6: Copper World North backfill simulated saturation indices

Mineral Phase	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North	Copper World North
Year	1	2	3	5	10	20	30	50	75	100	125	150	175	200
Percent Error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barite	**0.50**	**0.50**	**0.50**	**0.50**	0.48	0.43	0.39	0.31	0.23	0.18	0.15	0.12	0.09	0.06
Calcite	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**
Ferrihydrite	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
Fluorite	-0.11	-0.14	-0.15	-0.16	-0.18	-0.20	-0.22	-0.27	-0.32	-0.34	-0.37	-0.38	-0.40	-0.42
Gibbsite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Gypsum	-1.73	-1.71	-1.71	-1.71	-1.71	-1.71	-1.72	-1.72	-1.72	-1.73	-1.73	-1.74	-1.74	-1.75
H-Jarosite	-15.96	-15.93	-15.92	-15.92	-15.92	-15.93	-15.94	-15.95	-15.95	-15.96	-15.97	-15.98	-15.99	-16.00
K-Jarosite	-7.96	-7.98	-7.99	-8.01	-8.04	-8.08	-8.11	-8.17	-8.22	-8.26	-8.29	-8.32	-8.35	-8.37
Malachite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Na-Jarosite	-10.64	-10.64	-10.64	-10.65	-10.68	-10.71	-10.75	-10.81	-10.86	-10.89	-10.93	-10.95	-10.98	-11.01
Rhodochrosite	-0.43	-0.45	-0.46	-0.47	-0.49	-0.52	-0.55	-0.62	-0.67	-0.71	-0.74	-0.76	-0.78	-0.81
Pyrolusite	-9.35	-9.39	-9.41	-9.43	-9.46	-9.51	-9.55	-9.65	-9.73	-9.78	-9.82	-9.85	-9.88	-9.91
Tenorite	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59
Otavite	-0.71	-0.79	-0.81	-0.84	-0.87	-0.91	-0.94	-1.03	-1.12	-1.18	-1.21	-1.24	-1.26	-1.28
Zincite	-2.94	-2.98	-3.00	-3.02	-3.04	-3.07	-3.09	-3.16	-3.22	-3.25	-3.27	-3.29	-3.31	-3.32

0.00 Indicates mineral precipitation

Copper World South Pit

Simulated pore water chemistry for the Copper World South backfill is provided for the first 200-years of filling in Table 10.7. Key results from the geochemical model are:

- Predicted pore water is characterized as circum-neutral with low metal and major ion concentrations.
- Pore waters are predicted to be above water quality AWQS for fluoride during the first 10-years of closure, but are expected to meet standards long-term. Fluoride concentrations are attributed to mass loading from NAG Granodiorite materials along the pit floor.
- Elevated TDS is related to alkalinity released from saturated backfill. In reality, backfill alkalinity maybe equilibrated with calcite and other carbonate mineral species than those calculated from the geochemical model that would lead to lower release rates.
- Pore water concentrations decline with time as groundwater outflow removes mass from the system. Backfill infiltration becomes an increasingly dominant component of pore water throughout recovery.
- Barite, calcite, ferrihydrite, fluorite, gibbsite, and malachite were predicted to precipitate. Their simulated saturation indices are provided in Table 10.8. The effect of mineral precipitation is evaluated in the sensitivity analysis.

Table 10.7: Copper World South simulated pore water chemistry

Element	EPA I/II	AWQS	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South
Year			1	2	3	5	10	20	30	50	75	100	125	150	175	200
pH	6.5-8.5	-----	7.91	7.91	7.90	7.90	7.89	7.88	7.87	7.87	7.87	7.86	7.86	7.83	7.80	7.77
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity	-----	-----	326	326	325	321	312	303	298	294	289	285	283	265	240	223
Aluminum	0.2	-----	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Antimony	0.006	0.006	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Arsenic	0.015	0.05	0.019	0.018	0.018	0.017	0.016	0.014	0.013	0.012	0.011	0.010	0.009	0.008	0.008	0.008
Barium	2	2	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.02
Beryllium	0.004	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	-----	-----	0.046	0.045	0.044	0.043	0.040	0.036	0.032	0.026	0.021	0.017	0.014	0.010	0.008	0.006
Cadmium	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001
Calcium	-----	-----	79	79	79	79	80	82	82	80	78	77	76	69	61	54
Chloride	250	-----	26	26	25	24	21	19	17	15	12	11	9	8	7	7
Chromium	0.1	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	<0.003	<0.003	<0.003	<0.003
Copper	1	-----	0.026	0.026	0.026	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Fluoride	4	4	4.27	4.26	4.25	4.20	4.07	3.93	3.86	3.54	3.03	2.69	2.41	2.16	1.97	1.83
Iron	0.3	-----	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.015	0.05	0.014	0.013	0.013	0.013	0.011	0.010	0.009	0.008	0.007	0.006	0.006	0.005	0.005	0.005
Magnesium	150	-----	35	34	33	32	29	26	24	20	17	15	13	11	9	8
Manganese	0.05	-----	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Mercury	0.002	0.002	0.0007	0.0007	0.0007	0.0006	0.0005	0.0004	0.0004	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0001
Molybdenum	-----	-----	0.08	0.08	0.08	0.08	0.07	0.07	0.06	0.05	0.05	0.04	0.03	0.03	0.03	0.02
Nickel	-----	0.1	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.005	<0.005
Total Nitrogen	10	10	2.01	1.98	1.95	1.83	1.49	1.21	1.07	0.86	0.65	0.52	0.44	0.37	0.31	0.28
Phosphorus	-----	-----	0.08	0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.04	0.03	0.02	0.02	0.01	0.01
Potassium	-----	-----	33.1	32.7	32.2	30.8	27.6	25.0	23.4	20.8	18.0	16.2	14.7	13.4	12.3	11.6
Selenium	0.05	0.05	0.036	0.035	0.035	0.033	0.031	0.027	0.026	0.023	0.021	0.020	0.018	0.017	0.016	0.015
Silver	0.1	-----	0.010	0.010	0.010	0.009	0.007	0.006	0.005	0.004	0.003	0.003	<0.0025	<0.0025	<0.0025	<0.0025
Sodium	-----	-----	189	187	184	176	157	138	126	108	93	82	72	63	57	52
Sulfate	250	-----	465	458	450	432	392	351	320	268	222	190	160	133	112	97
Thallium	0.002	0.002	0.0019	0.0019	0.0019	0.0018	0.0014	0.0012	0.0010	0.0008	0.0006	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
TDS	500	-----	1,159	1,148	1,135	1,102	1,026	949	896	810	734	679	630	566	501	455
Uranium	0.03	-----	0.008	0.008	0.008	0.008	0.007	0.006	0.006	0.004	0.004	0.003	0.002	<0.002	<0.002	<0.002
Zinc	5	-----	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.04	0.04	0.04
0.00		Indicates values above AWQS														

Table 10.8: Copper World South backfill simulated saturation indices

Mineral Phase	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South	Copper World South
Year	1	2	3	5	10	20	30	50	75	100	125	150	175	200
Percent Error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barite	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.29	0.18	0.08	-0.01
Calcite	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.43	0.31	0.21
Ferrihydrite	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Fluorite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06	-0.18	-0.27	-0.35	-0.46	-0.58	-0.67
Gibbsite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gypsum	-1.09	-1.09	-1.10	-1.11	-1.12	-1.14	-1.16	-1.22	-1.28	-1.34	-1.40	-1.49	-1.60	-1.68
H-Jarosite	-14.68	-14.69	-14.70	-14.71	-14.74	-14.78	-14.83	-14.95	-15.07	-15.18	-15.30	-15.34	-15.31	-15.29
K-Jarosite	-6.61	-6.62	-6.64	-6.68	-6.76	-6.85	-6.93	-7.10	-7.29	-7.45	-7.61	-7.71	-7.75	-7.79
Malachite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na-Jarosite	-9.35	-9.36	-9.37	-9.41	-9.50	-9.60	-9.69	-9.88	-10.07	-10.24	-10.42	-10.53	-10.58	-10.63
Rhodochrosite	-0.05	-0.06	-0.06	-0.08	-0.11	-0.14	-0.17	-0.24	-0.26	-0.28	-0.31	-0.41	-0.54	-0.64
Pyrolusite	-9.17	-9.18	-9.18	-9.21	-9.26	-9.31	-9.36	-9.43	-9.46	-9.48	-9.53	-9.67	-9.88	-10.03
Tenorite	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59
Otavite	-0.73	-0.73	-0.74	-0.77	-0.85	-0.93	-0.98	-1.05	-1.10	-1.11	-1.13	-1.20	-1.29	-1.36
Zincite	-2.94	-2.95	-2.96	-2.98	-2.98	-2.95	-2.95	-2.95	-2.84	-2.75	-2.72	-2.76	-2.82	-2.86

0.00	Indicates mineral precipitation

10.4 Copper World Pit Backfill Geochemical Sensitivity Analysis

Sensitivity analyses were performed for Copper World North and South pits with the same suite of sensitivities as described in section 9.4. Sensitivity scenarios are re-iterated for convenience below:

- RRZ of 50 ft
- Low pE
- Increased scale factor
- Groundwater inflow + 25%
- Groundwater inflow - 25%
- Increased saturation indices by +1.0
- Infiltration + 25%
- Infiltration - 25%

Copper World North Pit Sensitivity Analysis Results

The Copper World North Pit sensitivity analyses indicated that long-term, overall pore water concentrations would decline through time and that several constituent values above AWQS could occur (antimony, cadmium, and thallium). Tabulated chemistry results from the sensitivities are provided in Appendix N. Key results from the sensitivity analysis are described as follows.

- Variation in pore water chemistry between sensitivities are greatest during early time filling, but tend to converge during late-time periods.
- Highest pore water concentrations are primarily associated with the “Increased scale factor” and “RRZ of 50 ft” sensitivities. Pore water concentrations decreased through time but remained higher in these sensitivities.
- All antimony, cadmium, and thallium values above AWQS occurred as a result of the “Increased scale factor” and “RRZ of 50 ft” sensitivities.
- Inhibiting mineral precipitation in the “Increased saturation indices by 1” and “Low pE” sensitivities produced higher concentrations of iron and aluminum. Other trace metal elements were more affected by the “Increased scale factor” and “RRZ of 50 ft” sensitivities in Copper World North.
- Reducing inflows to the backfill in the “Infiltration - 25%” and “Groundwater inflow - 25%” sensitivities resulted in lower concentrations of most elements. This result suggests that

a delay in the wetting front reaching the saturated pore water will result in lower than predicted pore water chemistry.

- Several early-time predicted values above AWQS are modeling artifacts related to applying ½ the detection limit to non-detect data sources. These include temporary elevated values for antimony, cadmium, and thallium. They occur when saturated backfill is very small and had flushed the pit floor. All leaching tests used to develop CRFs for exposed geochemical units (granodiorite and bolsa quartzite), recorded non-detect values for these constituents. These constituents are not expected to be present at elevated concentrations above AWQS in the saturated backfill.
- Box and whisker diagrams for sulfate, fluoride, and arsenic in Figure 10.13. Sulfate variation is limited and representative of most major ions. Fluoride is more variable, with it's highest concentrations occurring in the "Increased scale factor" sensitivity, when fluorite precipitation is inhibited. All other constituents follow the same general trends of declining concentrations through time.

Copper World South Pit Sensitivity Analysis Results

The Copper World South Pit sensitivity analyses indicated that long term pore water concentrations would decline through time overall and that several new constituents may become elevated with respect to AWQS (cadmium, mercury, selenium, and thallium) could occur. Tabulated chemistry results from the sensitivities are provided in Appendix N. Key results from the sensitivity analysis are described as follows.

- Highest pore water concentrations are primarily associated with the "Increased scale factor" and "RRZ of 50 ft" sensitivities. Pore water concentrations decreased through time, but remained higher in these sensitivities. All cadmium, mercury, selenium, and thallium values above AWQS occurred as a result of these sensitivities.
- Inhibiting mineral precipitation in the "Increased saturation indices by 1" produced higher concentrations of aluminum and fluoride (early time filling). Arsenic was predicted to be lowest in this sensitivity because a greater mass of ferrihydrite was precipitated when saturation indices were reached.
- The "Low pE" sensitivity produced higher concentrations of iron, copper, and arsenic. Other trace metal elements were more affected by the "Increased scale factor" and "RRZ of 50 ft" sensitivities.
- Reducing groundwater inflows to the backfill generally reduced pore water concentrations of major ions. Conversely, increasing infiltration (Infiltration +25%) also reduced major ion concentrations as the pore water was dominated by the influence of infiltrating precipitation rather than groundwater .

- Several early-time, elevated constituents are modeling artifacts related to applying ½ the detection limit to non-detect data sources. These include temporary elevated values above AWQS for cadmium, mercury, selenium, and thallium. They occur when the in-pit water volume is very small and has only flushed the pit floor. All the leaching test used to develop CRFs for exposed geochemical units (granodiorite, Bolsa, and Abrigo rock units), recorded non-detect values for these constituents. These constituents are not expected to be present at elevated concentrations in the saturated backfill.
- Box and whisker diagrams for sulfate, fluoride, and arsenic are provided in Figure 10.14. Each element's concentration is predicted to decline through time. Most of the sensitivities predicted fluoride and arsenic concentrations will eventually meet AWQS.

11 HEAVY WEIGHT PIT BACKFILL GEOCHEMICAL MODEL

11.1 Heavy Weight Pit Backfill Configuration

The Heavy Weight Pit will be the third pit mined, after Elgin Pit and prior to Copper World Pit. It is located in the central portion of the project in the Santa Cruz hydrographic basins (Figure 11.1). The pit is composed of a main central pit mined to a depth of 4,150 ft amsl. A small, shallow satellite sub-pit is planned to the northeast but not anticipated to become saturated. Heavy Weight Pit will be backfilled with waste rock material from Broadtop Butte, Copper World, and Rosemont Pits. Stage/area/volume relationships for are shown in Figure 11.2.

The Heavy Weight Pit wall is composed of Granodiorite, Qmp, and Concha rock units. NAG Granodiorite comprise the majority of the pit floor and walls. No AG material is anticipated to be exposed along the pit's highwall. Stage / Area / Lithology exposures for the pit are provided in Figure 11.3, and tabulated in Appendix J.

Groundwater has been characterized from two monitoring wells adjacent to the pit. Water chemistry is generally of good quality with high alkalinity and no elevated constituents with respect to AWQS. A weighted average of groundwater chemistry was used to develop surrogate groundwater inflows for each sub-pit and are summarized in Tables 11.1, and Figure 11.1.

Table 11.1: Heavy Weight Backfill composite groundwater chemistry

Parameter	Units	EPA I/II	AWQS	RNW-HB-091	RNW-HB-108	Composite Groundwater
% of Perimeter				**36.4%**	**63.6%**	***100%***
Number of samples				*1*	*1*	
pH, Lab	s.u.	6.5-8.5	----	7.21	7.08	7.34
Alkalinity, Total	$CaCO_3$ mg/L	----	----	200	280	251
Aluminum	mg/L	----	----	0.00	0.00	0.00
Antimony	mg/L	0.006	0.006	0.000	0.000	0.000
Arsenic	mg/L	0.01	0.05	0.000	0.006	0.004
Barium	mg/l	2	2	0.047	0.028	0.035
Beryllium	mg/l	0.004	0.004	0.000	0.000	0.000
Boron	mg/L	----	----	0.094	0.053	0.07
Cadmium	mg/L	0.005	0.005	0.000	0.000	0.000
Calcium	mg/L	----	----	180.0	66.0	107.5
Chloride	mg/L	250	----	13	16	15
Chromium	mg/L	0.1	0.1	0.003	0.003	0.003
Copper	mg/L	1.3	----	0.001	0.001	0.001
Fluoride	mg/L	4.0	4.0	1.9	2.4	2.2
Iron	mg/L	0.3	-	0.03	0.03	0.03
Lead	mg/L	0.015	0.05	0.000	0.000	0.000
Magnesium	mg/L	150	----	43.0	21.0	29.0
Manganese	mg/L	0.05	----	0.590	0.079	0.265
Mercury	mg/L	0.002	0.002	0.0000	0.0000	0.0000
Nickel	mg/L	----	0.1	0.004	0.001	0.002
Nitrogen, Total as N	mg/L	10	10	0.01	0.01	0.01
Potassium	mg/L	----	----	7.2	0.5	2.9
Selenium	mg/L	0.05	0.05	0.013	0.001	0.006
Silver	mg/L	0.1	----	0.000	0.000	0.000
Sodium	mg/L	----	----	140.0	91.0	108.8
Sulfate	mg/L	250	----	680	150	343
Thallium	mg/L	0.002	0.002	0.000	0.000	0.000
Uranium	mg/L	0.03	----	0.008	0.018	0.014
Zinc	mg/L	5	----	0.00	0.00	0.00
TDS	mg/L	500	----	1300	580	880

Indicates values above AWQS

11.2 Heavy Weight Pit Backfill Water Balance Results

Water balance results are presented in Table 11.2 for the Heavy Weight backfill over a period of 200 years. This captures the period of geochemical mass loading when pore water concentrations are highest. Key results pertaining to the water balance are as follows:

- Backfill water levels recovered to the 4,310 ft amsl elevation. Recovery occurs relatively slowly. Simulated recovery hydrographs are shown in Figure 11.4.

- The Heavy Weight Pit is anticipated to be a groundwater flow through system. This occurs because the groundwater outflow is the only discharge from the system. Groundwater outflow rates are predicted to be very small (0.7 gpm to 0.3 gpm). Simulated groundwater gradients across the backfill are generally towards the north and northwest as shown in Figure 11.5.
- Groundwater was the largest water balance component, followed by infiltration (Table 9.2 and Figure 11.6). Groundwater initially comprises 85% of the pore water in the backfill but decreases through time to 55% as inflows decrease (Figure 11.7).

Table 11.2: Heavy Weight backfill water balance summary

Time (yr)	Stage (ft, amsl)	Infiltration (gpm)	Total Runoff (gpm)	Groundwater Inflow (gpm)	Groundwater Outflow (gpm)
0	4150	0.4	0.0	2.1	-0.7
1	4156	0.4	0.0	1.8	-0.6
2	4161	0.4	0.0	1.3	-0.4
3	4165	0.4	0.0	1.1	-0.4
5	4172	0.4	0.0	0.9	-0.4
10	4185	0.4	0.0	0.6	-0.3
20	4204	0.4	0.0	0.5	-0.3
30	4214	0.4	0.0	0.5	-0.3
50	4233	0.4	0.0	0.5	-0.3
75	4254	0.4	0.0	0.5	-0.3
100	4268	0.4	0.0	0.5	-0.3
125	4280	0.4	0.0	0.5	-0.3
150	4292	0.4	0.0	0.4	-0.3
175	4302	0.4	0.0	0.4	-0.3
200	4310	0.4	0.0	0.4	-0.3

11.3 Heavy Weight Pit Backfill Geochemical Results

Simulated pore water chemistry for the Heavy Weight backfill is provided for the first 200-years of filling in Table 11.3. Key results from the geochemical model are:

- Predicted pore water is characterized as circum-neutral with low metal concentrations and elevated TDS.
- Fluoride temporarily becomes temporarily elevated with respect to AWQS and is expected to meet standards 10-years after closure. Fluoride concentrations are attributed to mass loading from NAG Granodiorite materials along the pit floor.
- The release of fluoride is related to the flushing of Granodiorite wall rock materials and moderately high concentrations in groundwater (2.2 mg/l, Table 11.1). Site specific leach testing for Granodiorite has not been completed. The Qmp CRF was used as

surrogate because of its similar geochemical composition with Granodiorite. Additional materials testing may yield lower mass loading rates for fluoride (and other constituents), thus provide grounds to adjust pore water chemistry predictions for Heavy Weight backfill.

- Predicted pore water chemistry resembles background groundwater chemistry. Major ions such as sulfate, calcium, sodium, and magnesium are consistent with the range of background groundwater chemistry. TDS is related to groundwater inflow, primarily the chemistry found in RNW-HB-091.

- Several minerals are predicted to precipitate and control backfill chemistry including barite, calcite, ferrihydrite, fluorite, gibbsite, malachite, and rhodochrosite. Their simulated saturation indices are provided in Table 11.4. The effect of mineral precipitation is evaluated in the sensitivity analysis.

Table 11.3: Heavy Weight simulated pore water chemistry

Element	EPA I/II	AWQS	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight
Year			1	2	3	5	10	20	30	50	75	100	125	150	175	200
pH	*6.5-8.5*	-----	7.95	7.94	7.93	7.93	7.93	7.93	7.92	7.92	7.92	7.91	7.91	7.91	7.91	7.90
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00	2.00	1.00	0.00	-1.00
Alkalinity	-----	-----	354	346	344	340	337	334	331	329	326	323	321	320	318	317
Aluminum	*0.2*	-----	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Antimony	*0.006*	*0.006*	0.004	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Arsenic	*0.015*	*0.05*	0.021	0.019	0.018	0.018	0.017	0.017	0.016	0.016	0.015	0.014	0.014	0.014	0.015	0.018
Barium	*2*	*2*	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	-----	-----	0.058	0.056	0.054	0.052	0.048	0.044	0.042	0.041	0.040	0.040	0.039	0.038	0.038	0.037
Cadmium	*0.005*	*0.005*	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Calcium	-----	-----	61	63	63	64	63	63	64	64	65	66	66	66	67	67
Chloride	*250*	-----	23	22	21	20	19	18	18	17	17	16	16	16	16	15
Chromium	*0.1*	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Copper	*1*	-----	0.026	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.027	0.046	0.056	0.055
Fluoride	*4*	*4*	**4.63**	**4.52**	**4.44**	**4.27**	**4.12**	3.94	3.82	3.73	3.64	3.54	3.47	3.40	3.35	3.30
Iron	*0.3*	-----	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	0.08
Lead	*0.015*	*0.05*	0.010	0.009	0.009	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.007
Magnesium	*150*	-----	31	30	29	28	26	25	24	23	23	23	22	22	22	22
Manganese	*0.05*	-----	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Mercury	*0.002*	*0.002*	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.09	0.09	0.09	0.09	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	1.12	0.97	0.92	0.85	0.82	0.76	0.71	0.67	0.62	0.56	0.52	0.49	0.47	0.45
Phosphorus	-----	-----	0.12	0.12	0.12	0.11	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08
Potassium	-----	-----	22.6	21.1	20.6	19.8	19.4	18.9	18.3	17.9	17.4	16.7	16.3	16.0	15.7	15.5
Selenium	*0.05*	*0.05*	0.024	0.023	0.023	0.023	0.022	0.022	0.022	0.022	0.021	0.021	0.021	0.021	0.020	0.020
Silver	*0.1*	-----	0.006	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	<0.0025	<0.0025	<0.0025
Sodium	-----	-----	173	165	161	155	148	140	136	132	130	127	124	122	120	119
Sulfate	*250*	-----	339	329	321	308	289	271	262	255	251	249	246	241	238	236
Thallium	*0.002*	*0.002*	0.0011	0.0009	0.0009	0.0008	0.0008	0.0007	0.0007	0.0006	0.0006	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
TDS	*500*	-----	1,010	982	966	941	908	876	857	843	834	825	817	808	801	795
Uranium	*0.03*	-----	0.012	0.012	0.011	0.011	0.010	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008
Zinc	*5*	-----	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.00		Indicates values above AWQS														

Table 11.4: Heavy Weight backfill simulated saturation indices

Mineral Phase	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight	Heavy Weight
Year	1	2	3	5	10	20	30	50	75	100	125	150	175	200
Percent Error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barite	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**
Calcite	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**
Ferrihydrite	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	-0.36
Fluorite	**0.00**	**0.00**	-0.01	-0.03	-0.05	-0.08	-0.10	-0.12	-0.13	-0.14	-0.16	-0.17	-0.18	-0.19
Gibbsite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Gypsum	-1.28	-1.28	-1.28	-1.29	-1.31	-1.33	-1.33	-1.34	-1.34	-1.33	-1.33	-1.34	-1.34	-1.34
H-Jarosite	-15.07	-15.06	-15.07	-15.08	-15.12	-15.16	-15.17	-15.18	-15.18	-15.17	-15.17	-15.18	-15.18	-16.87
K-Jarosite	-7.12	-7.14	-7.16	-7.20	-7.25	-7.30	-7.33	-7.35	-7.36	-7.37	-7.39	-7.40	-7.42	-9.12
Malachite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	-1.24	-3.17
Na-Jarosite	-9.73	-9.75	-9.76	-9.80	-9.86	-9.92	-9.95	-9.97	-9.98	-9.99	-10.00	-10.02	-10.03	-11.73
Rhodochrosite	**0.00**	**0.00**	**0.00**	-0.02	-0.06	-0.09	-0.11	-0.13	-0.14	-0.15	-0.16	-0.17	-0.18	-0.18
Pyrolusite	-9.04	-9.06	-9.06	-9.09	-9.13	-9.17	-9.20	-9.22	-9.24	-11.25	-13.27	-15.28	-17.30	-19.31
Tenorite	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-1.21	-2.17
Otavite	-0.88	-0.95	-0.98	-1.01	-1.02	-1.05	-1.08	-1.11	-1.14	-1.19	-1.22	-1.24	-1.26	-1.28
Zincite	-3.04	-3.09	-3.10	-3.12	-3.14	-3.15	-3.17	-3.19	-3.21	-3.23	-3.25	-3.26	-3.27	-3.28

0.00 Indicates mineral precipitation

11.4 Heavy Weight Pit Backfill Geochemical Sensitivity Analysis

Sensitivity analyses were performed for the Heavy Weight Pit with the same suite of sensitivities as described in Section 9.4. Sensitivity scenarios are re-iterated for convenience below:

- RRZ of 50 ft
- Low pE
- Increased scale factor
- Groundwater inflow + 25%
- Groundwater inflow - 25%
- Increased saturation indices by +1.0
- Infiltration + 25%
- Infiltration - 25%

Heavy Weight Pit Backfill Sensitivity Analysis Results

The Heavy Weight Pit sensitivity analyses indicated that long term pore water concentrations would decline through time, like the other backfilled pits. Several constituents above AWQS were predicted to occur (antimony, cadmium, and thallium) during early-time (<50 years). Elevated fluoride concentrations could persist longer in the “RRZ of 50ft” and “Increased scale factor” sensitivities. Tabulated chemistry results from the sensitivities are provided in Appendix O. Key results from the sensitivity analysis are described as follows.

- Variation in pore water chemistry between sensitivities are greatest during early time filling but tend to converge at late time.
- Highest pore water concentrations are primarily associated with the “Increased scale factor” and “RRZ of 50 ft” sensitivities. Pore water concentrations were higher in these sensitivities but continued the trend of declining concentrations through time. It is only in these sensitivities that fluoride is elevated with respect to AWQS in late-time (>50 years).
- Inhibiting mineral precipitation in the “Increased saturation indices by 1” and “Low pE” sensitivities produced higher concentrations of iron and aluminum. Other trace metal elements were more affected by the “Increased scale factor” and “RRZ of 50 ft” sensitivities.
- Reducing inflows to the backfill in the “Infiltration - 25%” and “Groundwater inflow - 25%” sensitivities resulted in lower concentrations of most elements. This result suggests that

a delay in the wetting front reaching the saturated pore water will result in lower than predicted pore water chemistry.

- Several early-time predicted values above AWQS are modeling artifacts related to applying ½ the detection limit to non-detect data sources. These include temporary elevated values above AWQS for antimony, cadmium, and thallium. All leaching tests used to develop CRFs for exposed geochemical units (granodiorite) recorded non-detect values. These constituents are not expected to be present at elevated concentrations above AWQS in the pit lake.
- Box and whisker diagrams for sulfate, fluoride, and manganese are shown in Figure 11.8. All constituents concentrations converge to similar values and decline through time.

12 ELGIN PIT LAKE GEOCHEMICAL MODEL

12.1 Elgin Pit Lake Configuration

The Elgin Pit is the second pit to be mined in the Project, after Peach Pit and prior to Heavy Weight. Elgin Pit is located on the western side of the Santa Ritas, north of the HLP and TSF-2 facilities. The pit configuration, as well as exposed geochemical units, are provided in Figure 12.1. The lowest mining bench is 4,050 ft amsl, which is completed in NAG Epitaph limestone and Granodiorite. Small pit depressions are found in the northern pit portions but are anticipated to be dry. Stage/area/volume relationships for the pit are shown in Figure 12.2.

The overwhelming majority of the Elgin Pit is composed of NAG Epitaph material. No AG materials are anticipated to be exposed on the ultimate pit wall (Figure 12.3). Exposures of granodiorite, Qmp, and Horquilla will also be present in lesser quantities higher in the pit wall. Stage / Area / Lithology exposures for the pit are provided in Figure 12.3, and tabulated in Appendix J.

Groundwater chemistry from three nearby monitoring wells was used to develop the chemistry of groundwater inflow. Groundwater chemistry is generally of good quality with no values above AWQS. A weighted average of groundwater chemistry is provided in Table 12.1 and shown visually in Figure 12.1.

Table 12.1: Elgin Pit composite groundwater chemistry

Parameter	Units	EPA I/II	AWQS	GH 2021-11	RNW-HB-091	GH 2021-22	Composite Groundwater
% of Perimeter				35.4%	45.3%	19.3%	***100%***
Number of samples				*2*	*1*	*2*	
pH, Lab	s.u.	6.5-8.5	----	7.47	7.50	7.97	*7.34*
Alkalinity, Total	$CaCO_3$ mg/L	----	----	205	200	137	*189*
Aluminum	mg/L	----	----	0.00	0.00	0.00	*0.00*
Antimony	mg/L	0.006	0.006	0.0001	0.0001	0.0001	*0.0001*
Arsenic	mg/L	0.01	0.05	0.0006	0.0001	0.0007	*0.0004*
Barium	mg/l	2	2	0.100	0.047	0.070	*0.070*
Beryllium	mg/l	0.004	0.004	0.000	0.000	0.000	*0.000*
Boron	mg/L	----	----	0.05	0.09	0.09	*0.08*
Cadmium	mg/L	0.005	0.005	0.000	0.000	0.000	*0.000*
Calcium	mg/L	----	----	53.0	180.0	51.3	*110.2*
Chloride	mg/L	250	----	18	13	13	*15*
Chromium	mg/L	0.1	0.1	0.003	0.003	0.003	*0.003*
Copper	mg/L	1.3	----	0.000	0.001	0.001	*0.001*
Fluoride	mg/L	4.0	4.0	2.6	1.9	1.5	*2.1*
Iron	mg/L	0.3	-	0.03	0.03	0.03	*0.03*
Lead	mg/L	0.015	0.05	0.0001	0.0001	0.0001	*0.0001*
Magnesium	mg/L	150	----	9.6	43.0	8.6	*24.5*
Manganese	mg/L	0.05	----	0.250	0.590	0.089	*0.373*
Mercury	mg/L	0.002	0.002	0.0000	0.0000	0.0001	*0.0001*
Nickel	mg/L	----	0.1	0.000	0.004	0.000	*0.002*
Nitrogen, Total as N	mg/L	10	10	0.01	0.01	0.01	*0.01*
Potassium	mg/L	----	----	0.5	7.2	0.5	*3.5*
Selenium	mg/L	0.05	0.05	0.000	0.013	0.000	*0.006*
Silver	mg/L	0.1	----	0.000	0.000	0.000	*0.000*
Sodium	mg/L	----	----	34.5	140.0	37.0	*82.7*
Sulfate	mg/L	250	----	35	680	113	*342*
Thallium	mg/L	0.002	0.002	0.000	0.000	0.000	*0.000*
Uranium	mg/L	0.03	----	0.048	0.008	0.006	*0.022*
Zinc	mg/L	5	----	0.00	0.00	0.00	*0.00*
TDS	mg/L	500	----	295	1300	323	*786*

Indicates values above AWQS

12.2 Elgin Pit Lake Water Balance Results

Water balance results are presented in Table 12.2 for the Elgin Pit lake for a period of 200 years post-mining which corresponds to when the pit lake will have reached 95% recovery. Key results pertaining to the water balance are as follows:

- The pit lake recovered to the 4,105 ft amsl elevation. Most of the pit lake recovery is anticipated to occur during the first 30 years-post closure, followed by slower recovery rates. Simulated lake recovery hydrographs are shown in Figure 12.4.
- A very small pit lake forms with an area of approximately 7 acres.
- The Elgin Pit lake is predicted to have a minor component of groundwater outflow (<1 gpm), directed to the north by northwest. Simulated piezometric levels are provided in Figure 12.5.
- The pit lake is primarily supported by surface water runoff and precipitation (Table 12.2 and Figure 12.6). The Stage-Area relationship at 4,100 ft amsl elevation is conducive to maintaining impounded surface waters in the pit, meaning that evaporative demand is less than runoff and precipitation inflows at that stage. Therefore, surface waters will be impounded if the wall rock permeability is low and unable to transmit surface water to the groundwater system.
- Outflow from the pit lake is primarily through evaporation with a minor component of groundwater outflow.
- Pit wall runoff remains relatively steady owing to the unchanged exposed pit wall area and contribution from adjacent drainages. Pit wall runoff inflow comprise ~70% of pit lake waters (Figure 12.7), followed by precipitation (25%) and groundwater (<5%).

Table 12.2: Elgin Pit lake water balance summary

Time (yr)	Stage (ft, amsl)	Precipitation (gpm)	Total Runoff (gpm)	Groundwater Inflow (gpm)	ET (gpm)	Groundwater Outflow (gpm)
0	4050	1.3	17.0	1.9	-2.1	-0.1
1	4057	1.7	17.9	1.8	-5.6	-0.1
2	4063	2.3	17.7	1.4	-7.3	-0.1
3	4069	2.8	17.5	1.2	-9.1	-0.2
5	4078	3.5	17.4	0.9	-11.4	-0.2
10	4092	4.7	17.1	0.5	-15.2	-0.3
20	4102	6.0	16.7	0.2	-19.4	-0.8
30	4104	6.5	16.6	0.1	-21.1	-1.0
50	4105	6.7	16.6	0.1	-21.8	-1.2
75	4105	6.8	16.5	0.1	-22.2	-1.2
100	4105	6.8	16.5	0.1	-22.2	-1.2
125	4105	6.8	16.5	0.1	-22.2	-1.2
150	4105	6.8	16.5	0.1	-22.2	-1.2
175	4105	6.8	16.5	0.1	-22.2	-1.2
200	4105	6.8	16.5	0.1	-22.2	-1.2

12.3 Elgin Pit Lake Geochemical Results

Simulated pit lake chemistry for the Elgin Pit is provided during filling in Table 12.3. Key results from the geochemical model are:

- Predicted lake water is characterized as circum-neutral with ample alkalinity. Major ions are projected to evapoconcentrate through time because the evaporation of surface waters is several times greater than groundwater discharge.
- Pit lake water is anticipated to possess fluoride concentrations above AWQS limits. Fluoride values elevated above AWQS are related to the moderate concentrations found in groundwater and wall rock flushing of NAG Epitaph material. Fluoride is predicted to evapoconcentration through time.
- The abundance of alkalinity from wall rock and groundwater create conditions that are conducive to geochemically attenuating most metals, which will serve as a geochemical control on trace attendant metals. This occurs for iron, copper, and aluminium elements, and are anticipated to continue in perpetuity.
- Groundwater outflow chemistry will reflect the bulk pit lake chemistry concentrations through time. The magnitude of outflow is small, on the order of a few gallons per minute, controlled by low permeability crystalline bedrock materials that are characteristic for this area. Many ore deposits contain local geologic structure and alterations that compartmentalize groundwater conditions at the pit scale. The presence of compartmentalizing structures in the Peach-Elgin Pit area would likely transform the Elgin Pit lake into a hydraulic sink.
- Several minerals are predicted to precipitate and control lake chemistry including barite, calcite, ferrihydrite, fluorite, gibbsite, and malachite. Their simulated saturation indices are provided in Table 12.4. The effect of mineral precipitation on lake chemistry is evaluated in the sensitivity analysis.
- Additional sources of calcium to the pit lake would support the precipitation of fluorite and help attenuate fluoride concentrations.
- Surface water management measures can be utilized to reduce inflow to the Elgin Pit and prevent potential groundwater degradation. These measures are further discussed in Section 12.5.

Table 12.3: Elgin Pit lake simulated chemistry

Element	EPA I/II	AWQS	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin
Year			1	2	3	5	10	20	30	50	75	100	125	150	175	200
pH	*6.5-8.5*	-----	7.92	7.90	7.90	7.90	7.92	7.95	7.99	8.05	8.11	8.16	8.20	8.22	8.24	8.26
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity	-----	-----	326	313	311	312	323	353	384	449	527	594	651	698	736	767
Aluminum	*0.2*	-----	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Antimony	*0.006*	*0.006*	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003
Arsenic	*0.015*	*0.05*	0.005	0.005	0.006	0.006	0.007	0.010	0.012	0.016	0.021	0.024	0.027	0.029	0.031	0.032
Barium	*2*	*2*	0.05	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.03	0.03	0.03	0.03	0.03	0.03
Beryllium	*0.004*	*0.004*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	-----	-----	0.011	0.010	0.010	0.009	0.008	0.008	0.007	0.007	0.008	0.008	0.008	0.008	0.008	0.008
Cadmium	*0.005*	*0.005*	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002
Calcium	-----	-----	60	62	62	62	59	52	46	37	30	26	23	21	19	18
Chloride	*250*	-----	13	12	12	12	13	17	20	27	35	41	46	50	53	55
Chromium	*0.1*	*0.1*	0.01	0.00	0.00	0.00	0.00	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Copper	*1*	-----	0.025	0.025	0.025	0.025	0.025	0.025	0.026	0.026	0.028	0.029	0.030	0.031	0.032	0.033
Fluoride	*4*	*4*	**4.22**	**4.03**	4.00	**4.01**	**4.16**	**4.58**	**5.01**	**5.91**	**6.98**	**7.92**	**8.70**	**9.34**	**9.86**	**10.28**
Iron	*0.3*	-----	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	*0.015*	*0.05*	0.007	0.005	0.005	0.004	0.004	0.004	0.003	0.004	0.004	0.004	0.005	0.005	0.005	0.005
Magnesium	*150*	-----	21	18	17	17	18	23	27	36	46	54	60	66	70	73
Manganese	*0.05*	-----	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.13	0.11	0.10	0.10	0.11	0.13	0.16	0.21	0.27	0.32	0.35	0.38	0.41	0.43
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	1.15	0.89	0.83	0.82	0.94	1.28	1.61	2.26	2.97	3.56	4.03	4.41	4.72	4.96
Phosphorus	-----	-----	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Potassium	-----	-----	22.2	19.1	18.5	18.6	21.1	27.4	33.5	45.3	58.2	68.8	77.4	84.2	89.7	94.1
Selenium	*0.05*	*0.05*	0.006	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.006	0.006	0.006	0.006
Silver	*0.1*	-----	0.005	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004
Sodium	-----	-----	98	85	83	83	92	116	140	187	238	280	314	341	363	381
Sulfate	*250*	-----	179	153	145	141	150	181	215	281	353	413	461	499	530	555
Thallium	*0.002*	*0.002*	0.0010	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0007	0.0008	0.0008	0.0008	0.0008
TDS	*500*	-----	725	668	653	651	681	775	874	1,071	1,297	1,488	1,645	1,773	1,876	1,959
Uranium	*0.03*	-----	0.006	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.00		Indicates values above AWQS														

Table 12.4: Elgin Pit lake simulated saturation indices

Mineral Phase	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin	Elgin
Year	1	2	3	5	10	20	30	50	75	100	125	150	175	200
Percent Error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barite	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Calcite	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Ferrihydrite	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Fluorite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gibbsite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gypsum	-1.48	-1.51	-1.52	-1.54	-1.54	-1.54	-1.54	-1.57	-1.61	-1.65	-1.69	-1.72	-1.74	-1.75
H-Jarosite	-15.46	-15.52	-15.55	-15.58	-15.59	-15.58	-15.58	-15.63	-15.72	-15.81	-15.88	-15.93	-15.98	-16.01
K-Jarosite	-7.53	-7.67	-7.72	-7.74	-7.68	-7.53	-7.41	-7.28	-7.20	-7.17	-7.15	-7.15	-7.14	-7.14
Malachite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na-Jarosite	-10.38	-10.52	-10.56	-10.58	-10.54	-10.40	-10.29	-10.15	-10.08	-10.05	-10.04	-10.03	-10.03	-10.03
Rhodochrosite	-0.63	-0.68	-0.70	-0.72	-0.74	-0.72	-0.69	-0.60	-0.51	-0.44	-0.38	-0.34	-0.31	-0.29
Pyrolusite	-9.72	-9.80	-9.82	-9.84	-9.83	-9.75	-9.64	-9.43	-9.21	-9.05	-8.92	-8.83	-8.76	-8.70
Tenorite	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59
Otavite	-0.90	-1.05	-1.11	-1.15	-1.15	-1.11	-1.06	-0.96	-0.85	-0.77	-0.72	-0.68	-0.64	-0.62
Zincite	-3.27	-3.41	-3.47	-3.51	-3.52	-3.49	-3.45	-3.36	-3.28	-3.21	-3.17	-3.13	-3.11	-3.09

0.00 Indicates mineral precipitation

12.4 Elgin Pit Lake Geochemical Sensitivity Analysis

Sensitivity analyses was performed for the Elgin Pit lake using the same suite of sensitivities as described in section 8.4. Sensitivity scenarios are re-iterated below for convenience:

- RRZ of 50 ft
- Low pE
- Increased scale factor
- Evaporation + 15%
- Evaporation - 15%
- Groundwater inflow + 25%
- Groundwater inflow - 25%
- Increased saturation indices by +1.0

Elgin Pit Sensitivity Analysis Results

The Elgin Pit lake sensitivity analyses indicated that potential elevated constituents with respect to AWQs include cadmium, thallium, and antimony during early-time (<3 years) and fluoride throughout. Arsenic values above AWQS were also observed for late-time (>125 years). Tabulated chemistry results from the sensitivities are provided in Appendix P. Key results from the sensitivity analysis are described as follows.

- The “Increased scale factor” sensitivity released the most mass into the pit lake and produced higher concentrations of most elements which evapoconcentrated through time. The effect of increasing the scaling factor is attributed to pit wall runoff being the principal source of inflow; therefore, increased mass loading via pit wall runoff has a downstream effect.
- The “RRZ of 50 ft” sensitivity had a moderate effect during early-time filling (0 yr – 30 yr), when the lake is rising and submerging wall rock. However, during late-time the concentrations from the “RRZ of 50 ft” sensitivity converge towards the Base Case.
- Inhibiting mineral precipitation in the “Increased saturation indices by 1” and “Low pE” sensitivities produced higher concentrations of constituents. Iron was predicted to be above AWQS in the “Low pE” sensitivity, but was still effectively removed when raising the saturation index by a factor of 10 (i.e. 1 log cycle). Iron and manganese are anticipated to be removed through oxide formation when the pit lake mixes.
- Both the “Increased scale factor” and “Low pE” sensitivities predicted arsenic values above AWQS in late-time. This is the result of reduced ferrihydrite precipitation and evapoconcentration through time for each of these sensitivities.

- Variation in evaporation affected the rate of evapoconcentration, which was more apparent during late-time pit lake filling. Increasing evaporation had the second highest effect of increasing overall concentrations.
- Adjusting groundwater inflow had minor effects on most predicted concentrations.
- Several early-time, predicted elevated constituents are modeling artifacts related to applying ½ the detection limit to non-detect data sources. These include temporary elevated values above AWQS for antimony, cadmium, and thallium. They occur when the pit lake is very small and had flushed the pit floor. All of the leaching tests used to develop CRFs for exposed geochemical units (primarily Epitaph), recorded non-detect values for these constituents. These constituents are not expected to be present at elevated concentrations above AWQS in the pit lake.
- Box and whisker diagrams for sulfate, fluoride, and manganese in Figure 14.8. Sulfate converges to a narrow band during late time. Manganese also converges to a narrow range of values, although lower evaporation rates reduce the amount of evapoconcentration of manganese.

13 PEACH PIT LAKE GEOCHEMICAL MODEL

13.1 Peach Pit Lake Configuration

The Peach Pit is the first pit to be mined in the Project. It is the western most pit on the property, located north of HLP and east of the TSF-1 facility. The pit configuration as well as exposed geochemical units are provided in Figure 13.1. The lowest mining bench is 3,950 ft amsl, which is completed in PAG Granodiorite. A small ridgeline of Bolsa quartzite and Abrigo limestone form the western border of the open pit. Stage/area/volume relationships for the pit are shown in Figure 13.2.

Peach Pit highwalls are primarily composed of NAG and PAG rock materials. The western high wall is comprised of Bolsa and Abrigo Limestones which form the ridgeline bounding the pit. The eastern highwall is comprised of Limestone units (Martin, Horquilla, Escarbosa, and Epitaph). A minor amount of AG material is anticipated to be exposed above the 4,050 ft elevation (<1%). Stage / Area / Lithology exposures for the pit are provided in Figure 13.3, and tabulated in Appendix J.

Groundwater samples from four nearby monitoring wells were collected to characterize incoming groundwater chemistry. Several wells reside in the footprint of the proposed TSFs and represent down-gradient groundwater conditions. Groundwater chemistry is generally of good quality with no constituents elevated with respect to AWQS. Manganese is consistently elevated in the ambient groundwater, with concentrations ranging from 0.25 mg/l to 0.59 mg/l. A weighted average of groundwater chemistry was used for surrogate groundwater inflow chemistry in the pit lake geochemical model, summarized in Table 13.1 and shown visually in Figure 13.1.

Table 13.1: Peach Pit composite groundwater chemistry

Parameter	Units	EPA I/II	AWQS	GH 2021-10	RNW-HB-091	GH 2021-11	GH 2021-17	Composite Groundwater
% of Perimeter				65.2%	15.9%	14.3%	4.6%	***100%***
Number of samples				*2*	*1*	*2*	*2*	
pH, Lab	s.u.	6.5-8.5	----	7.70	7.50	7.47	8.0	*7.65*
Alkalinity, Total	$CaCO_3$ mg/L	----	----	250	200	205	170	*232*
Aluminum	mg/L	----	----	0.00	0.00	0.00	0.02	*0.00*
Antimony	mg/L	0.006	0.006	0.0001	0.0001	0.0001	0.0003	*0.0001*
Arsenic	mg/L	0.01	0.05	0.0009	0.0001	0.0006	0.0013	*0.0007*
Barium	mg/l	2	2	0.081	0.047	0.100	0.170	*0.082*
Beryllium	mg/l	0.004	0.004	0.000	0.000	0.000	0.000	*0.000*
Boron	mg/L	----	----	0.09	0.09	0.05	0.12	*0.09*
Cadmium	mg/L	0.005	0.005	0.000	0.000	0.000	0.000	*0.000*
Calcium	mg/L	----	----	83.0	180.0	53.0	54.0	*92.8*
Chloride	mg/L	250	----	27	13	18	14	*23*
Chromium	mg/L	0.1	0.1	0.000	0.003	0.003	0.000	*0.001*
Copper	mg/L	1.3	----	0.001	0.001	0.000	0.009	*0.001*
Fluoride	mg/L	4.0	4.0	1.6	1.9	2.6	1.7	*1.8*
Iron	mg/L	0.3	-	0.03	0.03	0.03	0.15	*0.04*
Lead	mg/L	0.015	0.05	0.0001	0.0001	0.0001	0.0003	*0.0001*
Magnesium	mg/L	150	----	21.0	43.0	9.6	9.6	*22.3*
Manganese	mg/L	0.05	----	0.320	0.590	0.250	0.500	*0.361*
Mercury	mg/L	0.002	0.002	0.0000	0.0000	0.0000	0.0001	*0.0000*
Nickel	mg/L	----	0.1	0.000	0.004	0.000	0.005	*0.001*
Nitrogen, Total as N	mg/L	10	10	0.01	0.01	0.01	0.05	*0.01*
Potassium	mg/L	----	----	0.5	7.2	0.5	2.5	*1.7*
Selenium	mg/L	0.05	0.05	0.001	0.013	0.000	0.001	*0.003*
Silver	mg/L	0.1	----	0.000	0.000	0.000	0.000	*0.000*
Sodium	mg/L	----	----	57.0	140.0	34.5	42.0	*66.3*
Sulfate	mg/L	250	----	110	680	35	85	*189*
Thallium	mg/L	0.002	0.002	0.000	0.000	0.000	0.000	*0.000*
Uranium	mg/L	0.03	----	0.002	0.008	0.048	0.020	*0.010*
Zinc	mg/L	5	----	0.00	0.00	0.00	0.08	*0.01*
TDS	mg/L	500	----	590	1300	295	360	*654*

Indicates values above AWQS

13.2 Peach Pit Lake Water Balance Results

Water balance results are presented in Table 13.2 for the Peach Pit lake for a period of 200 years post-mining which corresponds to when the pit lake will have reached 95% recovery. Key results pertaining to the water balance are as follows:

- The pit lake recovered to 4,086 ft amsl elevation initially before declining to approximately 4,080 ft amsl elevation after 200 years. Pit lake recovery is affected by regional groundwater drawdown caused by dewatering of the Rosemont Pit. During the first 40 years post-closure, the Peach Pit lake stage increases. After 40 years, the dynamics of reduced seepage to the TSFs and drawdown from Rosemont Pit lake lowers the regional piezometric levels. This causes pit lake levels in Peach to decline. Simulated lake recovery hydrographs are shown in Figure 13.4.
- The Peach Pit lake area is very small, approximately 6 acres.
- The Peach Pit lake is predicted to have a minor component of groundwater outflow (1 gpm – 1.5 gpm), directed to the north-northwest. Simulated piezometric levels are provided in Figure 13.5.
- The pit lake is primarily supported by surface water runoff and precipitation (Table 13.2 and Figure 13.6). The Stage-Area relationship at 4,050 ft amsl elevation is conducive to maintaining impounded surface waters in the pit, meaning that evaporative demand is less than runoff and precipitation inflows at that stage. This is conceptually similar to the Elgin Pit lake.
- Pit lake outflow occurs primarily through evaporation with a minor groundwater component.
- Pit wall runoff remains relatively steady owing to the unchanged exposed pit wall area and contribution from adjacent drainages. Pit wall runoff comprises ~70% of pit lake waters (Figure 13.7), followed by precipitation (27%) and groundwater (~2%).

Table 13.2: Peach Pit lake water balance summary

Time (yr)	Stage (ft, amsl)	Precipitation (gpm)	Total Runoff (gpm)	Groundwater Inflow (gpm)	Evaporation (gpm)	Groundwater Outflow (gpm)
0	3952	0.4	15.4	0.2	-0.6	0.0
1	3978	0.7	16.2	0.2	-2.1	0.0
2	4001	1.2	16.0	0.1	-3.8	0.0
3	4009	1.6	15.9	0.0	-5.2	0.0
5	4023	2.1	15.7	0.0	-6.8	-0.3
10	4047	3.0	15.5	0.0	-9.7	-1.5
20	4064	4.1	15.2	0.4	-13.4	-0.9
30	4077	5.3	14.9	1.5	-17.2	-0.1
50	4086	6.2	14.7	1.2	-20.2	-0.4
75	4084	6.4	14.7	0.4	-20.8	-1.0
100	4081	6.1	14.7	0.1	-20.0	-1.3
125	4080	6.0	14.8	0.0	-19.4	-1.5
150	4080	5.9	14.8	0.0	-19.3	-1.4
175	4080	6.0	14.8	0.0	-19.5	-1.3
200	4080	6.0	14.8	0.0	-19.4	-1.4

13.3 Peach Pit Lake Geochemical Results

Simulated pit lake chemistry for the Peach Pit is provided during filling in Table 13.4. Key results from the geochemical model are:

- Predicted lake water is characterized as circum-neutral with ample alkalinity. Major ions are projected to evapoconcentrate through time because the evaporation of surface waters is greater than groundwater discharge.
- Pit lake water is anticipated to be below AWQS for most constituents, except fluoride. Elevated fluoride concentrations are attributed to moderate concentrations in background groundwater and contributions from exposed Granodiorite which evapoconcentrate through time.
- The abundance of alkalinity from wall rock and groundwater provides neutralization that are conducive to attenuating most metals, and will serve as a geochemical control on trace attendant metals. This occurs for iron, copper, and aluminium elements. These conditions are anticipated to continue in perpetuity.
- Groundwater outflow chemistry will reflect the bulk pit lake chemistry concentrations through time. As with the Elgin Pit, the presence of compartmentalizing structures in the Peach-Elgin Pit area, such as the western ridge of Bolsa quartzite, may turn the Peach Pit lake into a hydraulic sink.

- Several minerals are predicted to precipitate and control lake chemistry including barite, calcite, ferrihydrite, fluorite, gibbsite, malachite, and rhodochrosite. Their simulated saturation indices are provided in Table 13.4. The effect of mineral precipitation on lake chemistry is evaluated in the sensitivity analysis.
- Additional sources of calcium to the pit lake would support the precipitation of fluorite and help attenuate fluoride concentrations.
- Surface water management measures can be utilized to manage water entering the Peach Pit and prevent the potential degradation to the groundwater system. These measures are the same as those considered for the Elgin Pit and described in Section 13.5.

Table 13.3: Peach Pit lake simulated chemistry

Element	EPA I/II	AWQS	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach
Year			1	2	3	5	10	20	30	50	75	100	125	150	175	200
pH	*6.5-8.5*	-----	7.90	7.90	7.90	7.91	7.92	7.94	7.96	8.02	8.10	8.16	8.19	8.22	8.25	8.27
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity	-----	-----	307	303	303	310	317	335	355	411	498	577	635	682	728	766
Aluminum	*0.2*	-----	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	<0.0015	<0.0015	<0.0015	<0.0015	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Arsenic	*0.015*	*0.05*	0.002	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Barium	*2*	*2*	0.04	0.04	0.04	0.03	0.03	0.04	0.05	0.07	0.05	0.05	0.05	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	-----	-----	0.003	0.002	0.002	0.001	0.001	0.003	0.009	0.017	0.019	0.018	0.016	0.014	0.012	0.010
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002
Calcium	-----	-----	52	52	53	54	52	49	46	38	28	23	20	18	16	15
Chloride	*250*	-----	9	9	9	9	9	12	15	22	29	34	38	40	43	45
Chromium	*0.1*	*0.1*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Copper	*1*	-----	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.026	0.027	0.028	0.029	0.030	0.031	0.032
Fluoride	*4*	*4*	3.49	3.49	3.52	3.67	**4.02**	**4.27**	**4.55**	**5.31**	**6.49**	**7.54**	**8.32**	**8.95**	**9.55**	**10.05**
Iron	*0.3*	-----	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	*0.015*	*0.05*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Magnesium	*150*	-----	7	7	7	8	9	11	15	21	29	35	38	41	44	46
Manganese	*0.05*	-----	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.0005	0.0005	0.0005	0.0006
Molybdenum	-----	-----	0.04	0.04	0.04	0.04	0.05	0.07	0.09	0.13	0.18	0.22	0.24	0.26	0.28	0.30
Nickel	-----	*0.1*	0.01	0.01	0.01	<0.005	<0.005	<0.005	<0.005	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.69	0.62	0.58	0.57	0.62	0.76	0.95	1.41	2.05	2.57	2.92	3.20	3.46	3.68
Phosphorus	-----	-----	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Potassium	-----	-----	18.6	18.2	18.1	18.6	20.4	24.4	28.4	39.4	55.3	68.6	78.0	85.4	92.3	98.0
Selenium	*0.05*	*0.05*	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.005	0.005	0.005	0.005	0.005	0.005
Silver	*0.1*	-----	0.003	0.003	0.003	<0.0025	<0.0025	<0.0025	<0.0025	0.003	0.003	0.003	0.003	0.004	0.004	0.004
Sodium	-----	-----	62	60	60	61	67	80	96	133	182	220	245	266	285	301
Sulfate	*250*	-----	45	45	46	48	54	70	94	140	190	224	245	262	277	290
Thallium	*0.002*	*0.002*	0.0006	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0006	0.0006	0.0006	0.0006	0.0007
TDS	*500*	-----	506	499	500	512	533	586	654	811	1,020	1,192	1,311	1,407	1,499	1,574
Uranium	*0.03*	-----	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.003	0.004	0.004	0.003	0.003	0.003
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.00		Indicates values above AWQS														

Table 13.4: Peach Pit lake simulated saturation indices

Mineral Phase	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach	Peach
Year	1	2	3	5	10	20	30	50	75	100	125	150	175	200
Percent Error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barite	-0.10	-0.12	-0.14	-0.12	-0.04	0.20	0.45	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**
Calcite	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**
Ferrihydrite	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**
Fluorite	-0.08	-0.06	-0.04	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Gibbsite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Gypsum	-2.00	-1.99	-1.98	-1.96	-1.93	-1.86	-1.80	-1.82	-1.92	-2.00	-2.04	-2.07	-2.09	-2.11
H-Jarosite	-16.51	-16.49	-16.47	-16.43	-16.36	-16.23	-16.11	-16.14	-16.34	-16.49	-16.58	-16.64	-16.69	-16.73
K-Jarosite	-8.64	-8.62	-8.59	-8.53	-8.37	-8.09	-7.84	-7.60	-7.55	-7.58	-7.61	-7.63	-7.65	-7.66
Malachite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Na-Jarosite	-11.61	-11.59	-11.57	-11.51	-11.36	-11.07	-10.81	-10.57	-10.53	-10.57	-10.60	-10.63	-10.65	-10.67
Rhodochrosite	-1.28	-1.34	-1.39	-1.43	-1.41	-0.88	-0.36	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Pyrolusite	-10.39	-10.45	-10.50	-10.52	-10.47	-9.86	-9.25	-8.70	-8.49	-8.38	-8.33	-8.30	-8.26	-8.24
Tenorite	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59	-0.59
Otavite	-1.04	-1.09	-1.13	-1.15	-1.15	-1.07	-0.99	-0.80	-0.61	-0.53	-0.50	-0.48	-0.45	-0.44
Zincite	-3.40	-3.44	-3.47	-3.48	-3.47	-3.36	-3.24	-3.03	-2.87	-2.81	-2.80	-2.79	-2.77	-2.76

0.00 Indicates mineral precipitation

13.4 Peach Pit Lake Geochemical Sensitivity Analysis

Sensitivity analyses were performed for the Peach Pit lake using the same suite of sensitivities as described in Section 8.4. Sensitivity scenarios are re-iterated below for convenience:

- RRZ of 50 ft
- Low pE
- Increased scale factor
- Evaporation + 15%
- Evaporation - 15%
- Groundwater inflow + 25%
- Groundwater inflow - 25%
- Increased saturation indices by +1.0

Peach Pit Sensitivity Analysis Results

The Peach Pit lake sensitivity analyses indicated that no additional constituents were elevated with respect to AWQS. Tabulated chemistry results from the sensitivities are provided in Appendix Q. Key results from the sensitivity analysis are described as follows.

- The “Increased scale factor” sensitivity released the most mass into the pit lake and produced higher concentrations of most elements which evapoconcentrated through time. For example, sulfate concentrations at 200 years post-closure were predicted to be 277 mg/l for the “Base Case”, 525 mg/l for the “Increase scale factor” sensitivity. The effect of increasing the scaling factor is attributed to pit wall runoff being the principal source of inflow; therefore, increased mass loading via pit wall runoff has a downstream effect.
- The “RRZ of 50 ft” sensitivity had a moderate effect during early-time filling (0 yr – 30 yr), when the lake is rising and submerging wall rock. However, during late-time the concentrations from the “RRZ of 50 ft” sensitivity converge towards the Base Case.
- Inhibiting mineral precipitation in the “Increased saturation indices by 1” and “Low pE sensitivities produced higher concentrations of constituents.
- Fluoride was only predicted to become elevated with respect to AWQS for all time steps in the “50ft RRZ” and “Increased scale factor” sensitivities. After 10 years most all sensitivities predict elevated fluoride.
- Variation to evaporation affected the rate of evapoconcentration, which was more apparent during late-time pit lake filling.

- Adjusting groundwater inflow had minor effects on most predicted concentrations, except for manganese, which is associated with groundwater inflows.
- Box and whisker diagrams for sulfate, fluoride, and manganese highlight the generally consistent range of element concentrations across sensitivities (Figure 13.8). Geochemical controls for fluoride are evident from the convergence and plateauing of concentrations during late-time filling. Manganese concentrations demonstrate how the influx of groundwater acts as a control on concentrations.

14 PREDICTIVE GEOCHEMICAL MODEL UNCERTAINTY

The geochemical model is based on mixing solutes in proportion to the water balance and chemical release function and using equilibrium reactions from the Mineteq4 thermodynamic database to simulate a final solution. There are inherent degrees of uncertainty associated with elements of the geochemical model, varying by site location and geochemical setting. Therefore, the geochemical modeler must employ professional judgement and reasonable conservatism to ensure realistic suite of final pit lake or pore water chemistry. A discussion of model uncertainties and how they may affect predicted pore water / pit lake chemistry is discussed in the following sections.

14.1 Scaling

Uncertainties surrounding scaling laboratory results to field scale simulations are discussed in Section 4.1. Scaling factors may directly affect the quantity of solute mass added to the system. Geochemical sensitivity analyses identified scaling as a control on predicted chemistry. However, sensitivity analyses did not evaluate lower scaling factors. Scaling factors may have been lower than those estimated in this study owing to the conservative use of lab-measured surface area and environmental conditions which may lead to decreased reactivity, such as lower air temperatures and relative humidity. These considerations would reduce simulated concentrations.

14.2 Chemical release functions

Chemical release functions were developed from SPLP and MWMP testing for PAG and NAG materials, and HCTs for AG materials. CRFs span several temporal timesteps in the model for pit wall runoff. This approach tends to overpredict mass loading in the CRFs because leach tests only consist of a one-time, first flush measurement and does not quantify the time-varying decline mass release in subsequent flushes. Thus, the geochemical model continues to predict first flush mass release for wall rock materials that may have undergone many pore volumes of flushing by the end of the simulation. For PAG and NAG materials, this leads to an overprediction of mass loading to pit lakes.

14.3 Sulfide oxidation

Oxidation of sulfide materials were simulated through applying early time CRF mass loading rates to the rind of reactive wall rock surrounding the pit lake. Kinetic testing of AG rock types indicated early flushing produced the highest concentrations of constituents and consistently produced higher solute concentrations than late-time HCT leachates. Thus the early time release of constituents captures observed sulfide oxidation release rates from source materials, as well as parallel other mineral processes. Given the very little abundance of AG materials throughout the Project, the representation of sulfide oxidation modeling was captured in the sensitivity analysis and is not expected to affect predicted results.

14.4 Water balance

Water balance inputs are derived from meteorological data and the numerical groundwater model. Although meteorological data was derived from remote stations (i.e. Nogales pan evaporation station), it's effect on pit lake filling and chemistry was captured during sensitivity analyses. Groundwater inflows / outflows derived from the numerical model are based on the conceptual hydrogeologic understanding.

Hydrogeologic investigation along the western side of the Santa Ritas was conducted in 2021. The local scale hydrogeology near the Peach-Elgin pits is an area where focused investigation and interpretation may affect the permanent pit lake condition, such as verifying a hydraulic sink or flow through condition. There will be opportunity to refine the conceptual hydrogeology in the satellite pit areas with continued monitoring.

Meteoric water infiltration through backfill materials was assumed to begin upon day 1 of closure. This is an overestimate of infiltration because waste rock water content will initially be lower than equilibrated field conditions. Infiltration would reach the pit floor after the wetting front has migrated through the backfill. As a result, saturated backfill conditions are also overestimated.

14.5 Mine Plan

The analyses are based on mine plans developed during Fall of 2021. The mine plan informs the water balance, abundances of mined rock, and wall rock exposures. Modest modifications to the mine plan will affect predicted pit lake recovery and chemistry.

However, the overarching themes of the Project's geochemical character and broad impacts are not expected to change with the mine plan. The strongly neutralizing geochemical nature of rock materials will be consistent among feasible mine plans. WRF, backfilled pits, and pit lakes are anticipated to have thematically similar geochemistry because of the abundance of NAG material. The ultimate condition of backfilled pits and the Rosemont pit lake (as a hydraulic sink) are also expected to remain the same under any economic mine plan.

Peach and Elgin pits may experience the most change with adjustments to mining. Deepening or combining the pits may transform their ultimate flow through nature to a hydraulic sink.

14.6 Satellite Pit Geochemical Characterization

The current analysis is based on rock characterization occurring only from the Rosemont Pit area. Although the Satellite pits comprise only ~25% of the Project materials, additional material characterization will provide site specific mass loading rates to rock materials that are more abundant in the Satellite pits (i.e Granodiorite).

15 CONCLUSIONS

Predicted water chemistries reflect the neutralizing rock materials of the geologic setting. No acid rock drainage is anticipated to represent any of the planned facilities. Predicted water chemistry is generally of good quality with few predicted elevated constituents with respect to AWQS. Fluoride is the only constituent that was above AWQS. Elevated fluoride is associated with moderate concentrations in background groundwater (~2 mg/l) and exposures of Granodiorite in the Satellite pits. Detailed conclusions from the geochemical assessment are as follows:

- Potential seepage, from the WRF, if it occurs, is anticipated to meet AWQS with high confidence. Predicted seepage chemistry has a high level of confidence due to the sensitivity analysis and scaling assumptions. Seepage from the WRF may not occur for many years, until water content has equilibrated to field conditions.
- Tailings seepage is anticipated to be circum-neutral, low in metals, with elevated sulfate concentrations. Tailings seepage would be captured in a seepage collection system. The capture of tailings seepage is further discussed in Piteau (2022b) and Wood (2022).
- PLS from the HLP is representative of acid-leach solution, with low pH, high metal concentrations, and high sulfate. The HLP is a lined facility, thus no seepage is anticipated to reach the groundwater system. Draindown would be actively and passively managed into closure.
- The Rosemont Pit lake will form a hydraulic sink, thus no outflow to groundwater will occur. Pit lake chemistry is predicted to evapoconcentrate through time and until mineral equilibrium is reached. The pit lake area is approximately 83 acres.
- Broadtop Butte backfill will develop a small footprint of saturated backfill in the North sub-pit. Long-term pore water chemistry is anticipated be below AWQS.
- Copper World backfill will develop two very small footprints of saturated backfill.
    - The North sub-pit is predicted to have elevated fluoride concentrations initially upon closure and the decline below AWQS. Very minor groundwater outflows are predicted (<0.5 gpm). Pore water chemistry will reflect background groundwater chemistry.
    - The South sub-pit is predicted to be above AWQS for fluoride for the first 10-years post-closure and decline below AWQS. Very minor groundwater outflows are predicted (<0.5 gpm).
- Heavy Weight backfill is predicted to form a small footprint of saturated backfill. Very small groundwater outflows are anticipated (< 0.5 gpm). Fluoride is predicted to be above AWQS. The pore water chemistry for manganese, sulfate, and TDS constituents reflect the background groundwater chemistry.
- Elgin Pit is predicted to form a small pit lake that is approximately 55 ft deep and span 7 acres. The lake will evapoconcentrate through time, which will elevate fluoride

concentrations above AWQS. A small component of groundwater outflow is predicted from modelling results (~1.2 gpm).

- Peach Pit is predicted to form a small pit lake that is approximately 130 ft deep and span 6 acres. The lake will evapoconcentrate through time, which will lead to elevated concentrations of fluoride above AWQS. A small component of groundwater outflow is predicted (1 gpm - 1.4 gpm).
- Fluoride is the only element which is predicted to consistently be above AWQS across the Satellite pits. This is in part because background fluoride concentrations in the Satellite pit area groundwater range from 1.27 mg/l – 2.96 mg/l. The AWQS for fluoride is 4.0 mg/L.
- Sensitivity analyses indicate that long term geochemical predictions tend to converge to the Base Case estimates, adding confidence that predictions provide reasonable estimates of water chemistry. Early-time filling exhibits greater variability among sensitivity simulations. A limited number of additional elevated constituents (1-4) are predicted, generally consisting of the same constituents (antimony, cadmium, selenium, thallium) and related to applying higher mass loading rates at different pit locations.
- Results from site specific Granodiorite samples will refine geochemical predictions, particularly for Copper World, Heavy Weight, Peach, and Elgin Pits where Granodiorite is present. The current CRF used for this study is believed to overestimate mass loading and is therefore conservative for the impacts assessment.

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17 REPORT LIMITATIONS

This report has been prepared for the specific purpose identified herein at the request of and for the use of the Client. Observations, conclusions, and recommendations contained herein are opinions based upon the scope of services, information obtained through observations and measurements taken by Piteau Associates at certain points and certain times, and interpretation and extrapolation of secondary information from published and unpublished material. The report may infer the configuration of strata, ground and groundwater conditions both between data points and below the maximum depth of investigation. The report also may deduce temporal trends and averages for climatic, hydrological and water quality parameters. Such interpretations and extrapolations are only indicative and no liability is accepted for variations between the opinions expressed herein and conditions which may be identified at a later date through direct measurement and observation.

Should any information contained in this report be used by any unauthorized third party, it is done so at their own risk.

Respectfully submitted,

PITEAU ASSOCIATES USA LTD.

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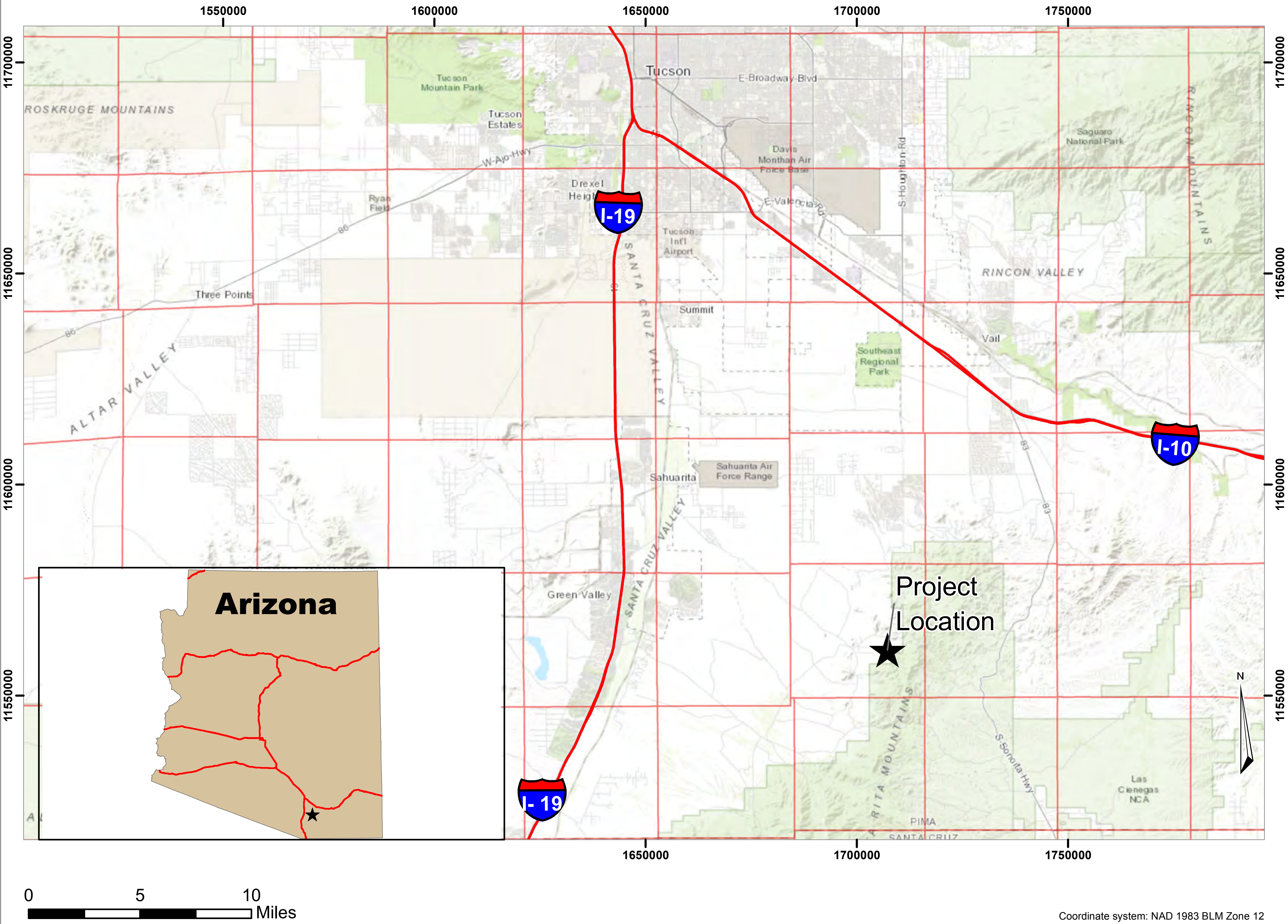
FIGURES



Project Location

Interstate

PLSS Township

Site Location Overview

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
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DRAWN:	WT/AP
CHECKED:	BG
DATE:	May 2022
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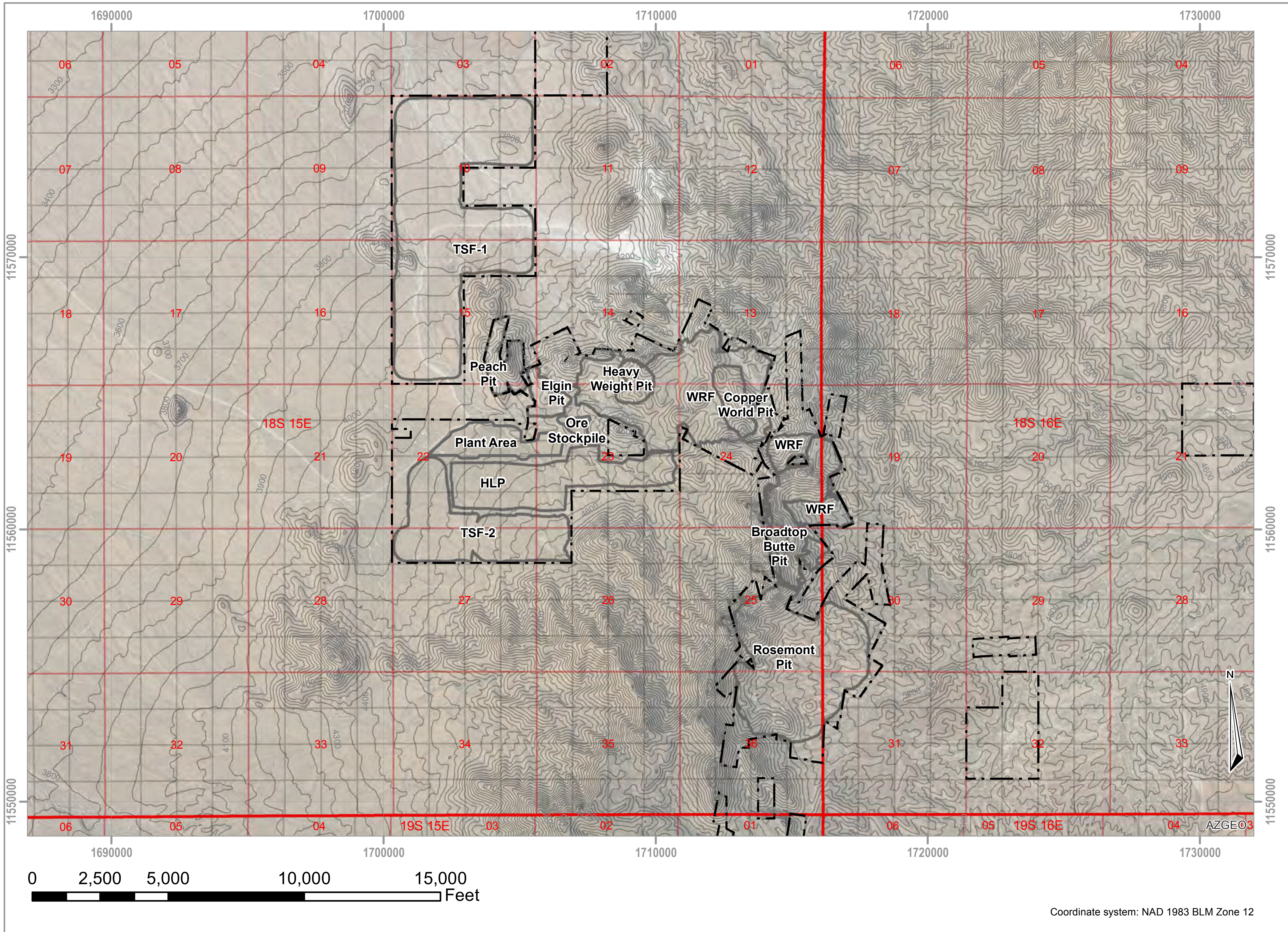

Facility Outlines
Private Land Boundaries
Topographic Elevation Contours
PLSS Township
PLSS Sections
PLSS Second Division

General Layout of Location

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A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Copper World Project
JOB:	4286
DRAWN: SM	CHECKED: BG
DATE:	May 2022
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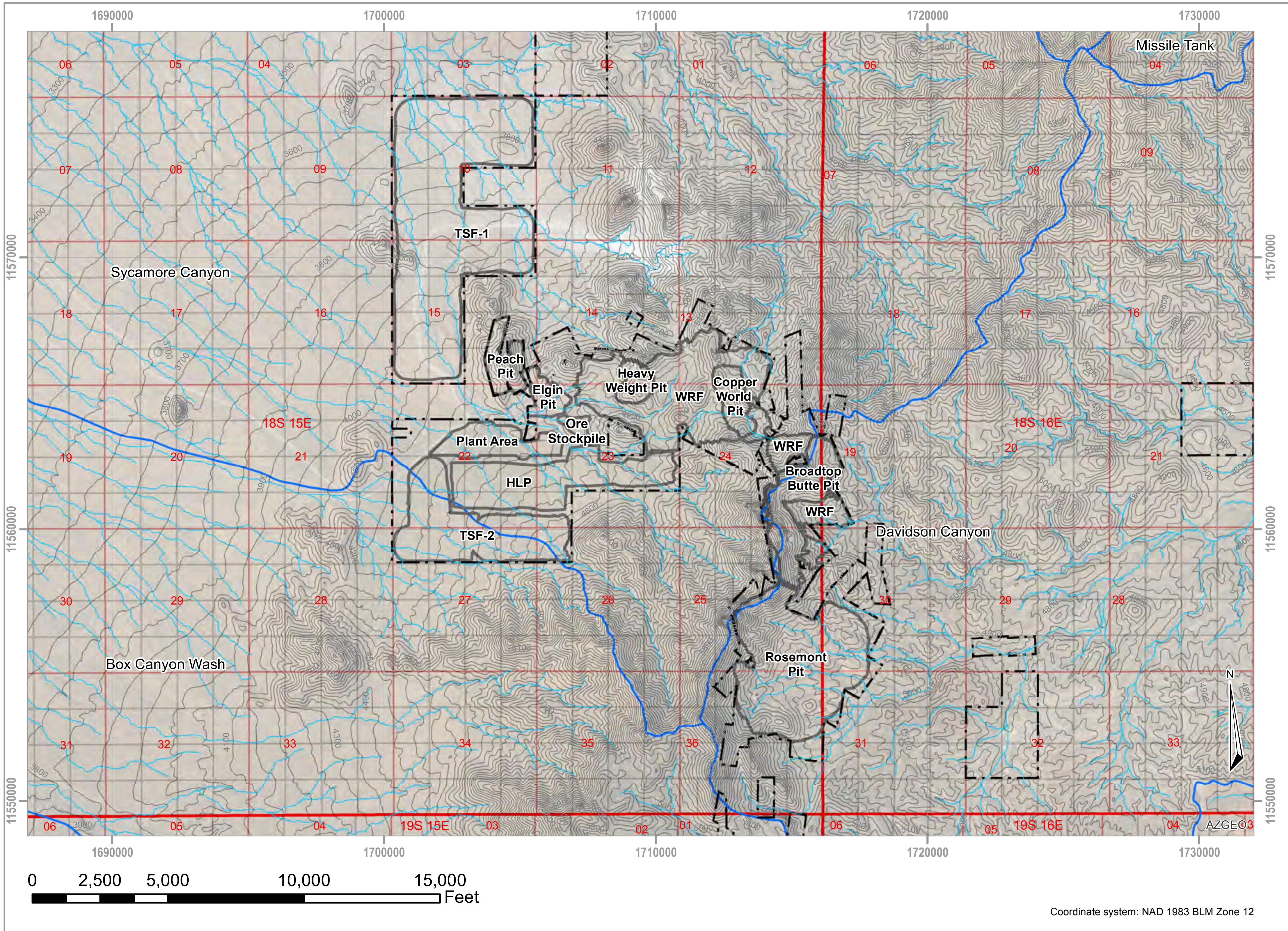

Facility Outlines

Private Land Boundaries

Pima County Floodplain

12th Order Basin Divide

Topographic Elevation Contours

PLSS Township

PLSS Sections

PLSS Second Division

Hydrographic Basin Boundaries

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CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: SM	CHECKED: BG
DATE:	May 2022
FIGURE:	2.1

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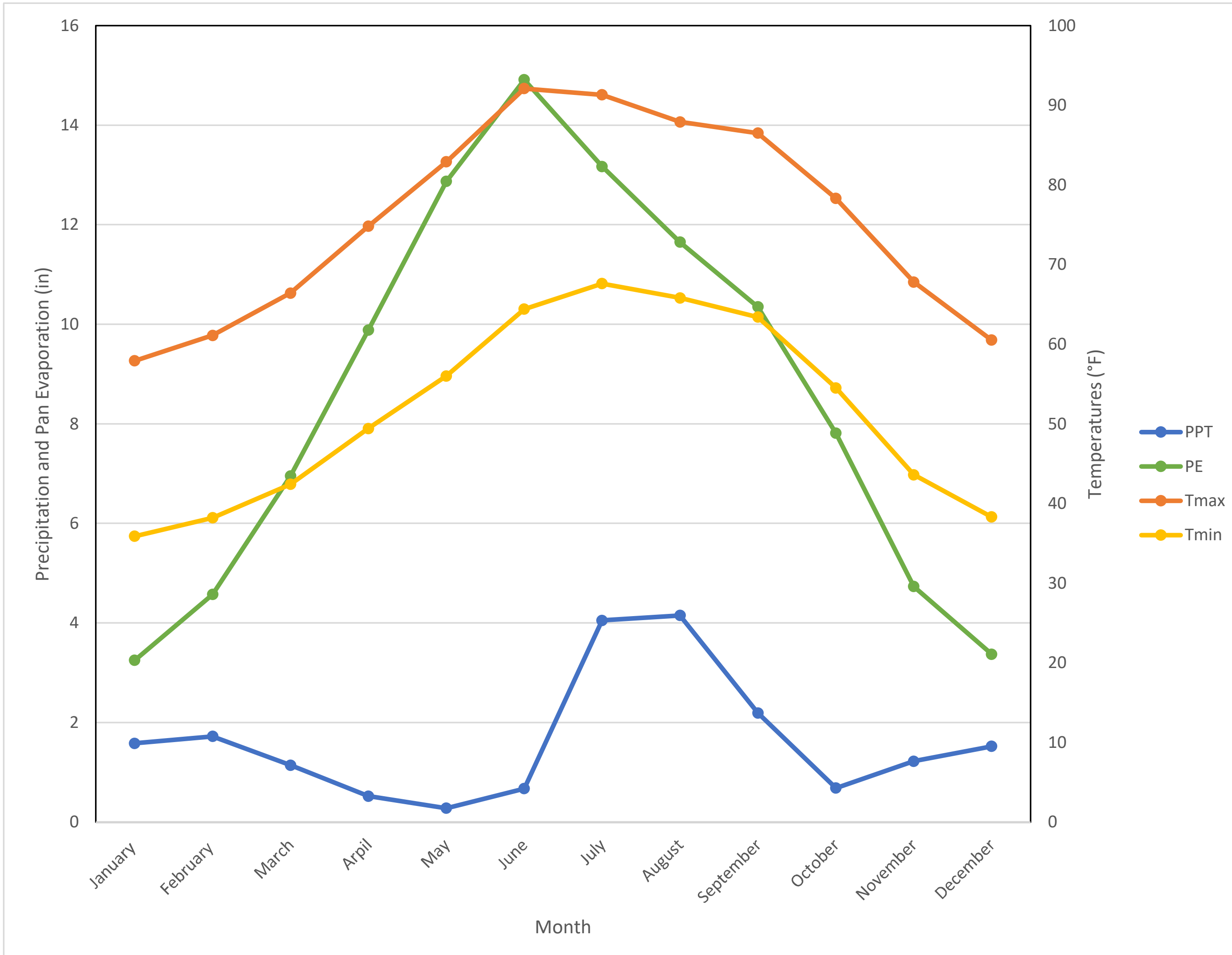
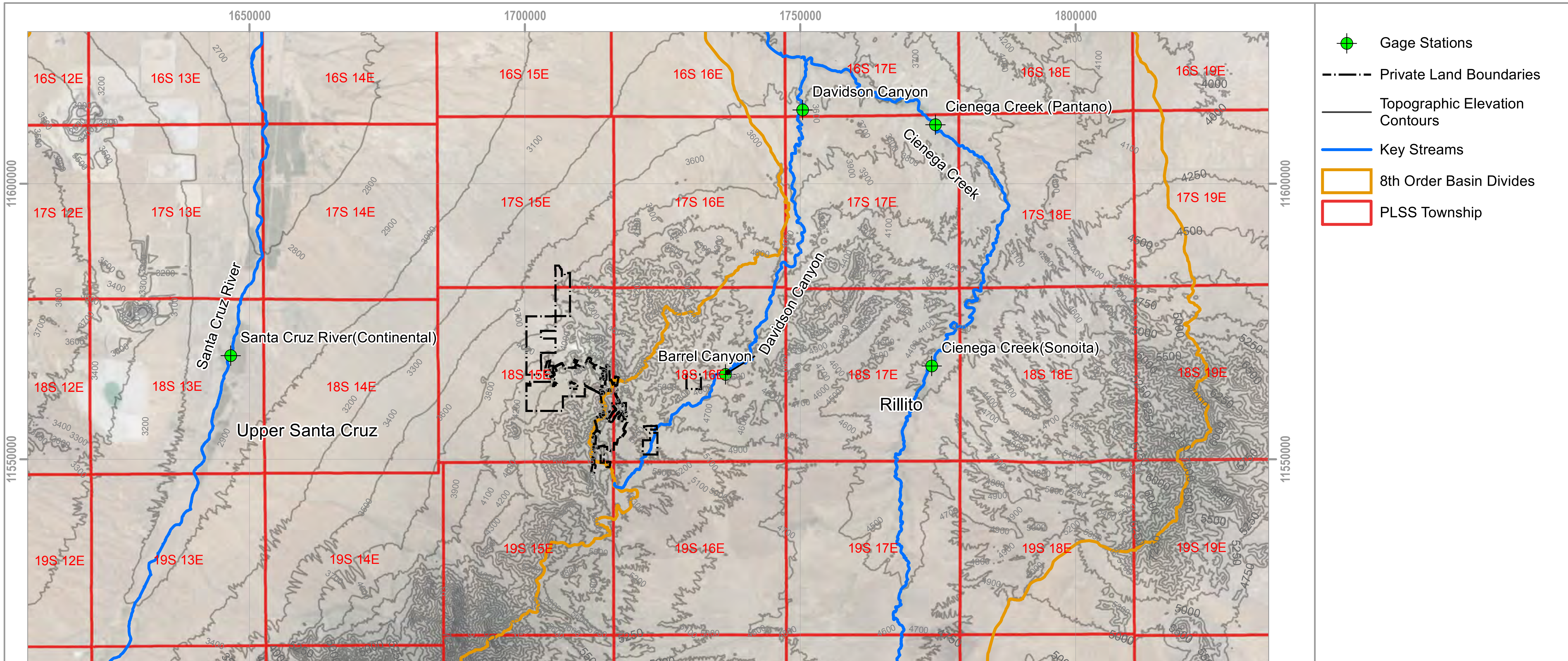
Monthly Precipitation, Pan Evaporation, and Minimum and Maximum Temperatures

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World
JOB #: 4286
DRAWN: KL
CHECKED: BG
DATE: May 2022
FIGURE: 2.2





Regional Surface Water Features

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CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	SM
CHECKED:	BG
DATE:	May 2022
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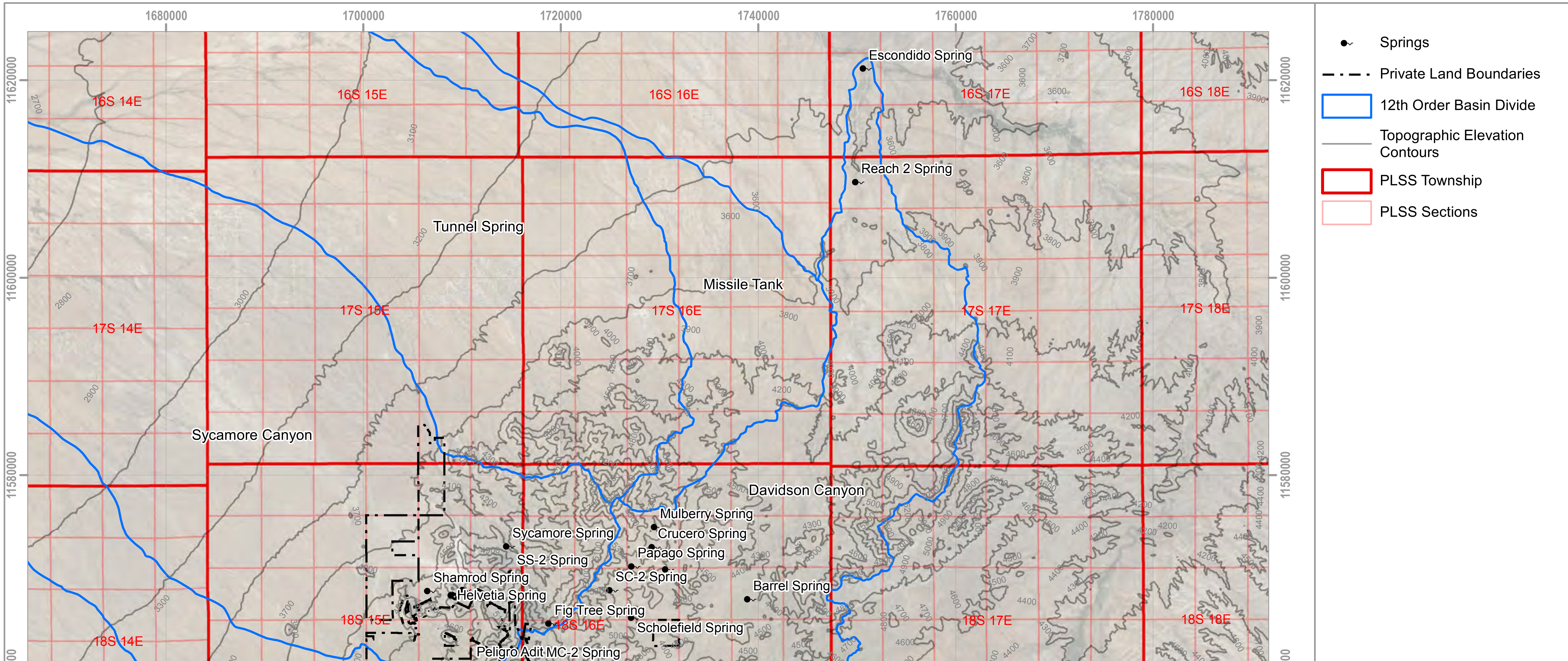

Project Area Surface Water Features

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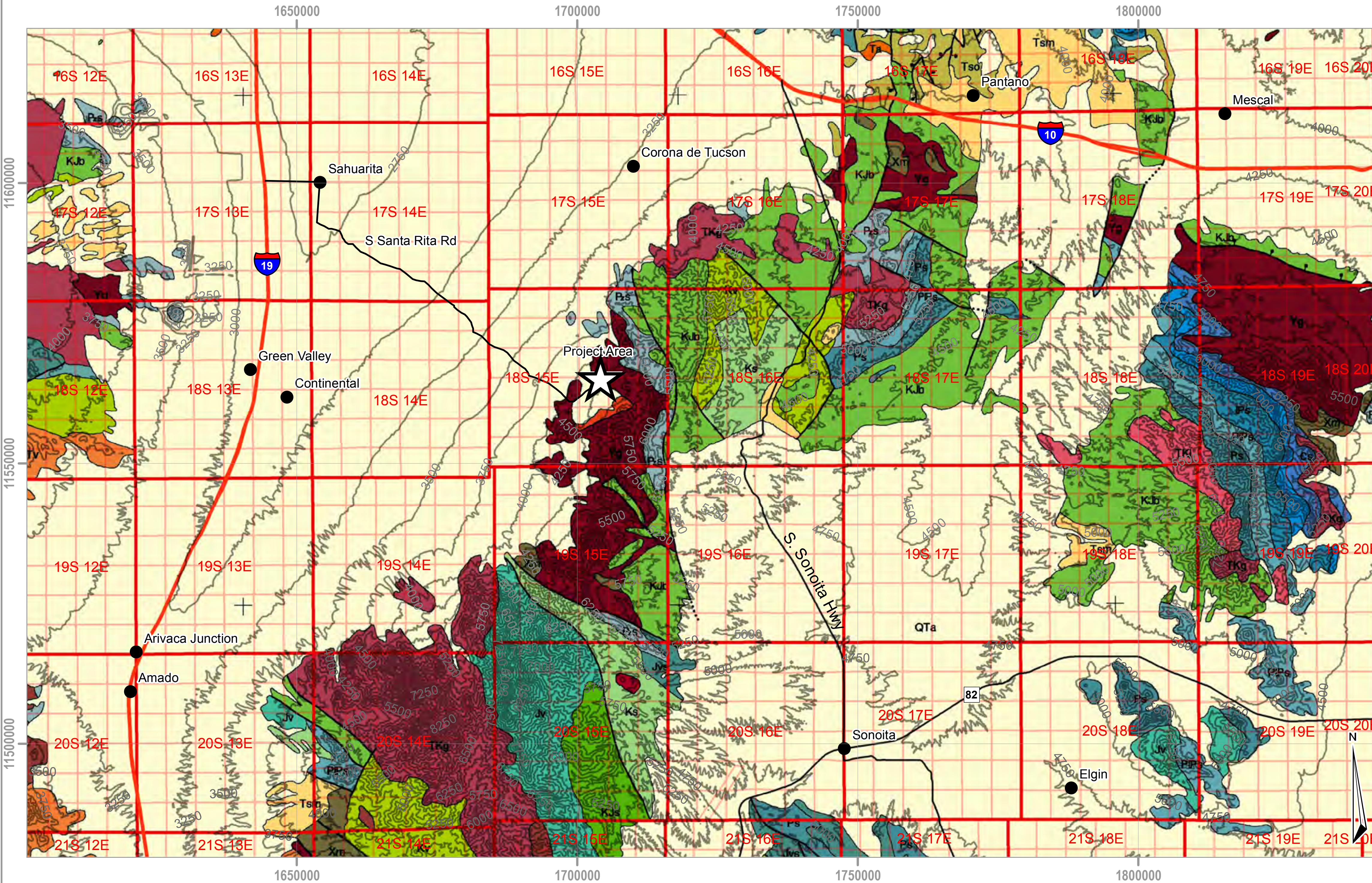
CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: SM	CHECKED: BG
DATE:	May 2022
FIGURE:	2.4



- QTa Alluvium and sedimentary rocks
- Tsm Sedimentary rocks
- Ta Andesitic volcanic rocks
- Tso Sedimentary rocks
- TKg Granitoid rocks
- TKi Intrusive rocks, undiv.
- Ks Sedimentary rocks
- KJb Bisbee Group rocks
- KJs Sedimentary rocks, undiv.
- Jvs Volcanic and sedimentary rocks
- Jv Volcanic rocks
- Pzs Sedimentary rocks, undiv.
- P|s Sedimentary rocks (Naco Group, undiv.)
- Ps Sedimentary rocks (Upper Naco Group)
- |s Sedimentary rocks (Lower Naco Group)
- MDs Sedimentary rocks (Escabrosa and Martin Fm.)
- Yg Granite
- Xm Metamorphic rock, undiv.

Coordinate system: NAD 1983 BLM Zone 12

0 1 2 4 6 8 10 Miles

- Towns
- Topographic Elevation Contours
- Roads
- Highways
- Interstates
- PLSS Township
- PLSS Sections

SOURCE: Peterson, J. A., et al., 2001.

Geology Map - Regional

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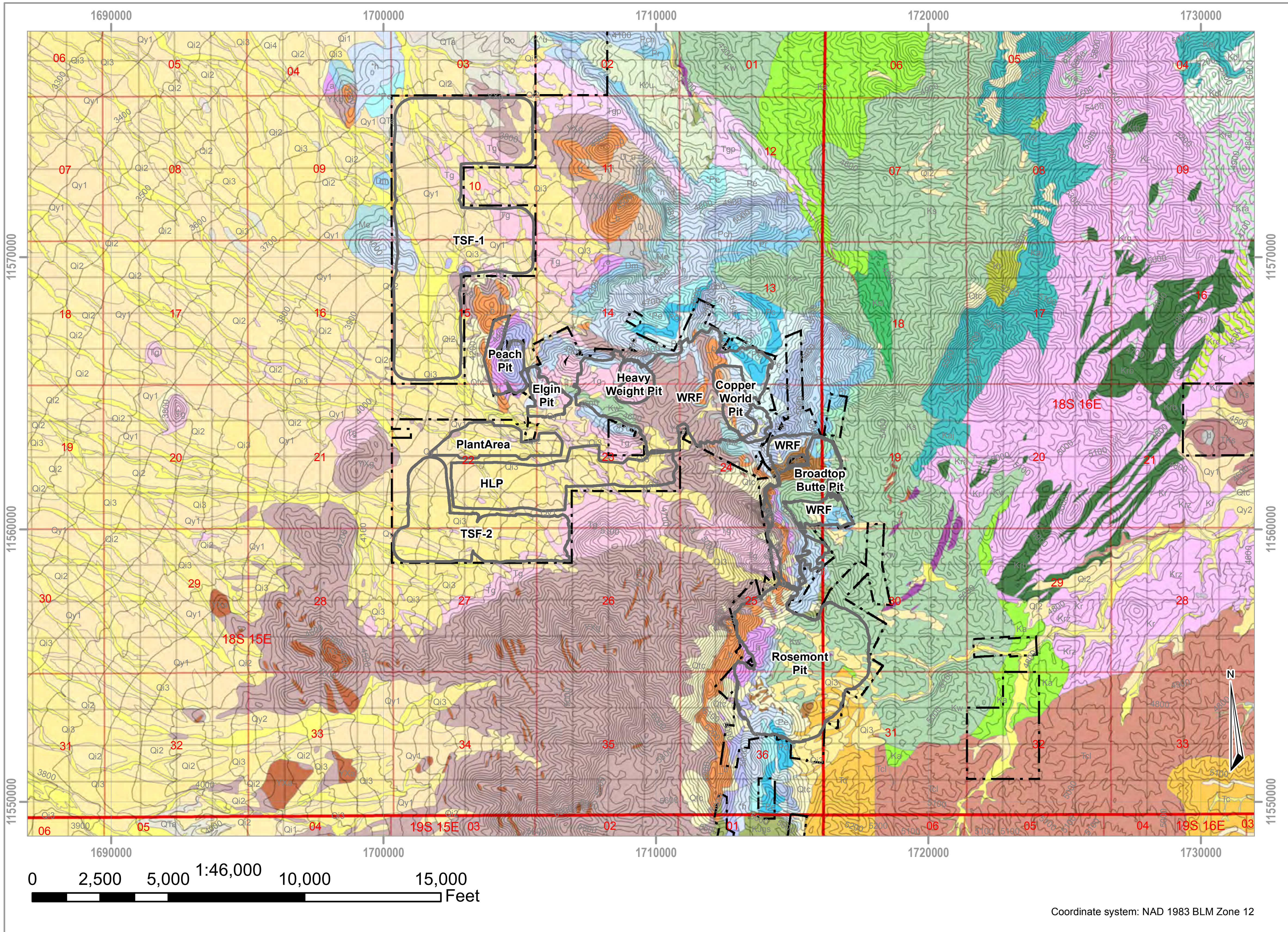
CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	MB/SM
CHECKED:	BG
DATE:	May 2022
FIGURE:	2.5



Facility Outlines

Private Land Boundaries

Topographic Elevation Contours

PLSS Township

PLSS Sections

PLSS Second Division

Geology Map - Overall Project Area

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A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Copper World Project
JOB:	4286
DRAWN:	SM/MB
CHECKED:	BG
DATE:	May 2022
FIGURE:	2.6

d	Disturbed Ground

Surficial Deposits

Qtc	Talus and Colluvium
Qy3	Deposits in active channels
Qy2	Deposits in low terraces and active fans
Qy1	Deposits in low terraces and young fans
Qy	Young alluvial deposits, undivided
Qyx	Eroded fine deposits
Qi4	Deposits in young intermediate deposits and alluvial fans
Qi3	Deposits in intermediate terrances and relic alluvial fans
Qi2	Deposits in higher intermediate fans and terraces
Qi1	Deposits in highest intermediate fans and terraces
Qo	Deposits in highest preserved alluvial fans
QTa	Old alluvial fan deposits

Bedrock Units

Tc	Gila Conglomerate (Miocene)
Tcl	Unit of Adobe Tank (Gila Group)
Tp	Pantano Formation (Oligocene to Miocene)
TKs	Lower Pantano megabreccia (U. Cretaceous - Oligocene)
Tgp	Porphyritic granite of Sycamore Canyon
Tg	Helvetia granite
TKp	Fine grained felsic porphyry (Tertiary - U. Cretaceous)
Kr	Rhyolite of Mt. Fagan
Krz	Heterolithic mesobreccia
Krg	Heterolithic megabreccia
Kra	Andesite megabreccia
Krb	Bisbee group megabreccia
Krc	Well-rounded conglomerate megabreccia
Kaj	Andesitic lava
Kai	Andesitic porpyry
Kd	Crystal-rich dacite ash-flow tuff
Kdl	Dacitic lava
Kfc	Fort Crittenden Formation
Kfcv	Fort Crittenden Formation, volcanic facies
KJr	Rhyolite Intrusions

Bisbee Group

Kt	Turney Formation
Ks	Shellenburg Formation
Ksl	Lower Shellenburg Formation
Ka	Apache Canyon Formation
Kw	Willow Canyon Formation
Kwm	Willow Canyon Formation, mafic lava
KJg	Glance Conglomerate
KJgs	Glance Conglomerate (quartz sandstone-carbonate dominant)
KJgg	Glance Conglomerate (granite dominant)
K^u	Undifferentiated Mesozoic clastic rocks
J^g	Gardner Canyon Formation
JPs	Quartz sandstone

Naco Group

Pr	Rainvalley Formation
Pch	Concha Limestone
Psu	Sherrer Formation, upper division
Psl	Sherrer Formation, lower division
Pe	Epitaph Formation, undivided
Pc	Colina Limestone
*Pe	Earp Formation
*h	Horquilla Limestone

Me	Escabrosa Limestone
MDu	Escabrosa Limestone and Martin Limestone, undifferentiated
Dm	Martin Formation
D_u	Martin Limestone and Abrigo Formation, undifferentiated
Pz	Marble, hornfels and skarn
_ a	Abrigo Formation
_ b	Bolsa quartzite
YXa	Megacrystic granite
YXg	Continental Granodiorite

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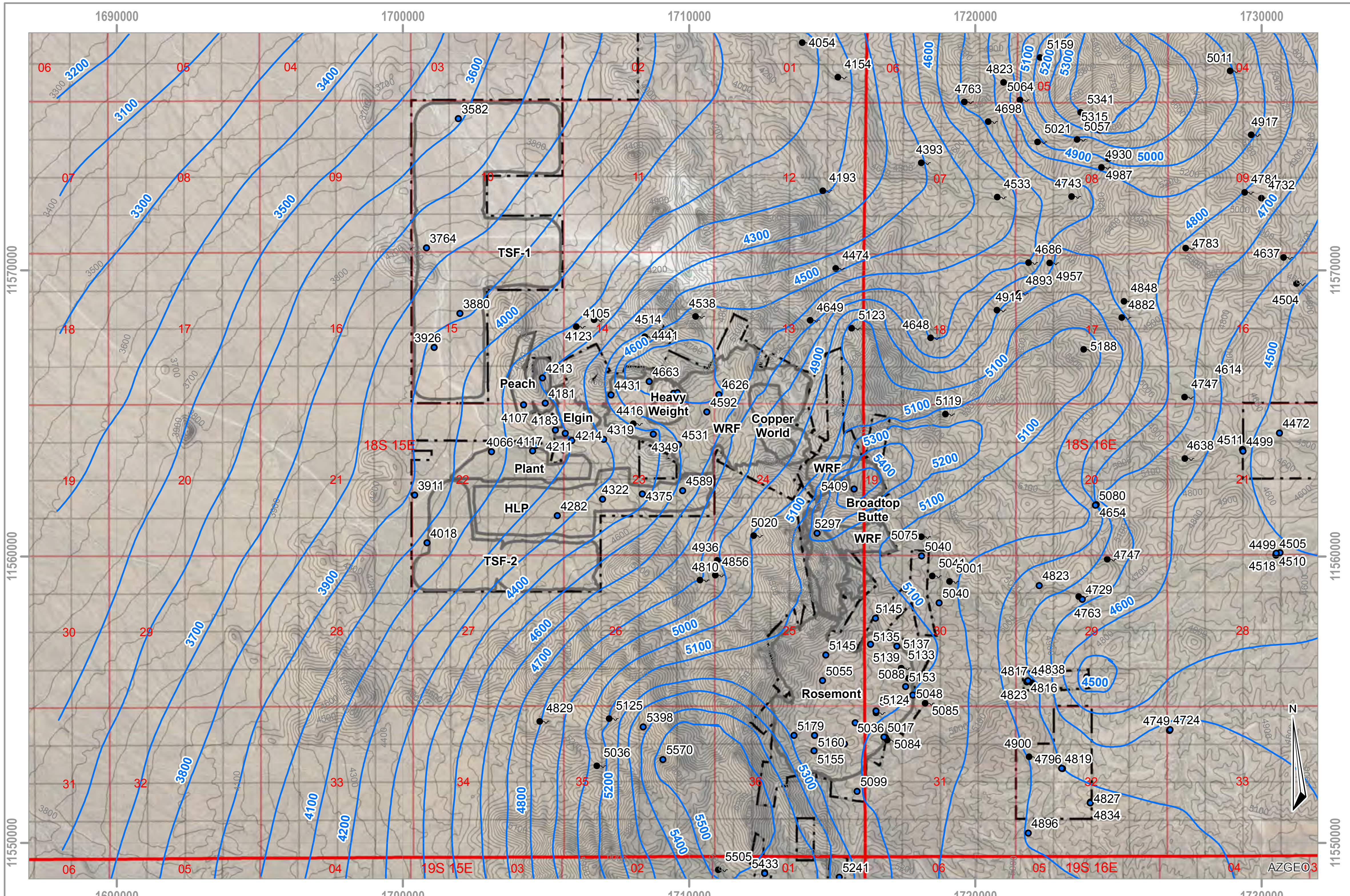
Ferguson, C.A., Johnson, B.J., Pearthree, P.A., Spencer, J.E., Shipman, T.C., and Cook, J.P., 2019, Geologic Map of the Helvetia 7.5' Quadrangle, Pima County, Arizona. Arizona Geological Survey Digital Geologic Maps, DGM-144, 1 map sheet, map scale 1:24,000.

Cook, J.P., Ferguson, C.A., 2019, Geologic Map of Empire Ranch 7.5' Quadrangle, Pima County, Arizona Arizona Geological Survey Digital Geologic Maps, DGM 143, 1 map sheet, map scale 1:24,000.

Legend for Geologic Maps

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Copper World Project
JOB:	4286
DRAWN:	MB
CHECKED:	BG
DATE:	May 2022
FIGURE:	2.7



- Groundwater Elevations
- Springs
- PLSS Township
- PLSS Sections
- PLSS Second Division
- Facility Outlines
- Topographic Elevation Contours
- Private Land Boundaries

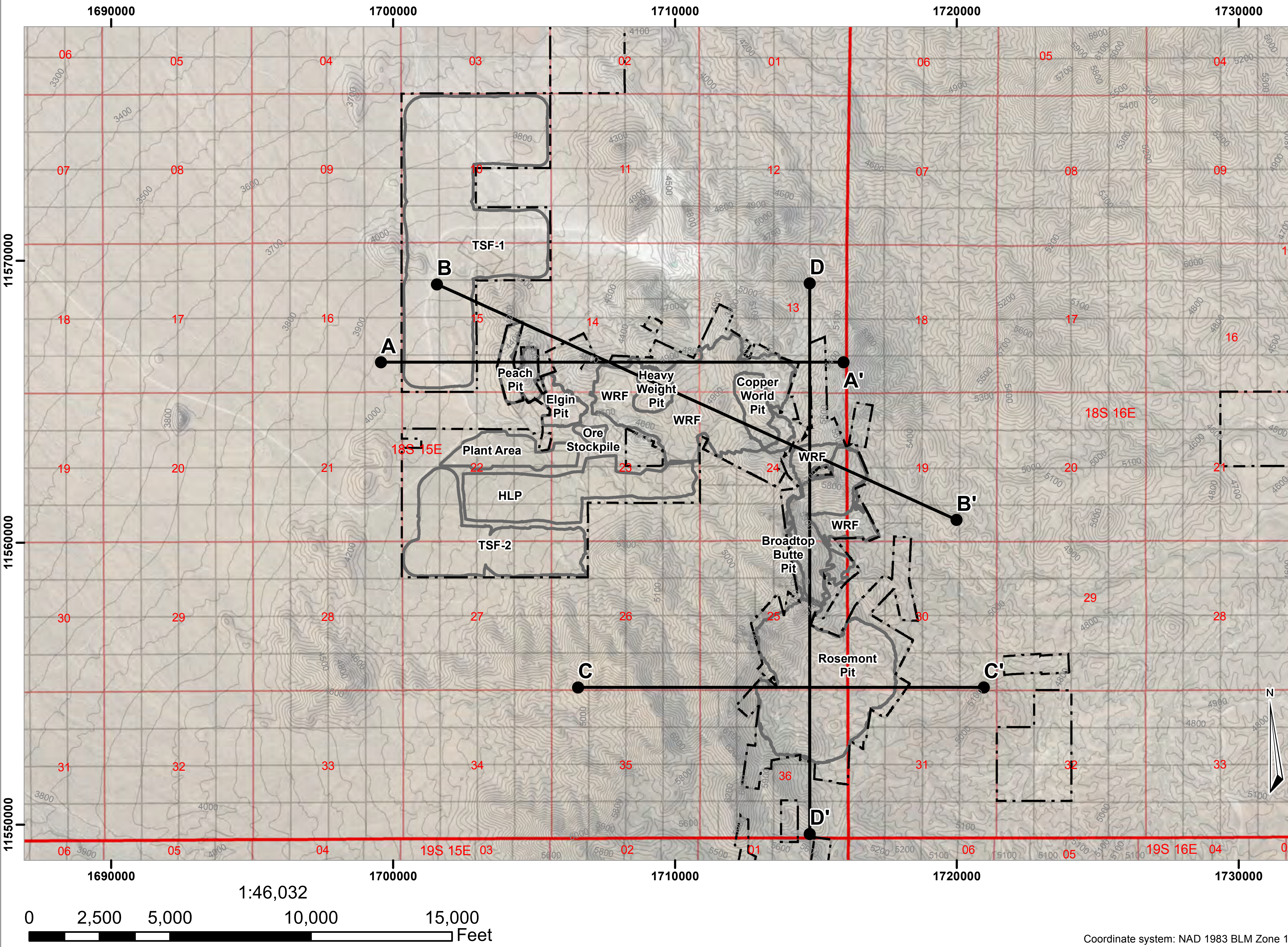
0 2,500 5,000 1:46,000 10,000 15,000 Feet

Coordinate system: NAD 1983 BLM Zone 12

Baseline Groundwater Level and Flow Directions - Project Area

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Copper World Project
JOB:	4286
DRAWN:	SM/AP
CHECKED:	BG
DATE:	May 2022
FIGURE:	2.8



Cross Section Endpoints

Cross Section Trace

Facility Outlines

Private Land Boundaries

Topographic Elevation Contours

PLSS Township

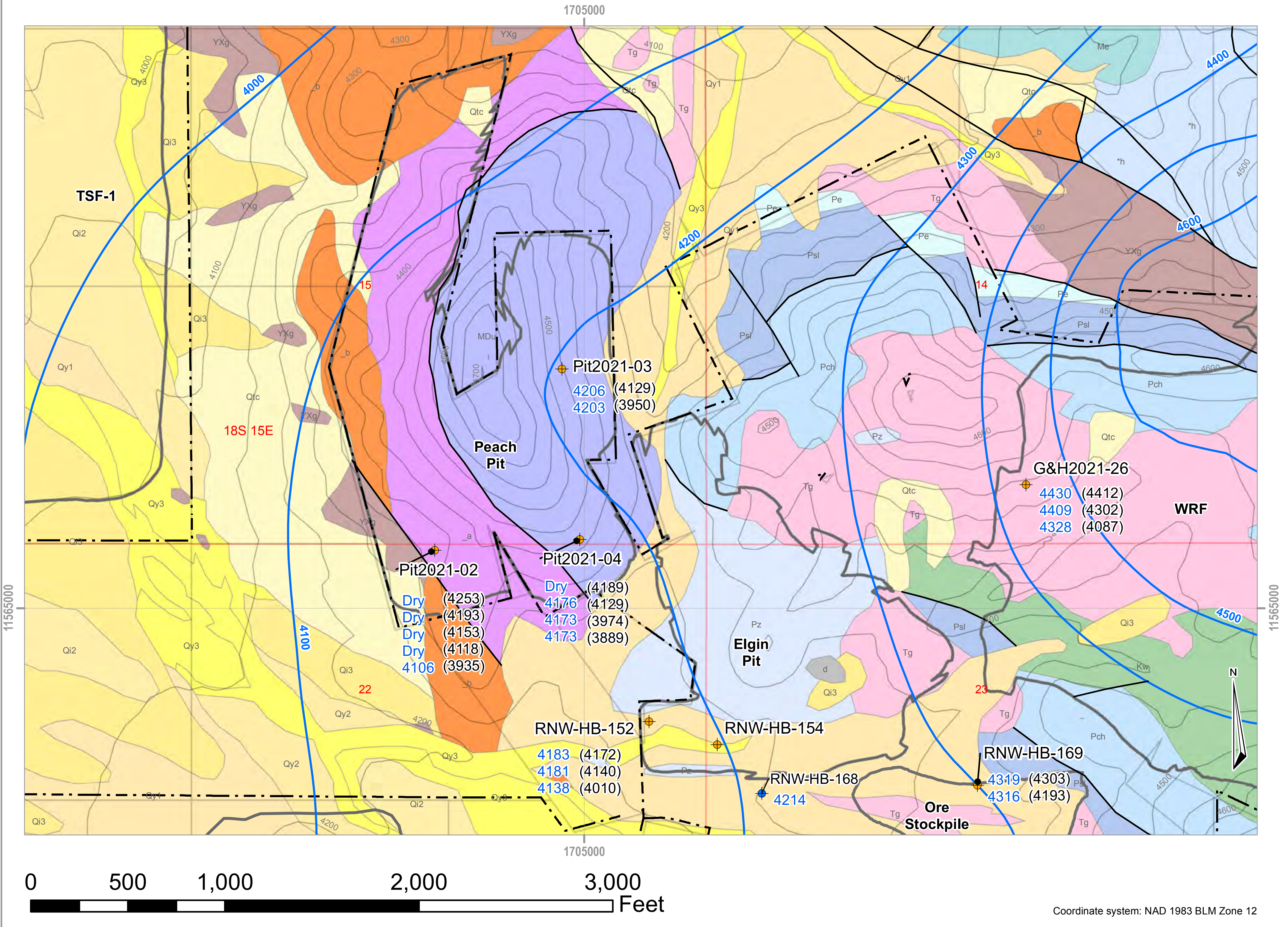
PLSS Sections

PLSS Second Division

Project Area Hydrogeologic Cross Section Locations

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: SM	CHECKED: BG
DATE:	May 2022
FIGURE:	2.9



OSPs and Monitoring Wells

VWPs

3000 Piezometric Elevation (ft amsl)

(3000) Sensor Elevation (ft amsl)

Facility Outlines

Private Land Boundaries

Faults

Local Groundwater Elevation Contours

Topographic Elevation Contours

PLSS Township

PLSS Sections

PLSS Second Division

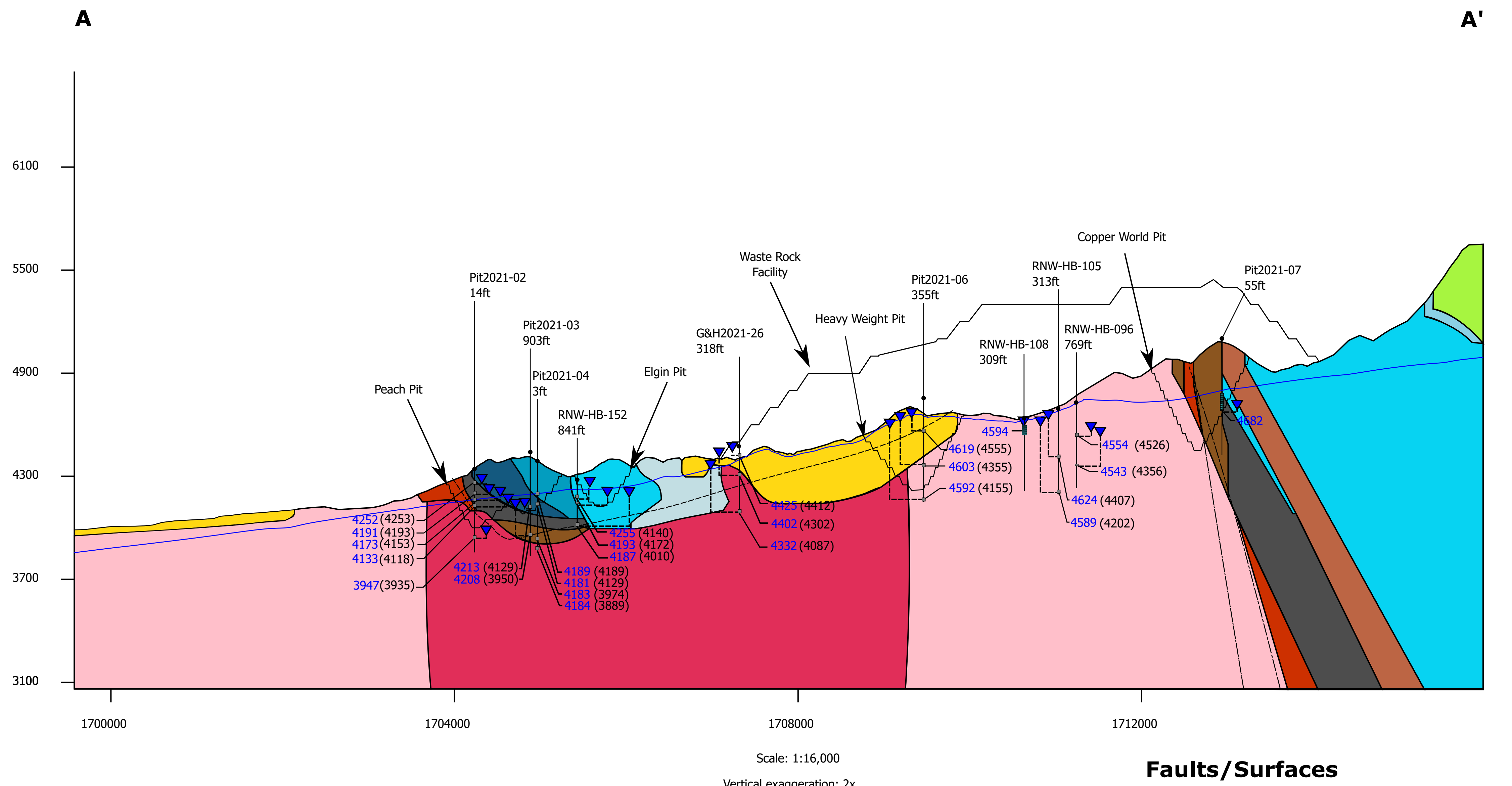
Geology legend and references on Figure 2.7

Peach and Elgin Pits Hydrogeology

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	SM
CHECKED:	BG
DATE:	May 2022
FIGURE:	2.10

Peach and Northern WRF Hydrogeologic Cross Section



Screened Interval

- Monitoring Well
- Piezometric Level
- Grouted VWP

Hole ID
Distance from section (ft)

Piezometric level (ft amsl)
[Sensor Elevation (ft amsl)]

Coordinate system: NAD 83 BLM Zone 12

Faults/Surfaces

- Back Bone North Fault Trace
- Back Bone North Narraganset
- Helvetia Fault Trace
- Piezometric Surface

Lithology

- ABRIGO
- ANDESITE
- ARKOSE
- BOLSA
- CONCHA
- EARP
- EPITAPH
- ESCABROSA
- GILA
- GLANCE
- GRANODIORITE 1
- GRANODIORITE 2
- HORQUILLA
- MARTIN
- QMP
- SCHERRER

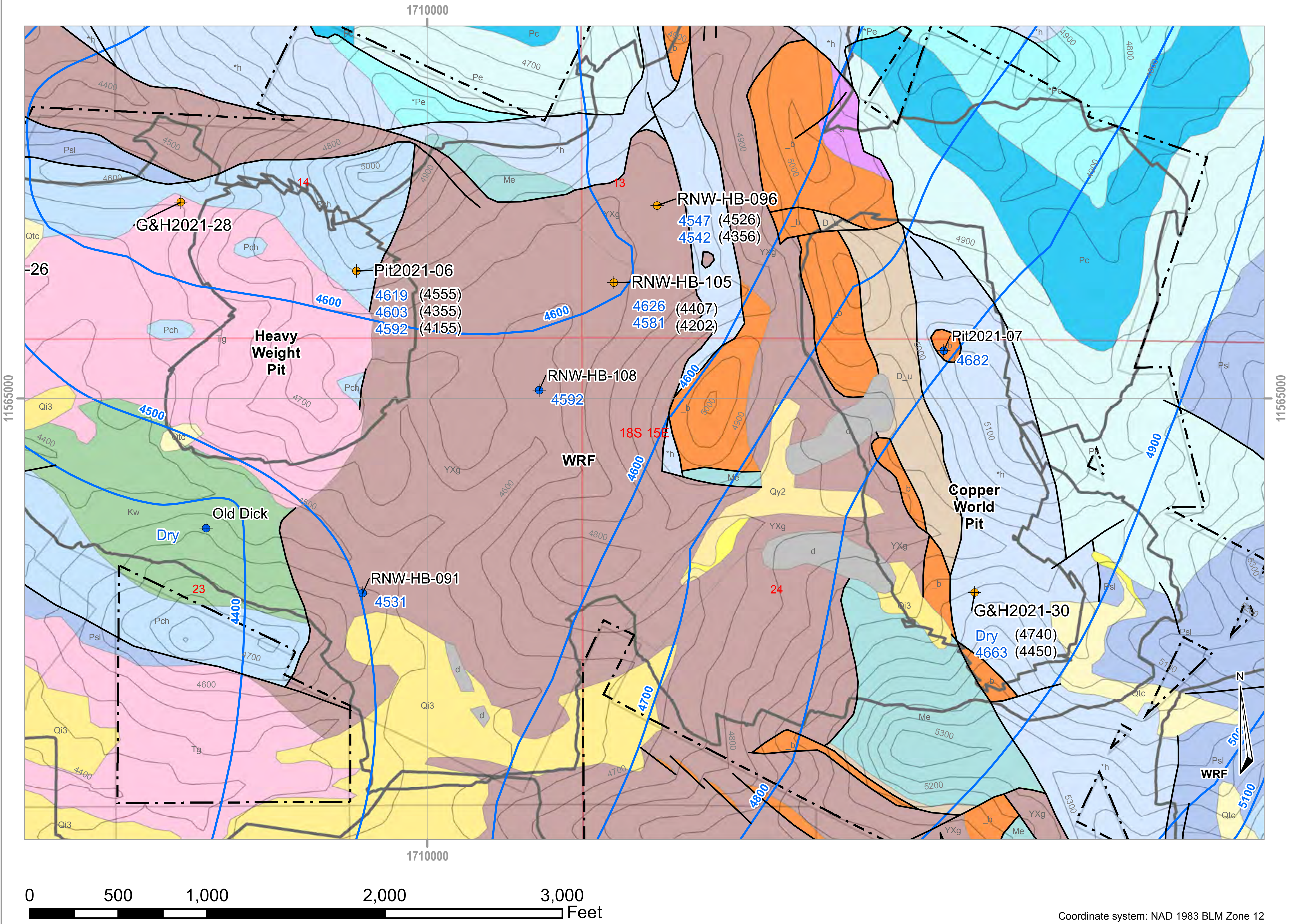
Section End Points

A : 1699573, 11565337
A': 1715979, 11565337

Peach and Northern WRF Hydrogeologic Cross Section

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: AP	CHECKED: BG
DATE:	May 2022
FIGURE:	2.11



OSPs and Monitoring Wells

VWPs

3000 Piezometric Elevation (ft amsl)

(3000) Sensor Elevation (ft amsl)

Facility Outlines

Private Land Boundaries

Faults

Local Groundwater Elevation Contours

Topographic Elevation Contours

PLSS Township

PLSS Sections

PLSS Second Division

Geology legend and references on Figure 2.7

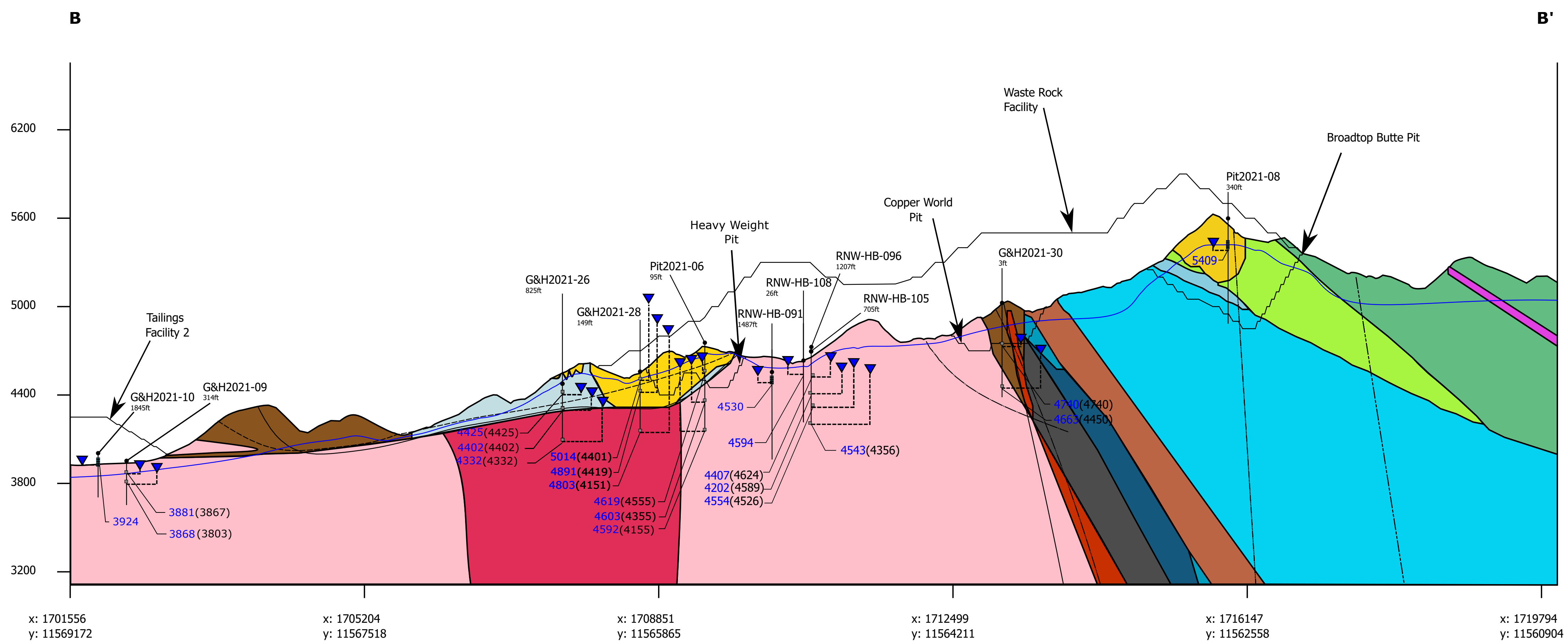
Coordinate system: NAD 1983 BLM Zone 12

Heavy Weight and Copper World Pits Hydrogeology

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	SM
CHECKED:	BG
DATE:	May 2022
FIGURE:	2.12

Heavy Weight, Copper World, Broadtop Butte and Central WRF Hydrogeologic Cross Section



Screened Interval

- Monitoring Well
- Piezometric Level
- Grouted VWP

Hole ID
Distance from section (ft)

Piezometric level (ft amsl)
[Sensor Elevation (ft amsl)]

Scale: 1:18,000

Vertical exaggeration: 2x

0ft 4000ft

Coordinate system: NAD 83,BLM Zone 12

Faults/Surfaces

- Graben Fault
- Back Bone North
- Back Bone North CW
- WE BT Fault
- Helvetia Fault
- Piezometric Surface

Lithology

- ABRIGO
- ANDESITE
- ARKOSE
- BOLSA
- CONCHA
- EARP
- EPITAPH
- ESCABROSA
- GILA
- GLANCE
- GRANODIORITE 1
- GRANODIORITE 2
- HORQUILLA
- MARTIN
- QMP
- SCHERRER

Section End Points

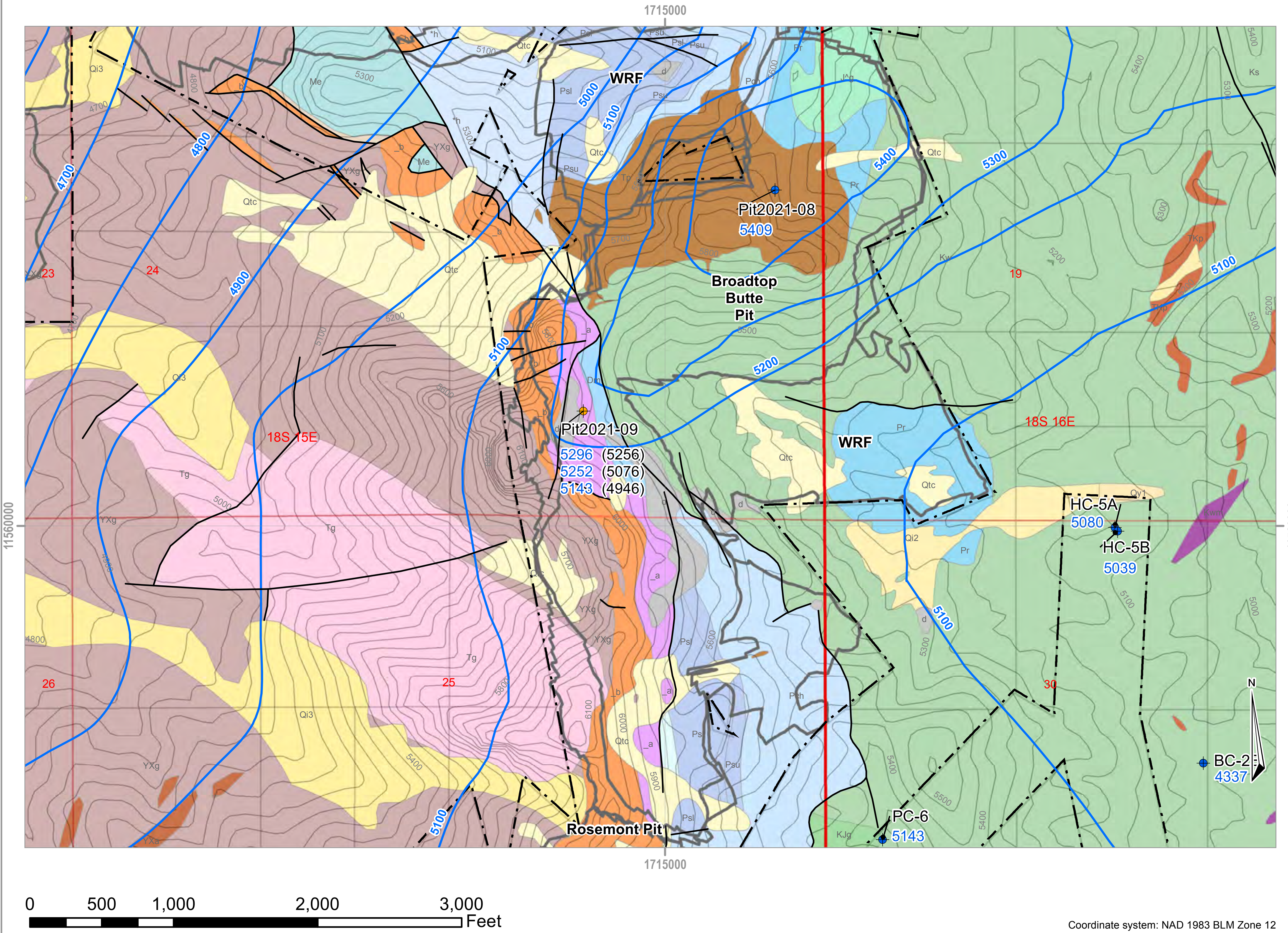
B: 1701556, 11569172

B' : 1719991, 11560815

Heavy Weight, Copper World, Broadtop Butte and Central WRF Hydrogeologic Cross Section

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	AP
CHECKED:	BG
DATE:	May 2022
FIGURE:	2.13



Coordinate system: NAD 1983 BLM Zone 12

OSPs and Monitoring Wells

VWPs

3000 Piezometric Elevation (ft amsl)

(3000) Sensor Elevation (ft amsl)

Facility Outlines

Private Land Boundaries

Faults

Local Groundwater Elevation Contours

Topographic Elevation Contours

PLSS Township

PLSS Sections

PLSS Second Division

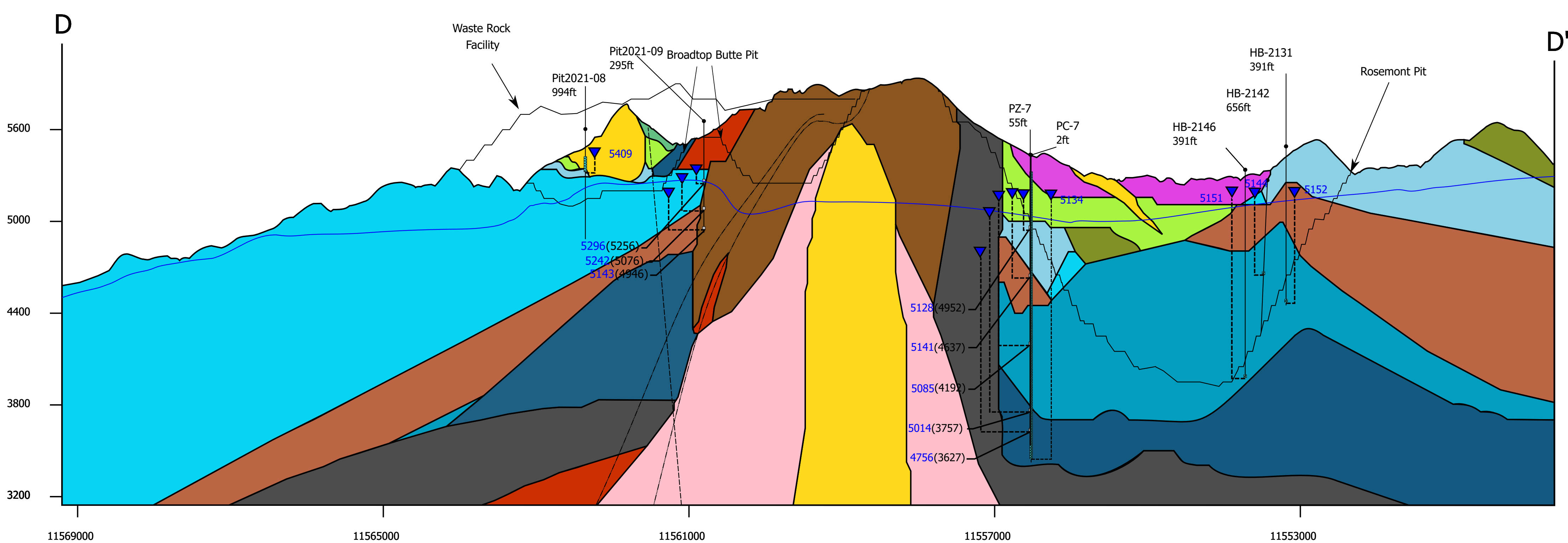
Geology legend and references on Figure 2.7

Broadtop Butte Pit Hydrogeology

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: SM	CHECKED: BG
DATE:	May 2022
FIGURE:	2.14

WRF, Broadtop Butte, and Rosemont Hydrogeologic Cross Section



Lithology

- ABRIGO
- ANDESITE
- ARKOSE
- BOLSA
- CONCHA
- EARP
- EPITAPH
- ESCABROSA
- GILA
- GLANCE
- GRANODIORITE 1
- GRANODIORITE 2
- HORQUILLA
- MARTIN
- QMP
- SCHERRER

Section End Points

D: 1714775, 11569205
D': 1714775, 11549675

Screened Interval

- Monitoring Well
- Piezometric Level
- Grouted VWP

Hole ID
Distance from section (ft)

Piezometric level (ft amsl)
[Sensor Elevation (ft amsl)]

Scale: 1:16,000
Vertical exaggeration: 2x
0ft 4000ft

Coordinate system: NAD 83,BLM Zone 12

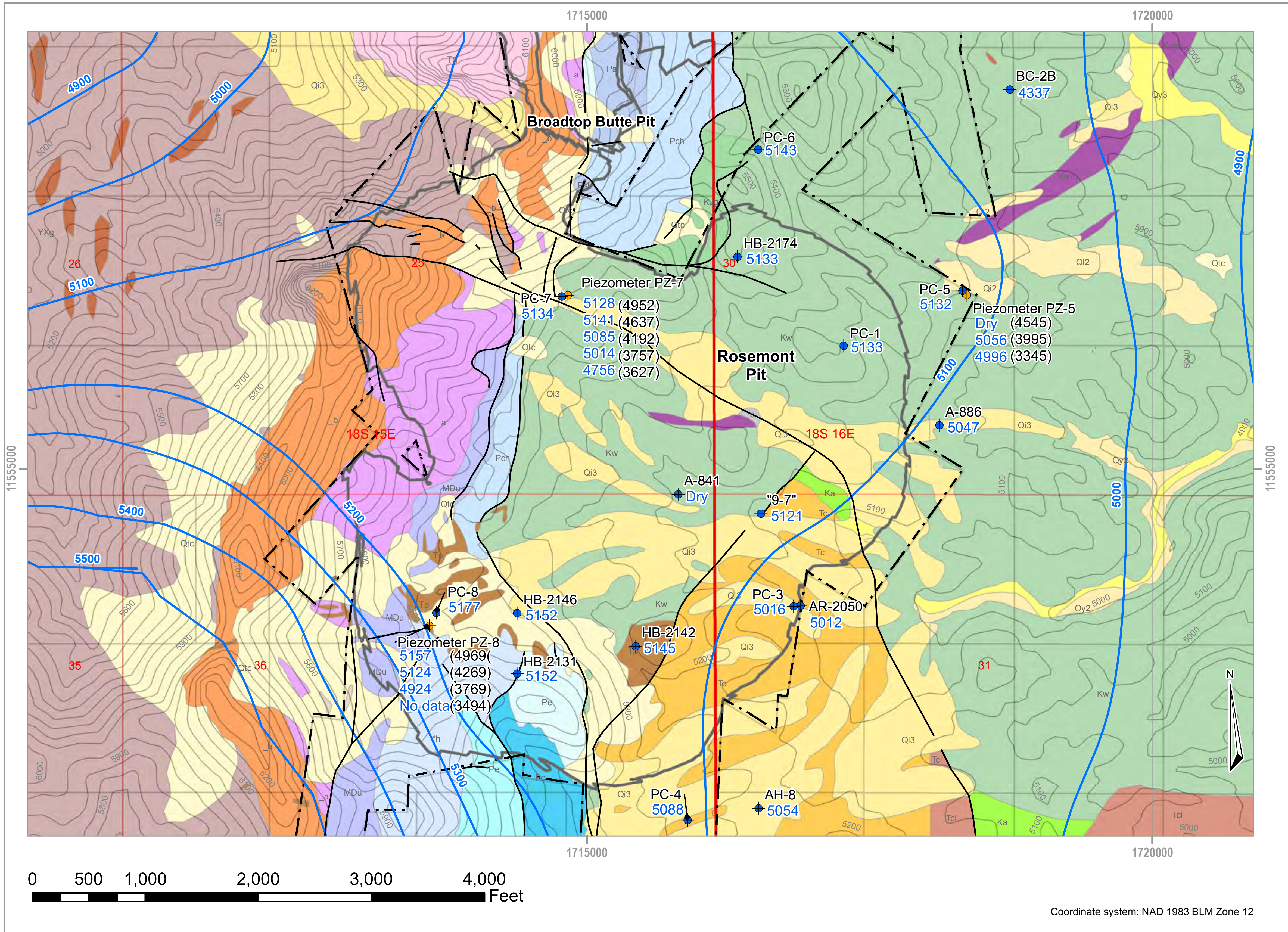
Faults/Surfaces

- Backbone North CW
- Backbone North
- WE BT
- Piezometric Surface

WRF, Broadtop Butte, and Rosemont Hydrogeologic Cross Section

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	AP
CHECKED:	BG
DATE:	May 2022
FIGURE:	2.15



OSPs and Monitoring Wells

VWPs

3000 Piezometric Elevation (ft amsl)

(3000) Sensor Elevation (ft amsl)

Facility Outlines

Private Land Boundaries

Faults

Local Groundwater Elevation Contours

Topographic Elevation Contours

PLSS Township

PLSS Sections

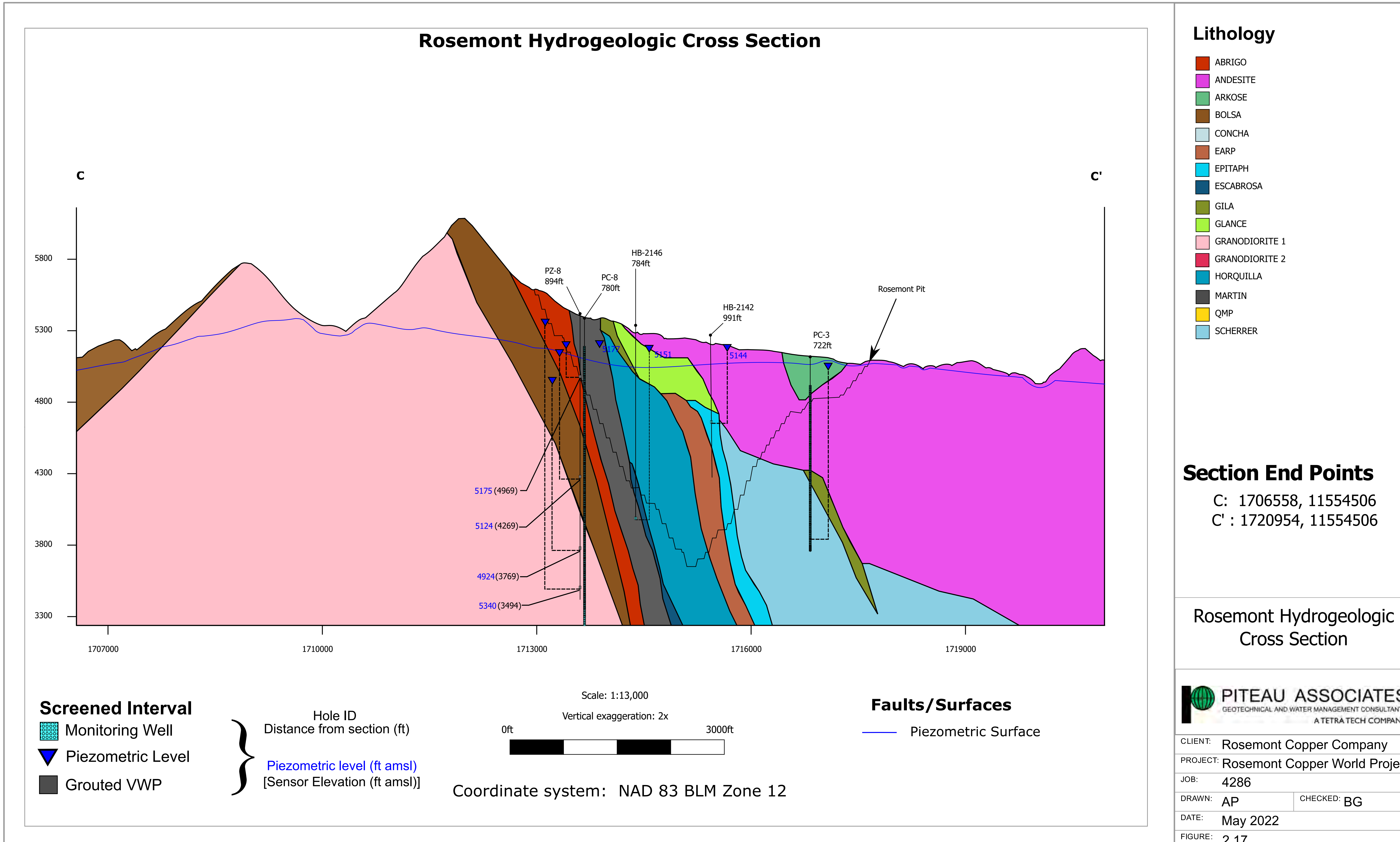
PLSS Second Division

Geology legend and references on Figure 2.7

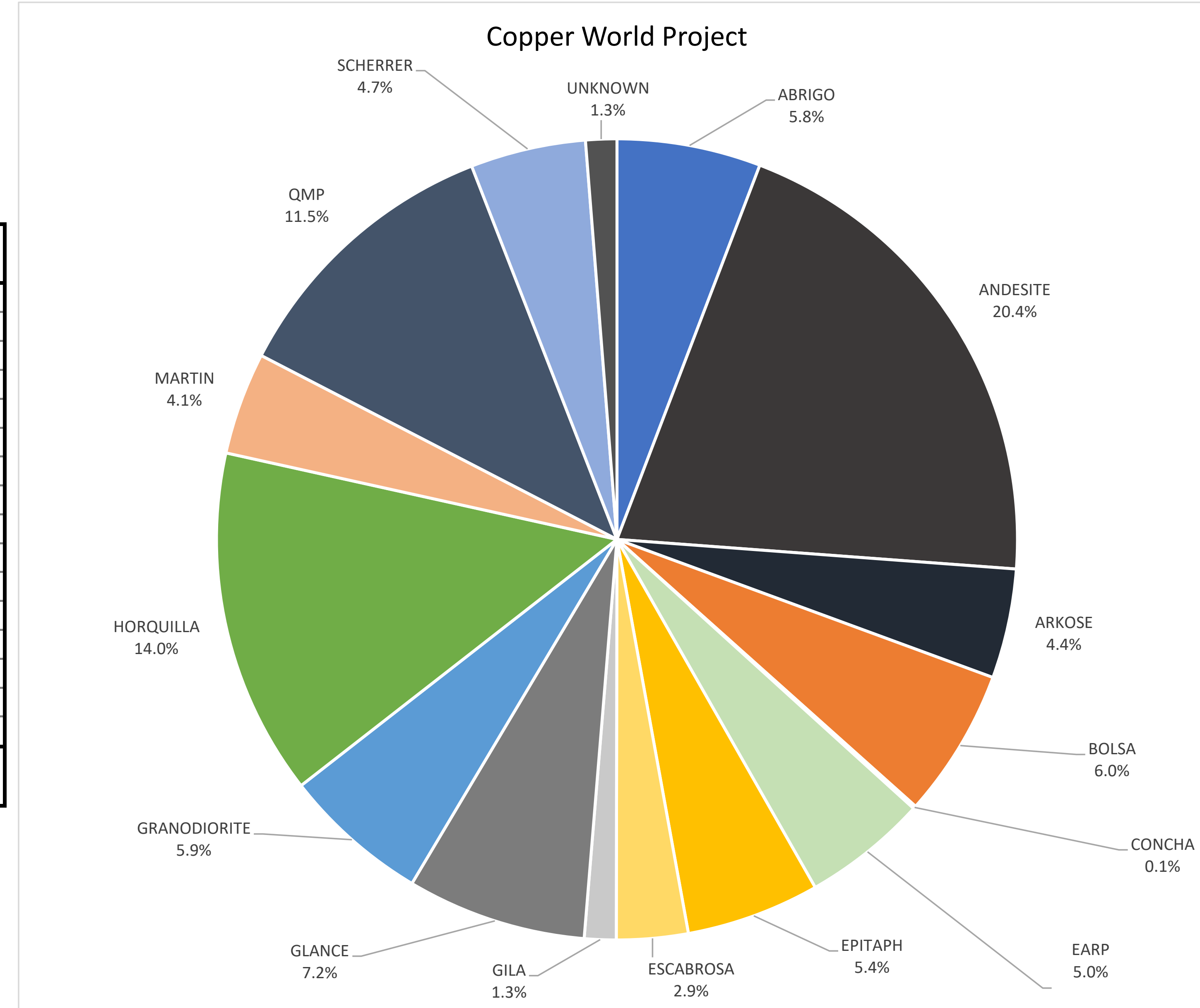
Rosemont Pit Hydrogeology

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

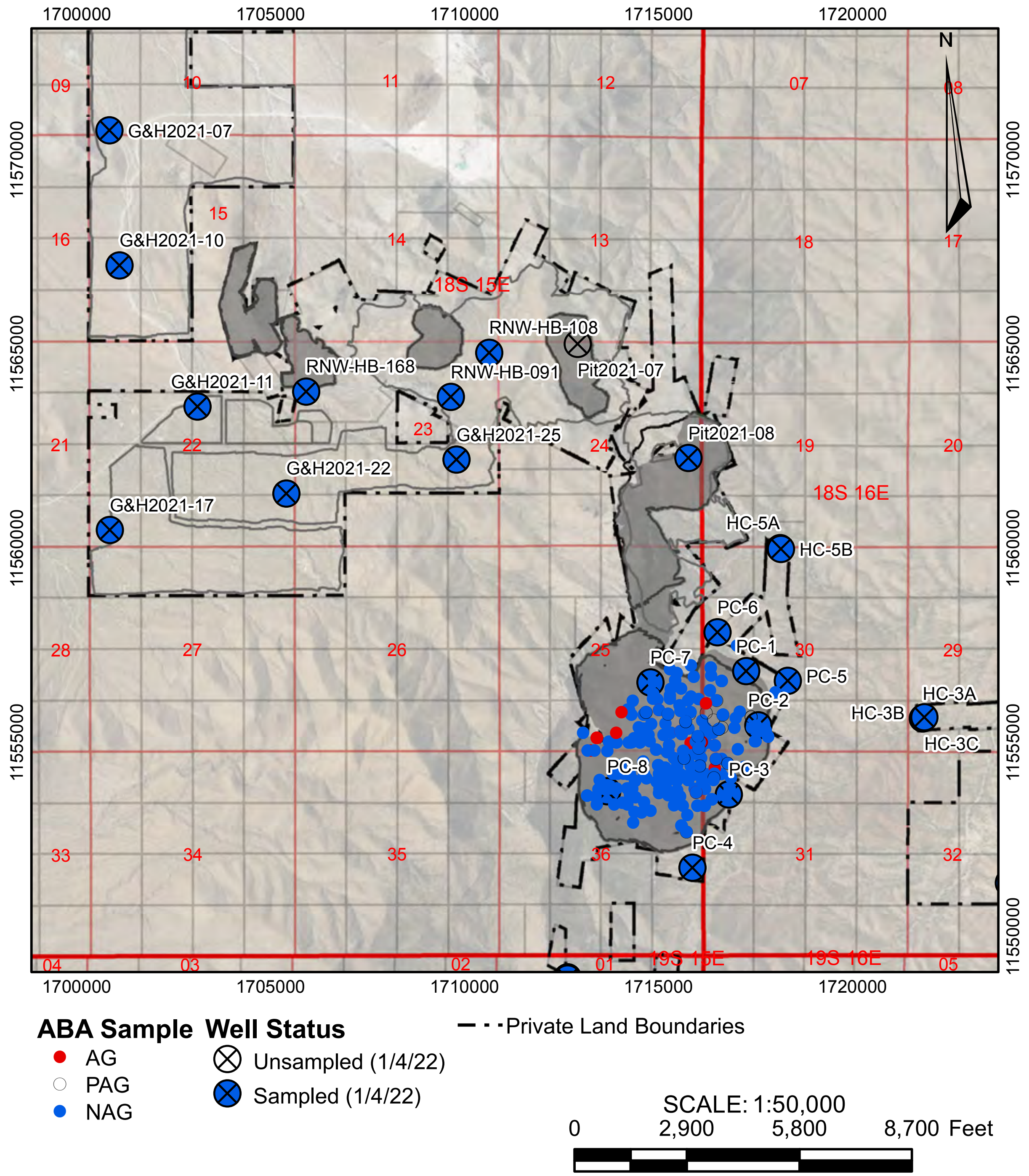
CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: SM	CHECKED: BG
DATE:	May 2022
FIGURE:	2.16


Rosemont Hydrogeologic Cross Section
C
C'
5800
5300
4800
4300
3800
3300
1707000
1710000
1713000
1716000
1719000
PZ-8
894ft
PC-8
780ft
HB-2146
784ft
HB-2142
991ft
PC-3
722ft
Rosemont Pit
5177
5151
5144
5175 (4969)
5124 (4269)
4924(3769)
5340 (3494)
Screened Interval
Monitoring Well
Piezometric Level
Grouted VWP
Hole ID
Distance from section (ft)
Piezometric level (ft amsl)
[Sensor Elevation (ft amsl)]
Scale: 1:13,000
Vertical exaggeration: 2x
0ft
3000ft
Coordinate system: NAD 83 BLM Zone 12
Faults/Surfaces
Piezometric Surface
Lithology
ABRIGO
ANDESITE
ARKOSE
BOLSA
CONCHA
EARP
EPITAPH
ESCABROSA
GILA
GLANCE
GRANODIORITE 1
GRANODIORITE 2
HORQUILLA
MARTIN
QMP
SCHERRER
Section End Points
C: 1706558, 11554506
C' : 1720954, 11554506
Rosemont Hydrogeologic Cross Section
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY
CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB: 4286
DRAWN: AP
CHECKED: BG
DATE: May 2022
FIGURE: 2.17

Mined Geologic Units (Tons)						
Geologic Unit	**Broadtop**	**Copper World**	**Heavy Weight**	**Peach / Elgin**	**Rosemont**	**Grand Total**
ABRIGO	1.52E+07	5.47E+06		5.35E+06	5.27E+07	7.86E+07
ANDESITE					2.76E+08	2.76E+08
ARKOSE	1.17E+07				4.82E+07	5.99E+07
BOLSA	2.13E+07	1.95E+07		2.21E+06	3.84E+07	8.14E+07
CONCHA			7.18E+05	8.62E+05		1.58E+06
EARP		4.61E+06			6.36E+07	6.82E+07
EPITAPH	1.58E+07	2.15E+05		2.11E+07	3.59E+07	7.30E+07
ESCABROSA	1.54E+06			8.14E+06	2.94E+07	3.91E+07
GILA					1.73E+07	1.73E+07
GLANCE	4.36E+07				5.46E+07	9.82E+07
GRANODIORITE	1.58E+07	8.78E+06	8.13E+06	1.56E+07	3.18E+07	8.01E+07
HORQUILLA		2.69E+06		4.40E+06	1.83E+08	1.90E+08
MARTIN		7.18E+05		3.84E+06	5.14E+07	5.59E+07
QMP	7.36E+07		1.65E+07	3.63E+06	6.20E+07	1.56E+08
SCHERRER	6.56E+06				5.65E+07	6.30E+07
UNKNOWN					1.70E+07	1.70E+07
Grand Total	**2.05E+08**	**4.20E+07**	**2.54E+07**	**6.51E+07**	**1.017E+09**	**1.35E+09**
Percent of Total	***15%***	***3%***	***2%***	***5%***	***75%***	



PITEAU ASSOCIATES	Rosemont Total Mined Geology			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May 2022		FIGURE: 3.1	



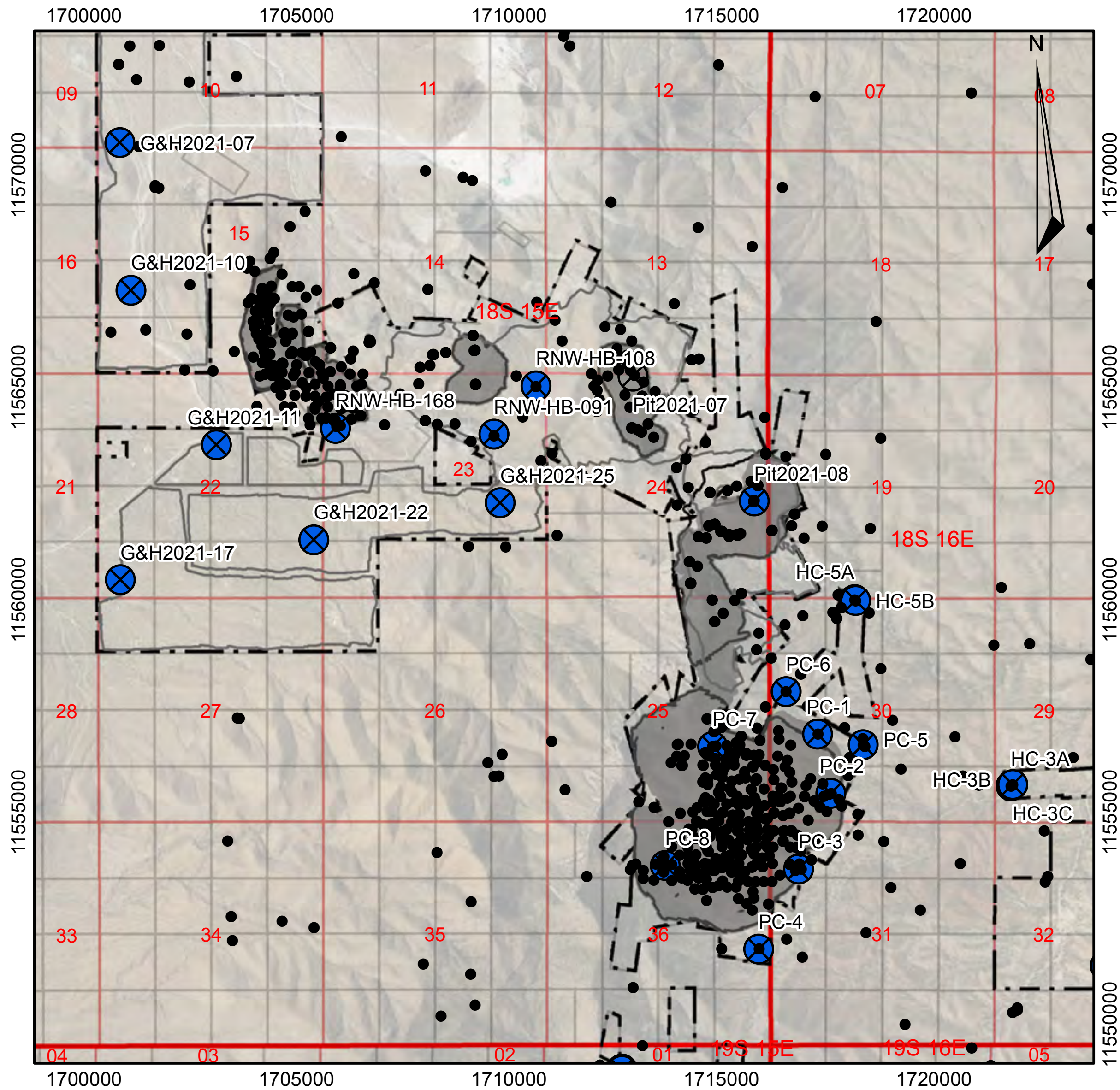
PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Rosemont Copper Company
Rosemont Copper World Project

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

ABA Sample Locations

BY:	DATE:
WT	MAY 22
APPROVED:	FIG:
TC	3.2



- Exploration Boreholes
- Private Land Boundaries

Well Status

- Unsampled (1/4/22)
- Sampled (1/4/22)

SCALE: 1:50,000

0 2,900 5,800 8,700 Feet

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

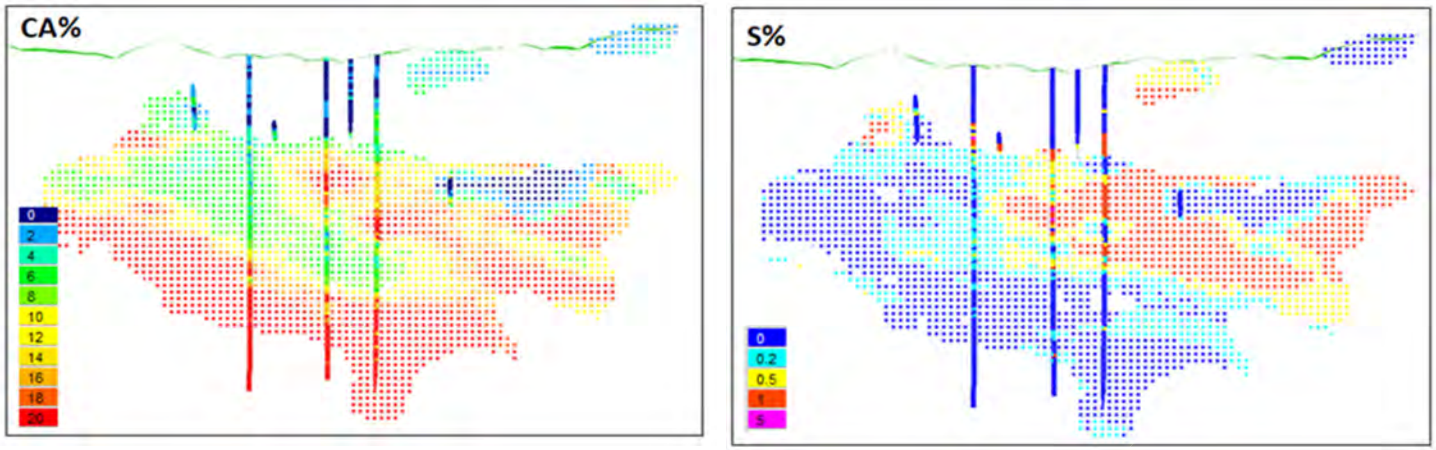
Rosemont Copper Company
Rosemont Copper World Project

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

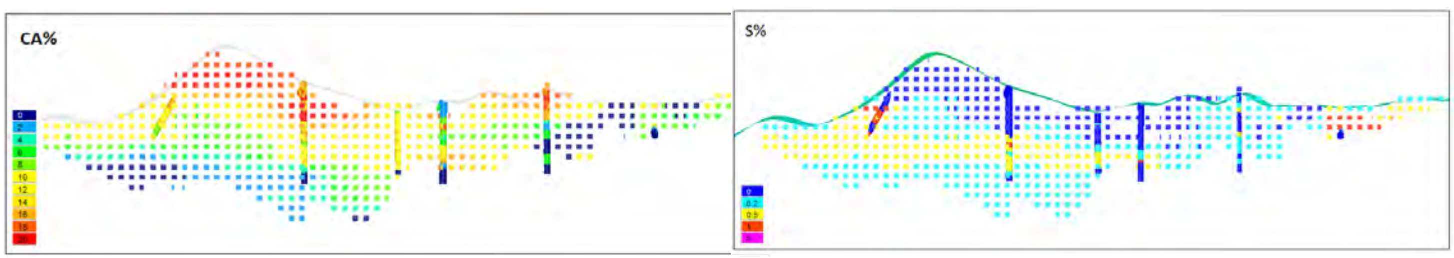
Exploration Borehole Locations

BY:	DATE:
WT	MAY 22
APPROVED:	FIG:
TC	3.2

Rosemont Pit



Peach and Elgin Pit



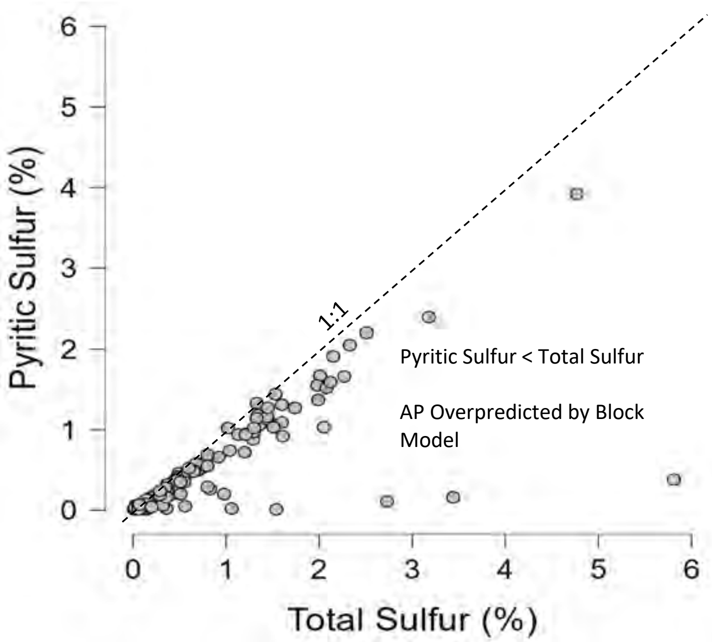
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Exploration Ca and S values and kriged block model

CLIENT:	Rosemont Copper	PROJECT:	Rosemont Copper World Project
JOB #:	4286	DRAWN:	RR
		CHECKED:	TC
DATE:	May 2022	FIGURE:	3.4

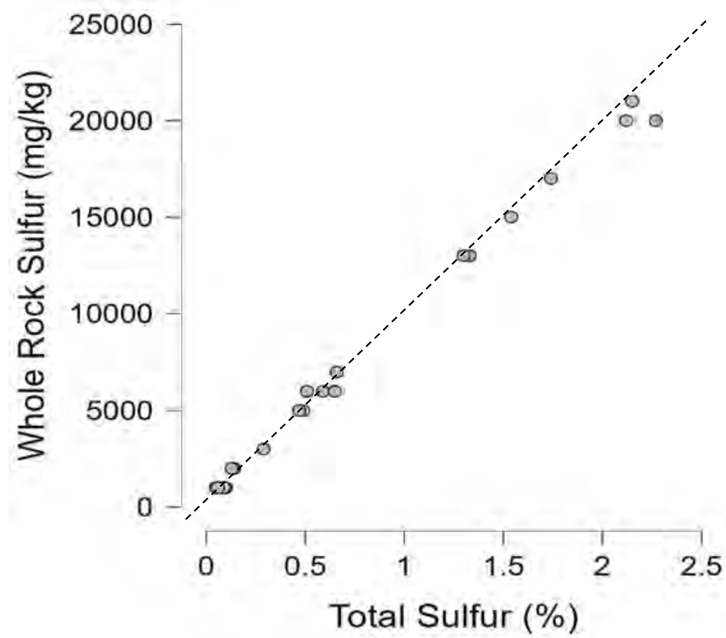
Pearson's Correlations

n	Pearson's r	p	UCL	LCL
358	0.812	< .001	0.844	0.774



Pearson's Correlations

n*	Pearson's r	p	UCL	LCL
100	0.996	< .001	0.998	0.995



*105 ABA samples possess adequate whole rock sulfur

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Correlation Between Total, Pyritic, and Whole Rock Sulfur

CLIENT: Rosemont Copper

PROJECT: Rosemont Copper World Project

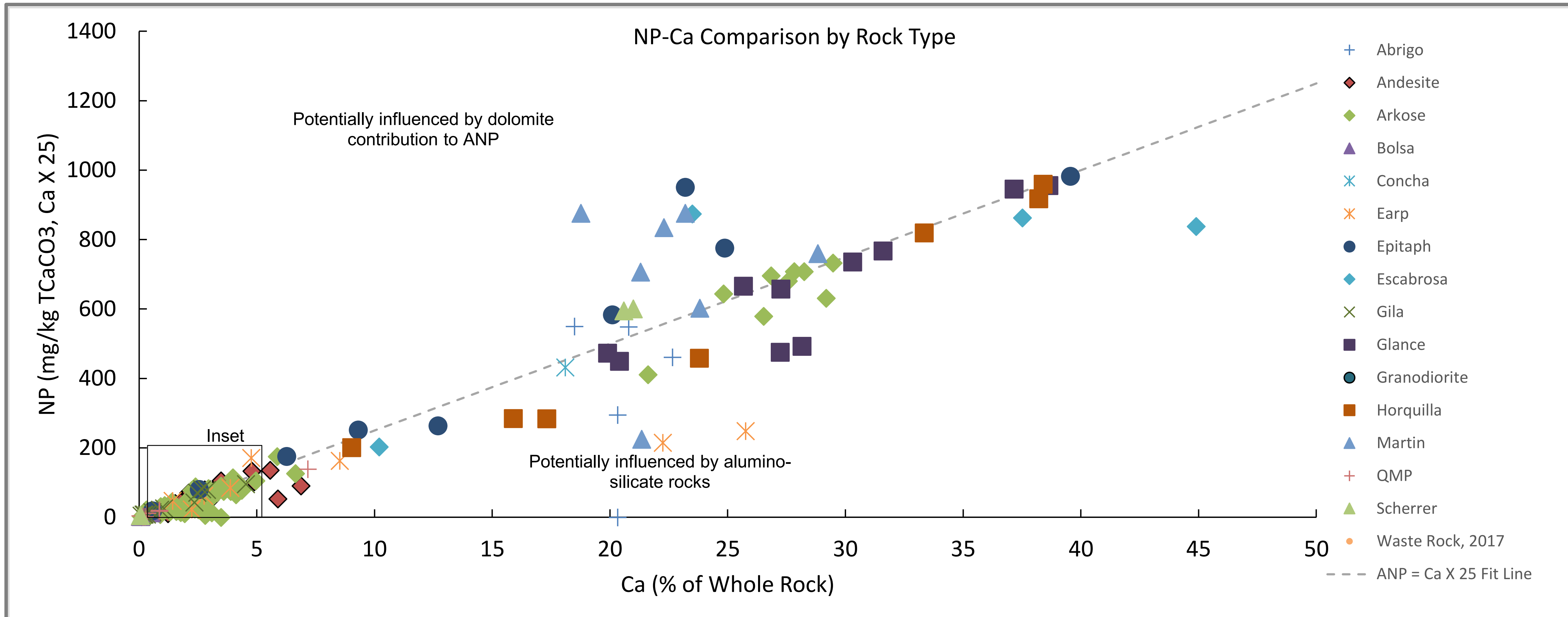
JOB #: 4286

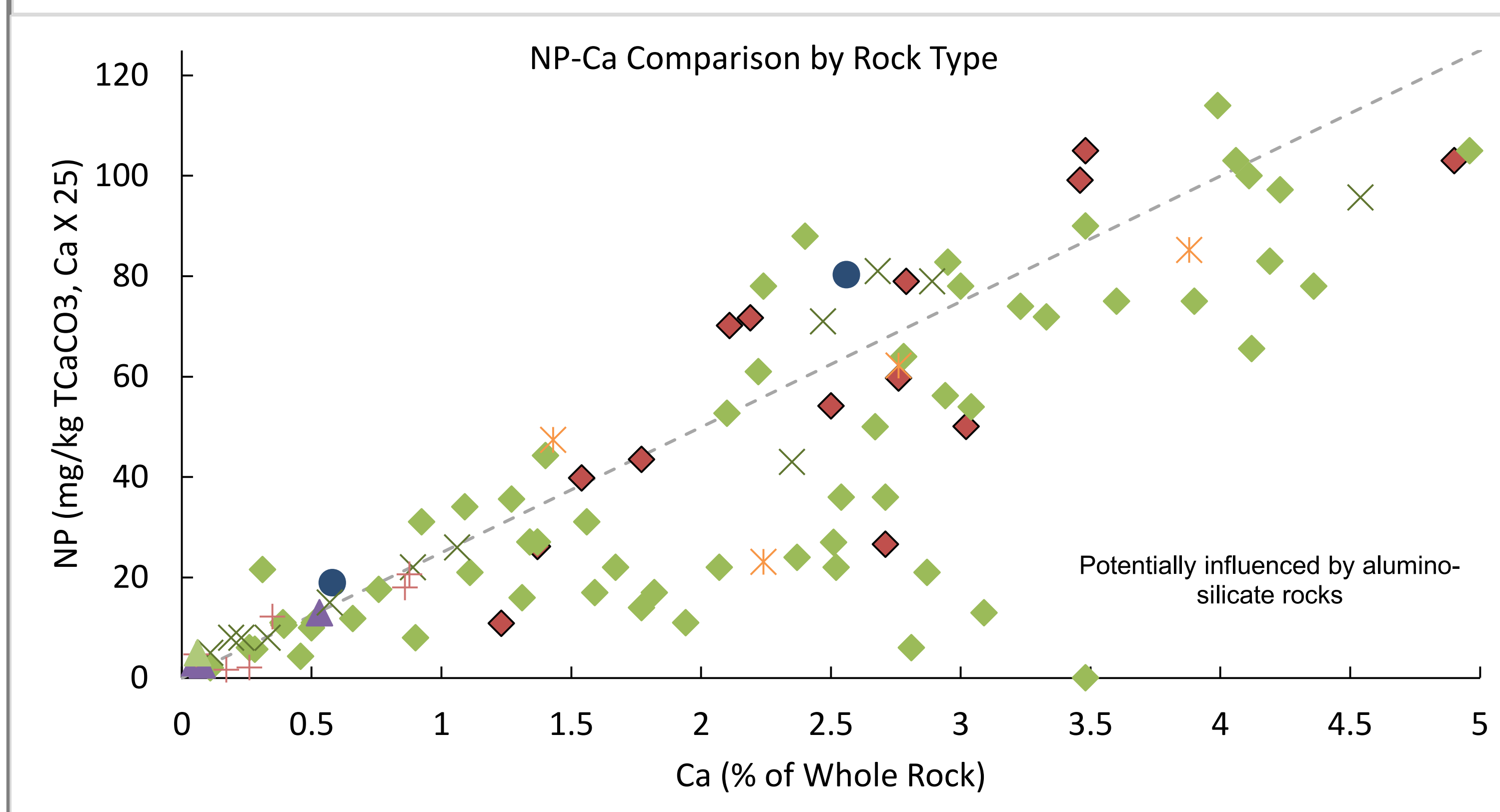
DRAWN: WT

CHECKED: TC

DATE: May 2022

FIGURE: 3.5





Statistical Analysis

All Materials

n	Pearson's r	R^2	p	UCL	LCL	RMSE
183	0.952	0.91	<0.001	0.964	0.936	89.4

Limestones

n	Pearson's r	R^2	p	UCL	LCL	RMSE
62	0.876	0.77	<0.001	0.802	0.924	147

Intrusive and Clastic Rocks

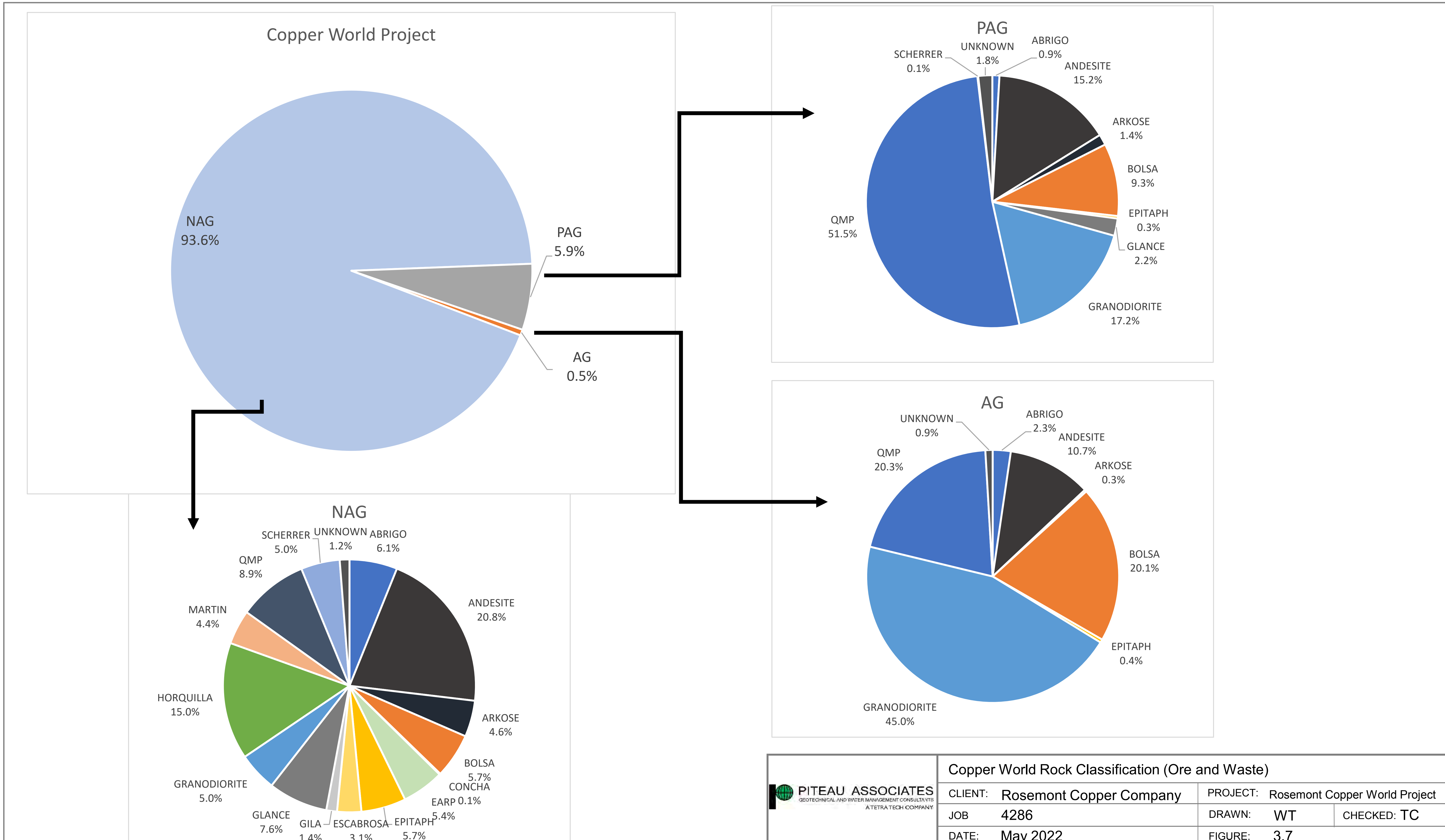
n	Pearson's r	R^2	p	UCL	LCL	RMSE
121	0.986	0.97	<0.001	0.98	0.98	30.9

Rocks Ca < 5%

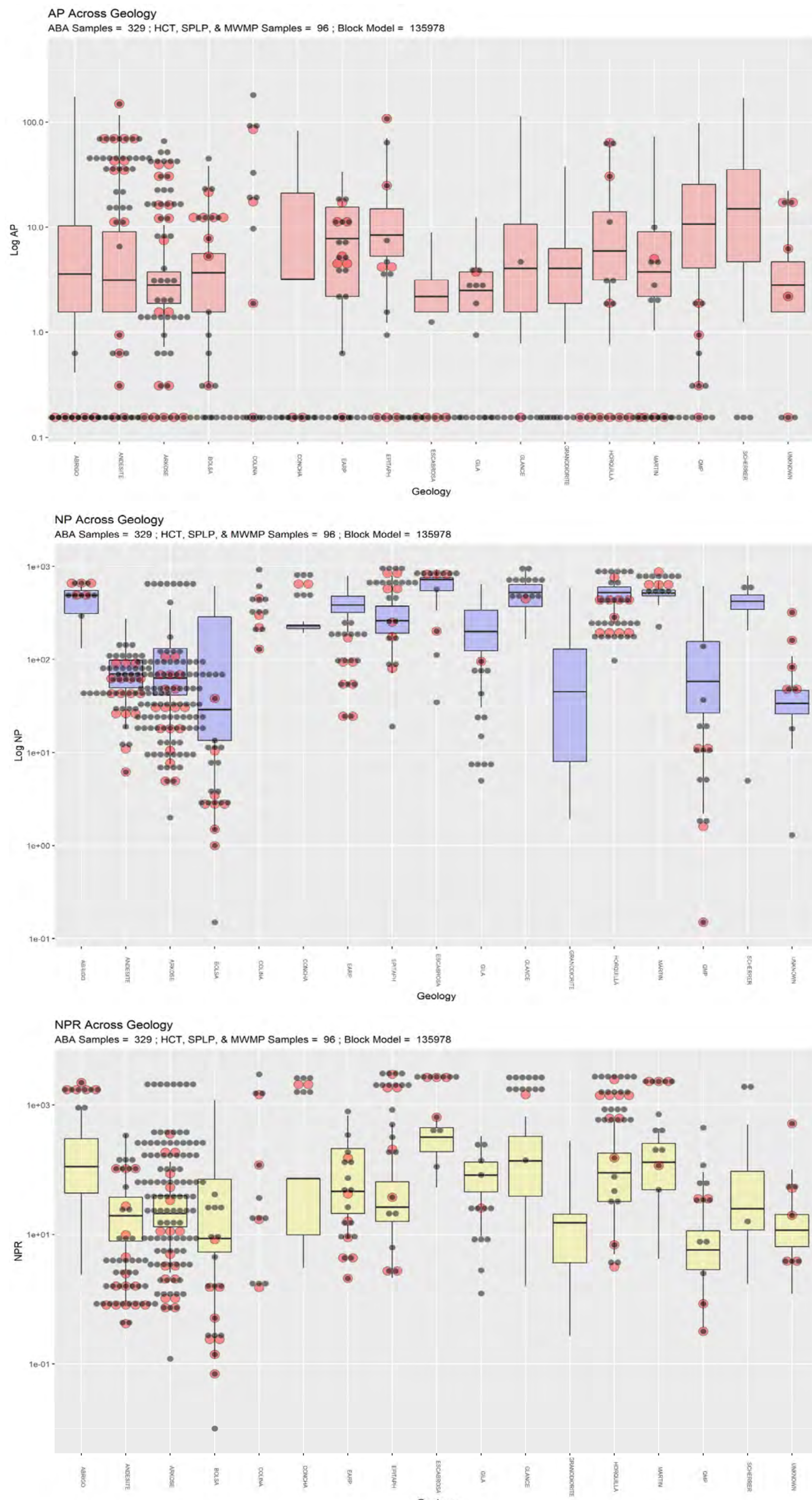
n	Pearson's r	R^2	p	UCL	LCL	RMSE
113	0.855	0.73	<0.001	0.898	0.797	19.9

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

NP-Ca Comparison of ABA samples			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May 2022		FIGURE: 3.6	



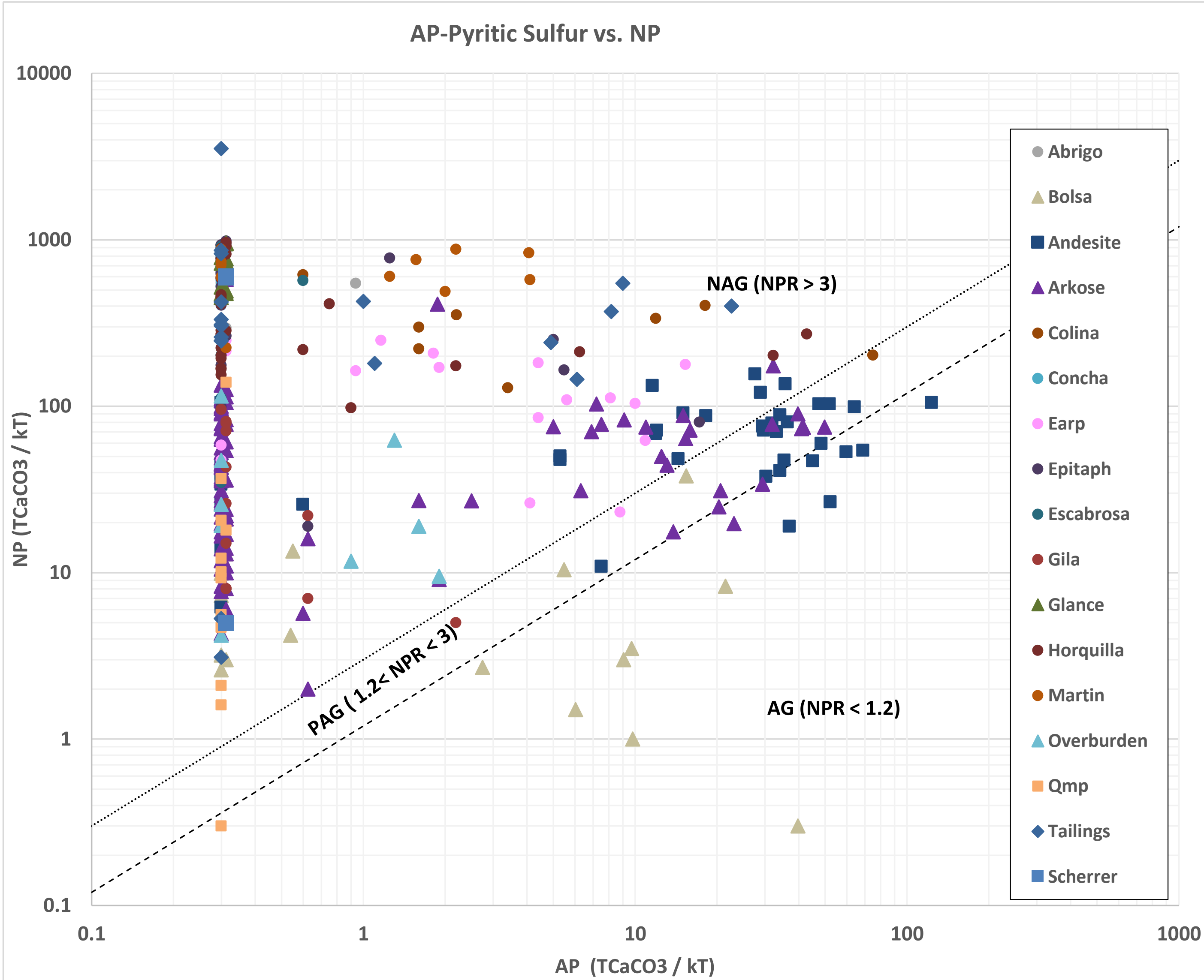
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	Copper World Rock Classification (Ore and Waste)			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May 2022		FIGURE: 3.7	



ABA distributions of sample data versus geologic units

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

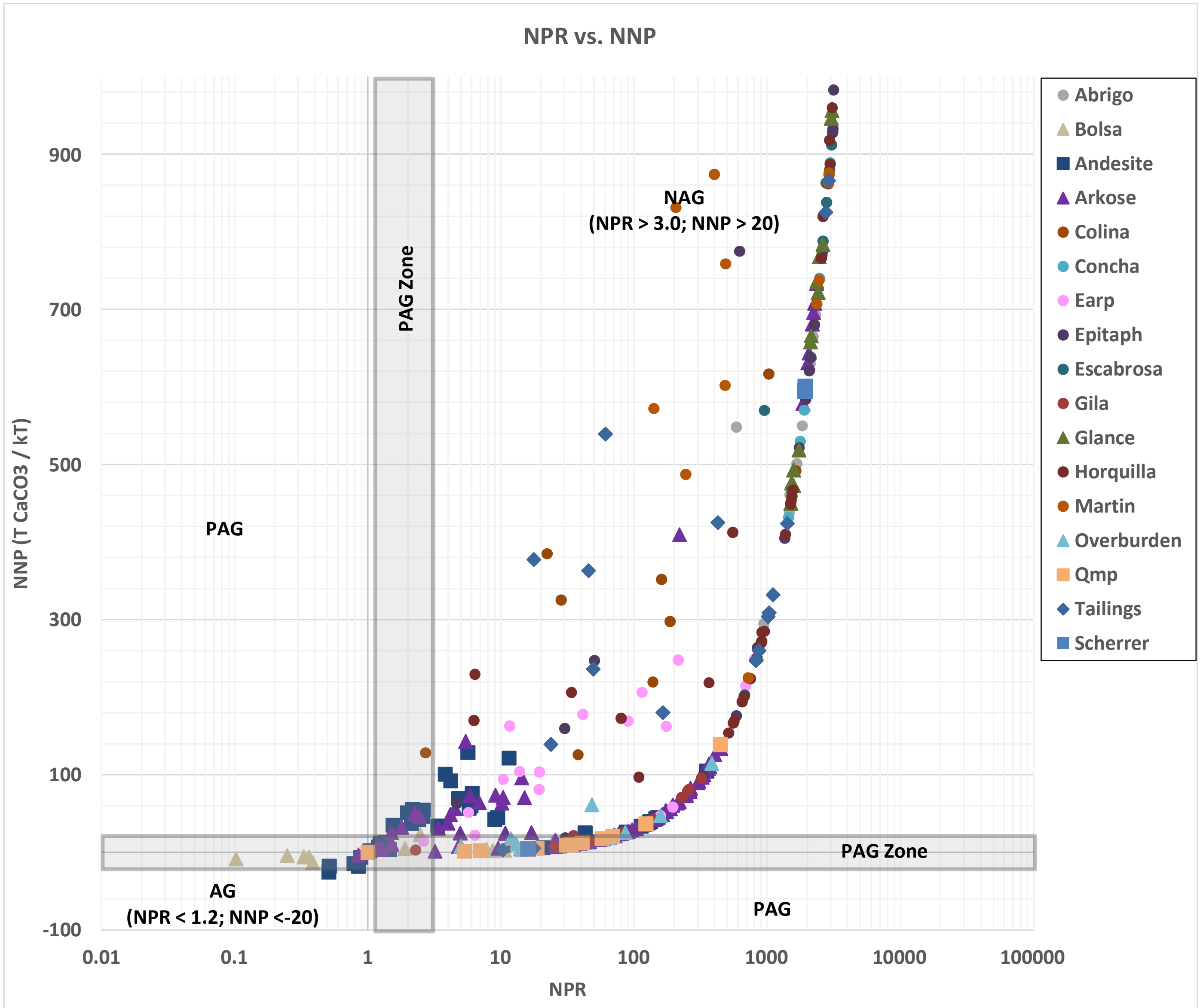
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB	4286	DRAWN: TC	CHECKE TC
DATE:	May 2022	FIGURE:	3.8



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

AP Versus NP

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 3.9



PITEAU ASSOCIATES

A TETRA TECH COMPANY

NPR Versus NNP

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

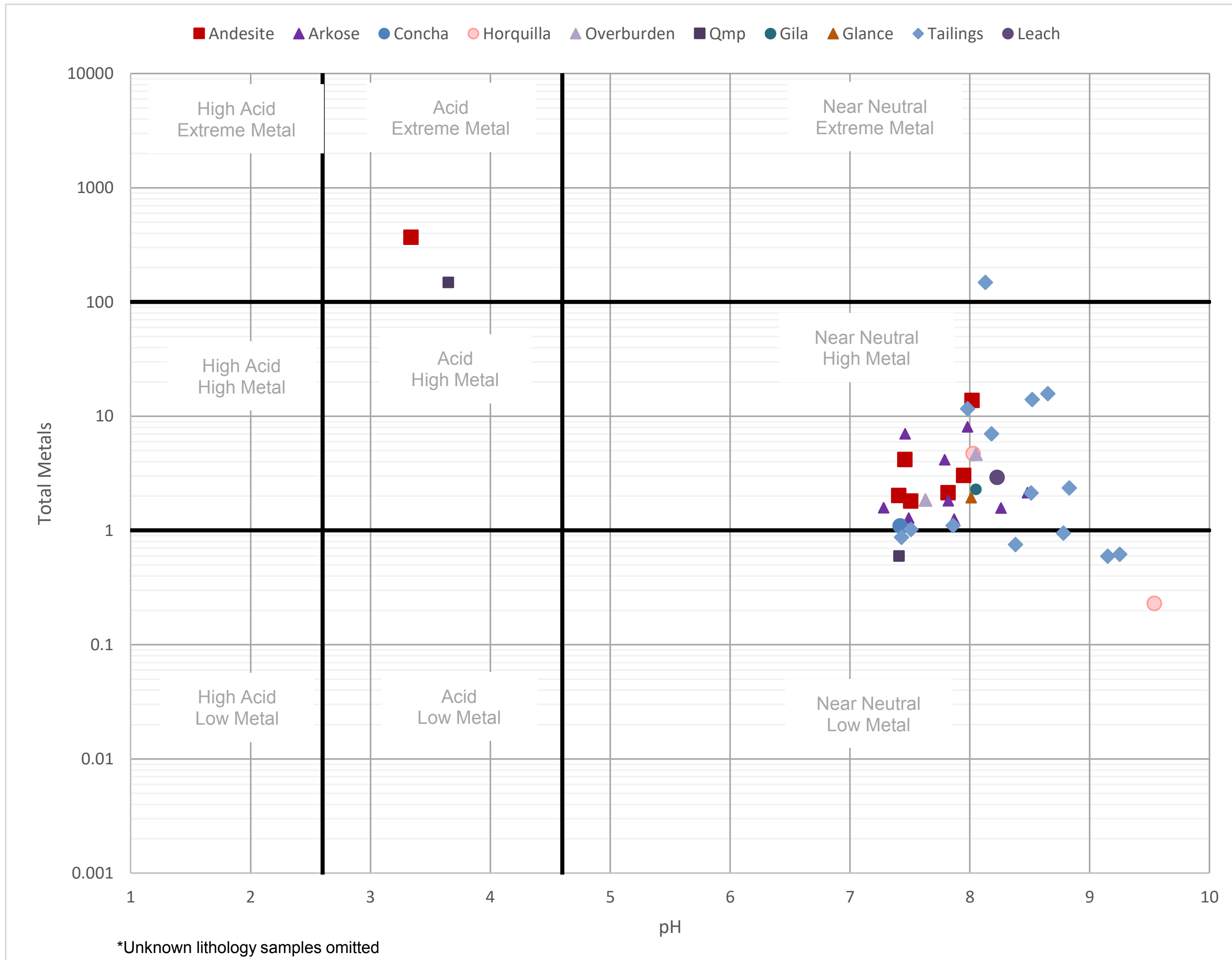
JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 3.10



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

MWMP pH vs. Total Metals

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

JOB #: 4286

DRAWN: TC

CHECKED: TC

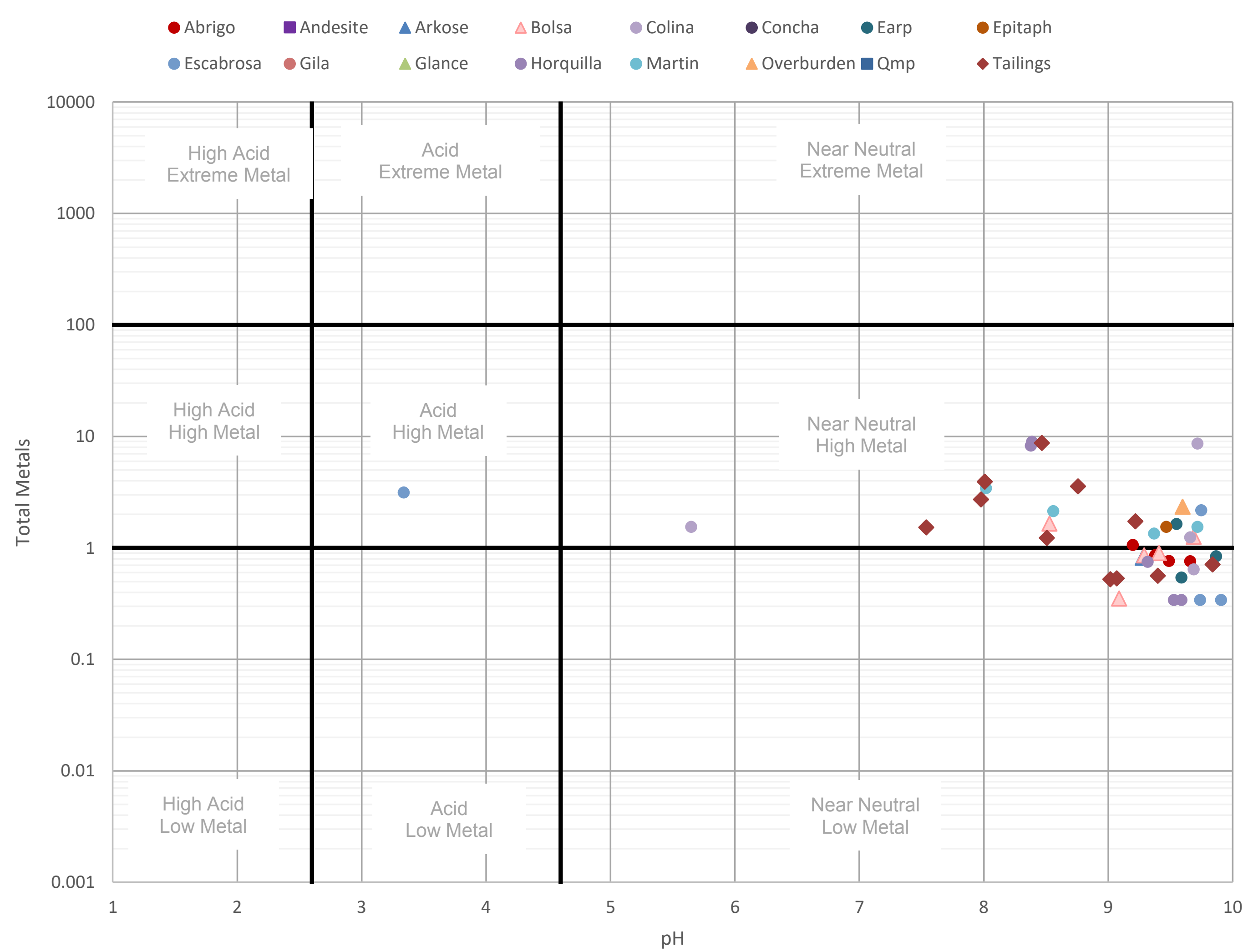
DATE: May 2022

FIGURE: 3.11

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP pH vs. Total Metals

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 3.12

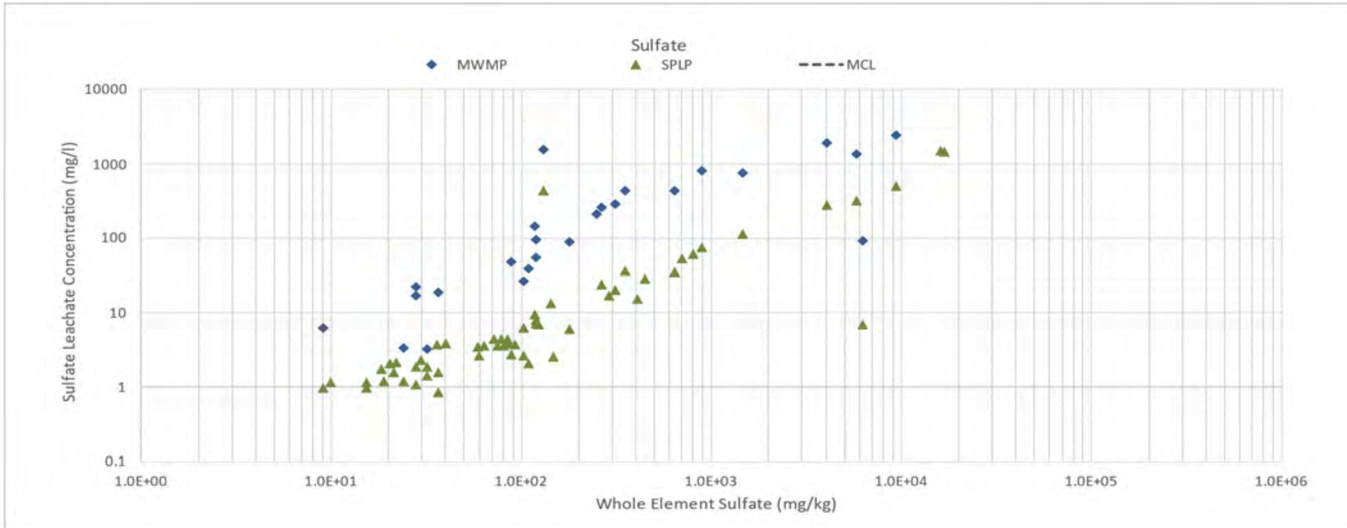


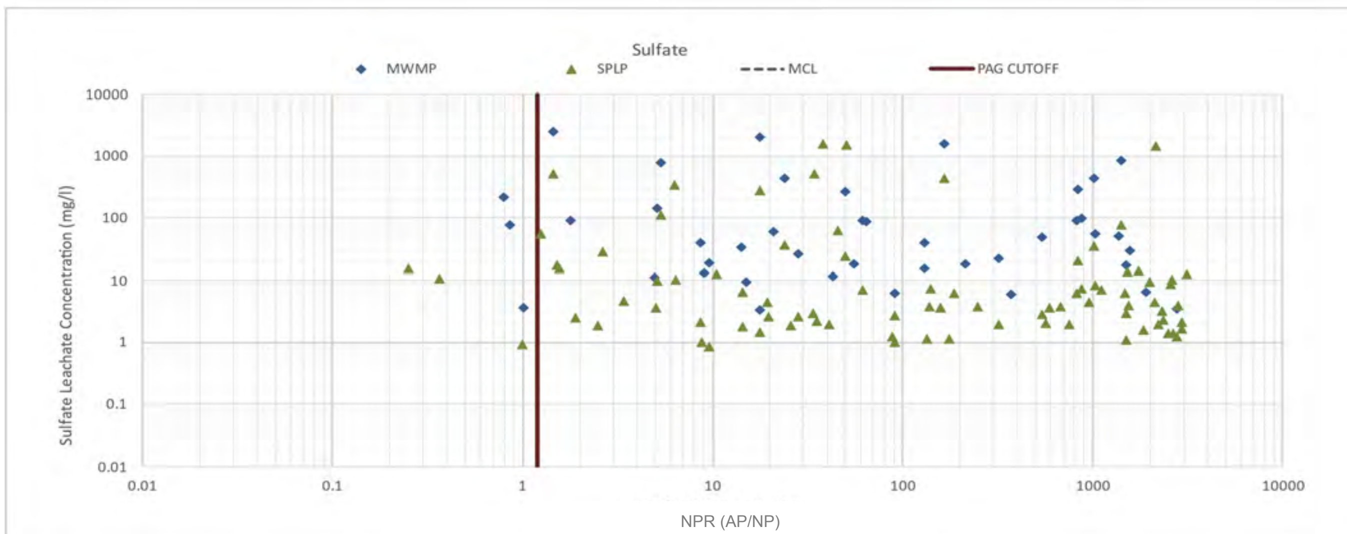
*Unknown lithology samples omitted

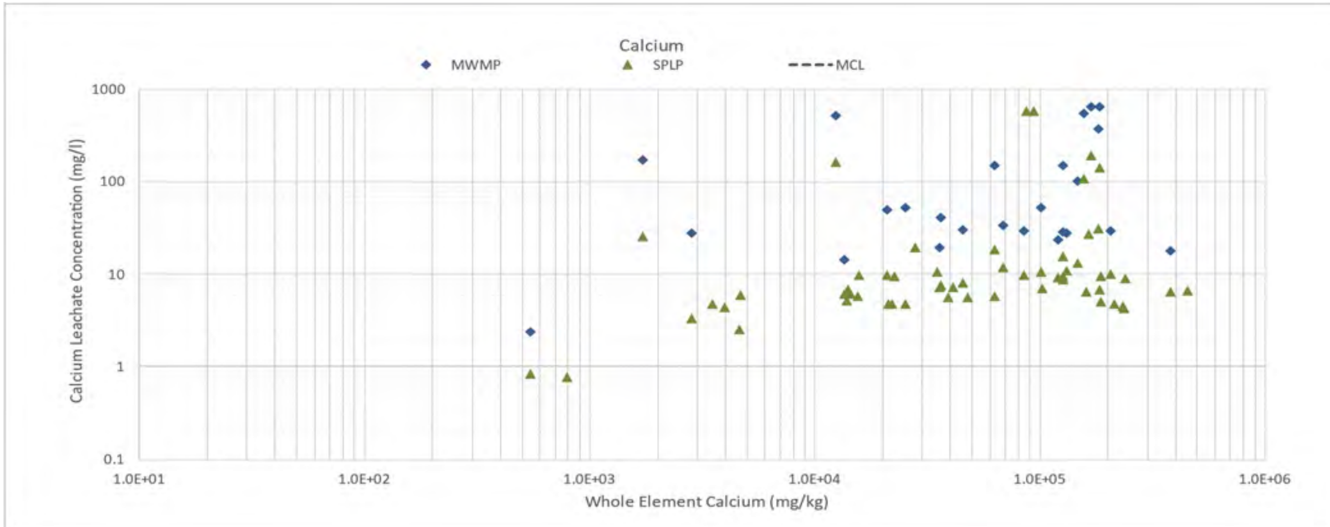
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

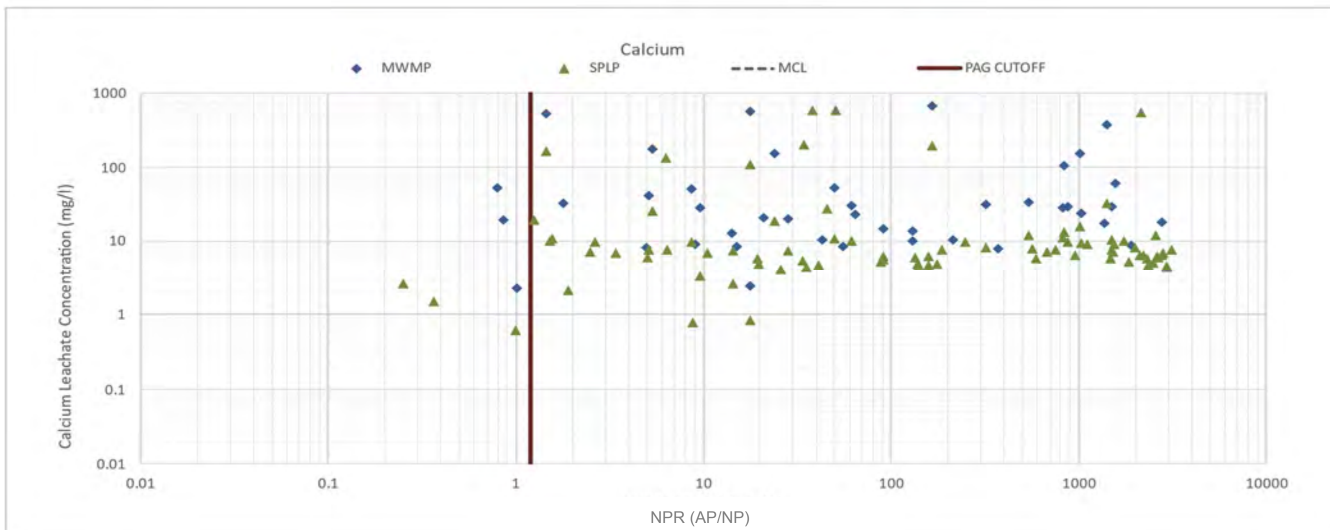
SPLP and MWMP Results: Sulfate

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 3.13









PITEAU ASSOCIATES
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A TETRA TECH COMPANY

SPLP and MWMP Results: Calcium

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

JOB #: 4286

DRAWN: TC

CHECKED: TC

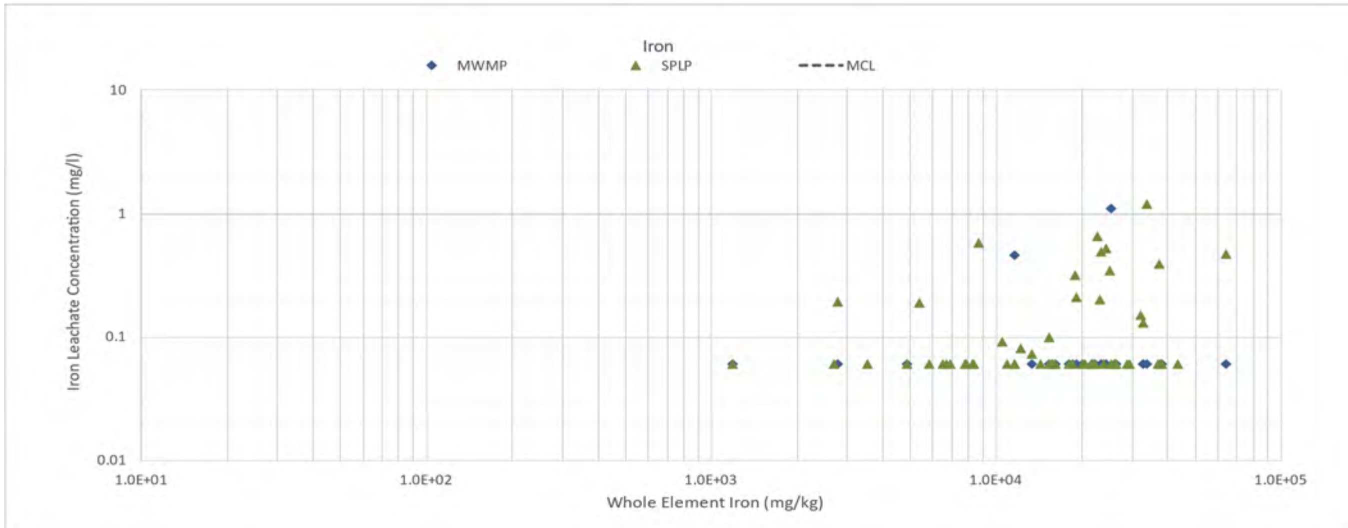
DATE: Ma 2022

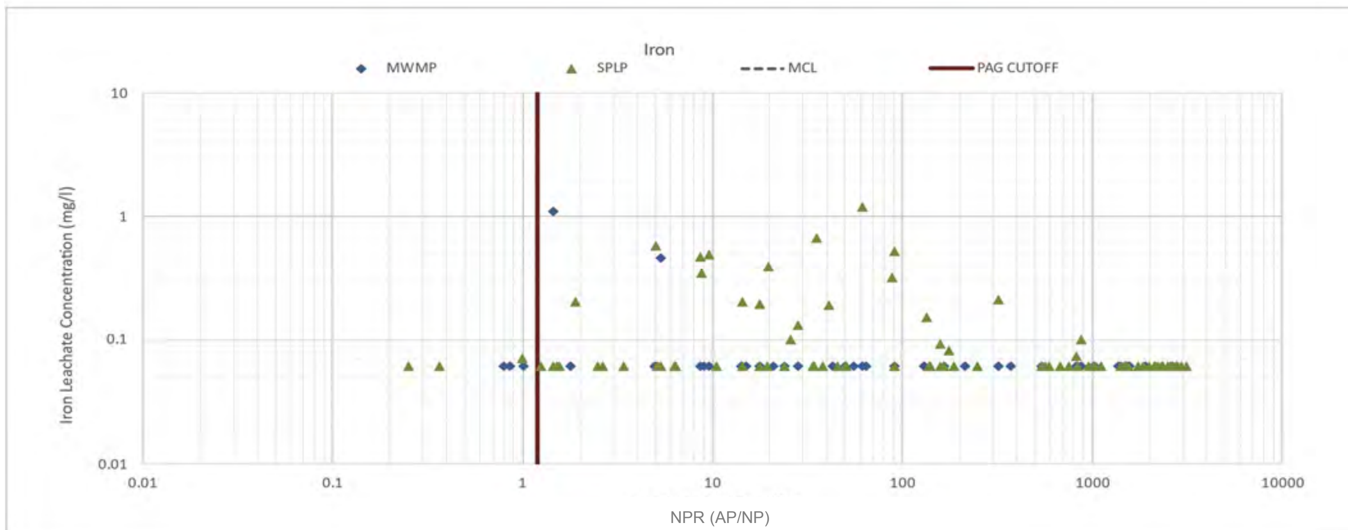
FIGURE: 3.14

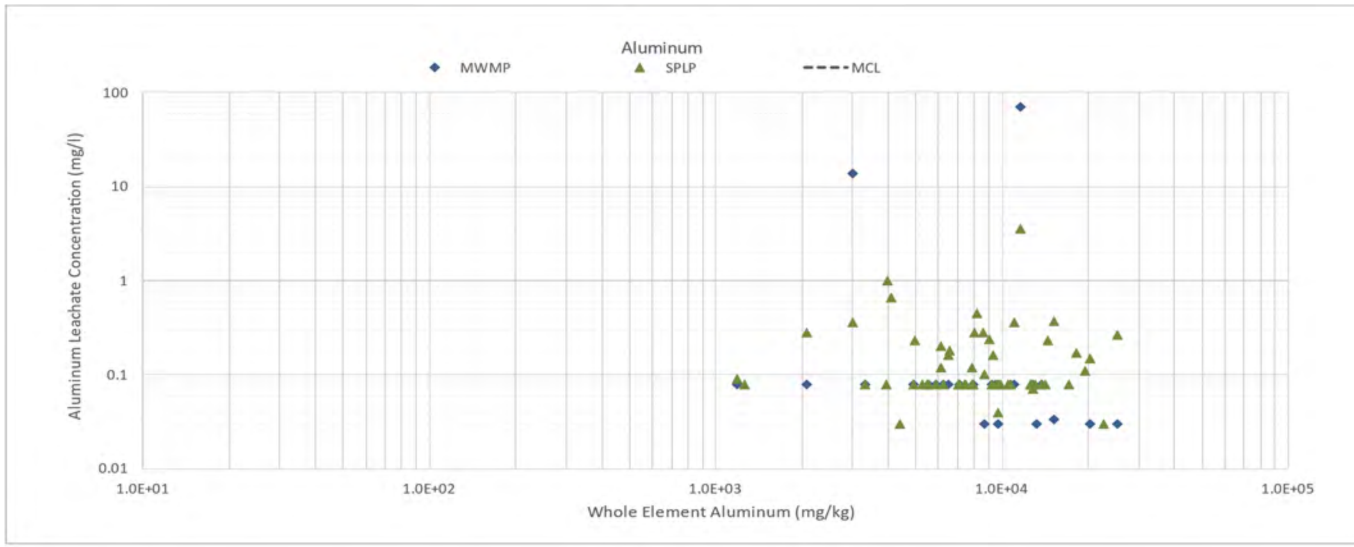
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

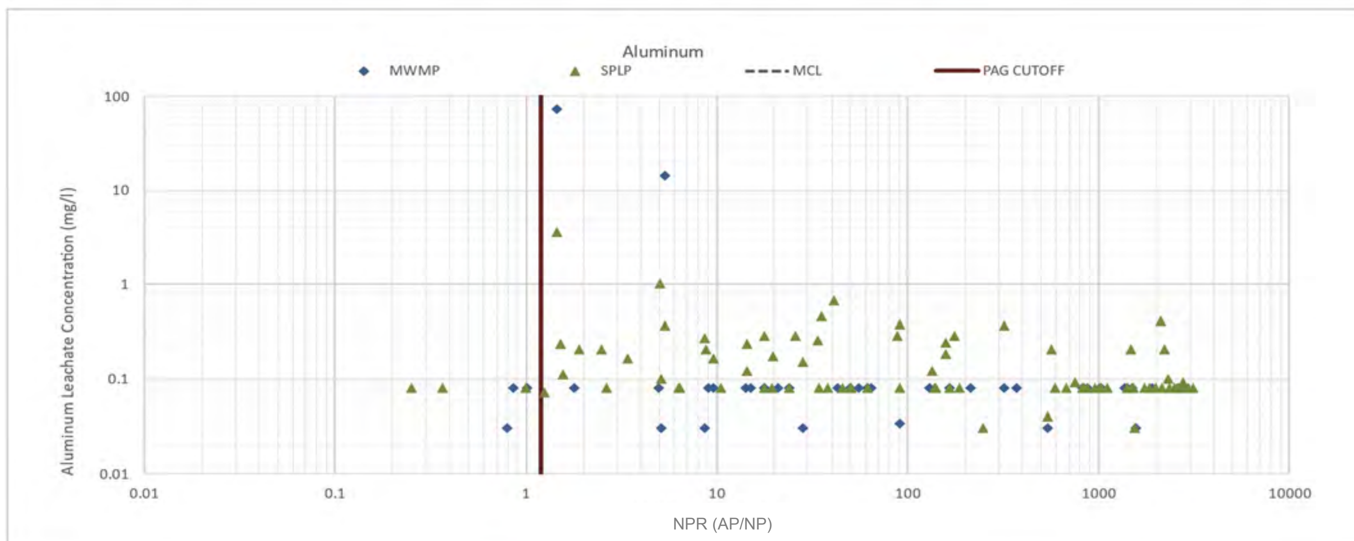
SPLP and MWMP Results: Iron

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 3.15









PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Aluminum

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

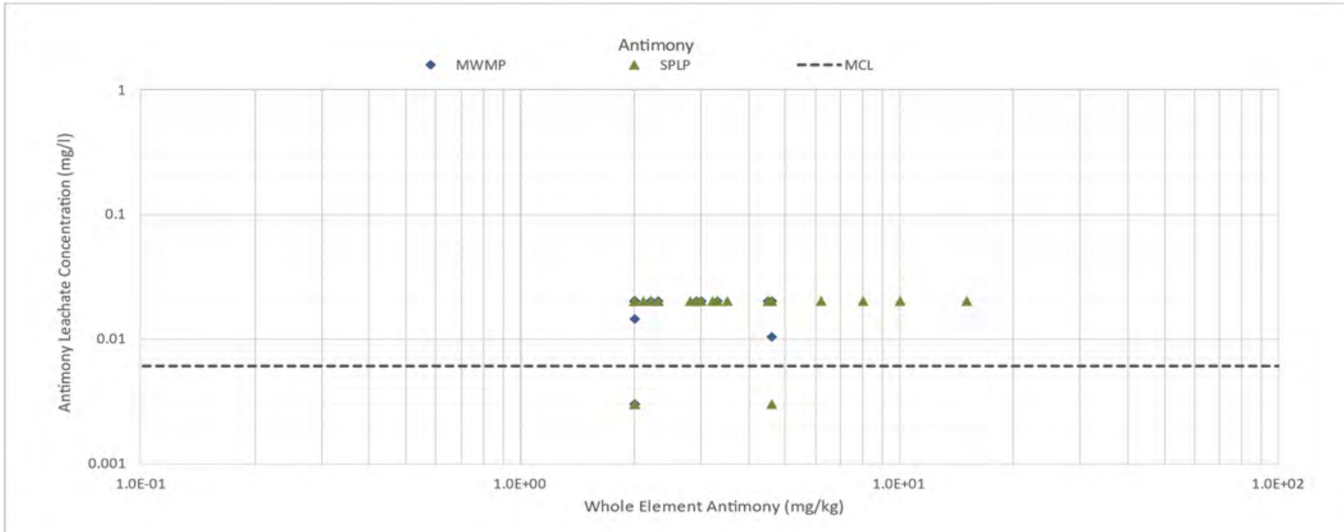
JOB #: 4286

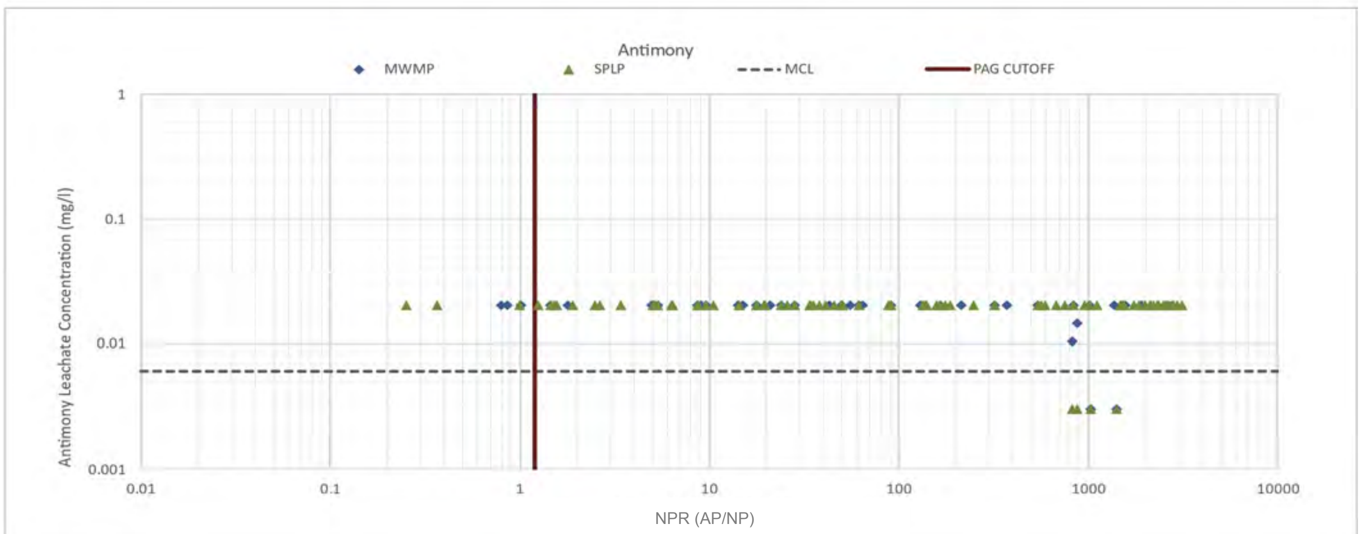
DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 3.16





PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Antimony

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

JOB #: 4286

DRAWN: TC

CHECKED: TC

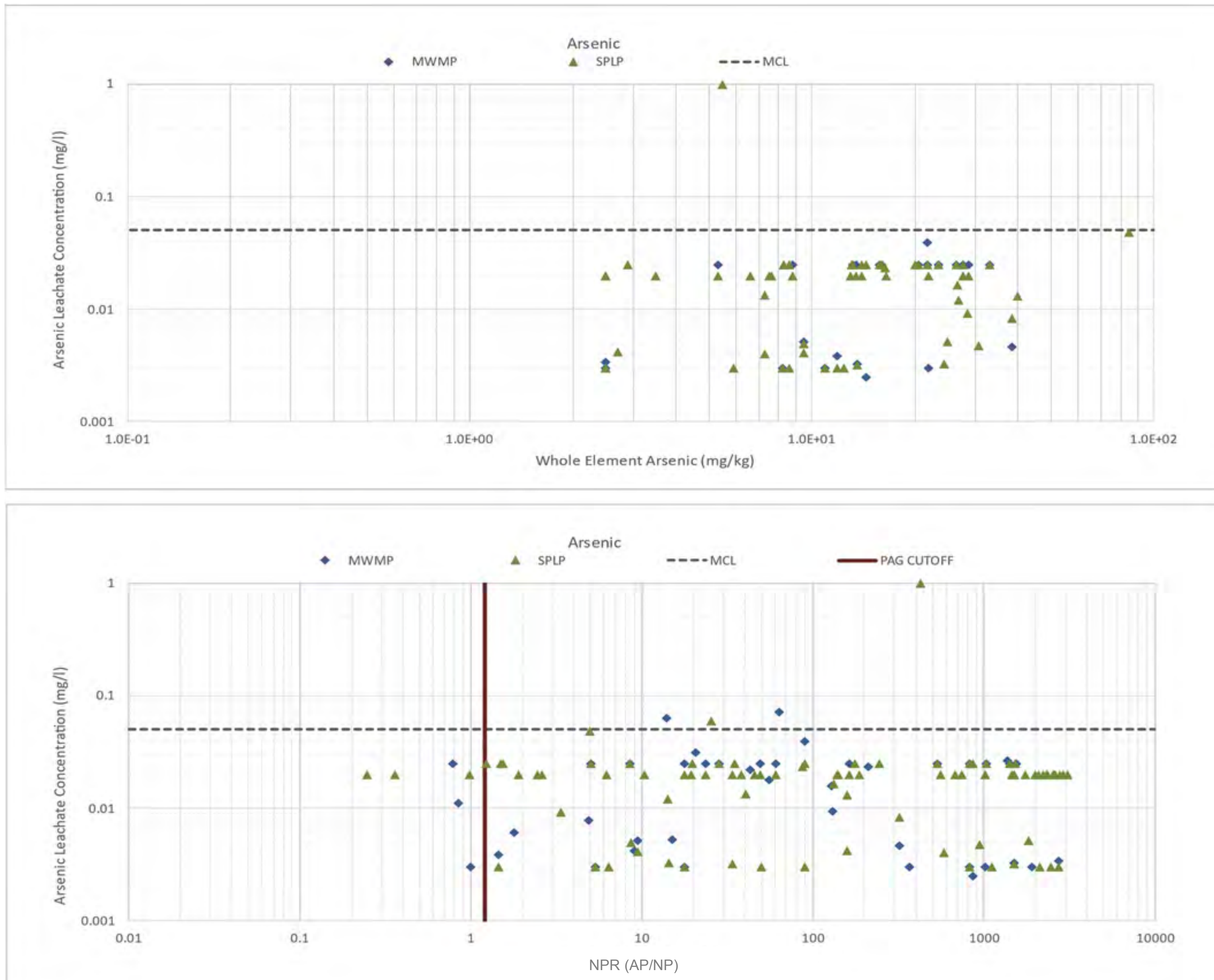
DATE: May 2022

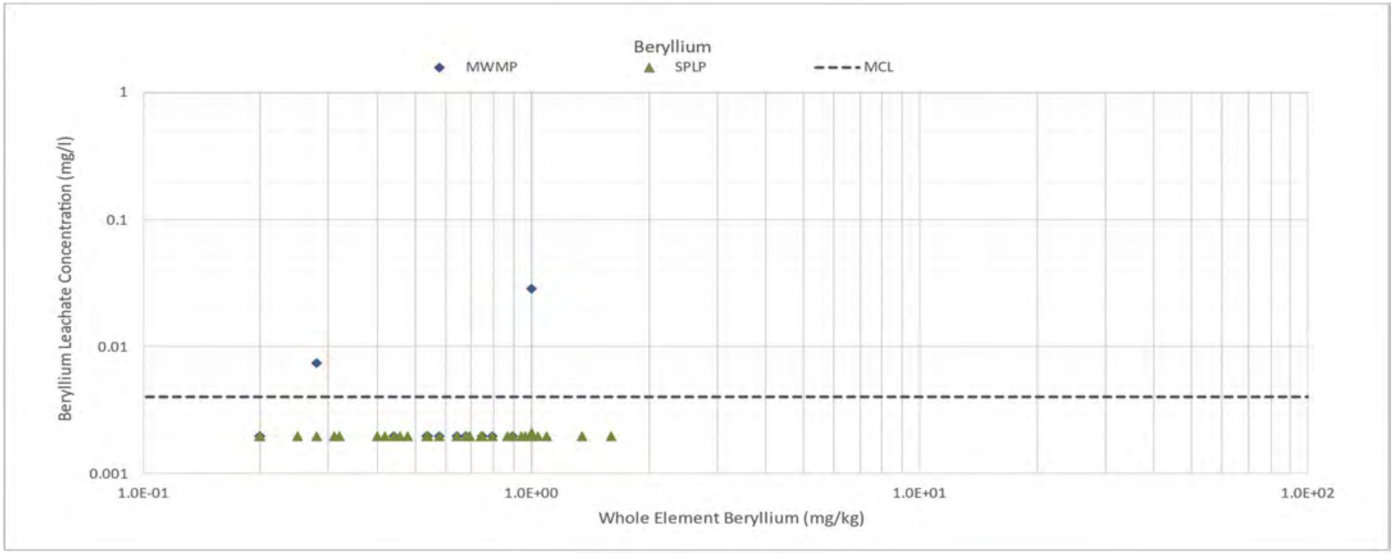
FIGURE: 3.17

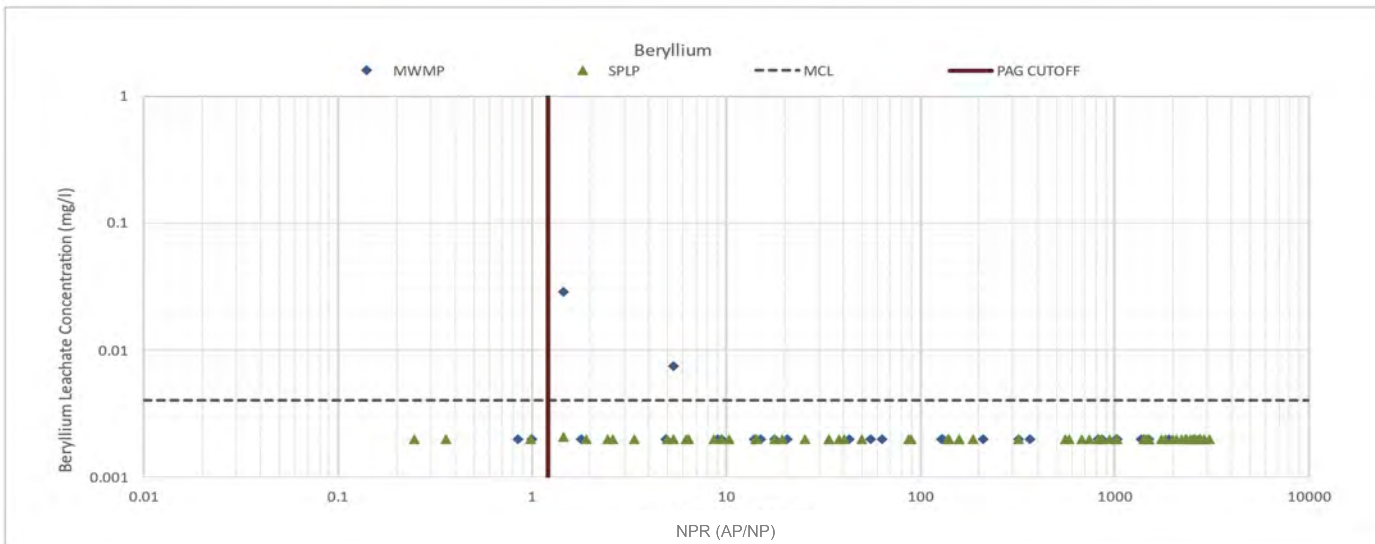
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Arsenic

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 3.18



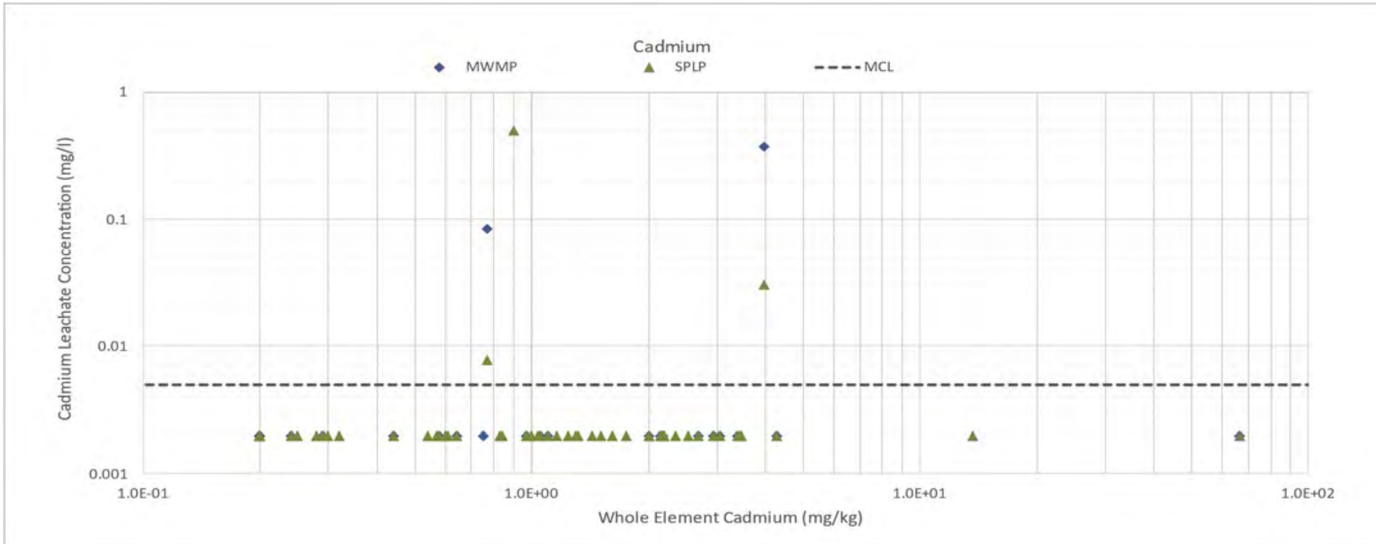


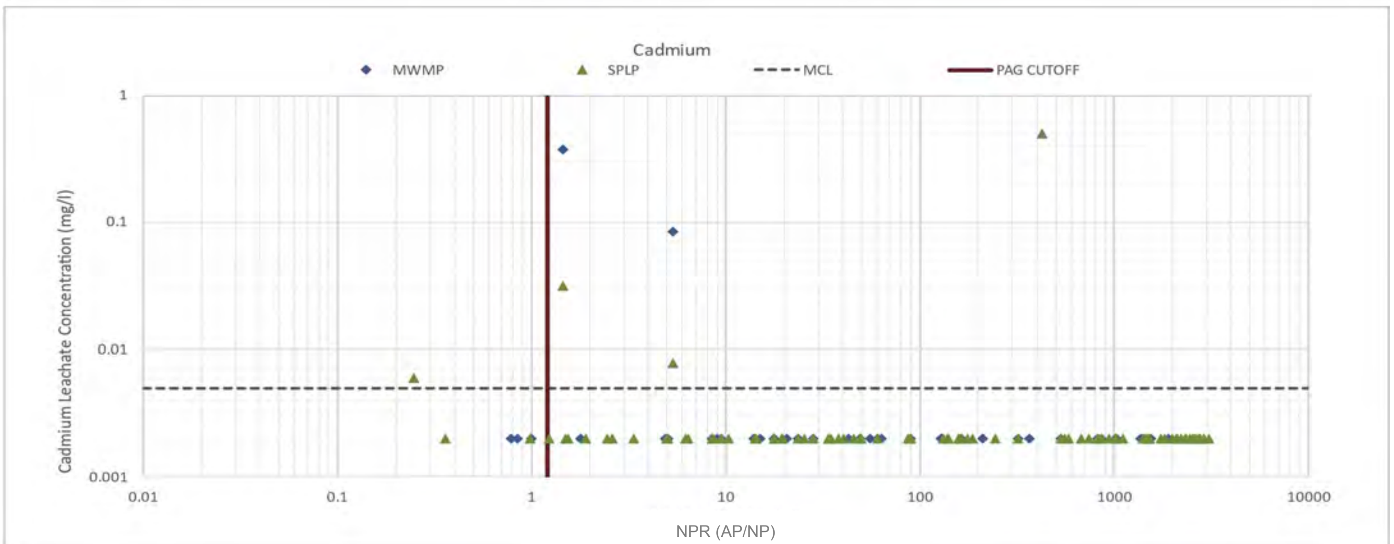


PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Beryllium

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 3.19





PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Cadmium

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 3.20

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Copper

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

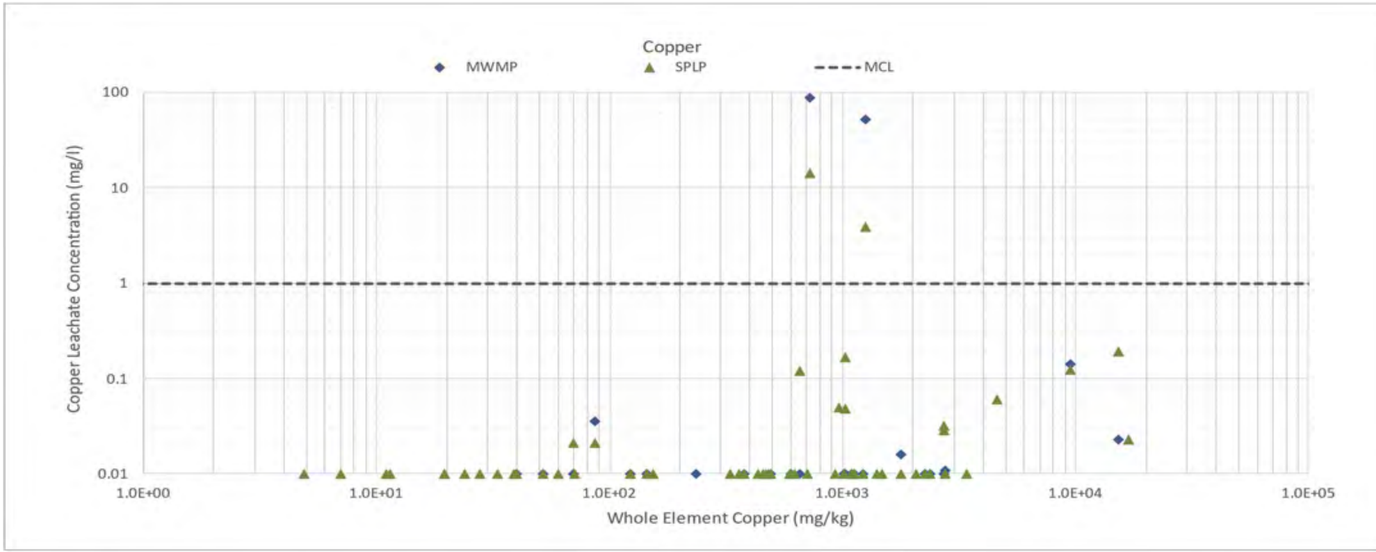
JOB #: 4286

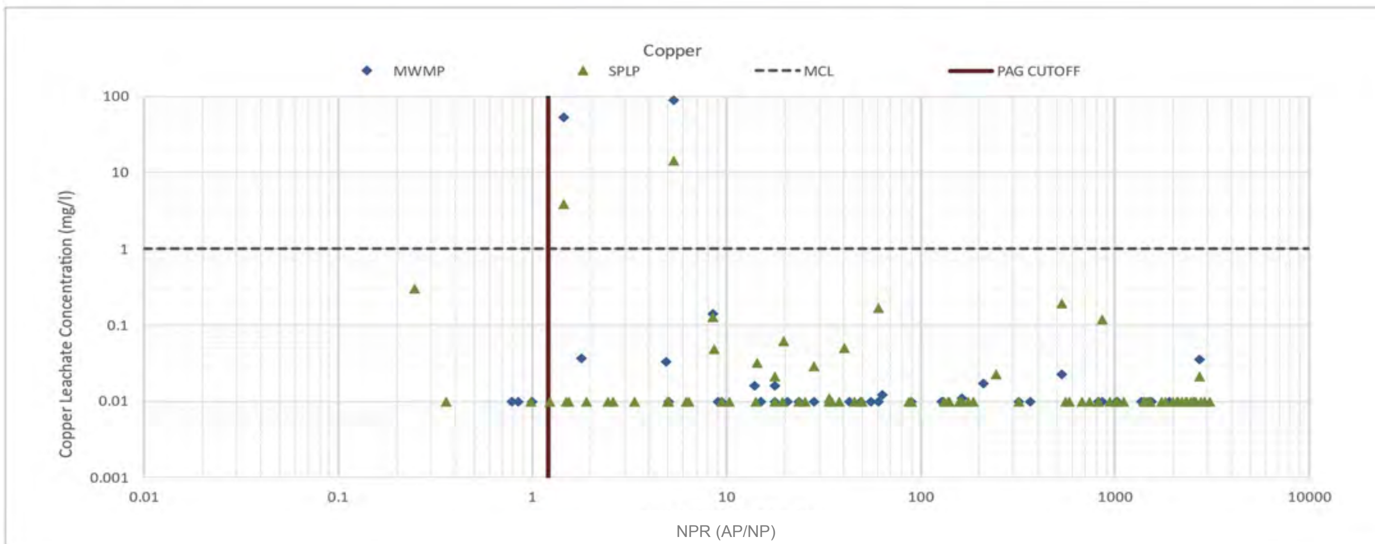
DRAWN: TC

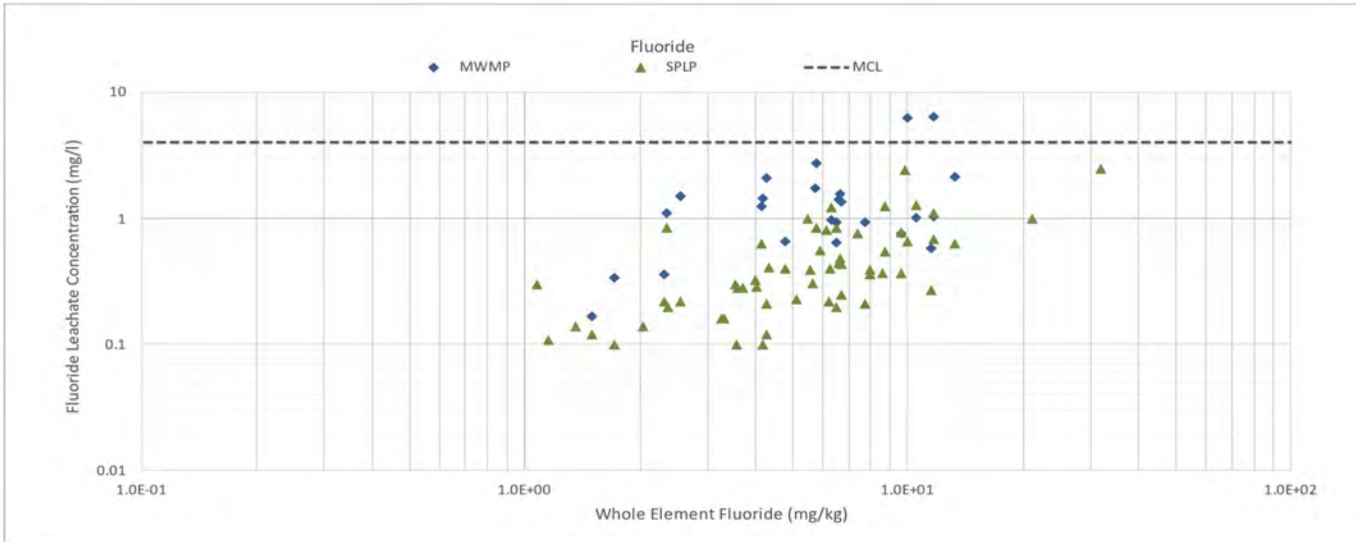
CHECKED: TC

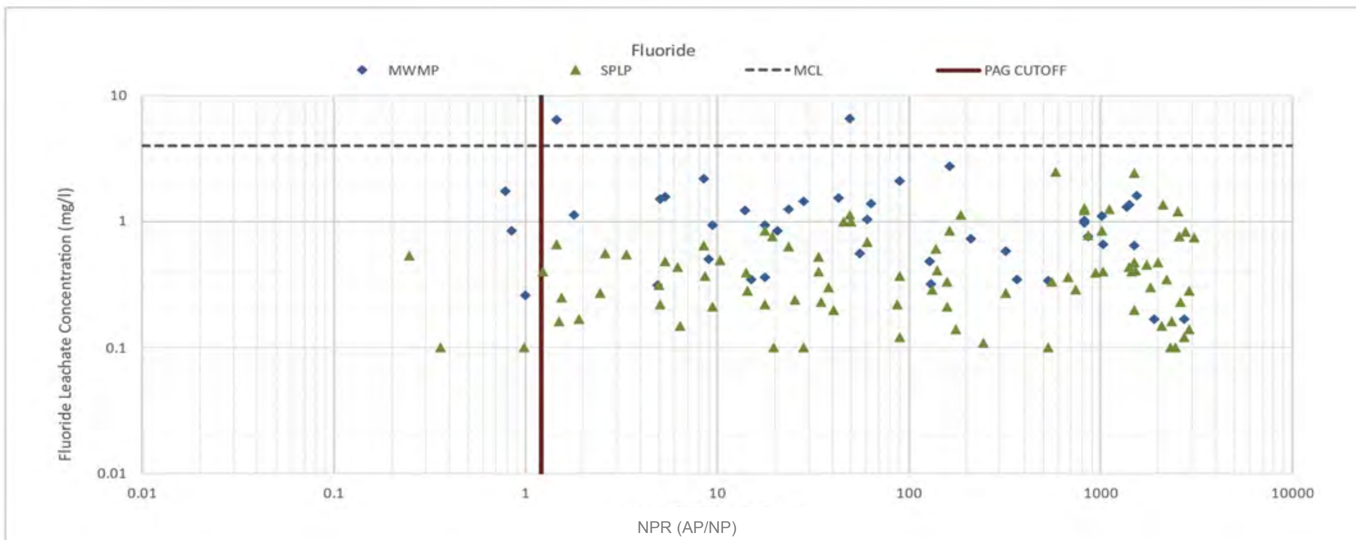
DATE: May 2022

FIGURE: 3.21





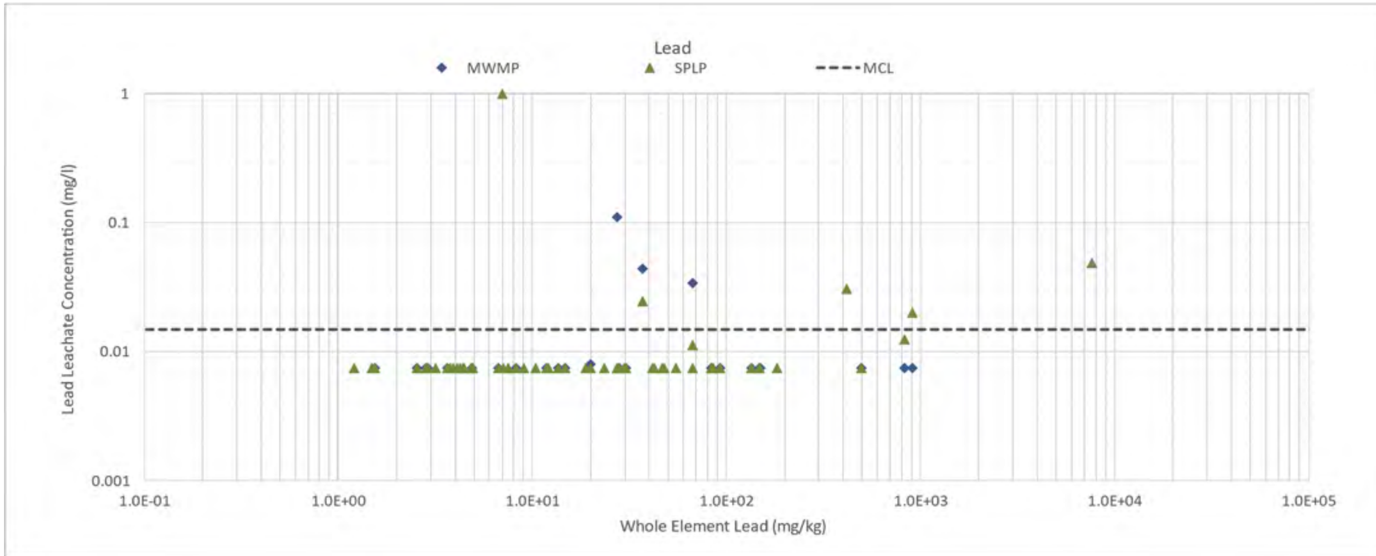


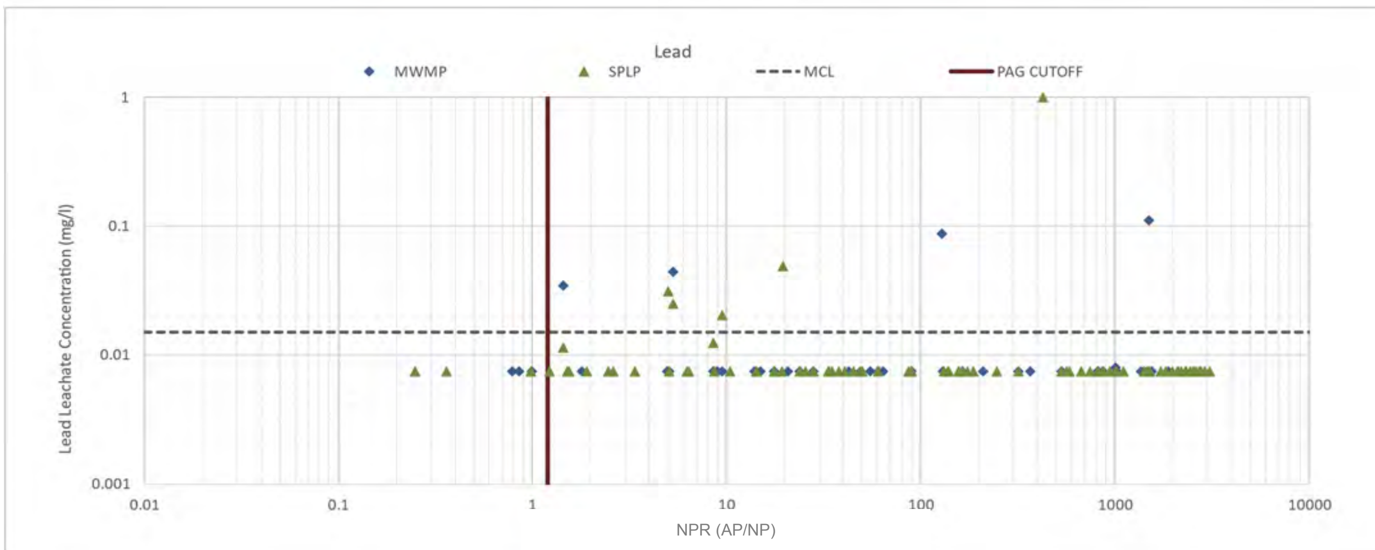


PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Fluoride

CLIENT:	Rosemont Copper Company	PROJECT:	Rosemont Copper World Project
JOB #:	4286	DRAWN:	TC
		CHECKED:	TC
DATE:	May 2022	FIGURE:	3.22





PITEAU ASSOCIATES
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A TETRA TECH COMPANY

SPLP and MWMP Results: Lead

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 3.23

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Magnesium

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

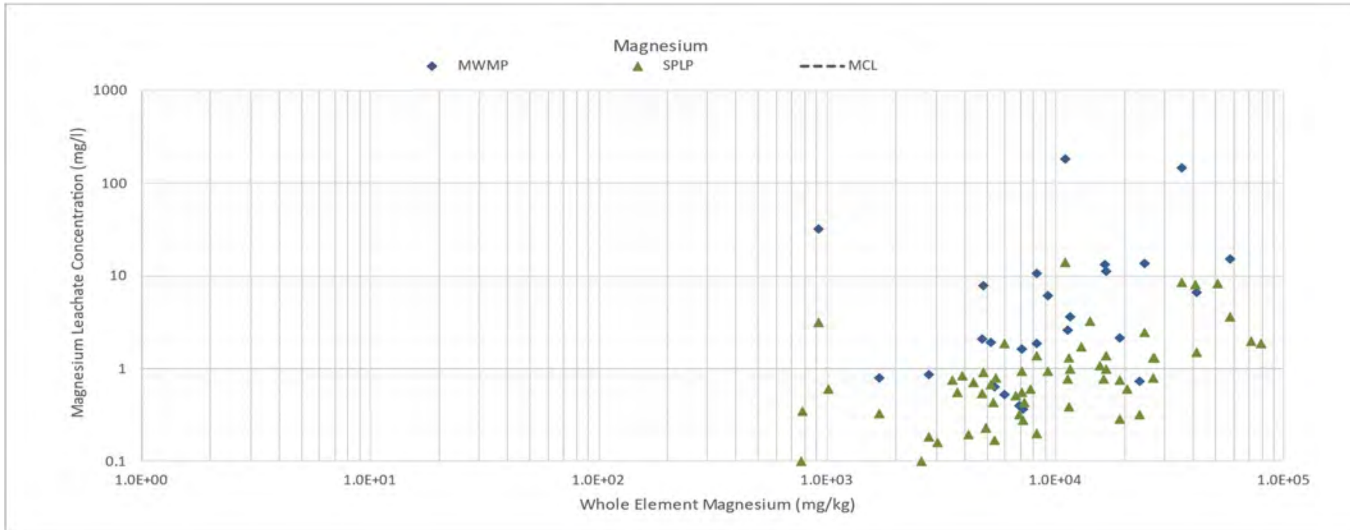
JOB #: 4286

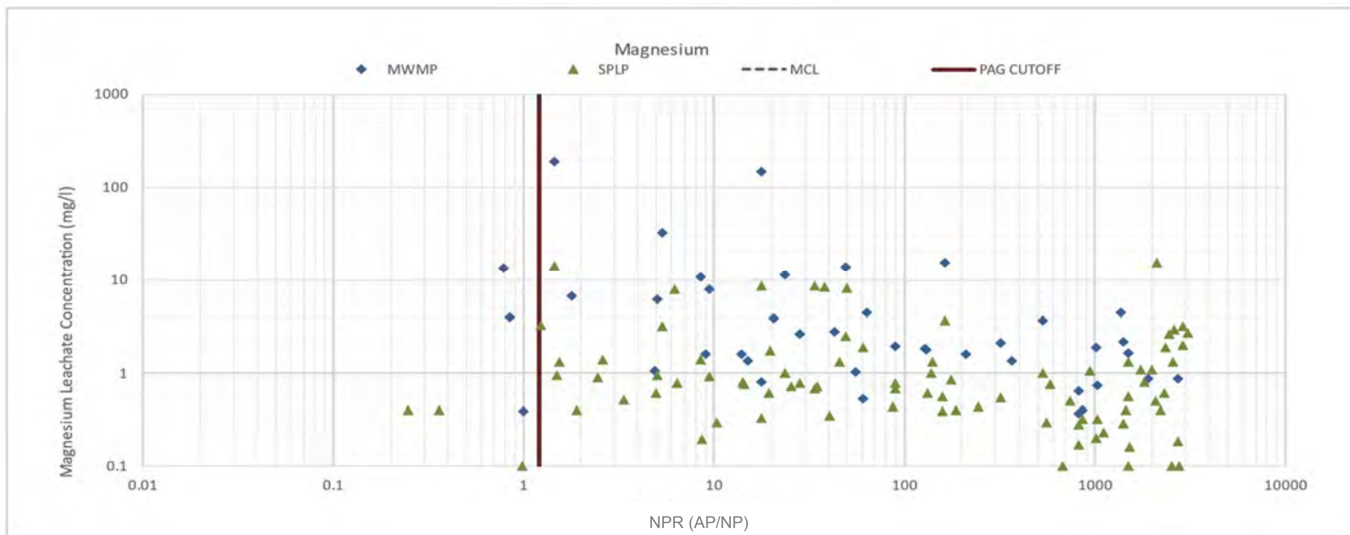
DRAWN: TC

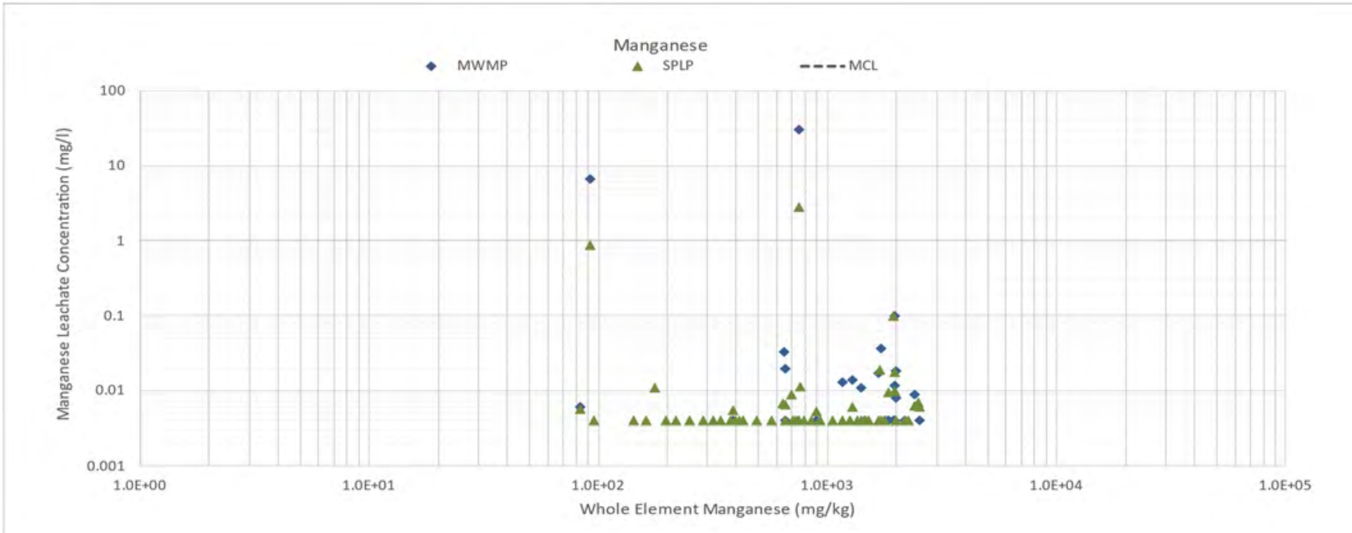
CHECKED: TC

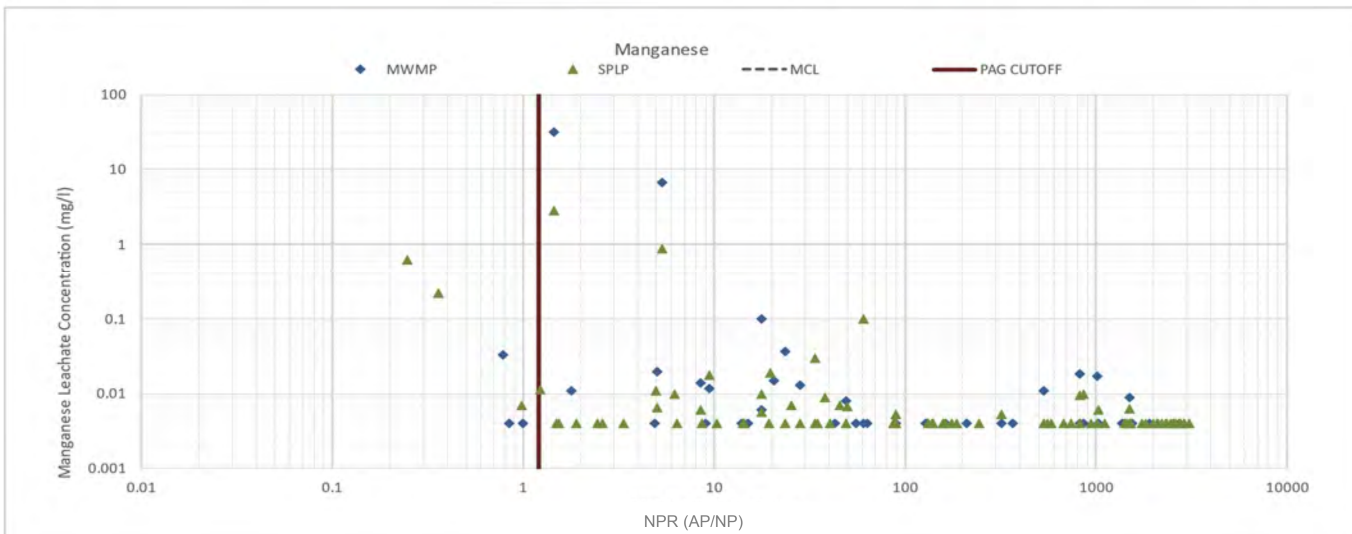
DATE: May 2022

FIGURE: 3.24









PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Manganese

CLIENT:	Rosemont Copper Company	PROJECT:	Rosemont Copper World Project
JOB #:	4286	DRAWN:	TC
		CHECKED:	TC
DATE:	May 2022	FIGURE:	3.25

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Selenium

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

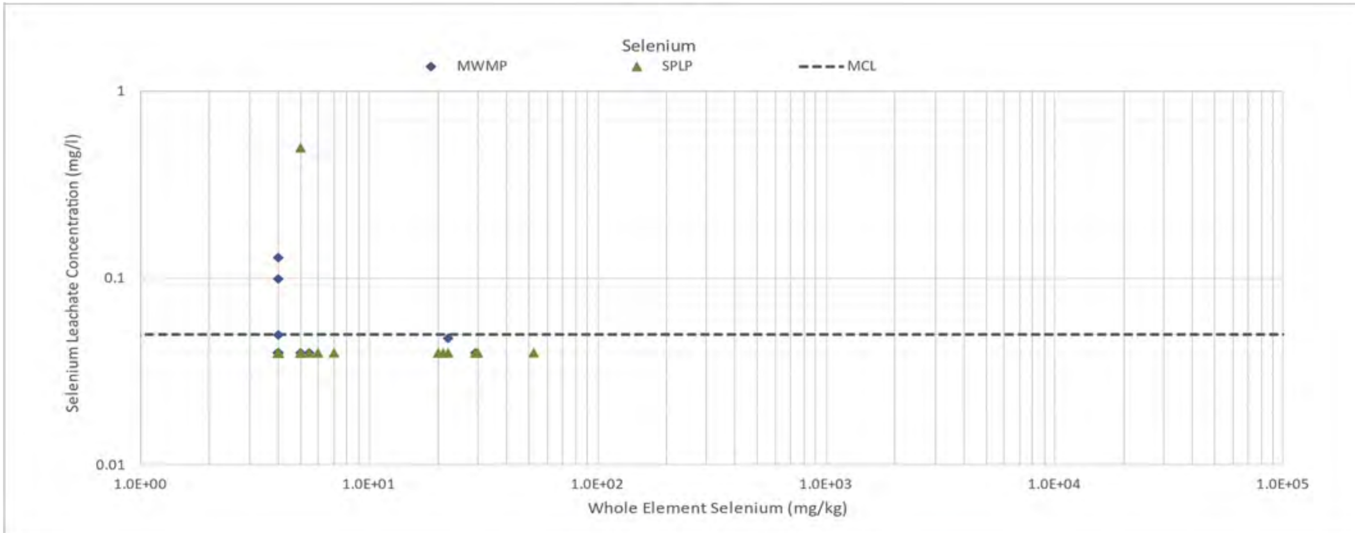
JOB #: 4286

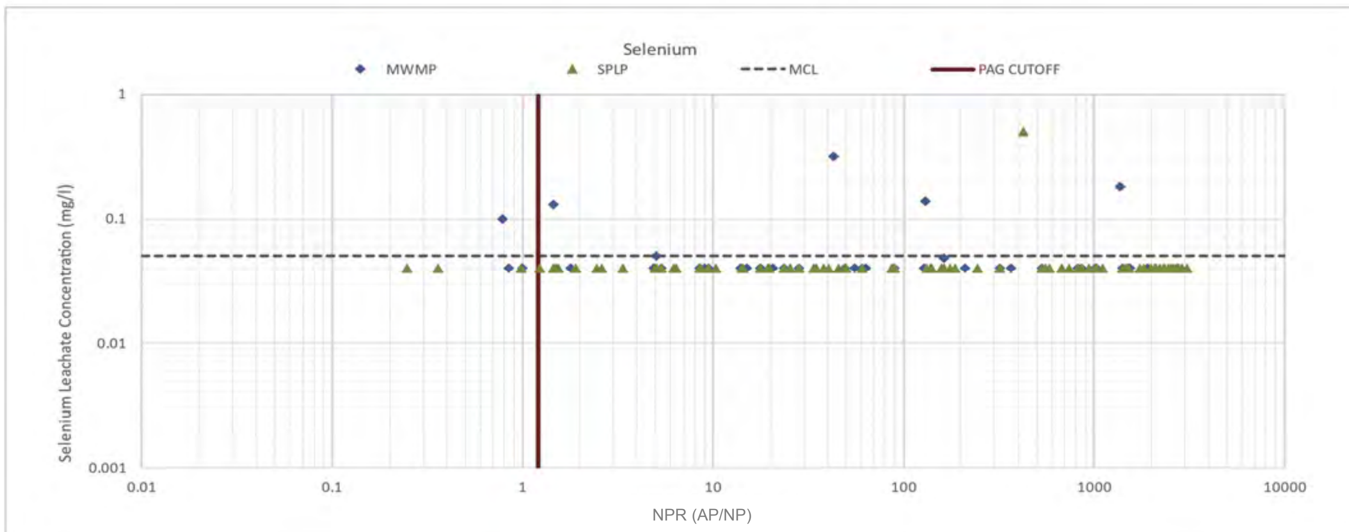
DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 3.26

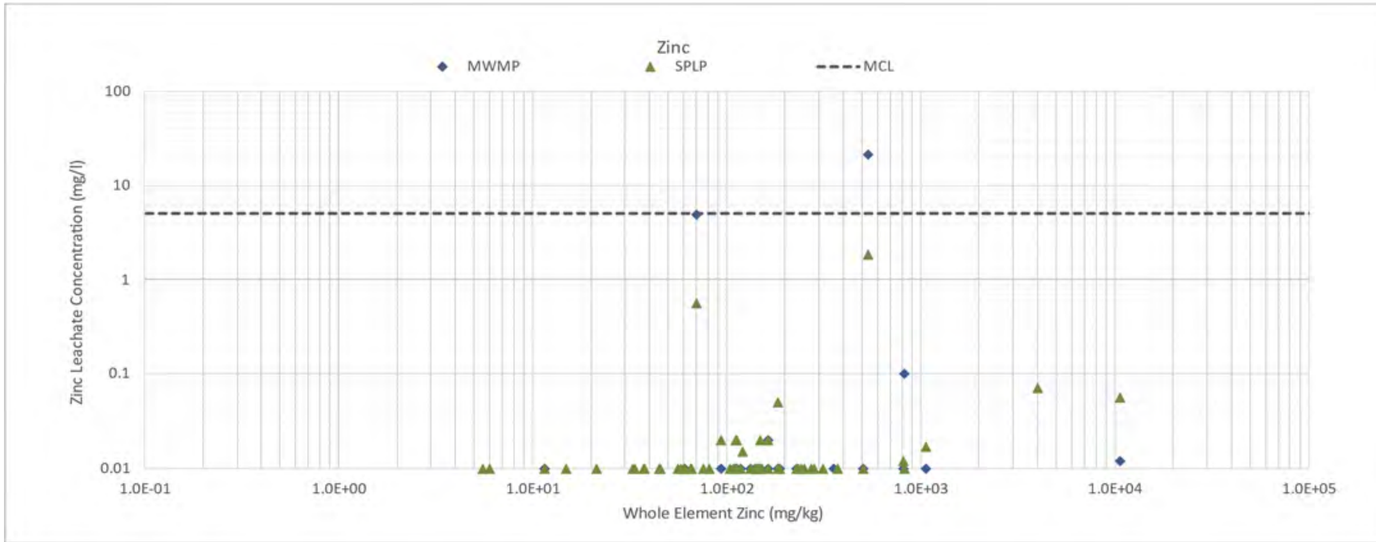


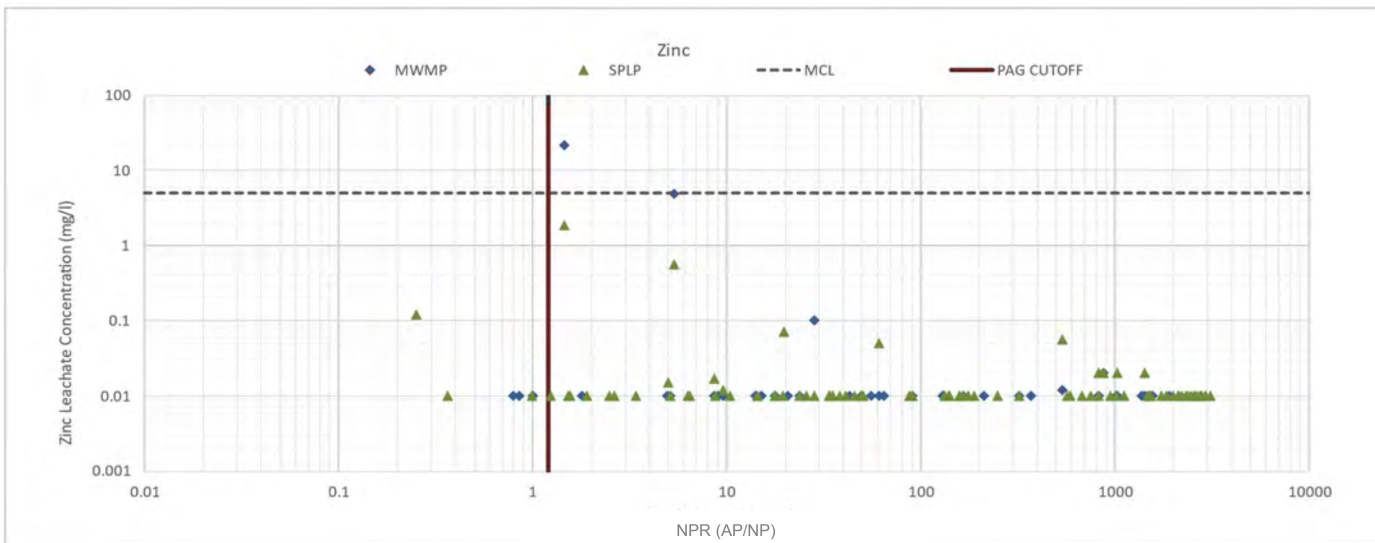


PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SPLP and MWMP Results: Zinc

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 3.27





PITEAU ASSOCIATES

A TETRA TECH COMPANY

SPLP vs. MWMP Results

CLIENT: Rosemont Copper Company

JOB #: 4286

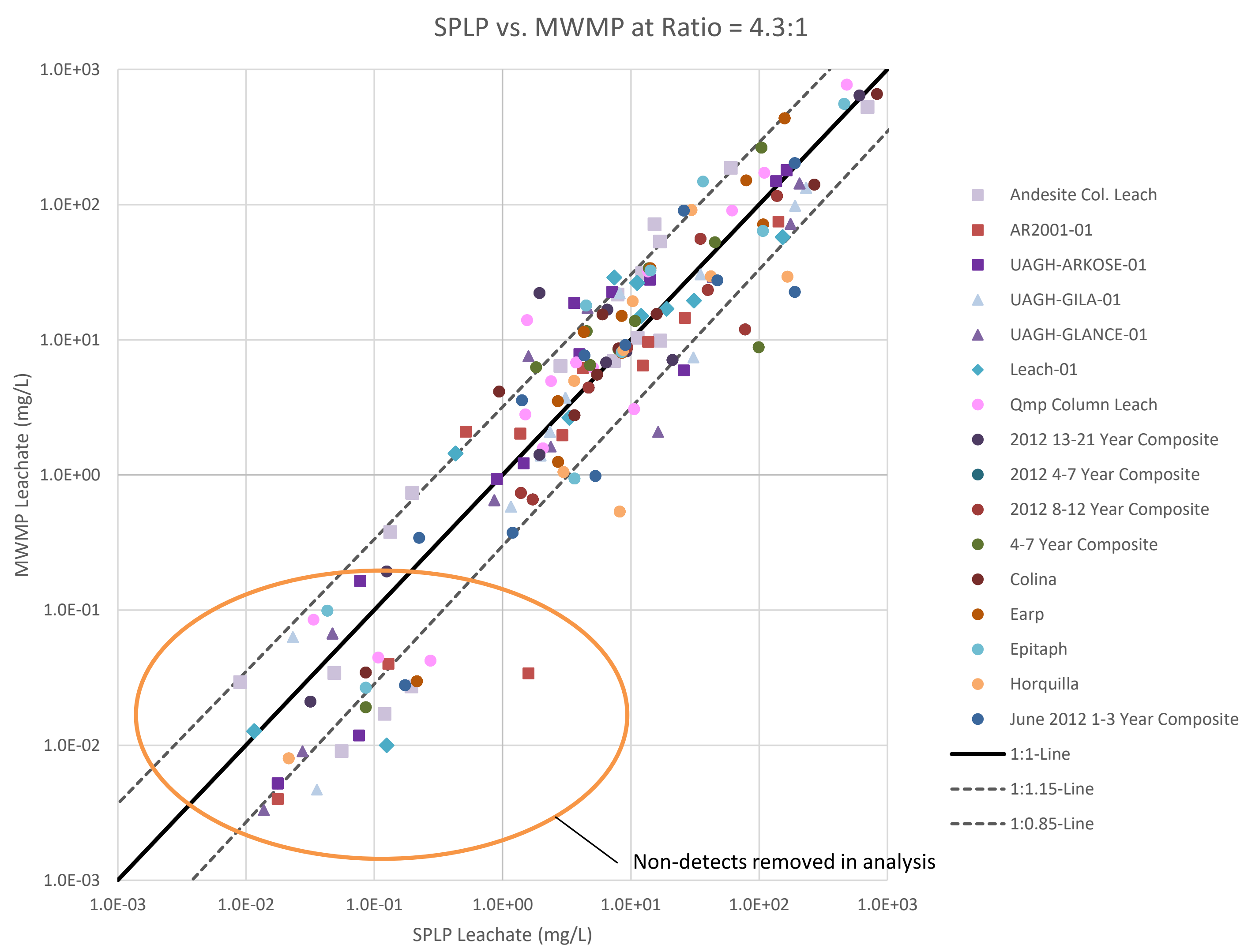
DATE: May 2022

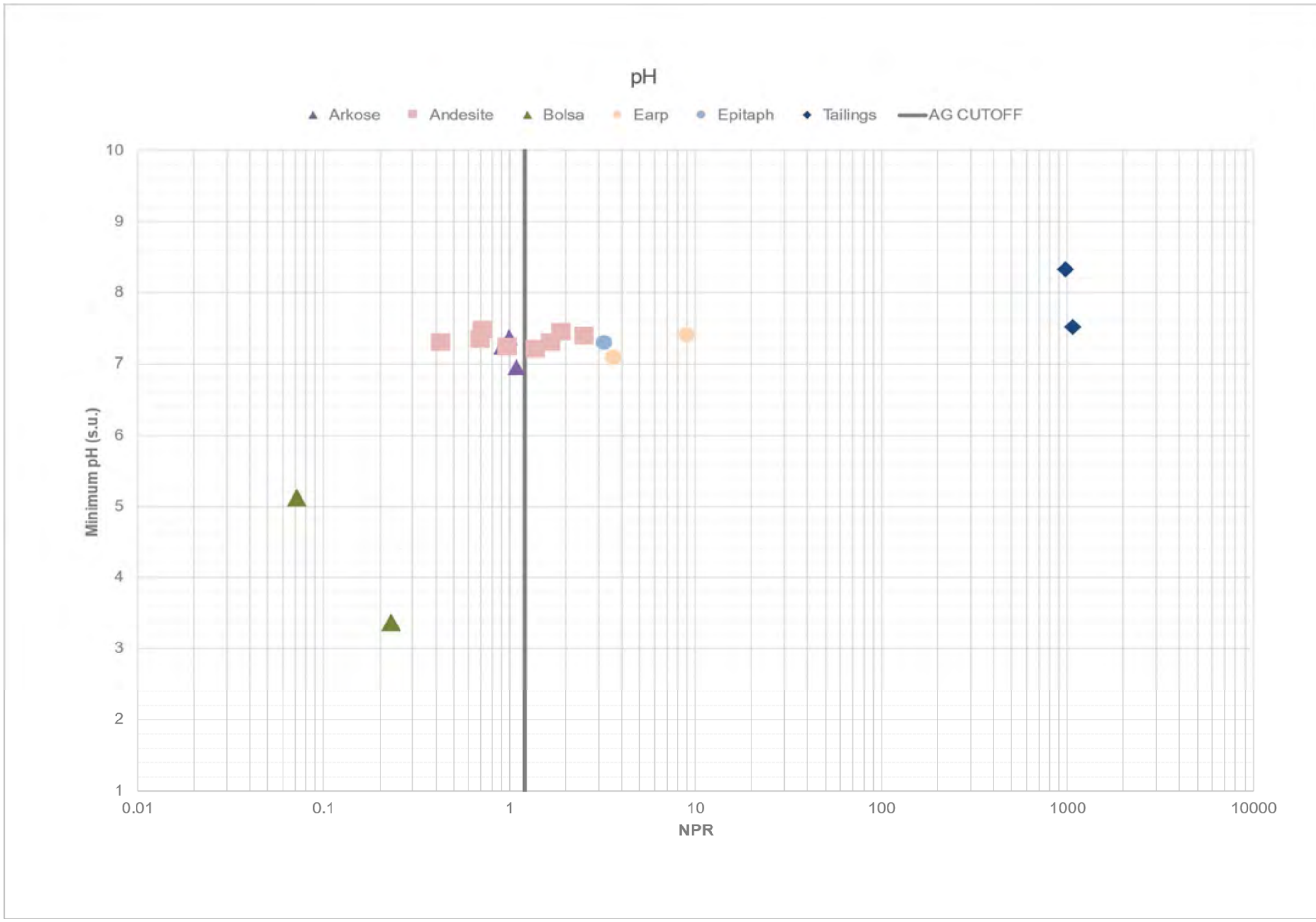
PROJECT: Rosemont Copper World Project

DRAWN: TC

CHECKED: TC

FIGURE: 3.28





PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT pH vs. NPR

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 3.29

PITEAU ASSOCIATES
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A TETRA TECH COMPANY

HCT Maximum SO4 vs. NPR

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

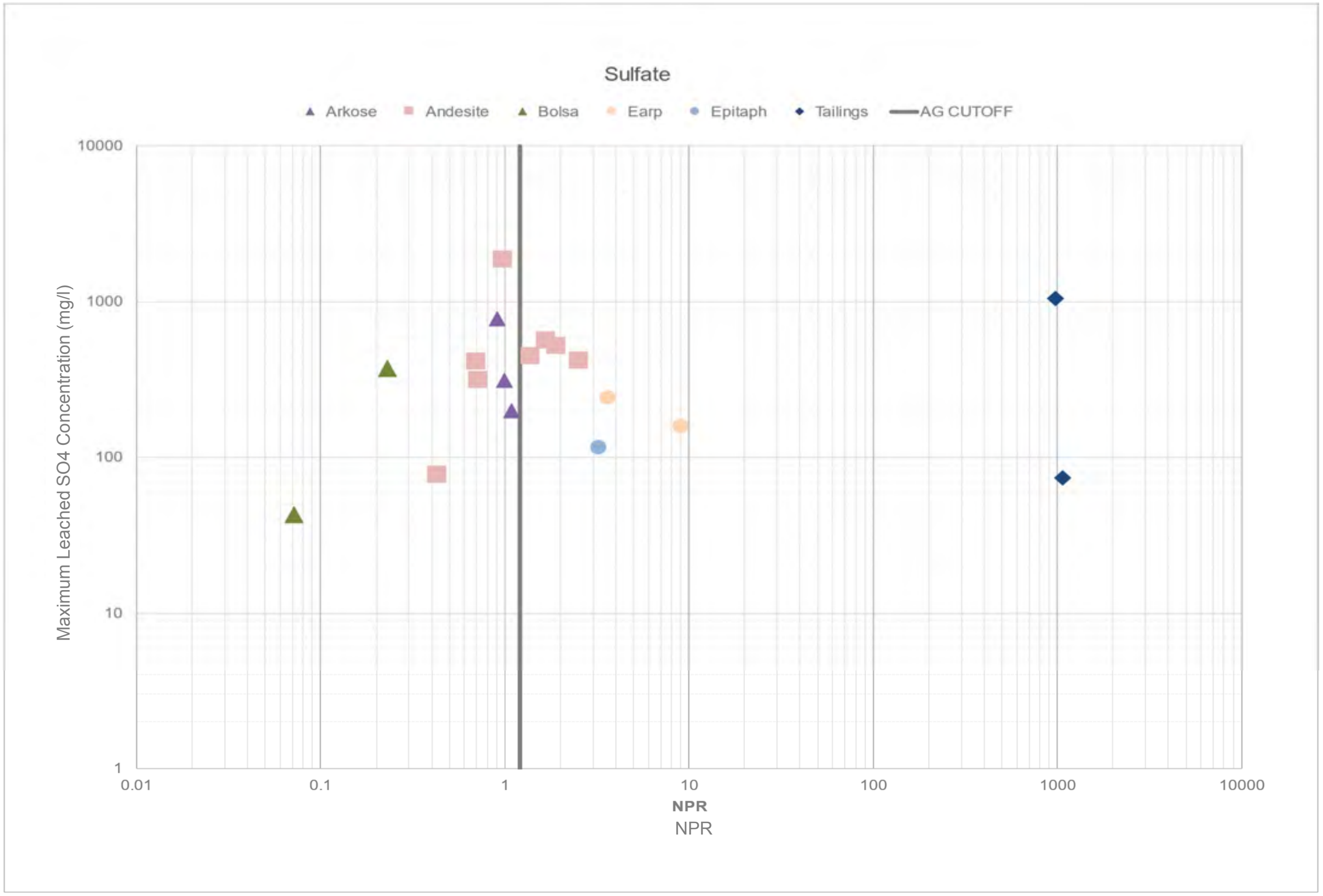
JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 3.30



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT Sulfate Release

CLIENT: Rosemont Copper Company

JOB #: 4286

DATE: May 2022

PROJECT: Rosmeont Copper World Project

DRAWN: TC

CHECKED: TC

FIGURE: 3.31

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT Alkalinity Release

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

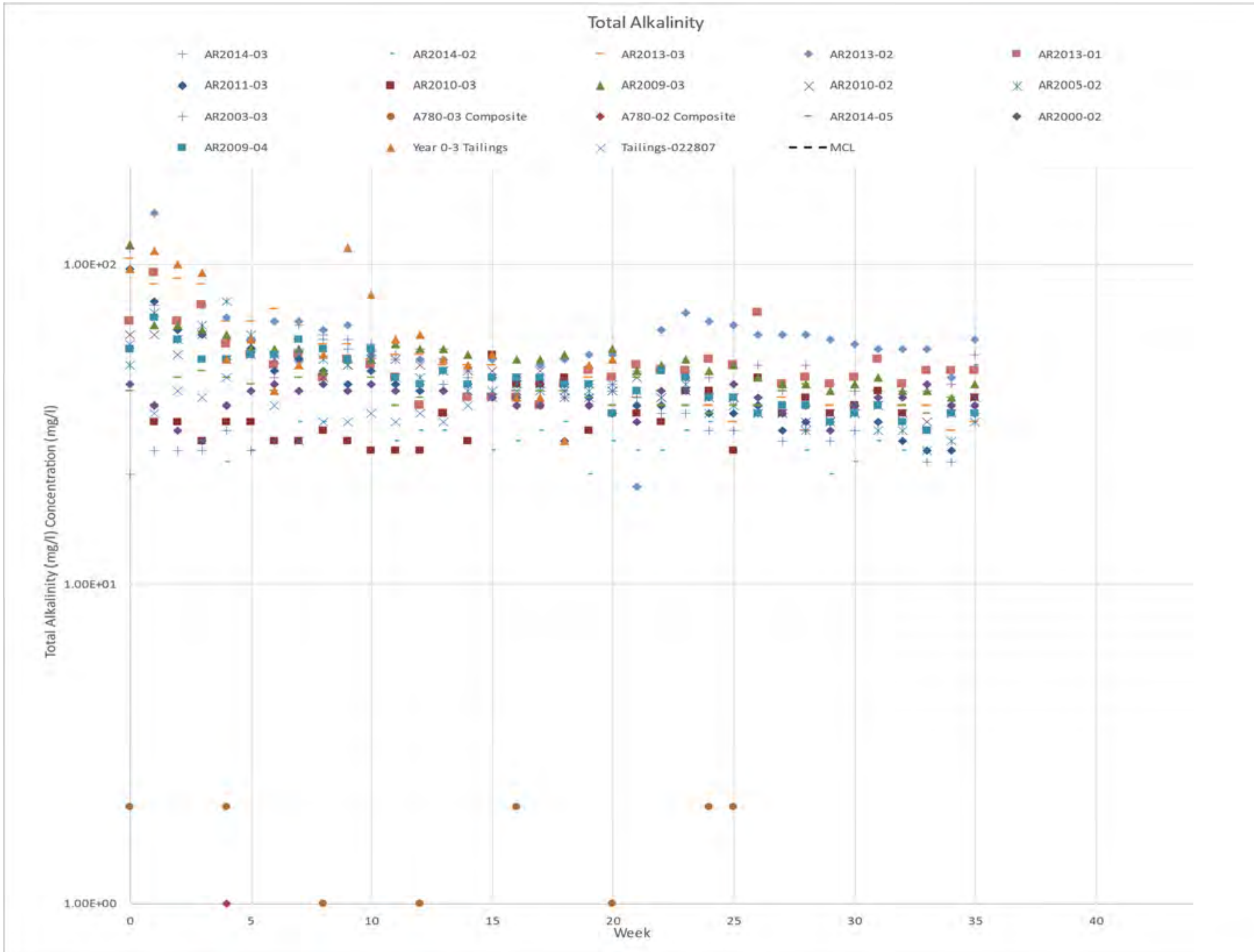
JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 3.32



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT Iron Release

CLIENT: Rosemont Copper Company

JOB #: 4286

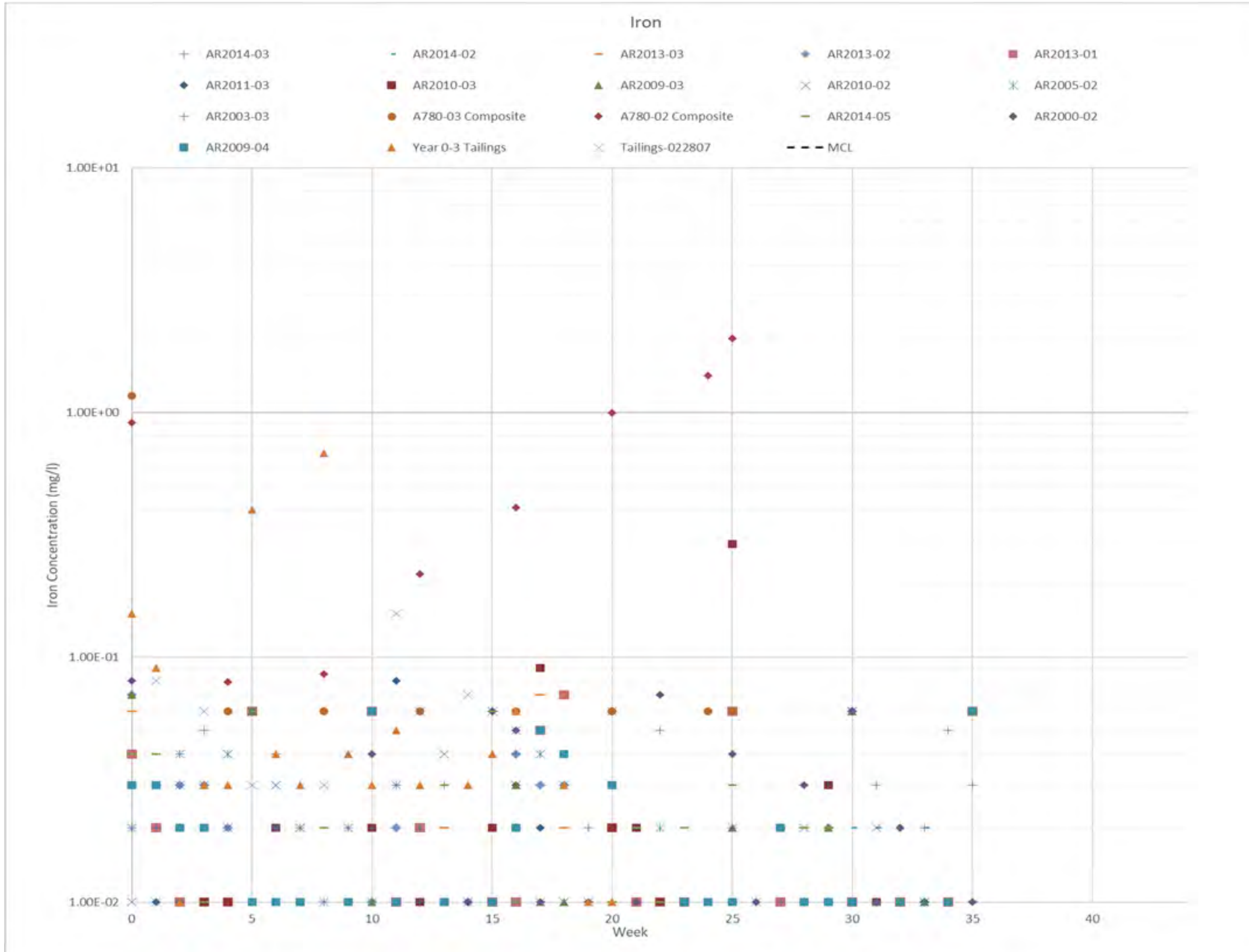
DATE: May 2022

PROJECT: Rosemoth Copper World Project

DRAWN: TC

CHECKED: TC

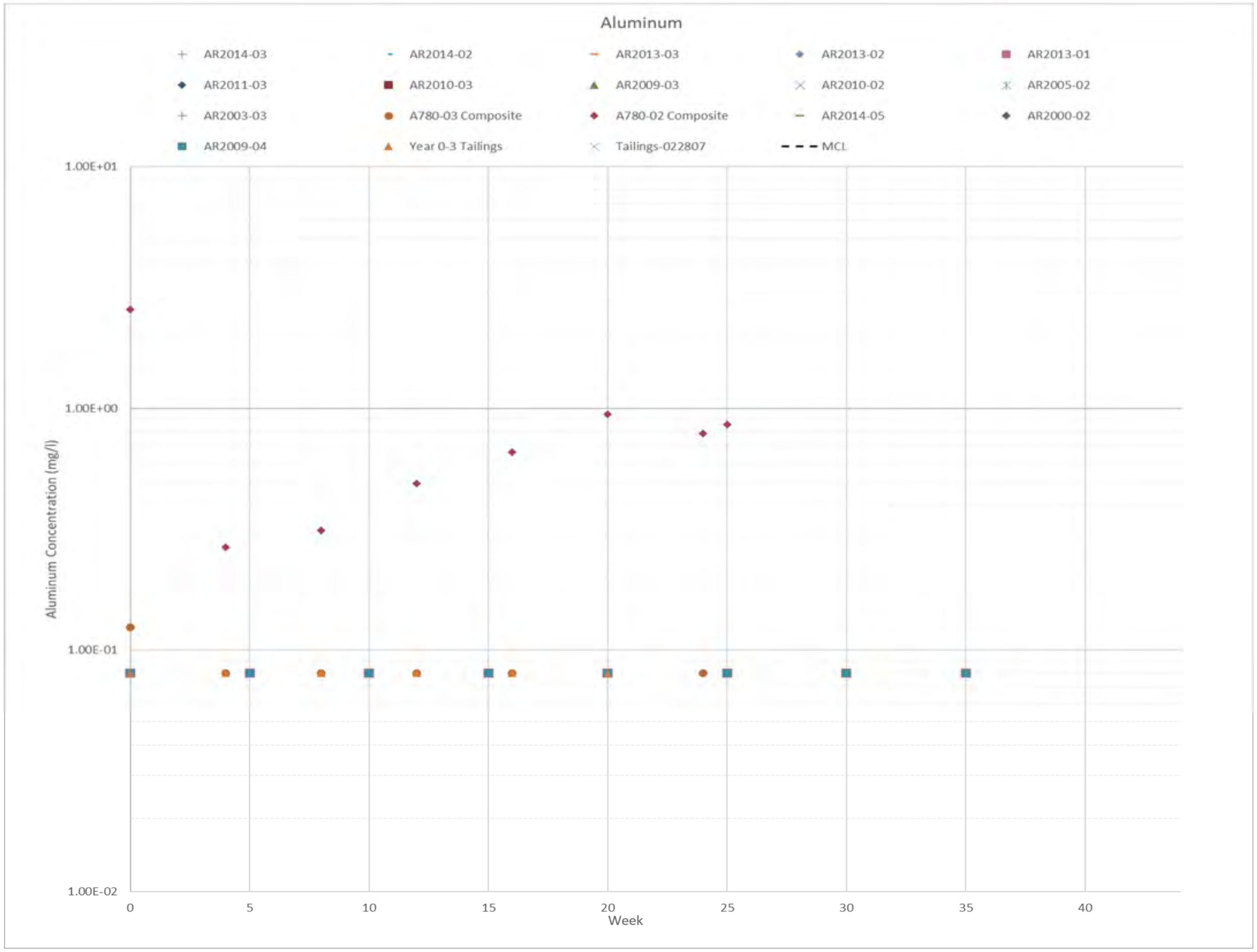
FIGURE: 3.33



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT Aluminium Release

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 3.34



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT Antimony Release

CLIENT: Rosemont Copper Company

JOB #: 4286

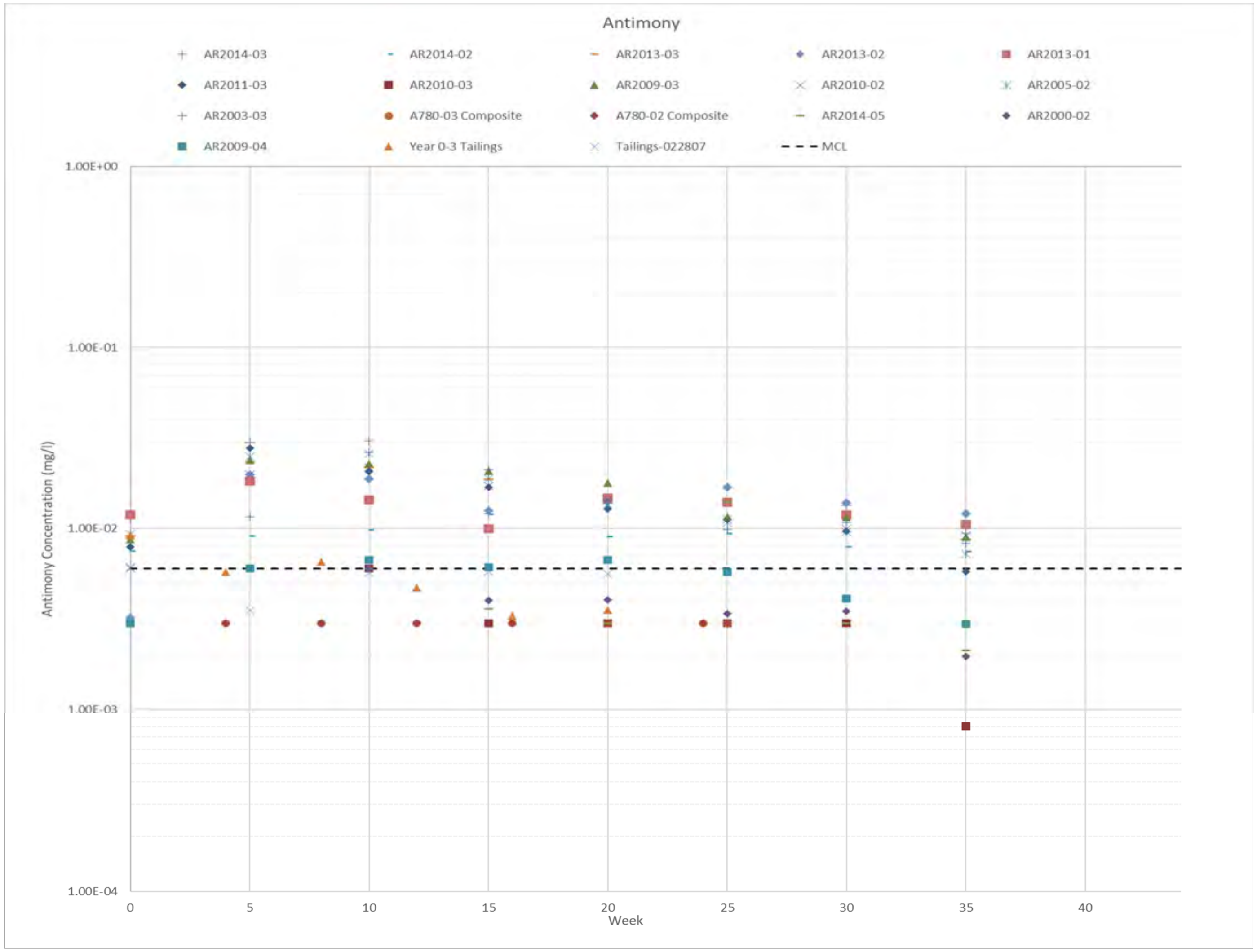
DATE: May 2022

PROJECT: Rosemont Copper World Project

DRAWN: TC

CHECKED: TC

FIGURE: 3.35



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT Arsenic Release

CLIENT: Rosemont Copper Company

JOB #: 4286

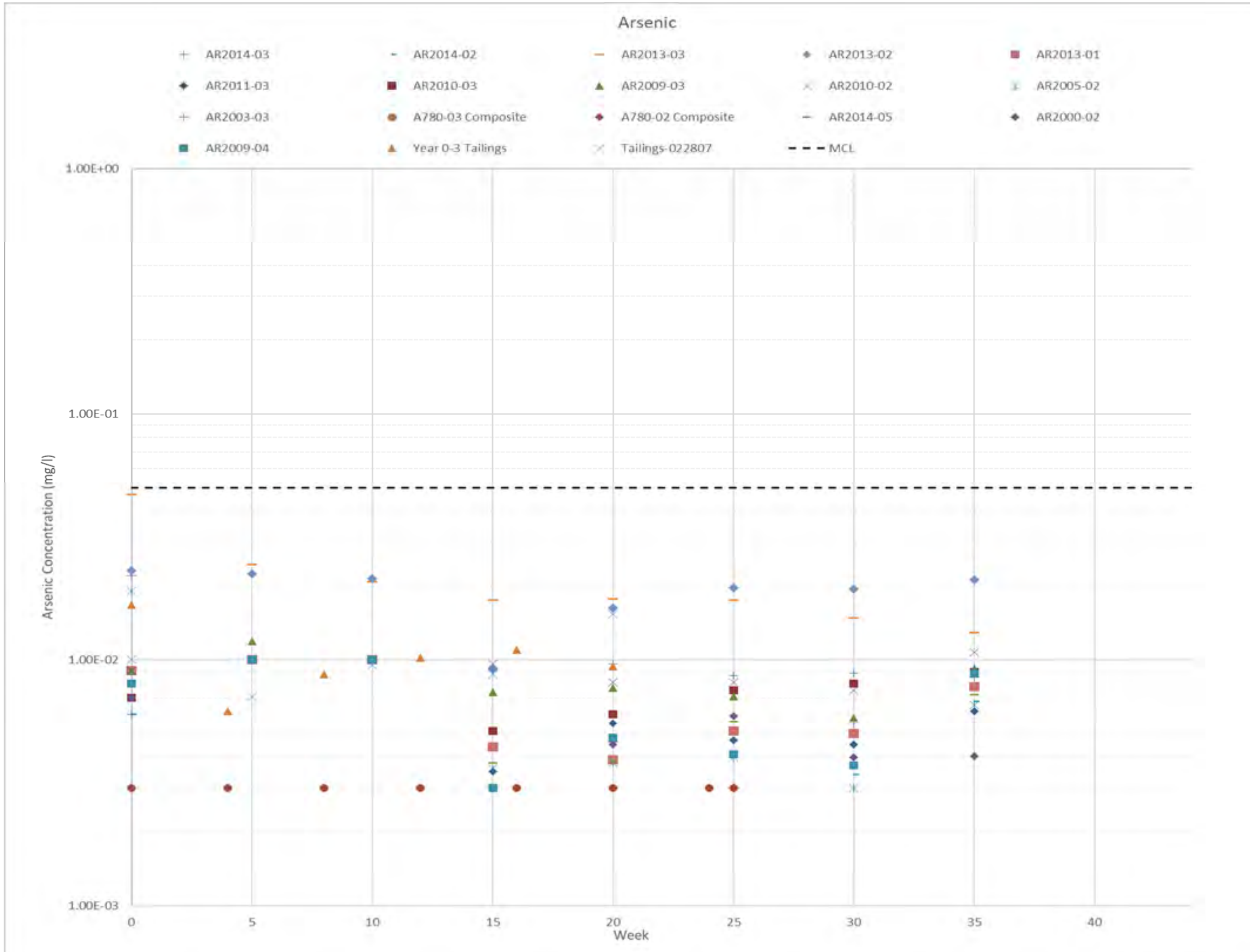
DATE: May 2022

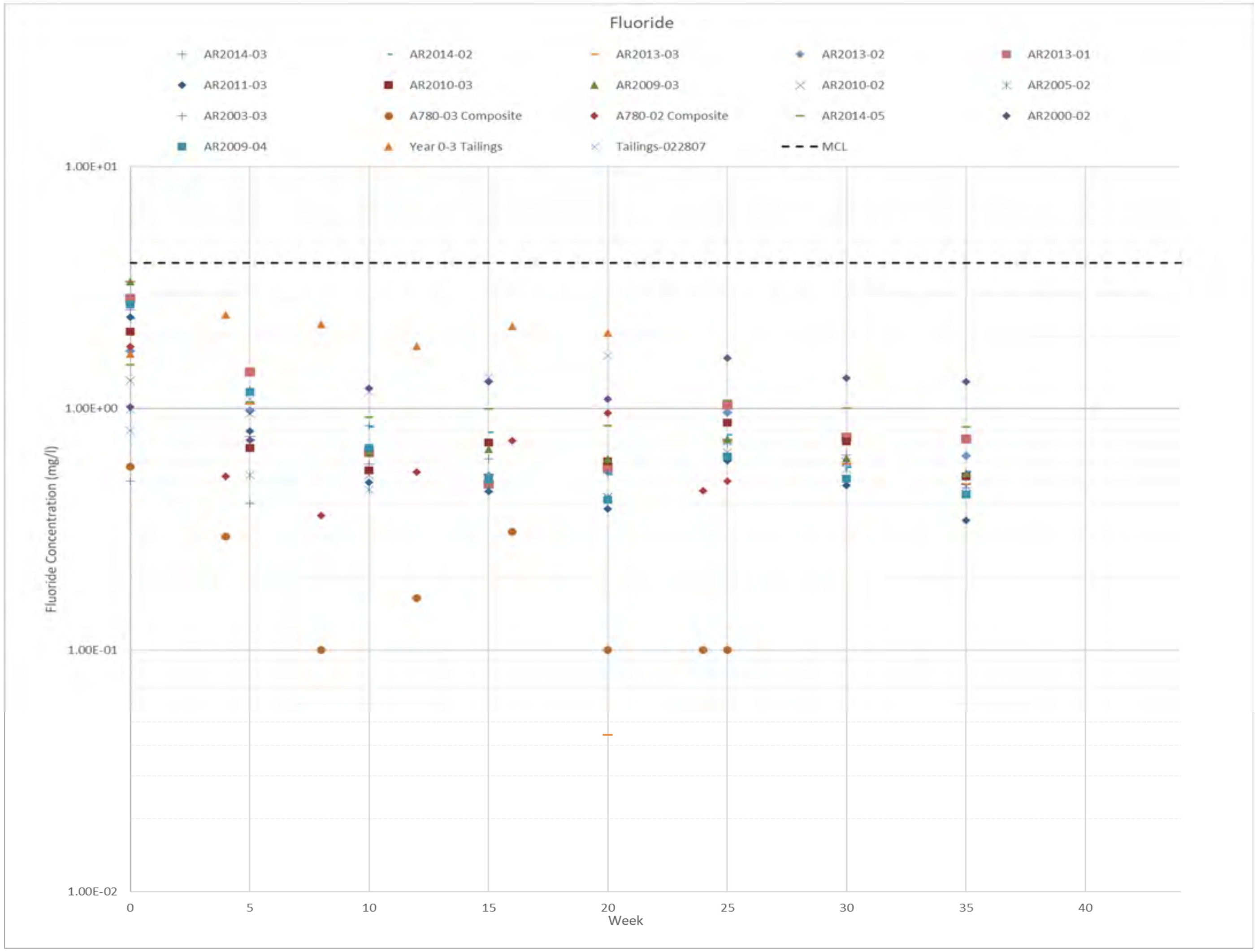
PROJECT: Rosemont Copper World Project

DRAWN: TC

CHECKED: TC

FIGURE: 3.36





PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT Fluoride Release

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

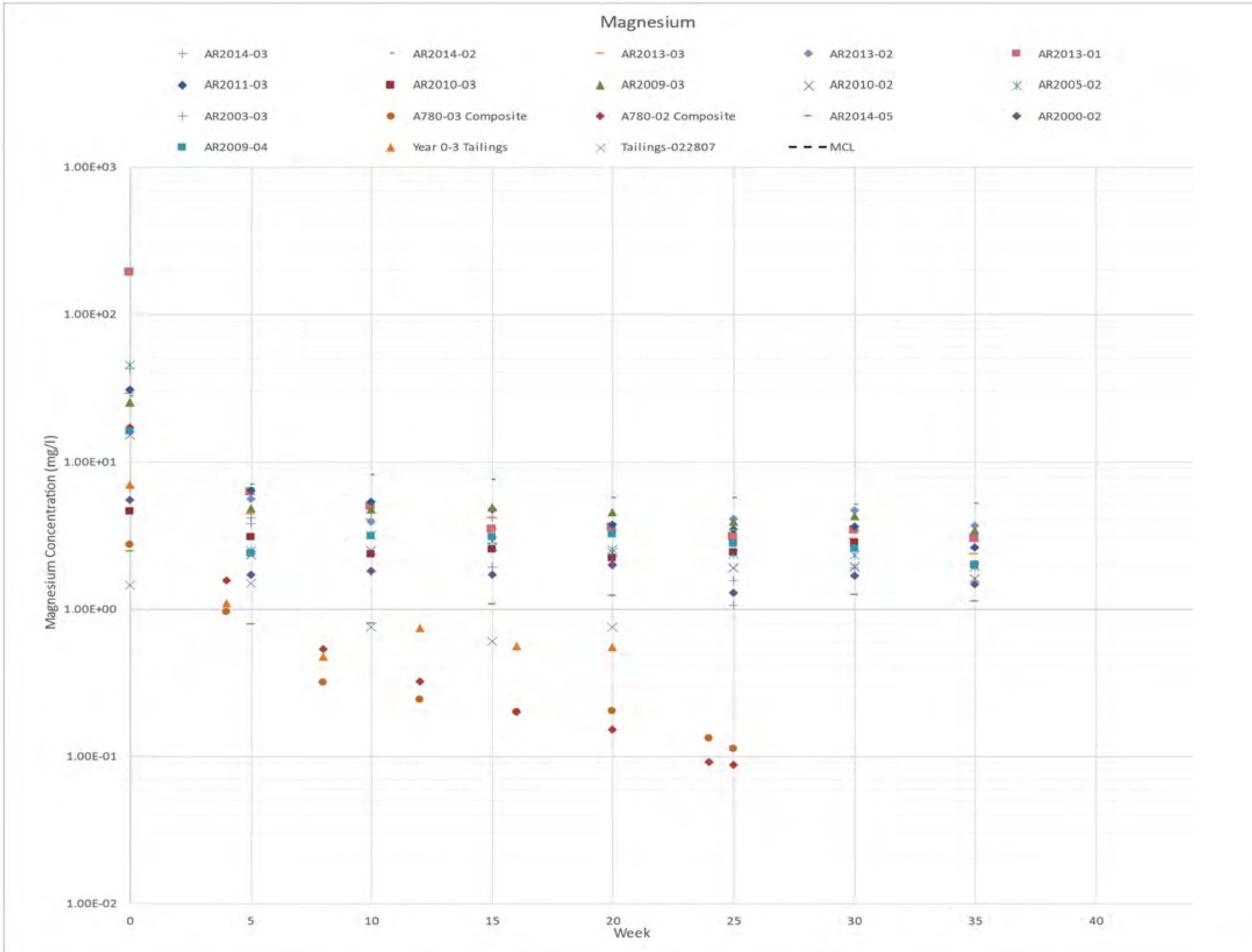
JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 3.37



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT Magnesium Release

CLIENT: Rosemont Copper Company

JOB #: 4286

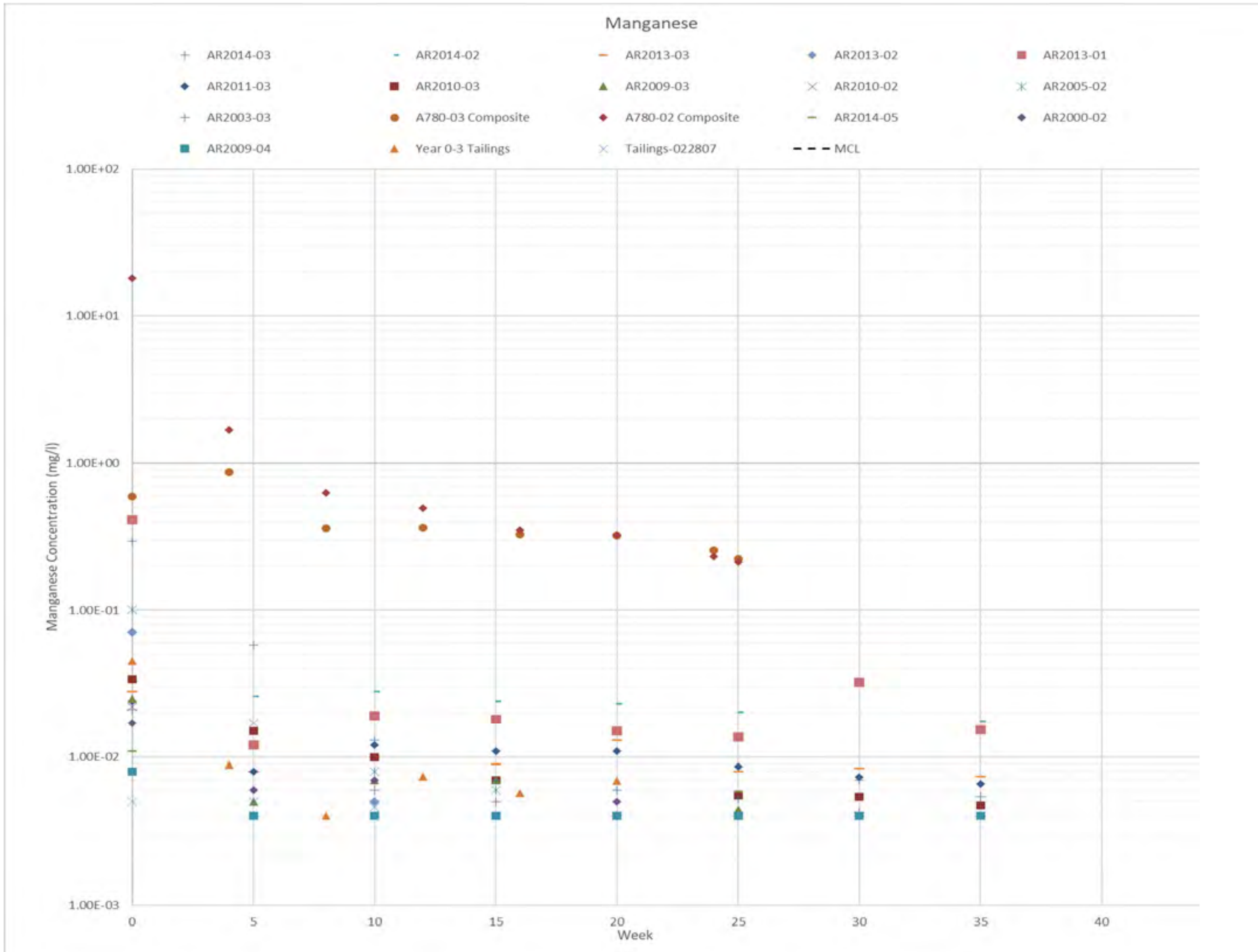
DATE: May 2022

PROJECT: Rosemont Copper World Project

DRAWN: TC

CHECKED: TC

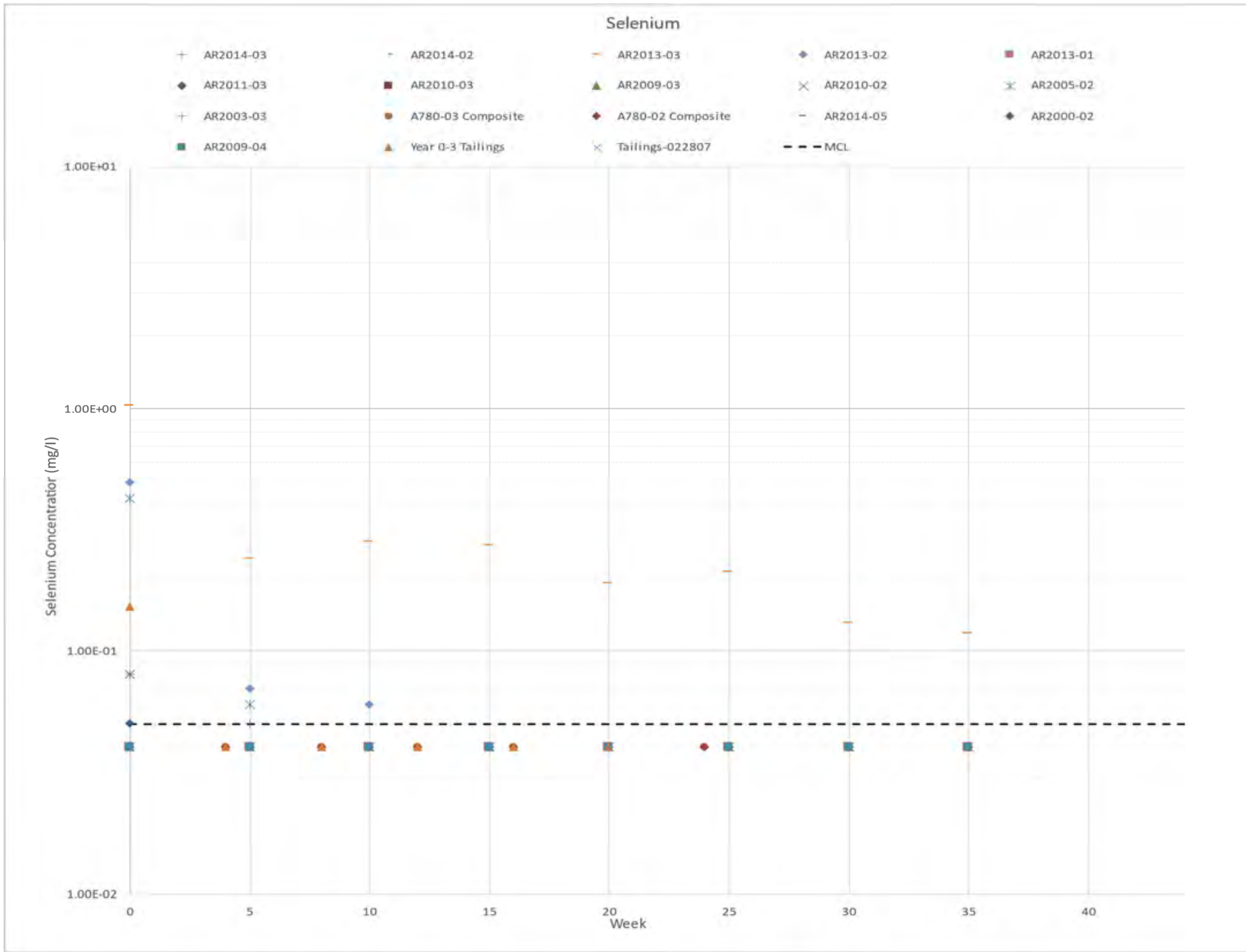
FIGURE: 3.38



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT Manganese Release

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 3.39



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HCT Selenium Release

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

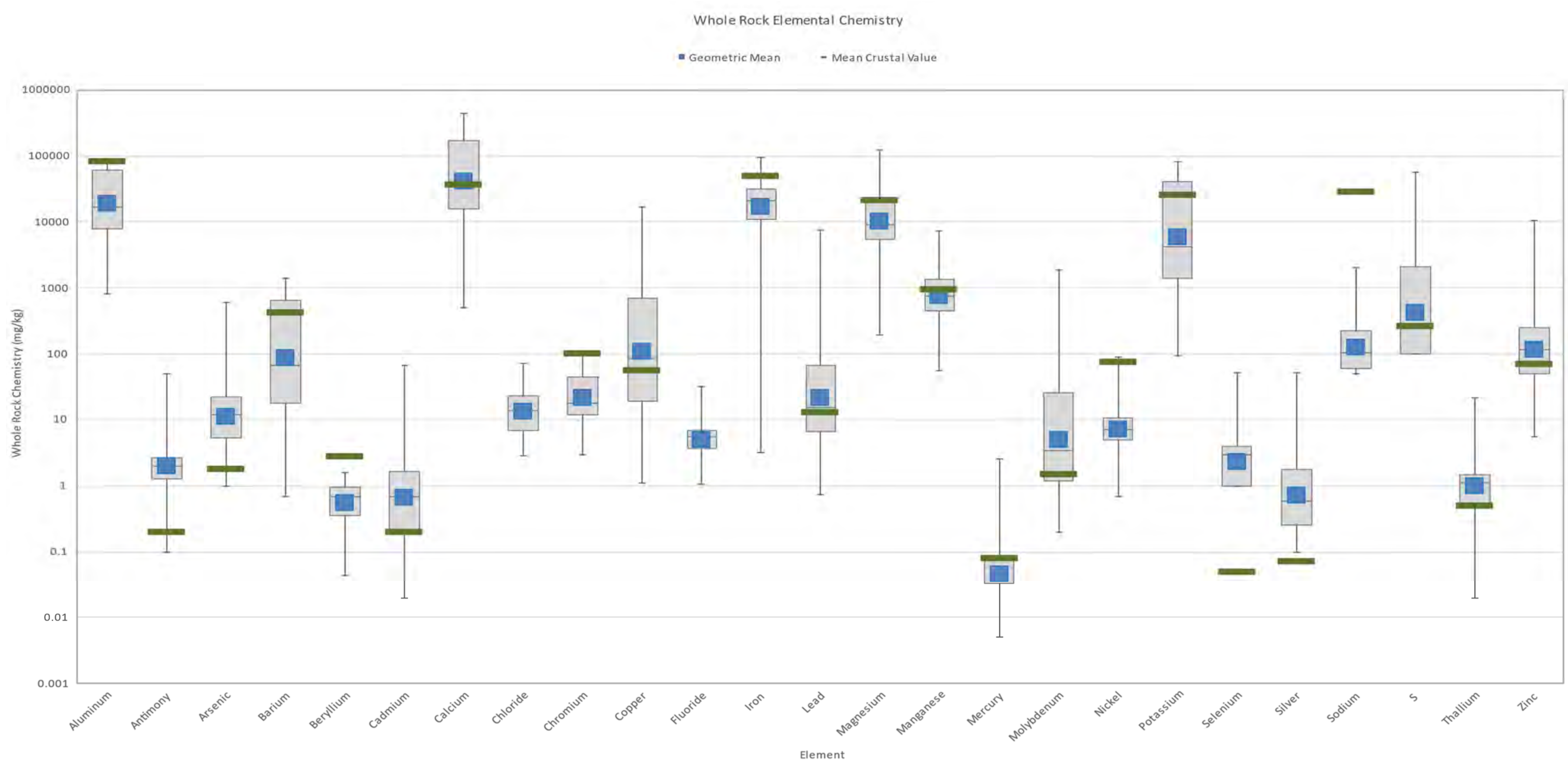
JOB #: 4286

DRAWN: TC

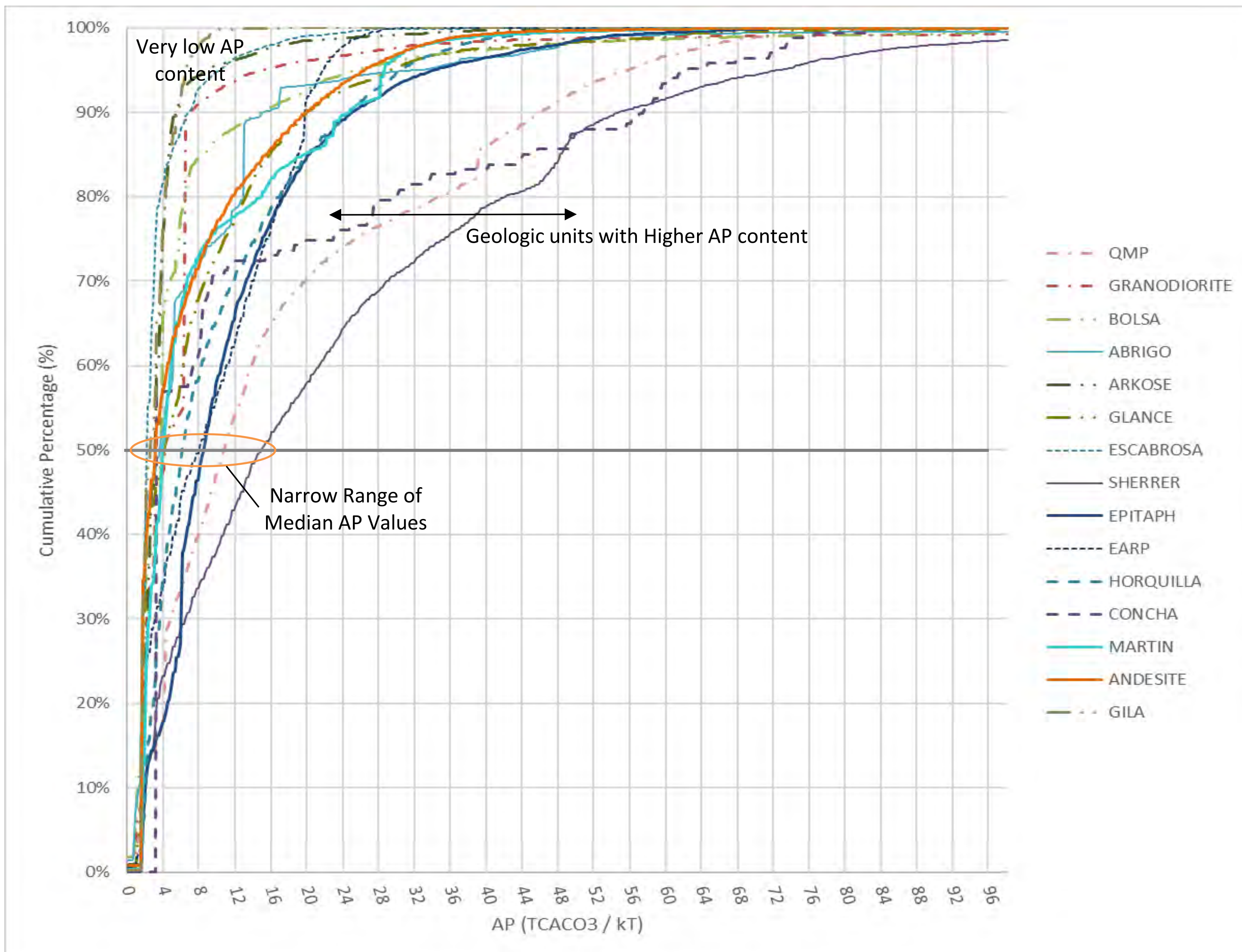
CHECKED: TC

DATE: May 2022

FIGURE: 3.40



PITEAU ASSOCIATES	Whole Rock Elemental Chemistry versus Crustal Averages			
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project		
	JOB 4286	DRAWN: TC	CHECKED: TC	
	DATE: May 2022	FIGURE: 3.41		



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Cumulative Distribution Function of AP

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 3.42

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Cumulative Distribution Function of NP

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

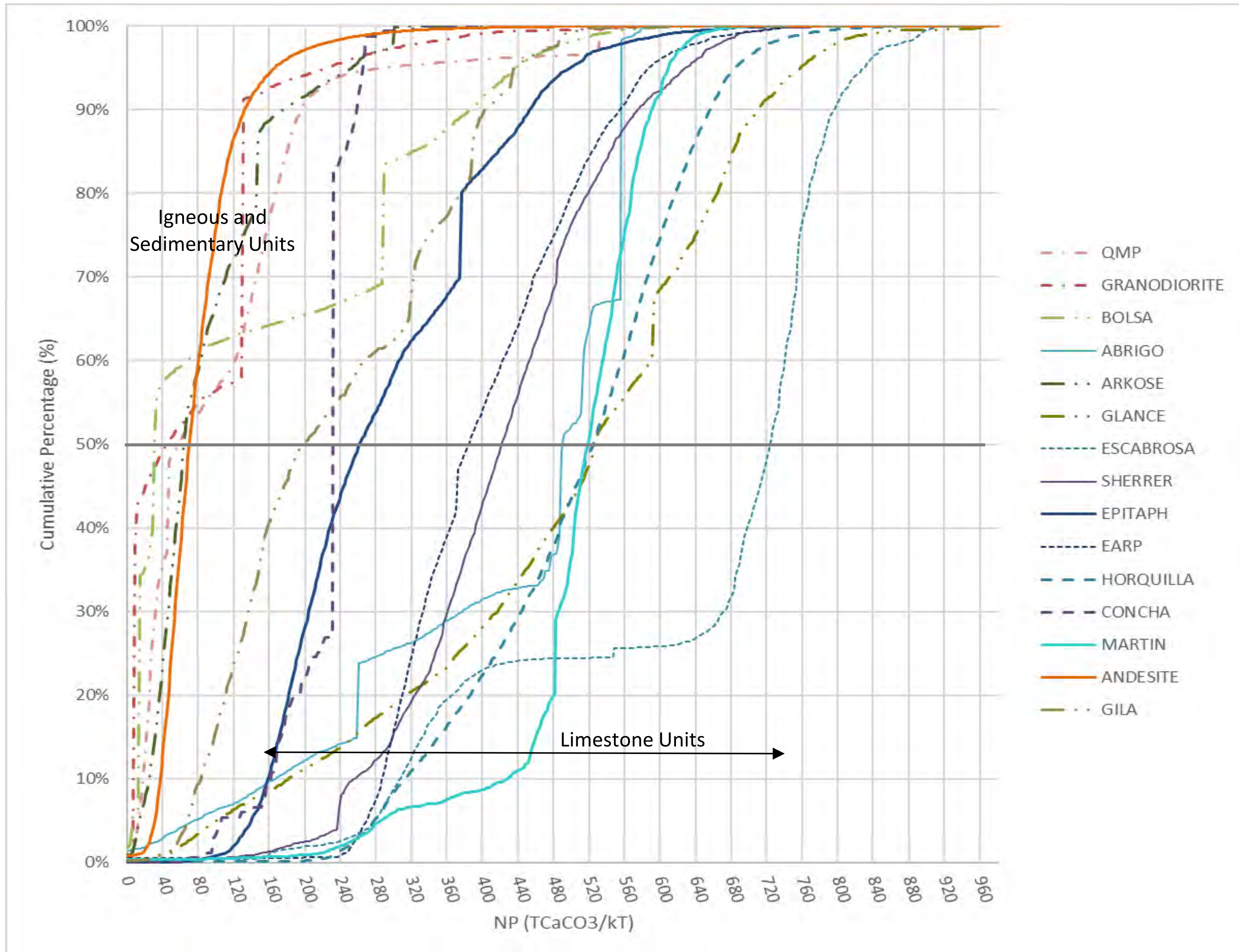
JOB #: 4286

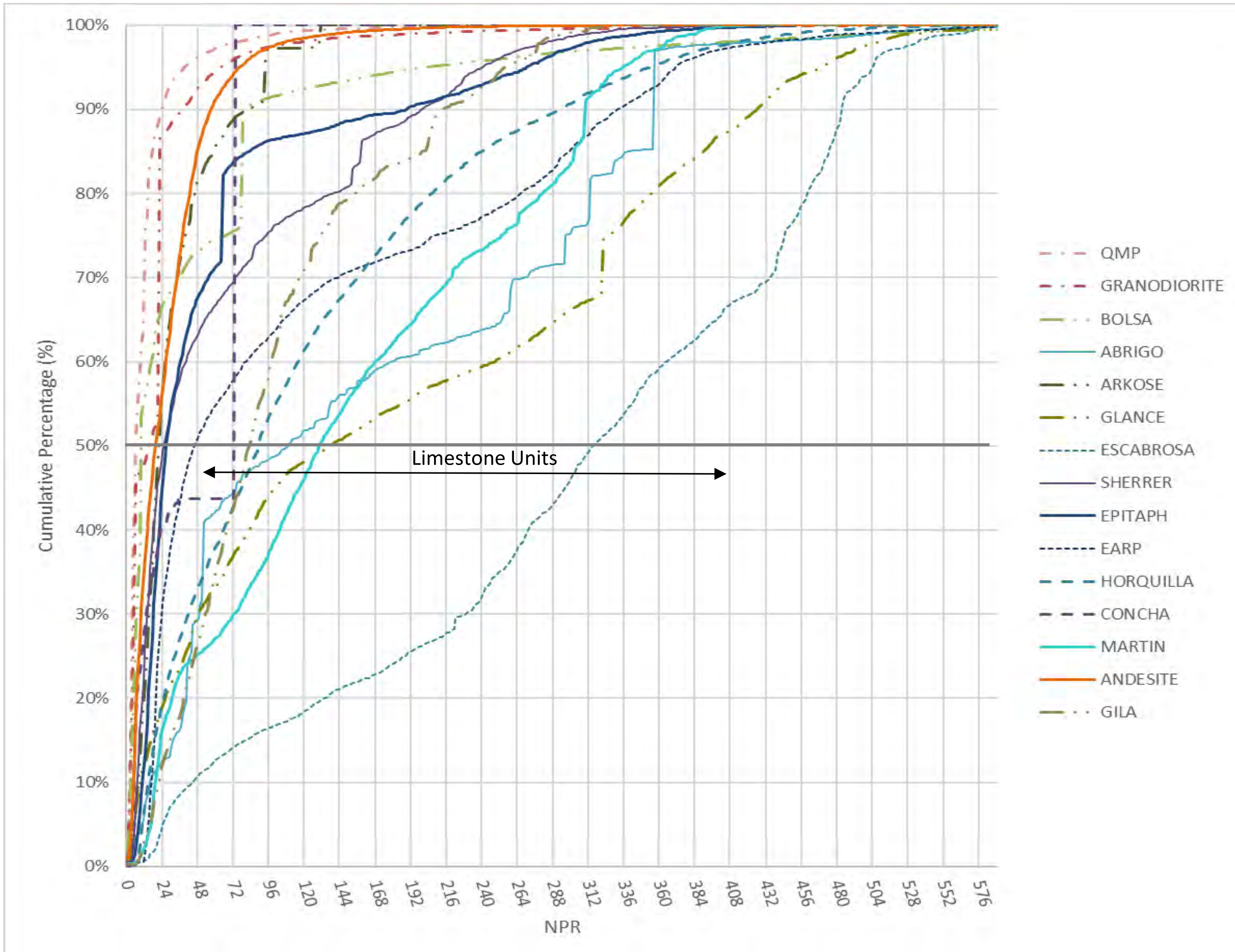
DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 3.43

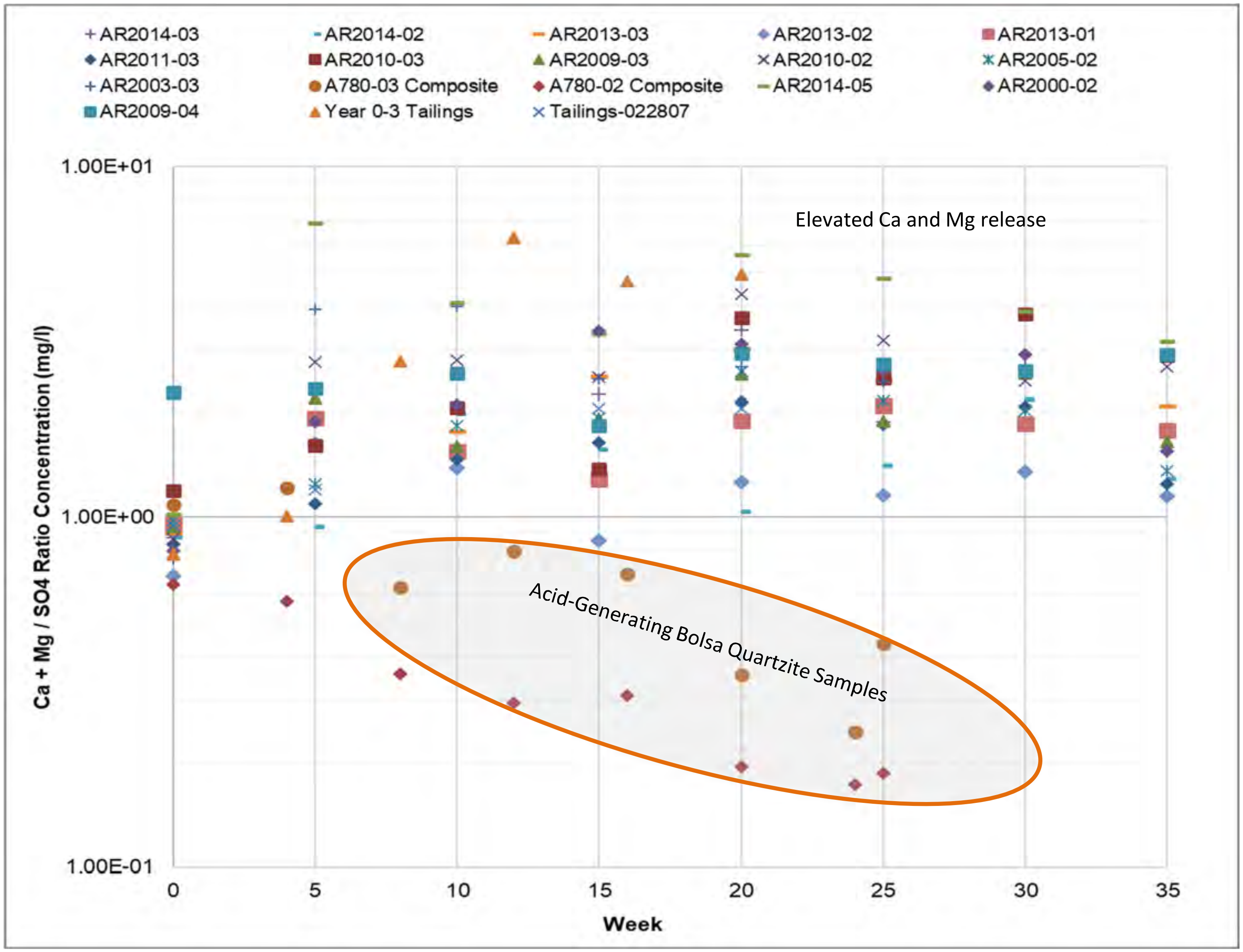




PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRATECH COMPANY

Cumulative Distribution Function of NPR

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 3.44



PITEAU ASSOCIATES
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A TETRA TECH COMPANY

Molar Ratio of Ca + Mg / SO4

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 3.45

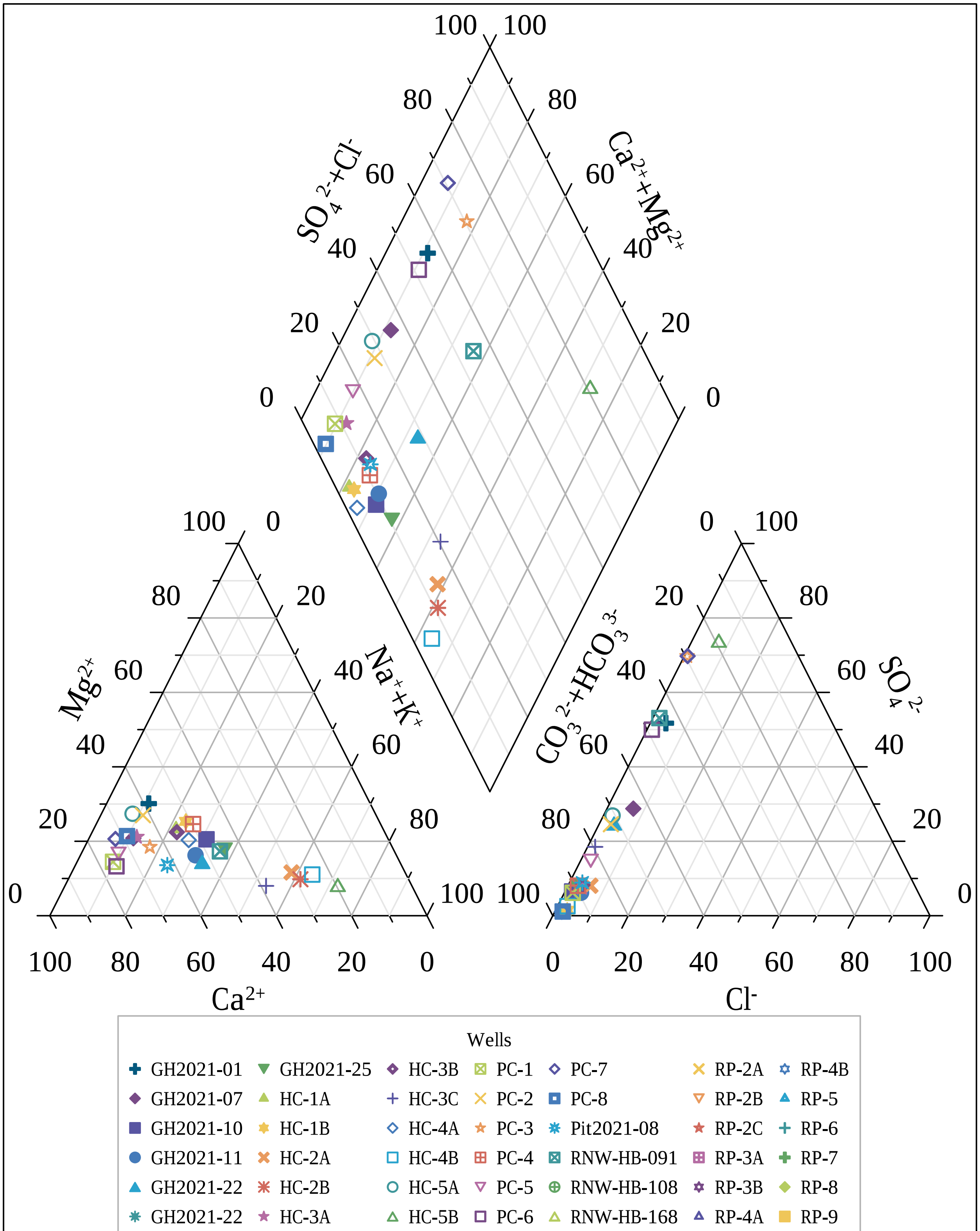

Fig. 3.46
Rosemont Copper Company
Rosemont Copper World Project

PITEAU ASSOCIATES
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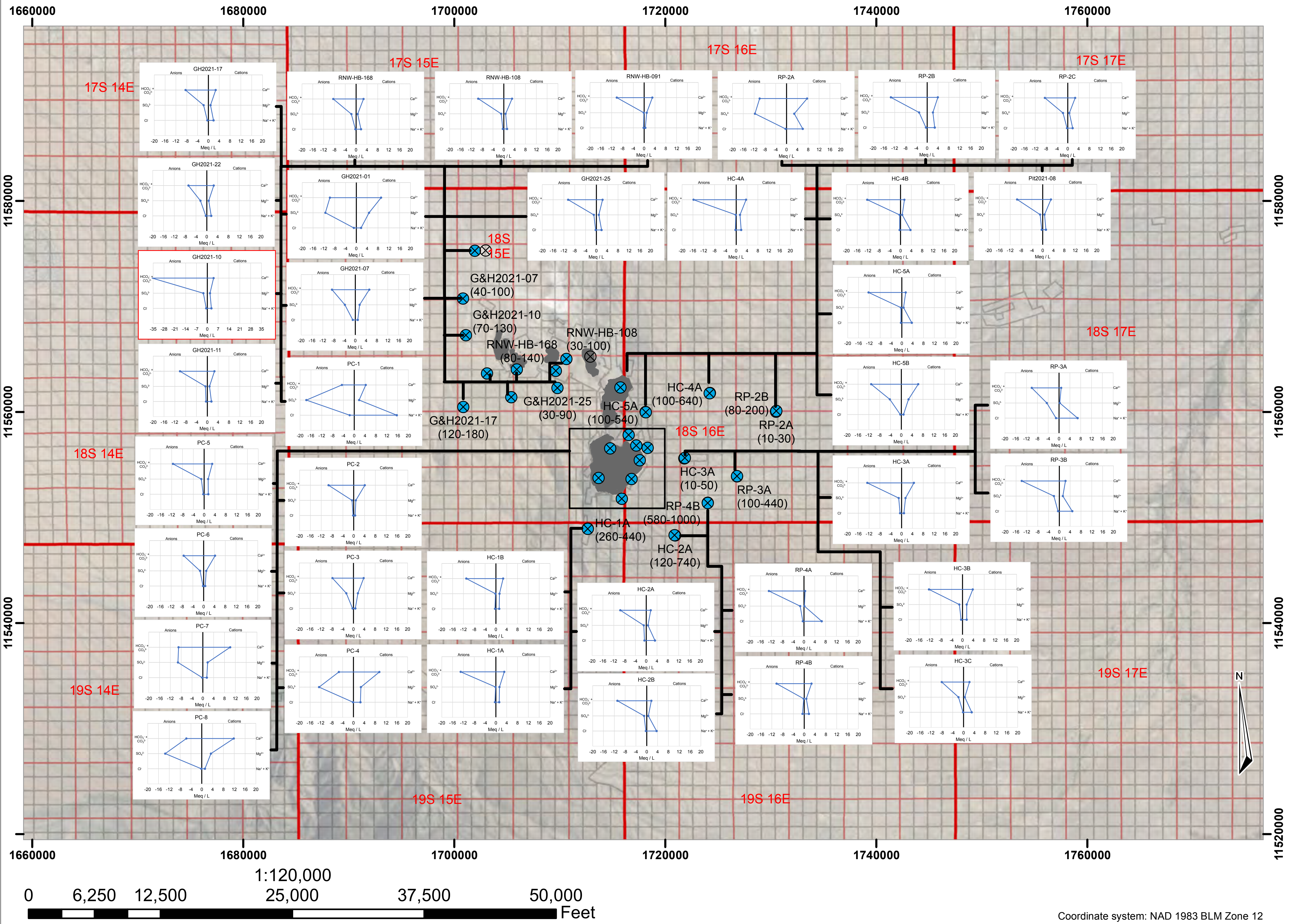
A TETRA TECH COMPANY



Groundwater Wells

- Unsampled
- Sampled *(Screen int.)*
- X-axis +/-35meq/l
- Pit Footprints
- PLSS Sections
- PLSS Second Division
- PLSS Township

Stiff Diagrams of Groundwater

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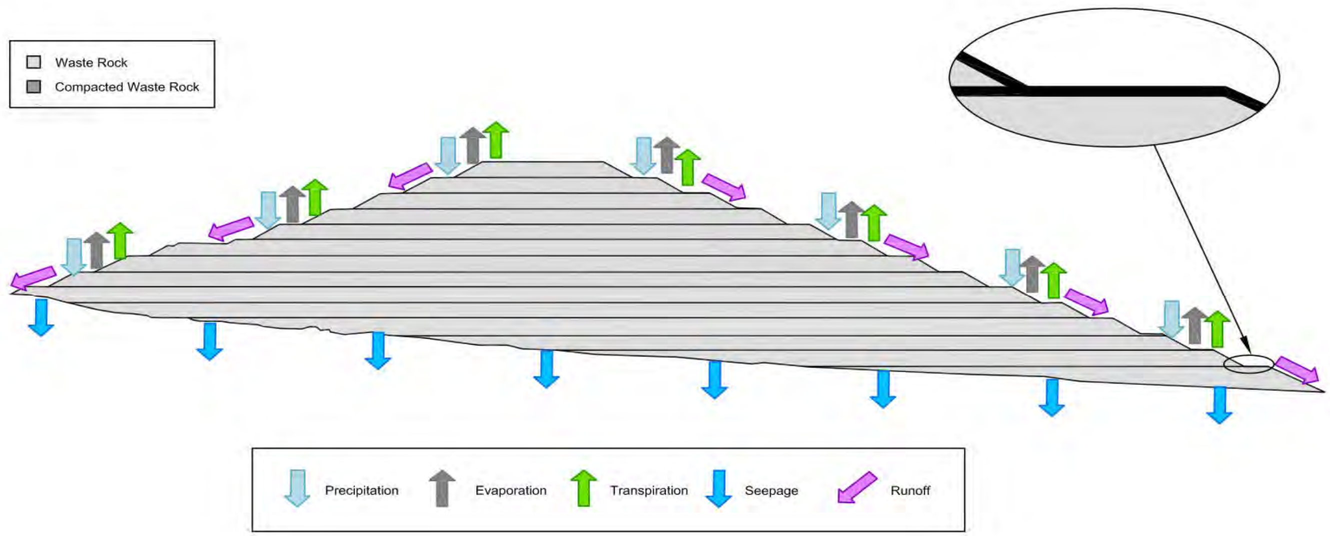
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	WT
CHECKED:	TC
DATE:	May 2022
FIGURE:	3.47



PITEAU ASSOCIATES
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A TETRA TECH COMPANY

WRF Conceptual Model

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

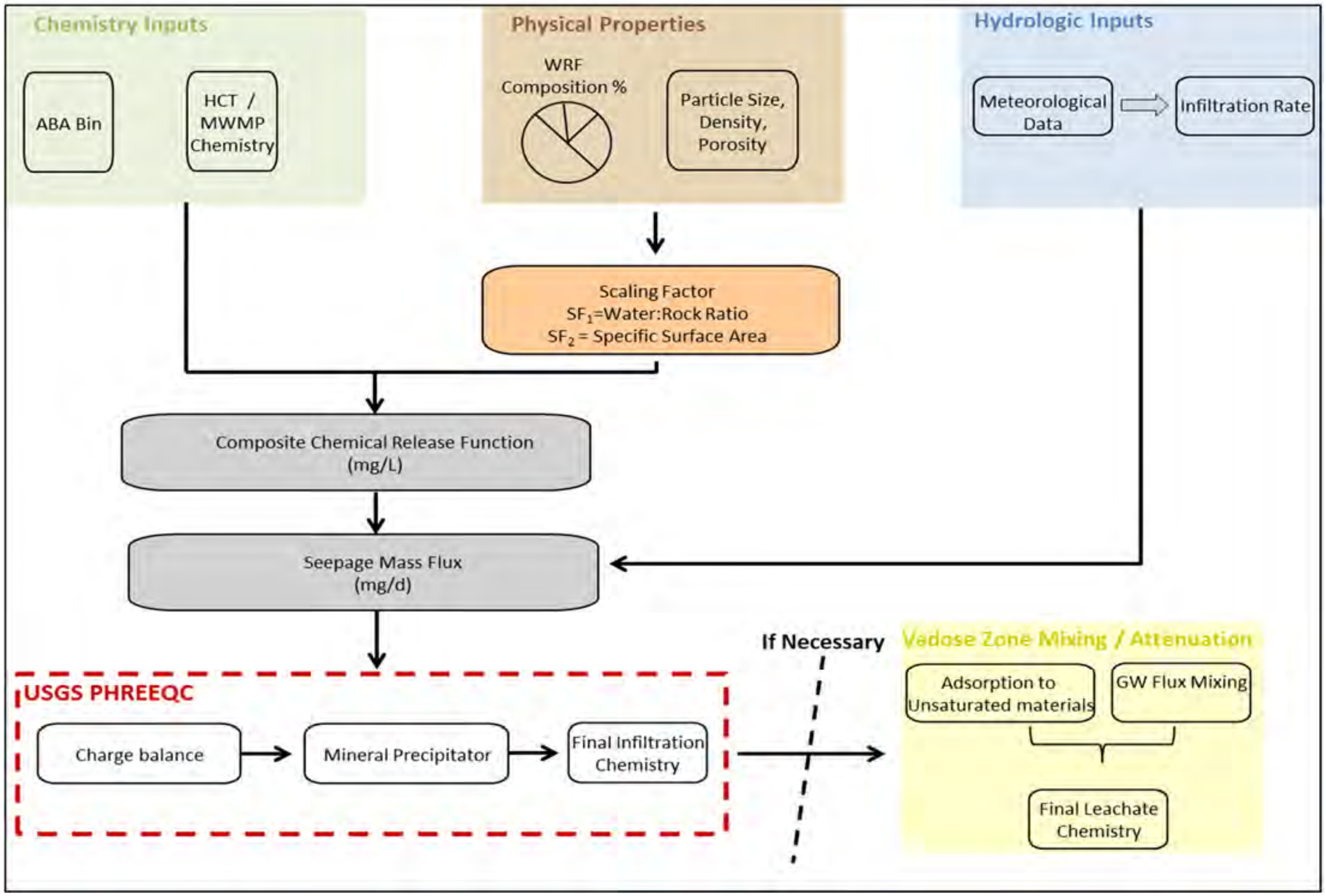
JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 4.1



PITEAU ASSOCIATES
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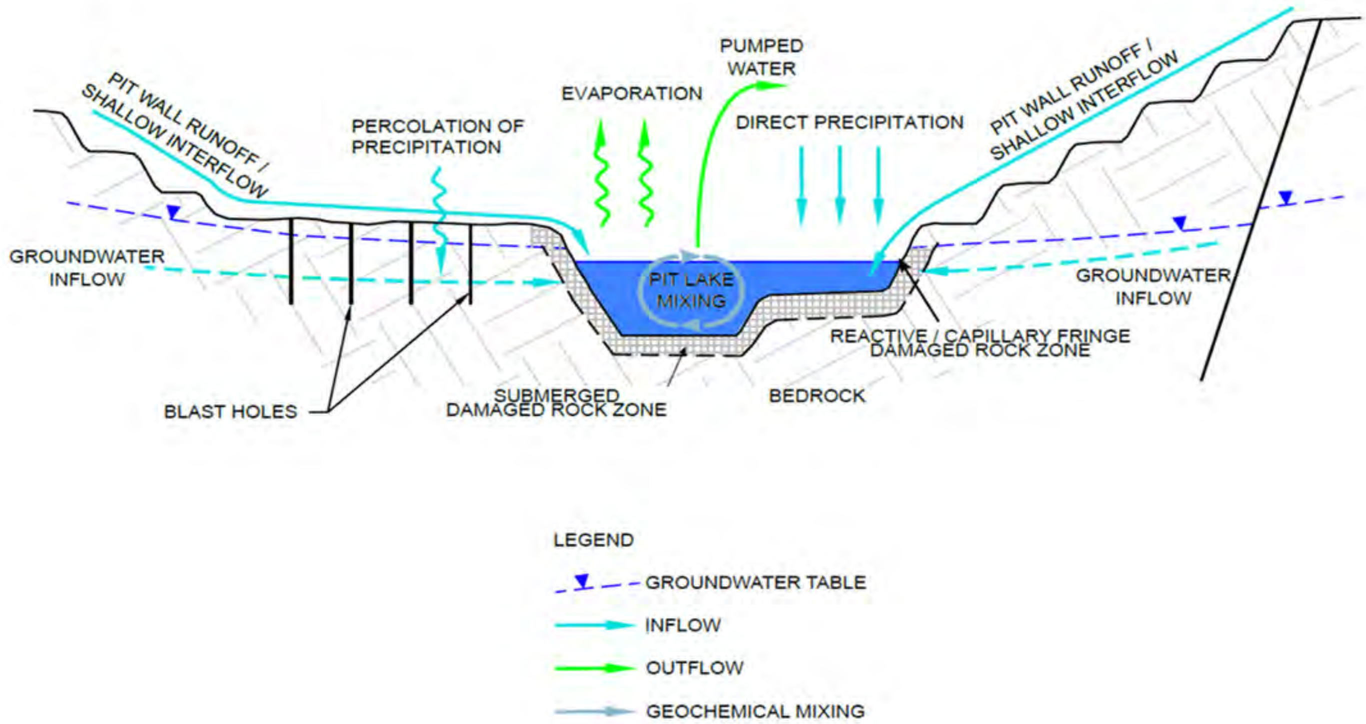
A TETRA TECH COMPANY

Waste Rock Facility Modeling Approach

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 4.2



PITEAU ASSOCIATES
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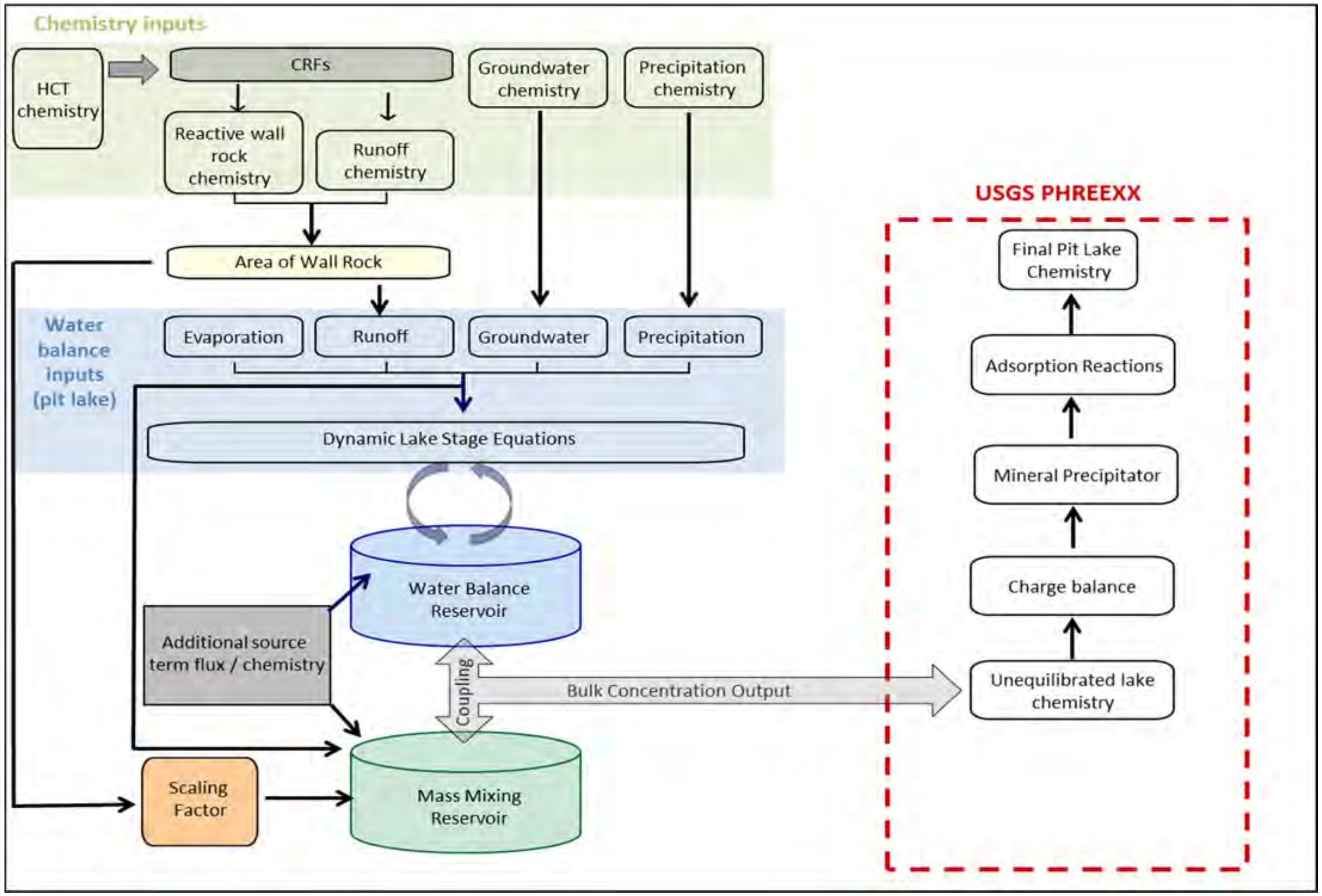
A TETRA TECH COMPANY

Pit Lake Conceptual Model Configuration

CLIENT: Rosemont Copper
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 4.3



PITEAU ASSOCIATES
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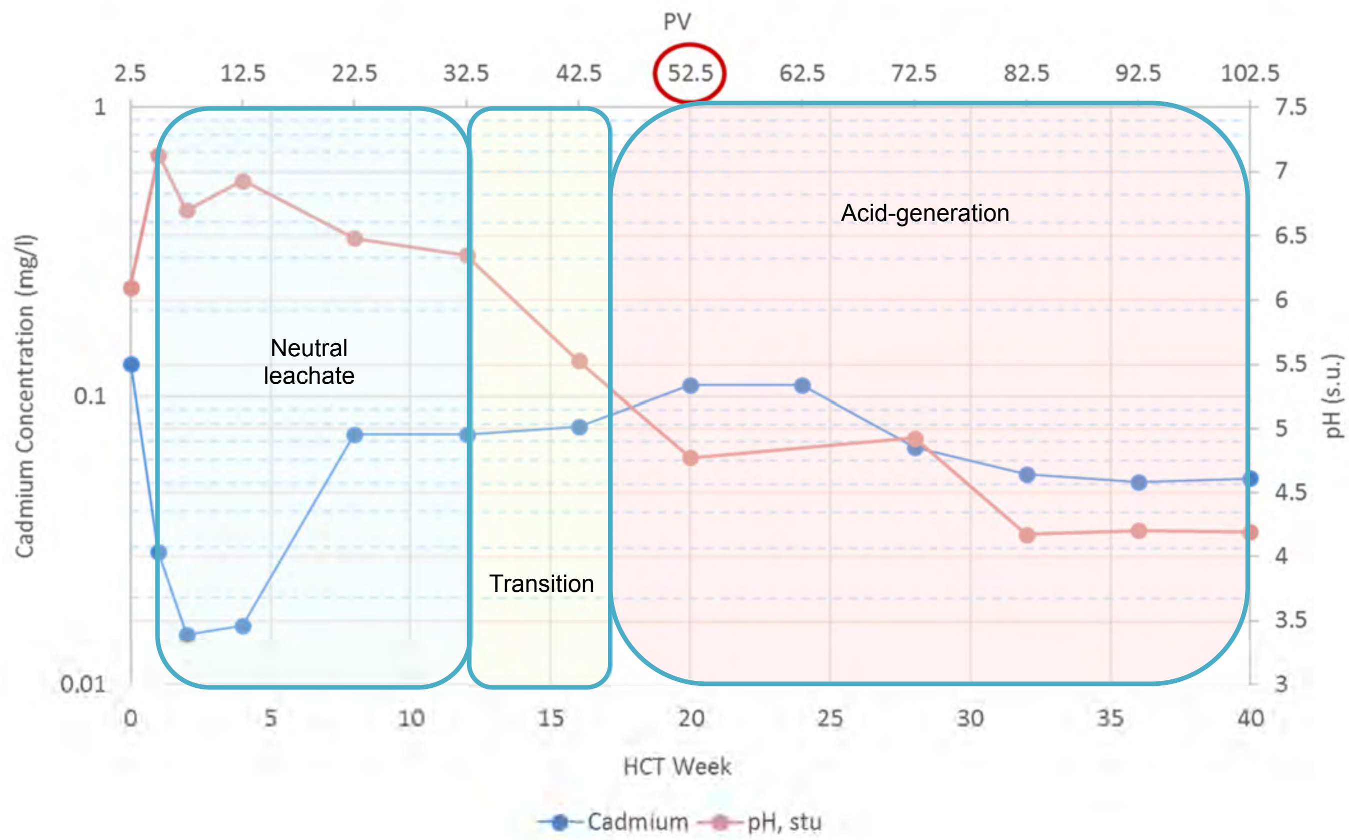
A TETRA TECH COMPANY

Pit Lake Modeling Approach

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 4.4

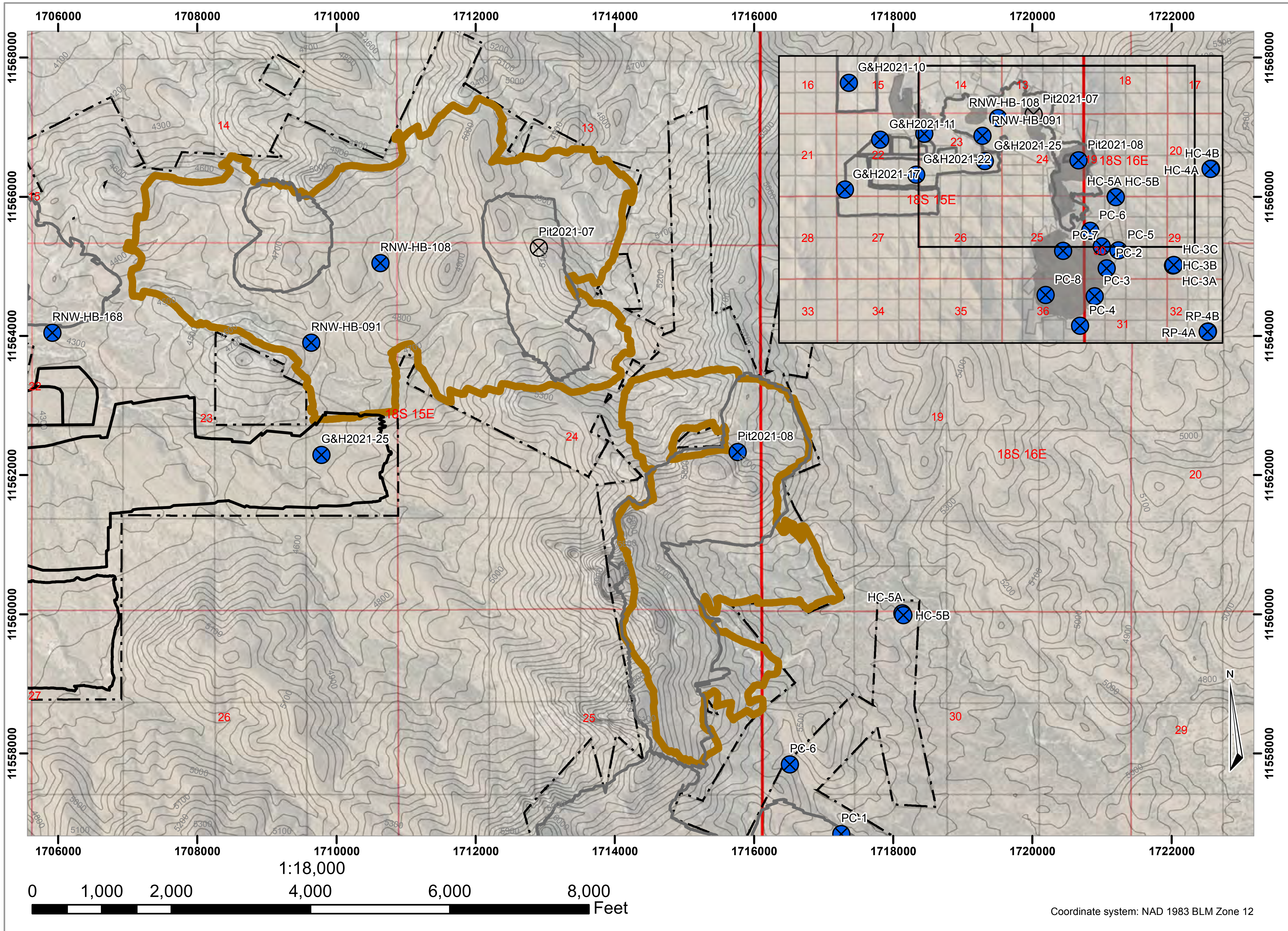


PITEAU ASSOCIATES

A TETRA TECH COMPANY

HCT Chemical Release Function Derivation

CLIENT:	Rosemont Copper Company	PROJECT:	Rosemont Copper World Project
JOB #:	4286	DRAWN:	TC
		CHECKED:	TC
DATE:	May 2022	FIGURE:	4.5



Waste Rock Facility Location

PITEAU ASSOCIATES
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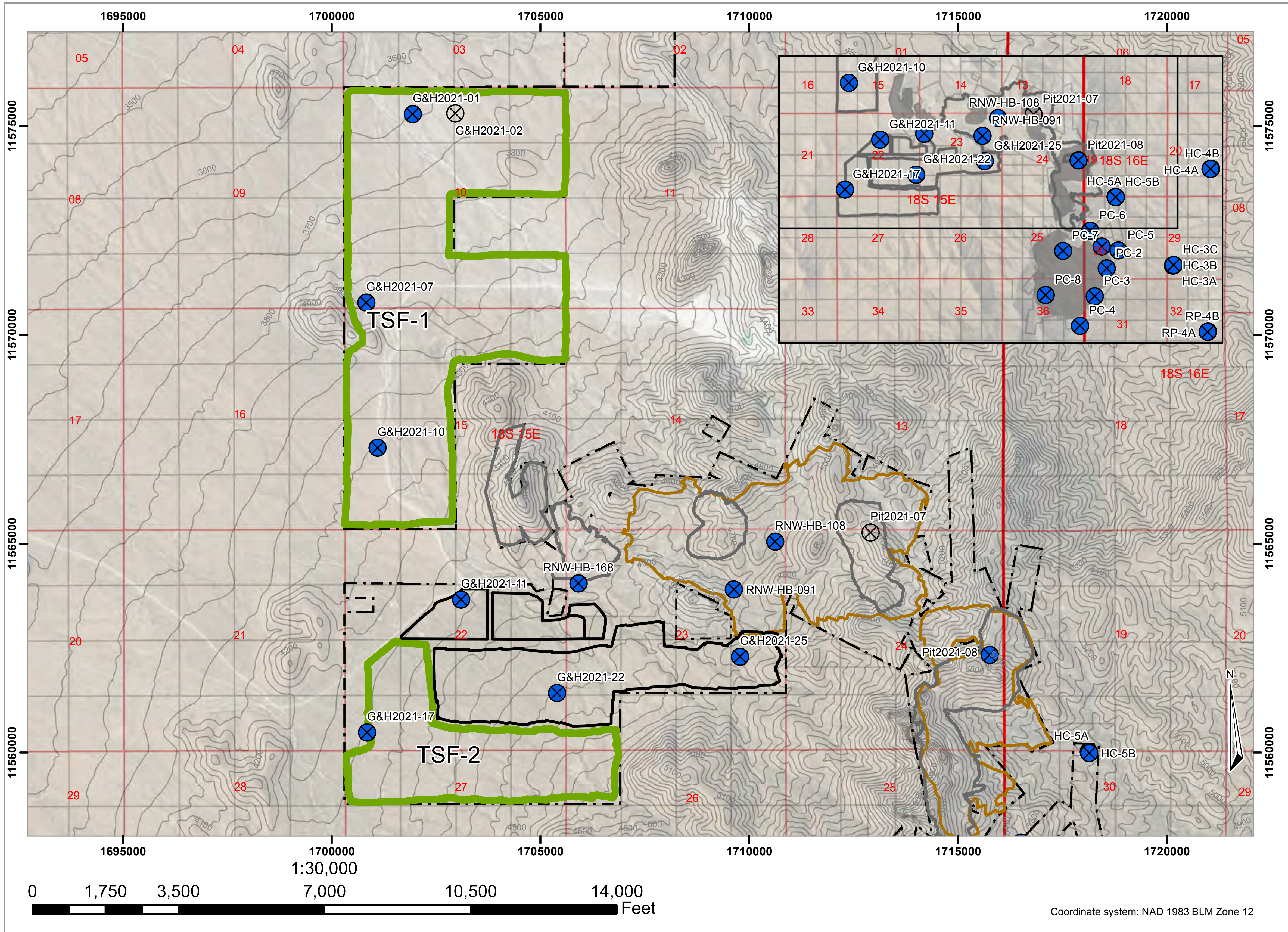
A TETRA TECH COMPANY

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB: 4286
DRAWN: WT CHECKED: TC
DATE: May 2022
FIGURE: 5.1



Geochemistry Wells

- Unsampled (1/4/22)
- Sampled (1/4/22)
- Pit Footprints
- Facility Outlines
- Tailings Facilities (TSF)
- Waste Rock Facility
- Private Land Boundaries
- Topographic Elevation Contours
- PLSS Sections
- PLSS Second Division
- PLSS Township

Tailings Facility Configuration

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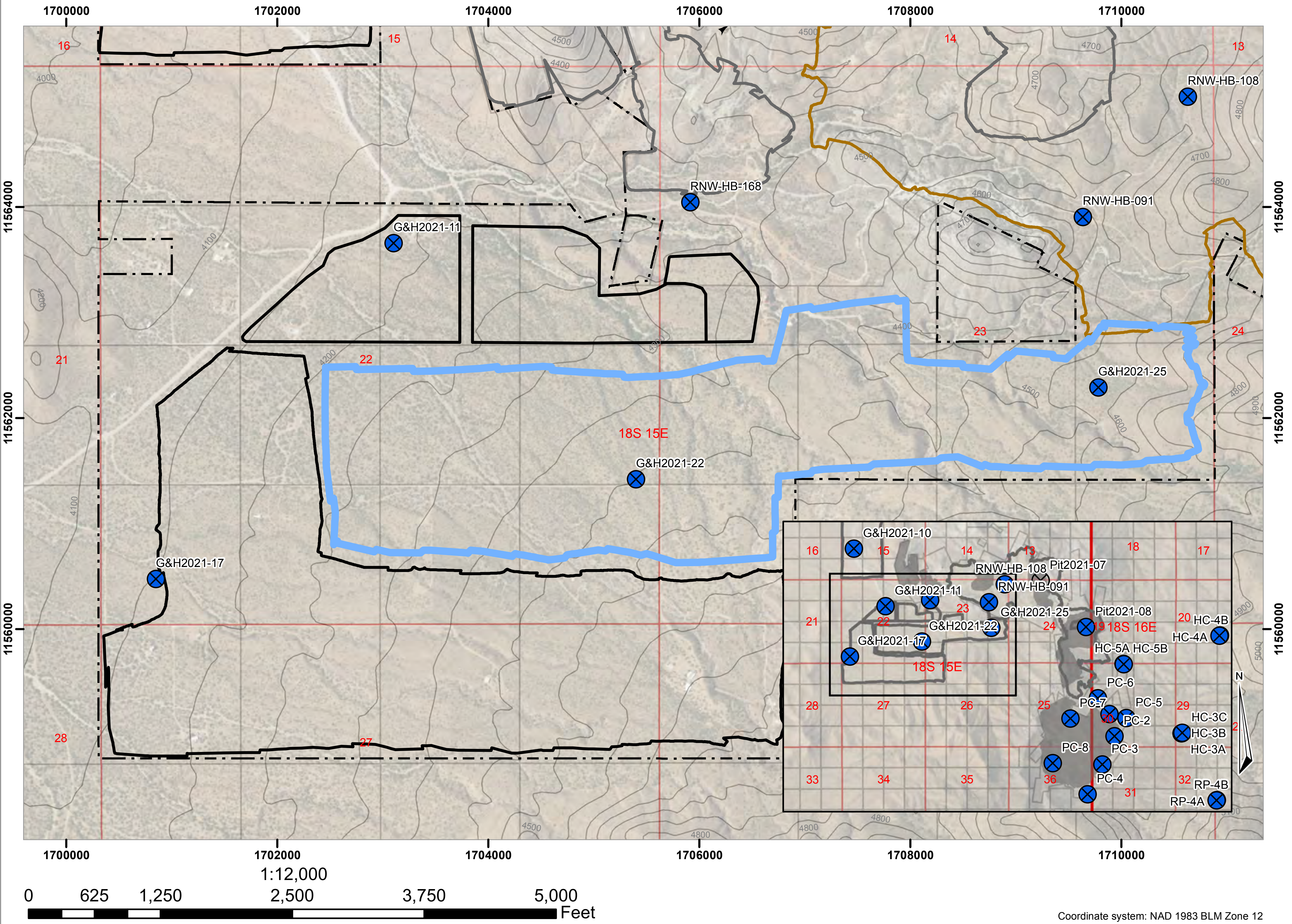
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	WT
CHECKED:	TC
DATE:	May 2022
FIGURE:	6.1



Geochemistry Wells

- Unsampled (1/4/22)
- Sampled (1/4/22)
- Pits
- Heap Leach Facility
- Facility Outlines
- Waste Rock Facility
- Private Land Boundaries
- Topographic Elevation Contours
- PLSS Sections
- PLSS Second Division
- PLSS Township

Heap Leach Facility Configuration

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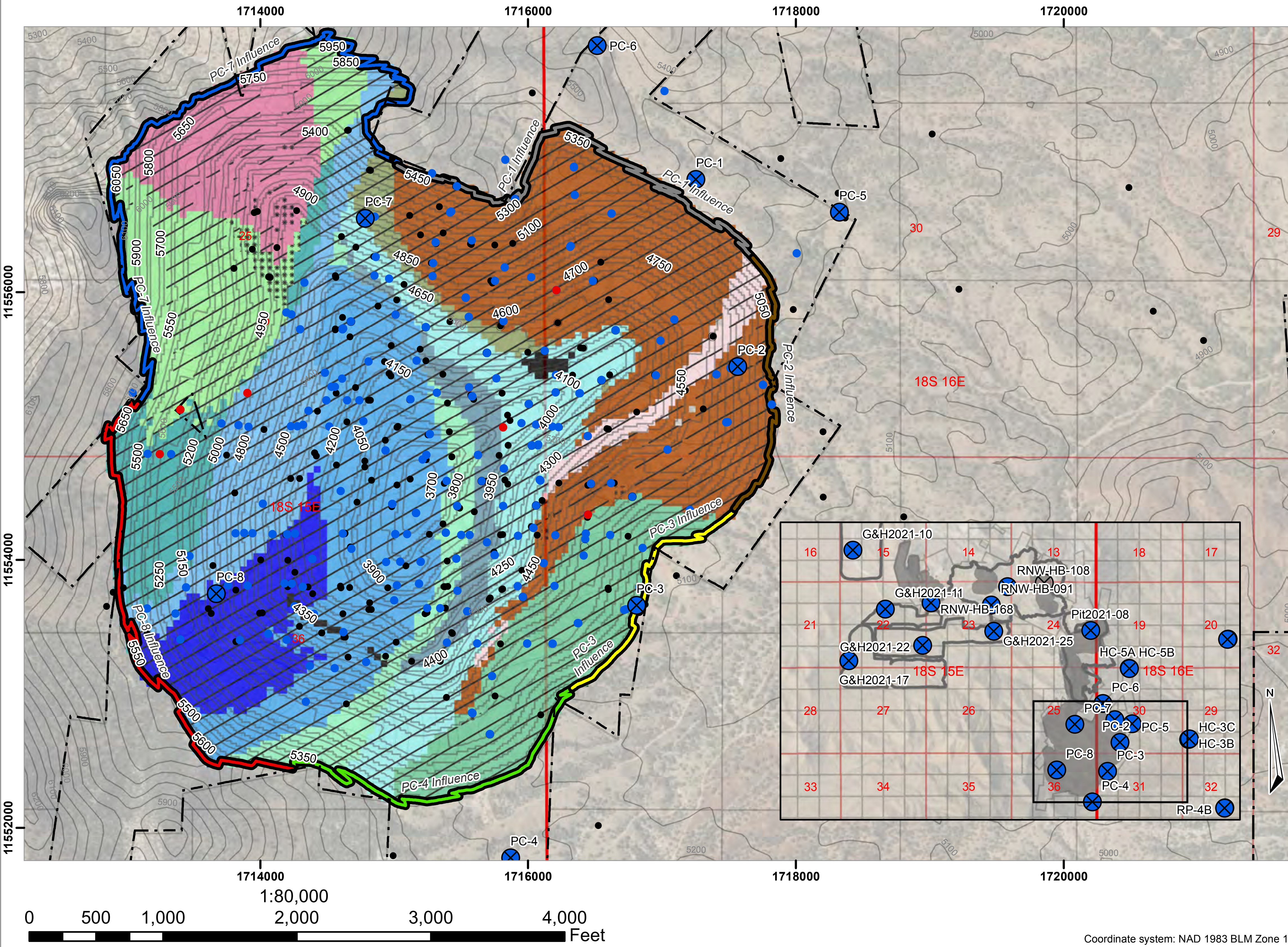
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	WT
CHECKED:	TC
DATE:	May 2022
FIGURE:	7.1



Geochemistry Wells

- Unsampled (1/4/22)
- Sampled (1/4/22)

ABA Samples

- AG
- PAG
- NAG
- Whole Rock Chemistry
- Private Land Boundaries

GW Well Influence

- PC-1 Influence
- PC-2 Influence
- PC-3 Influence
- PC-4 Influence
- PC-7 Influence
- PC-8 Influence
- Rosemont Pit - 50 ft Contour
- Topographic Elevation Contours
- PLSS Township
- PLSS Sections
- PLSS Second Division

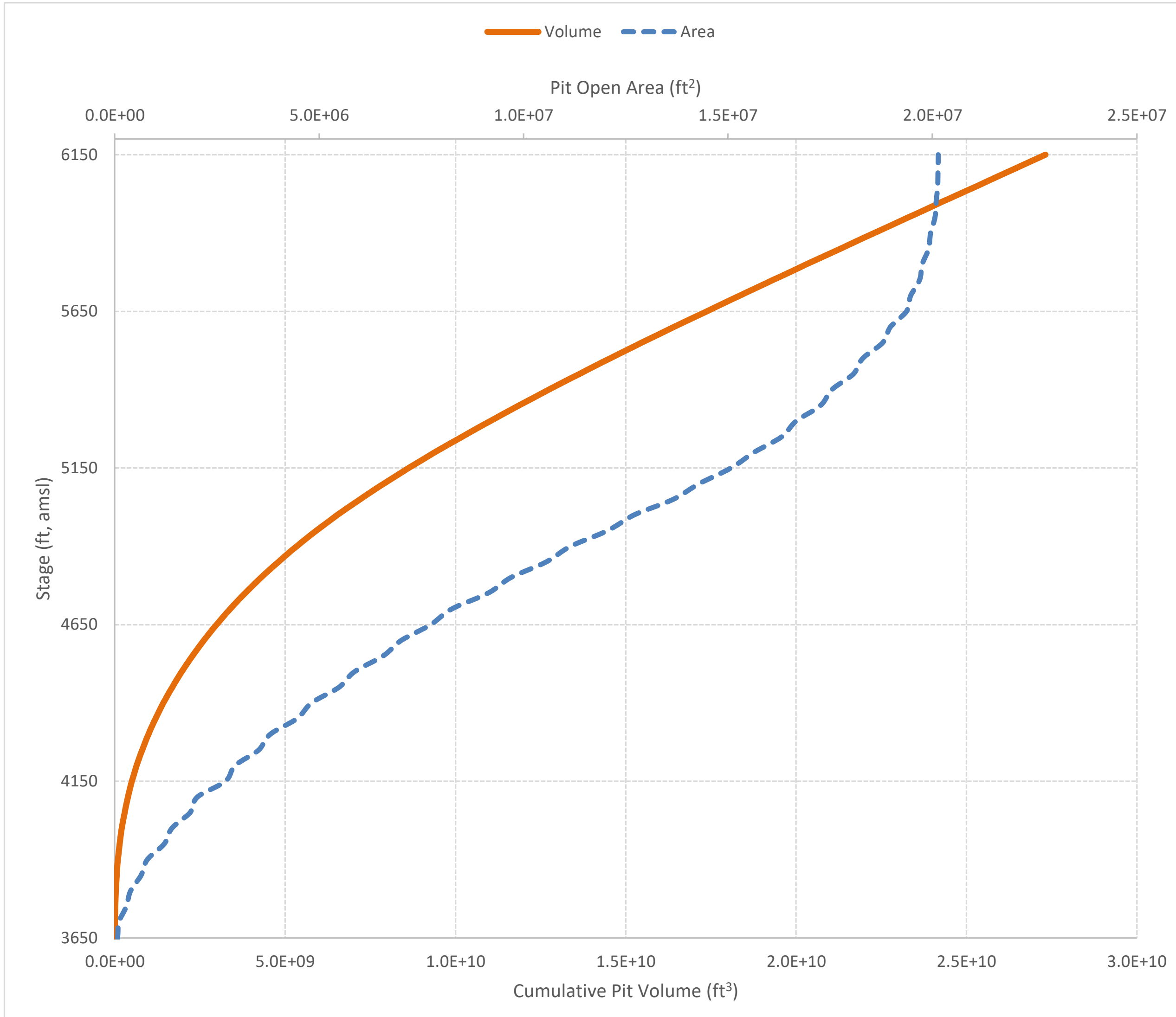
Ultimate Pit Lithology

- Private Land Boundaries
- ABRIGO:>3.0
- ANDESITE:1.2-3.0
- ANDESITE:<1.2
- ANDESITE:>3.0
- ARKOSE:1.2-3.0
- ARKOSE:<1.2
- ARKOSE:>3.0
- BOLSA:1.2-3.0
- BOLSA:<1.2
- BOLSA:>3.0
- EARP:>3.0
- EPITAPH:>3.0
- ESCABROSA:>3.0
- GILA:>3.0
- GLANCE:>3.0
- GRANODIORITE:1.2-3.0
- GRANODIORITE:<1.2
- GRANODIORITE:>3.0
- HORQUILLA:>3.0
- MARTIN:>3.0
- QMP:1.2-3.0
- QMP:>3.0
- SCHERRER:1.2-3.0
- SCHERRER:>3.0
- UNKNOWN:>3.0

Rosemont Pit Configuration

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

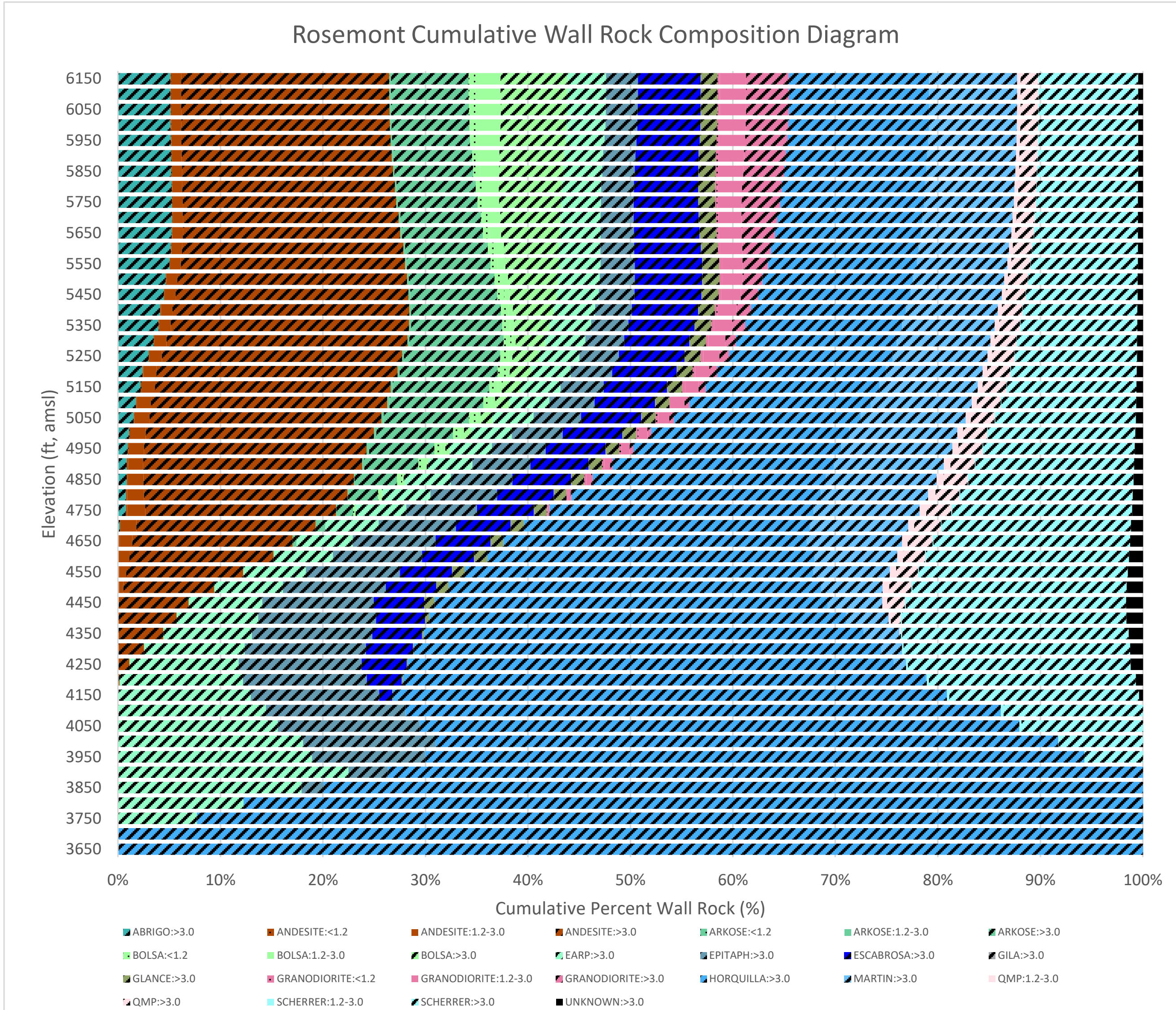
CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	WT — CHECKED: TC
DATE:	May 2022
FIGURE:	8.1



PITEAU ASSOCIATES
A TETRA TECH COMPANY

Rosemont Stage-Area-Volume Curves

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB#:	4286
DRAWN:	WT
CHECKED:	TC
DATE:	May 2022
FIGURE:	8.2



PITEAU ASSOCIATES
A TETRA TECH COMPANY

Rosemont Cumulative Wall Rock Composition Diagram

CLIENT: Rosemont Copper Company

JOB #: 4286

DATE: May 2022

PROJECT: Rosemont Copper World Project

DRAWN: WT

CHECKED: TC

FIGURE: 8.3

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A TETRA TECH COMPANY

Rosemont Pit Lake Recovery

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

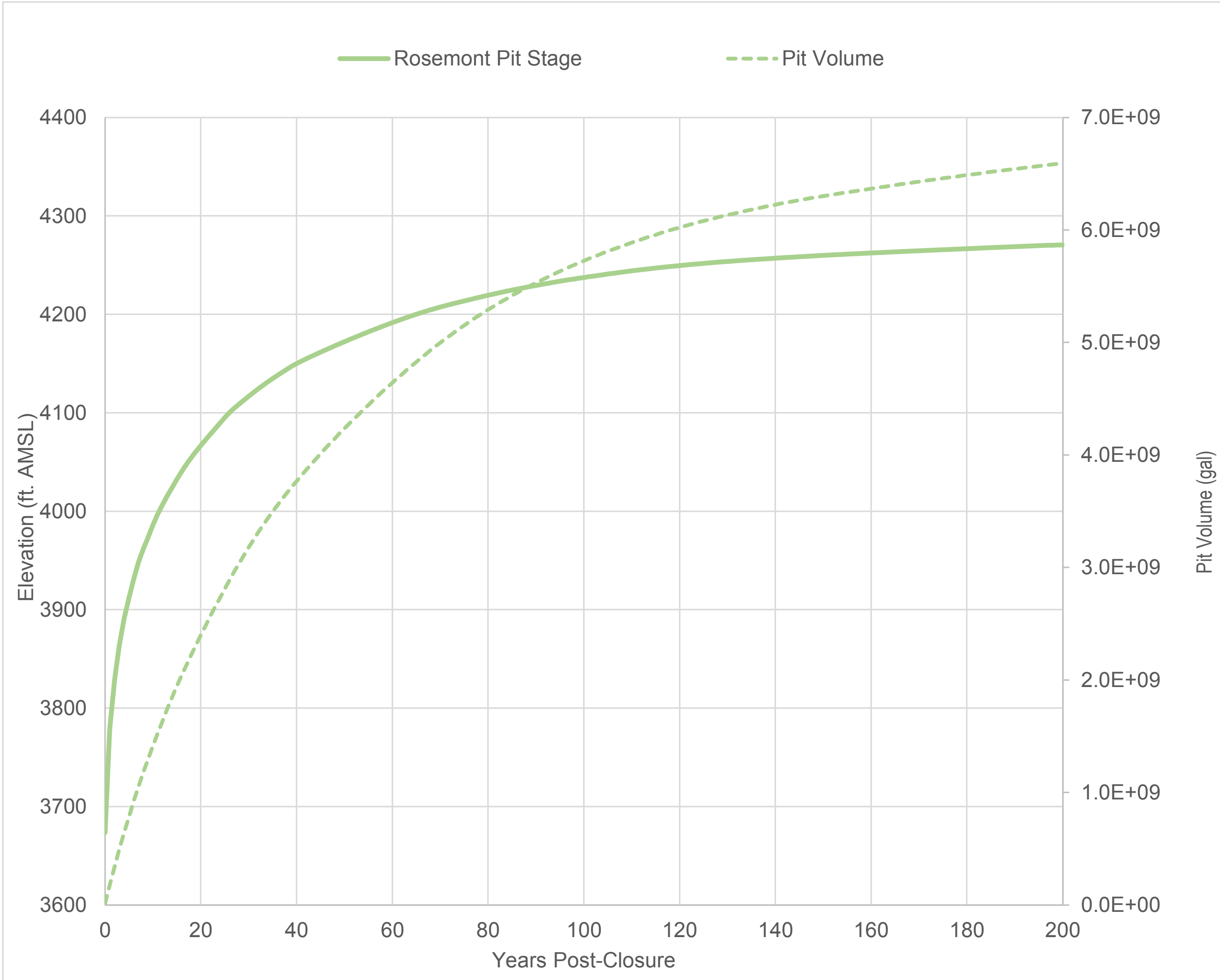
JOB #: 4286

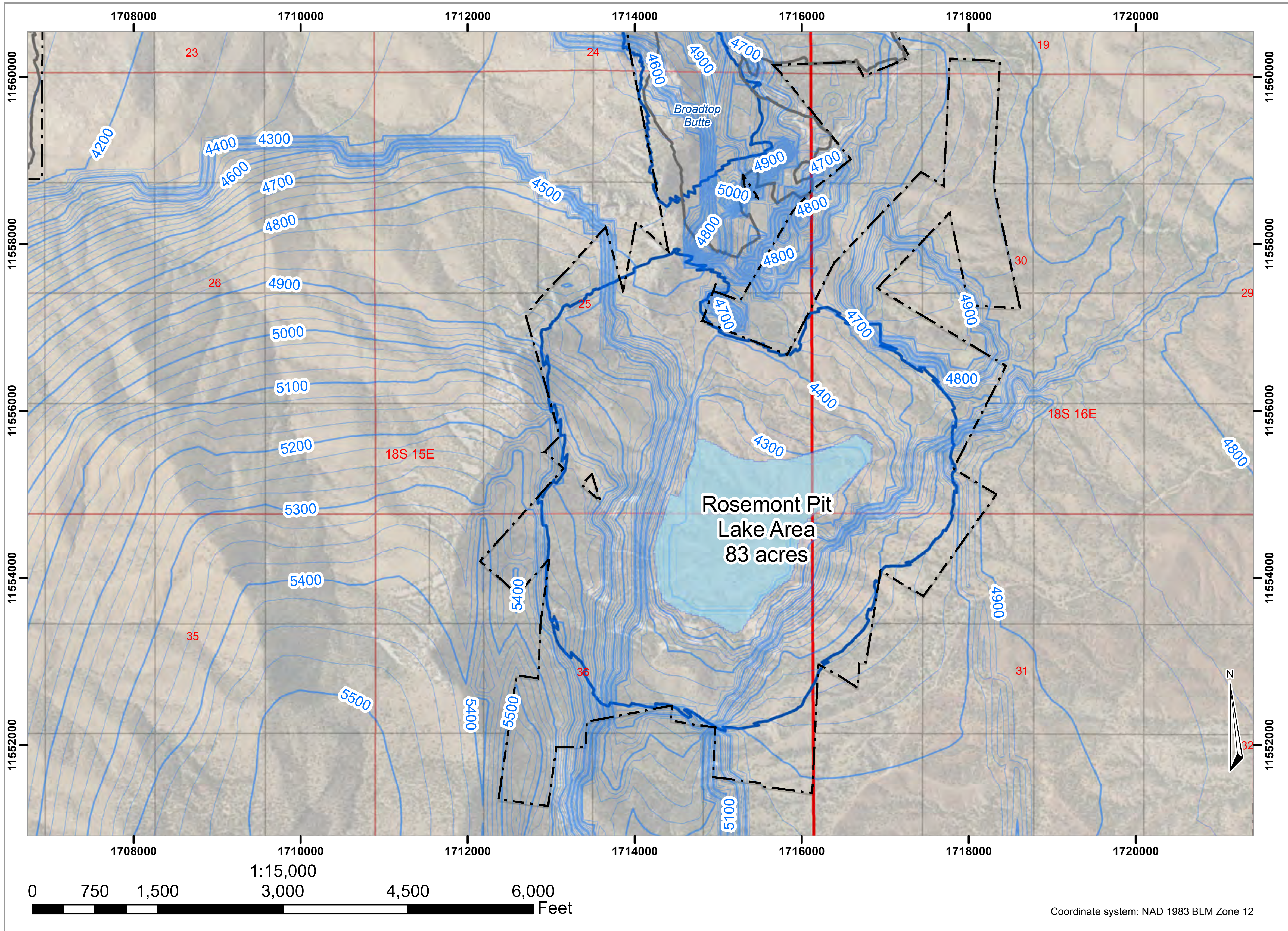
DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 8.4

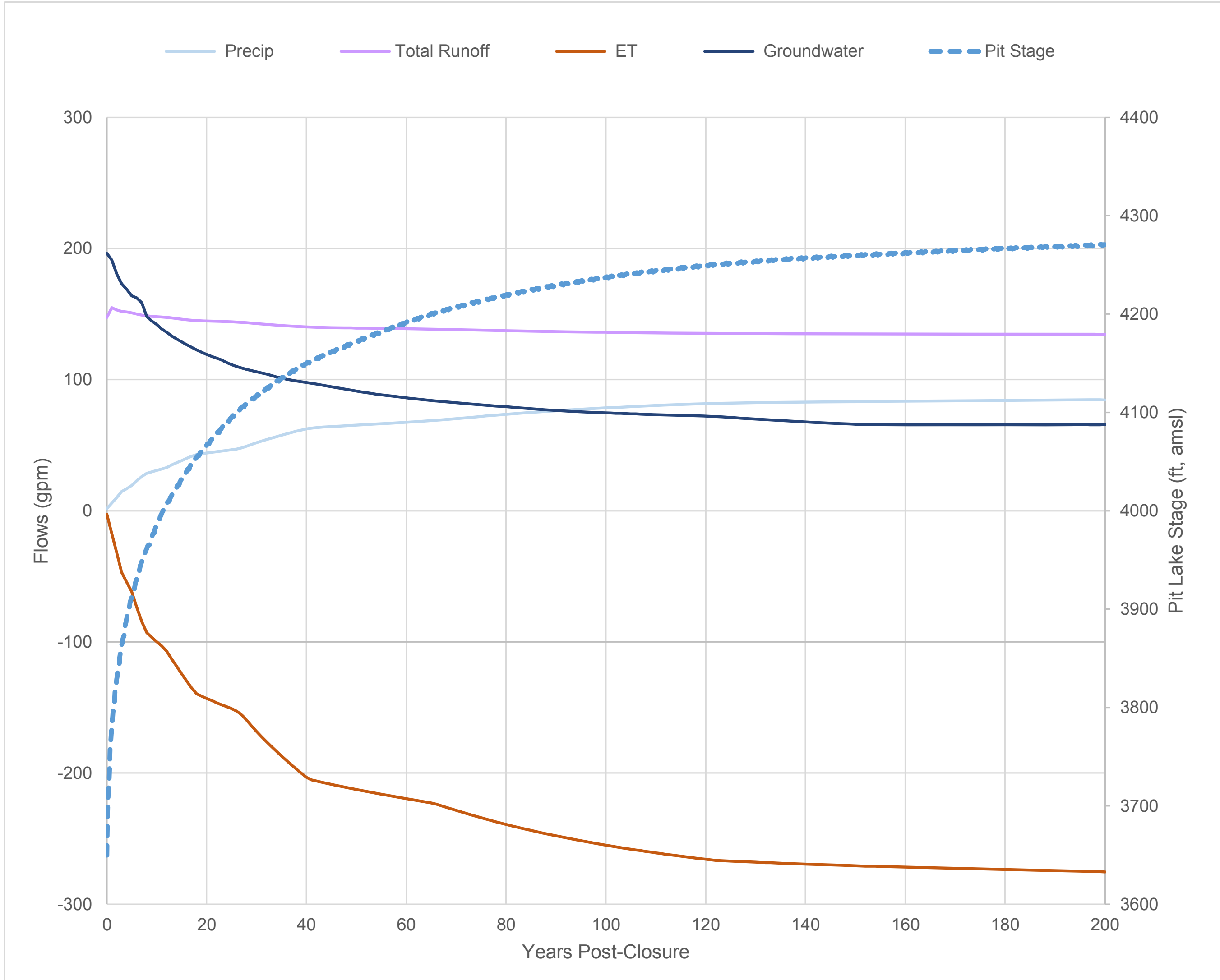




Rosemont Pit Modelled Piezometric Surface

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: WT	CHECKED: TC
DATE:	May 2022
FIGURE:	8.5



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A TETRA TECH COMPANY

Rosemont Water Balance Components

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

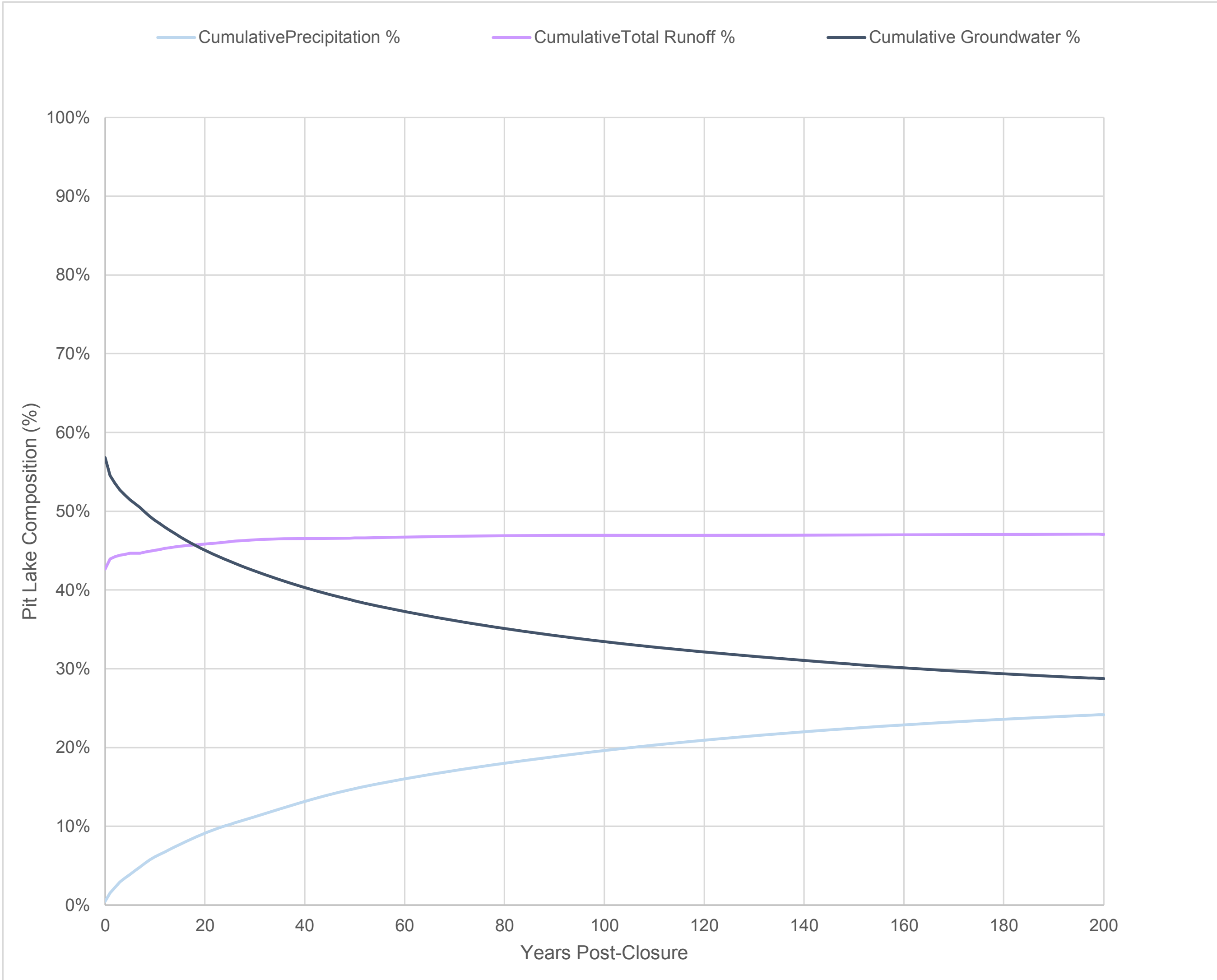
JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 8.6



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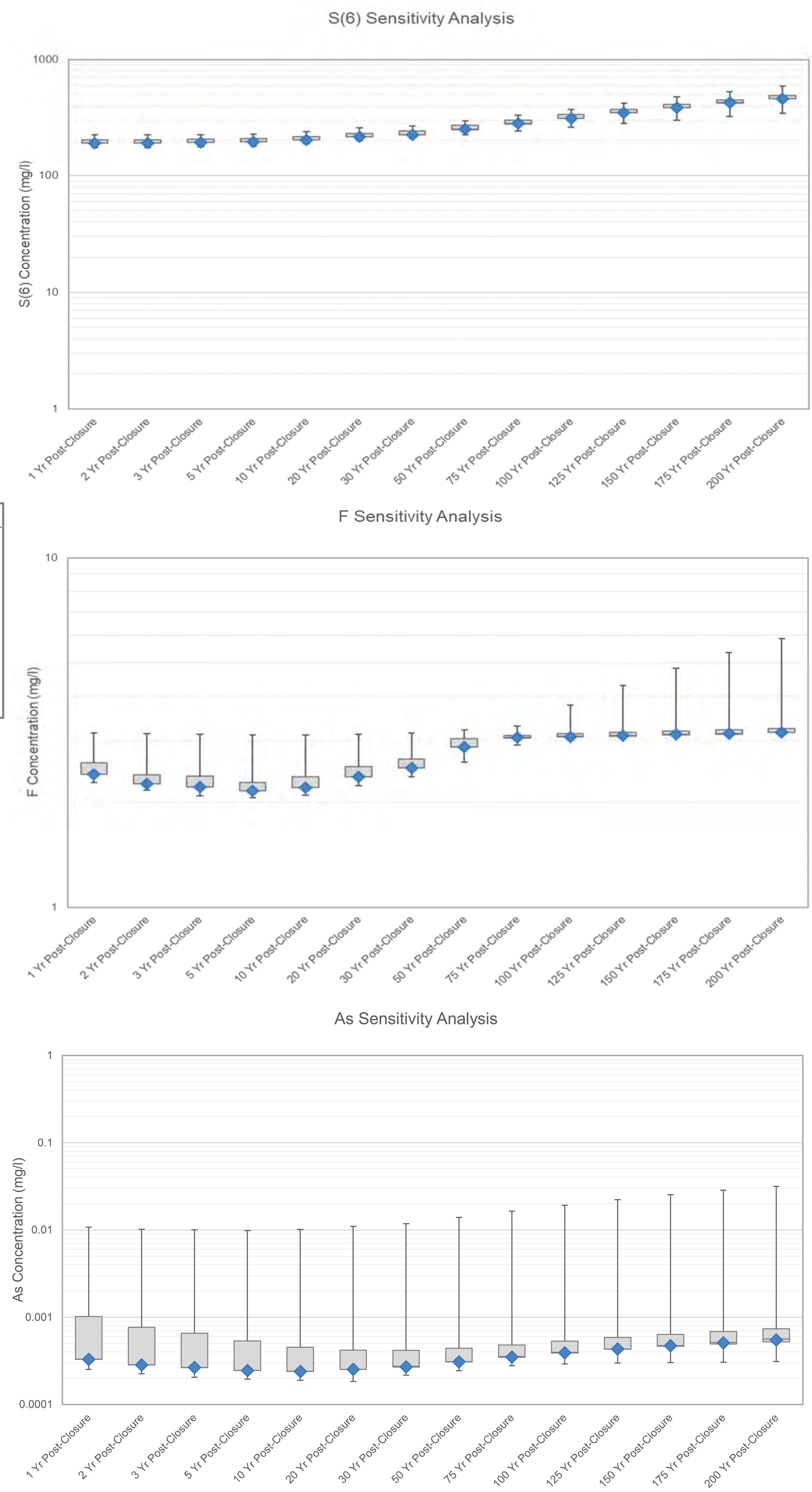
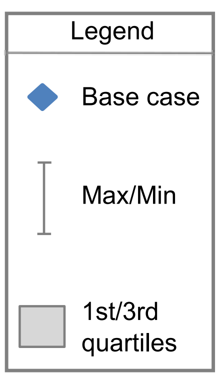
A TETRA TECH COMPANY

Rosemont Pit Lake Cumulative Percentage

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 8.7





PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Rosemont Sensitivity Analysis box diagram (Sulfate, Fluoride,

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

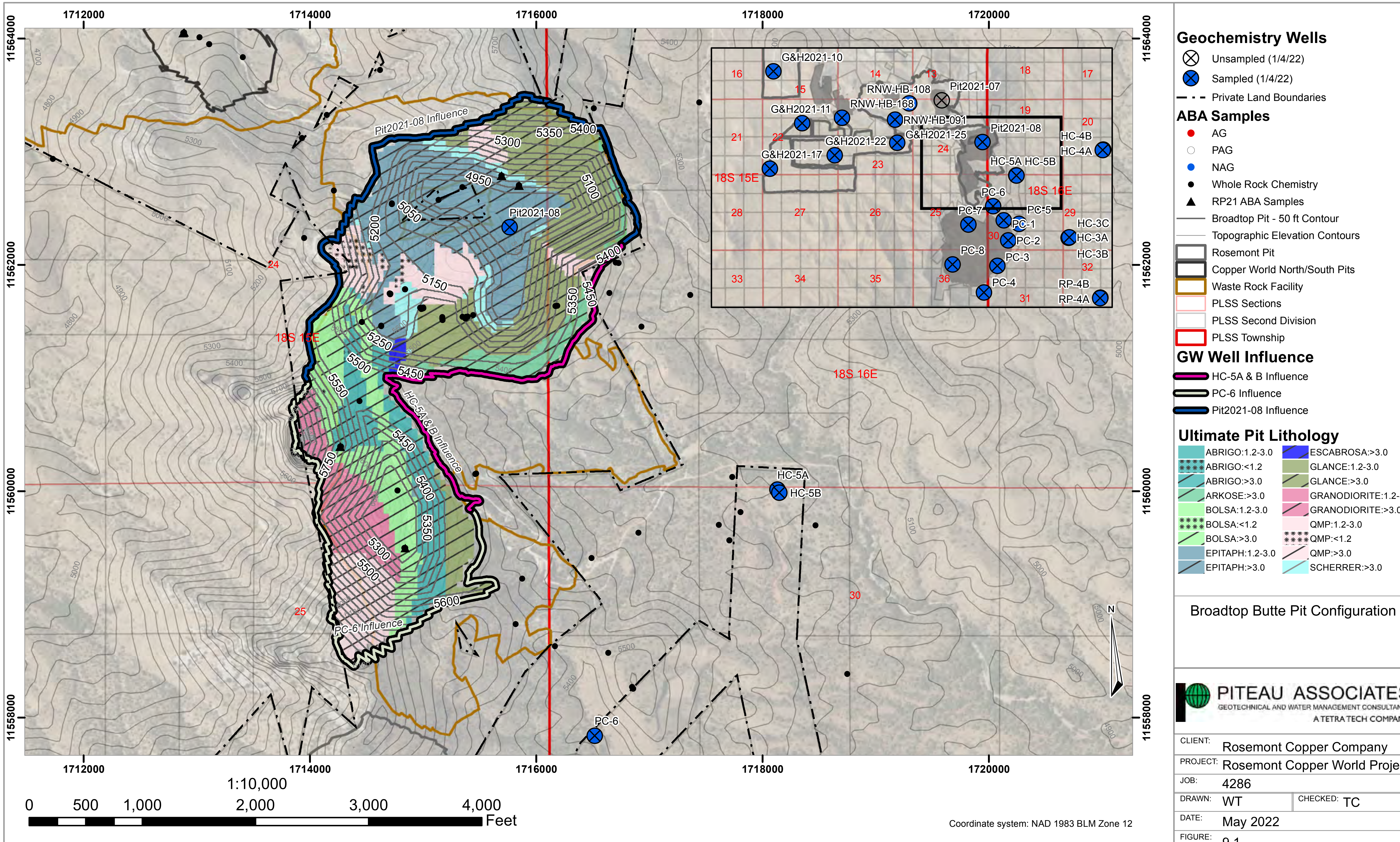
JOB 4286

DATE: May 2022

DRAWN: WT

CHECKED: TC

FIGURE: 8.8



Broadtop Butte Pit Configuration

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: WT	CHECKED: TC
DATE:	May 2022
FIGURE:	9.1

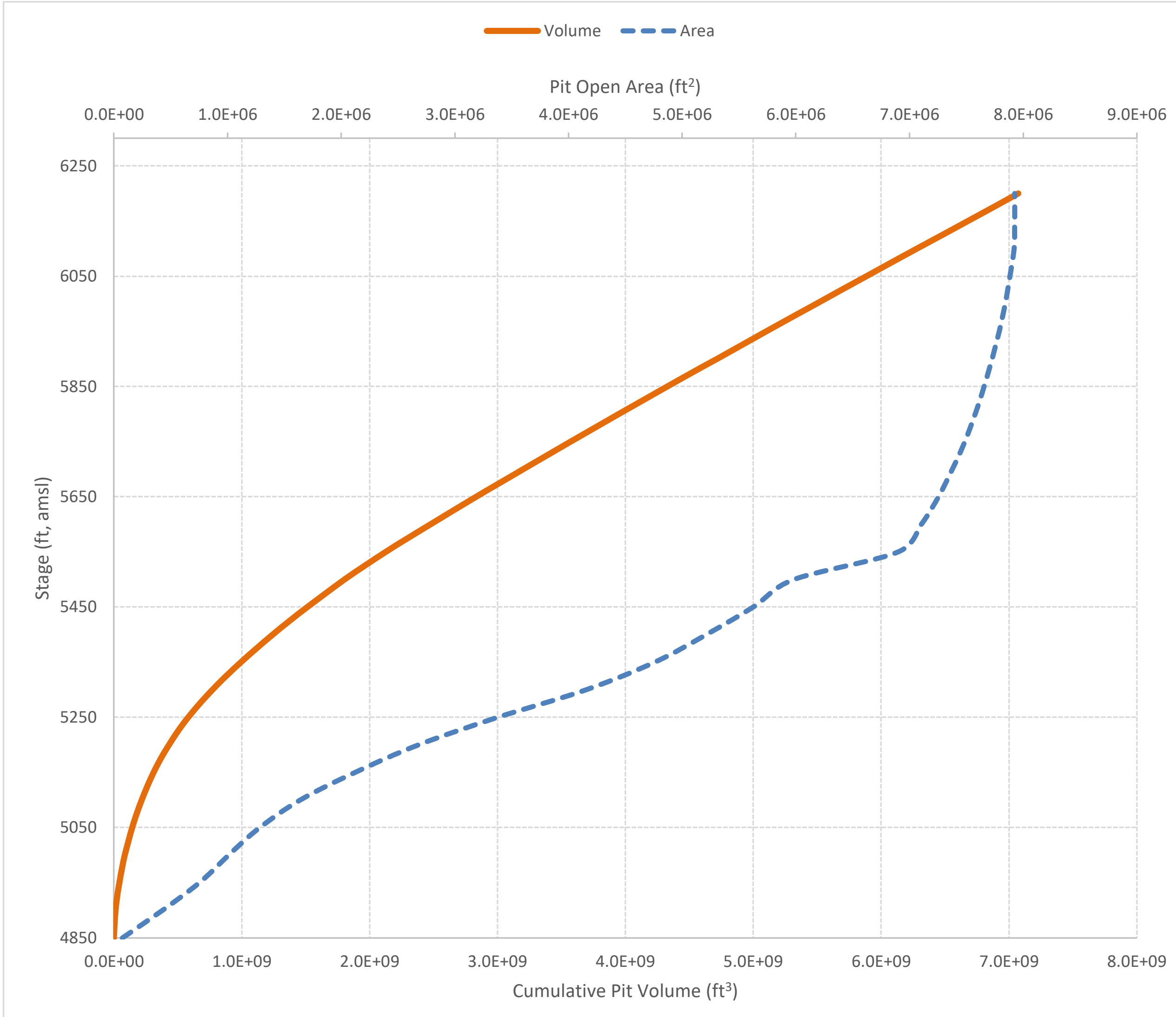
PITEAU ASSOCIATES

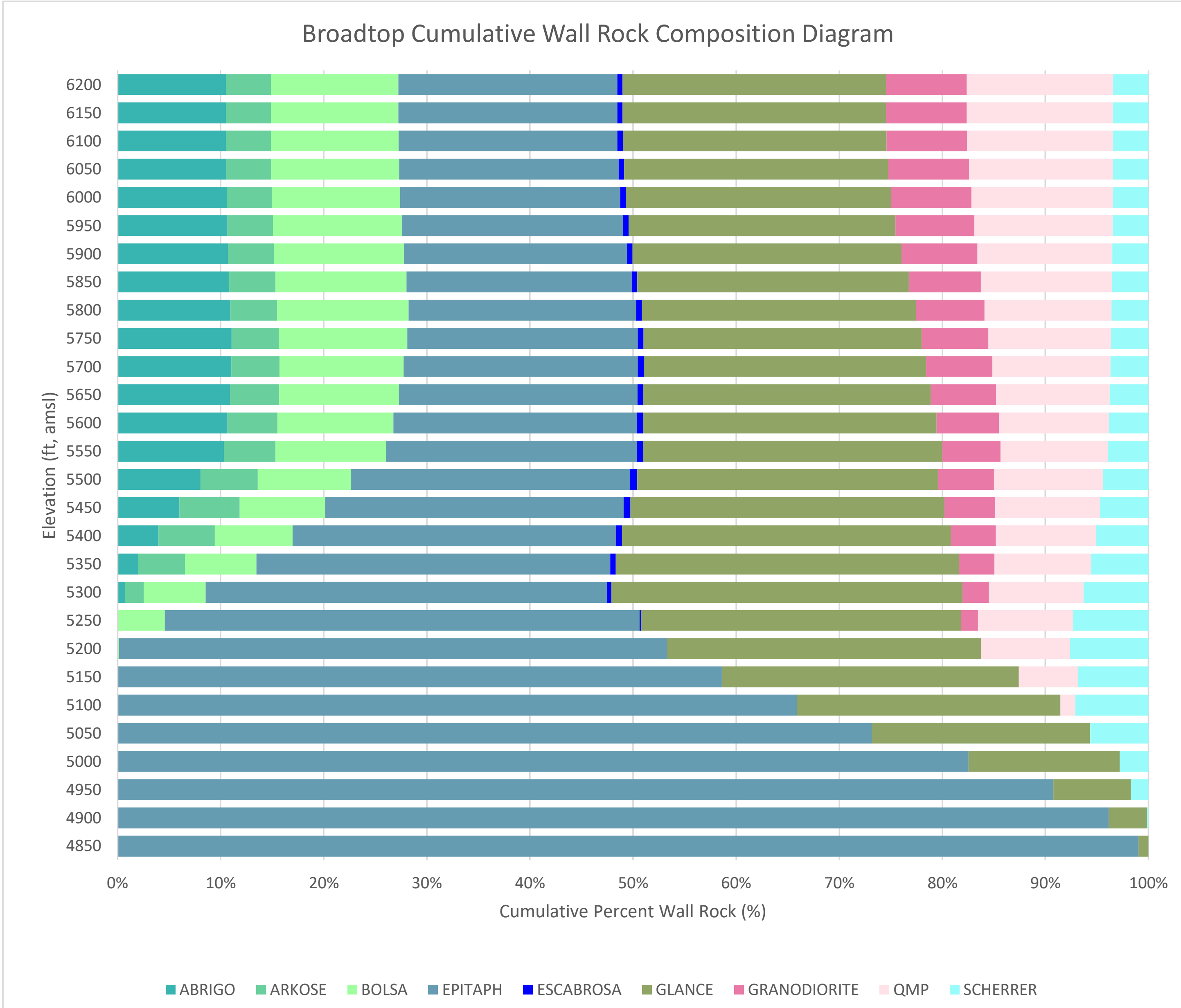
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

A TETRA TECH COMPANY

Broadtop Butte Stage-Area-Volume Curves

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: WT
	CHECKED: TC
DATE: May 2022	FIGURE: 9.2

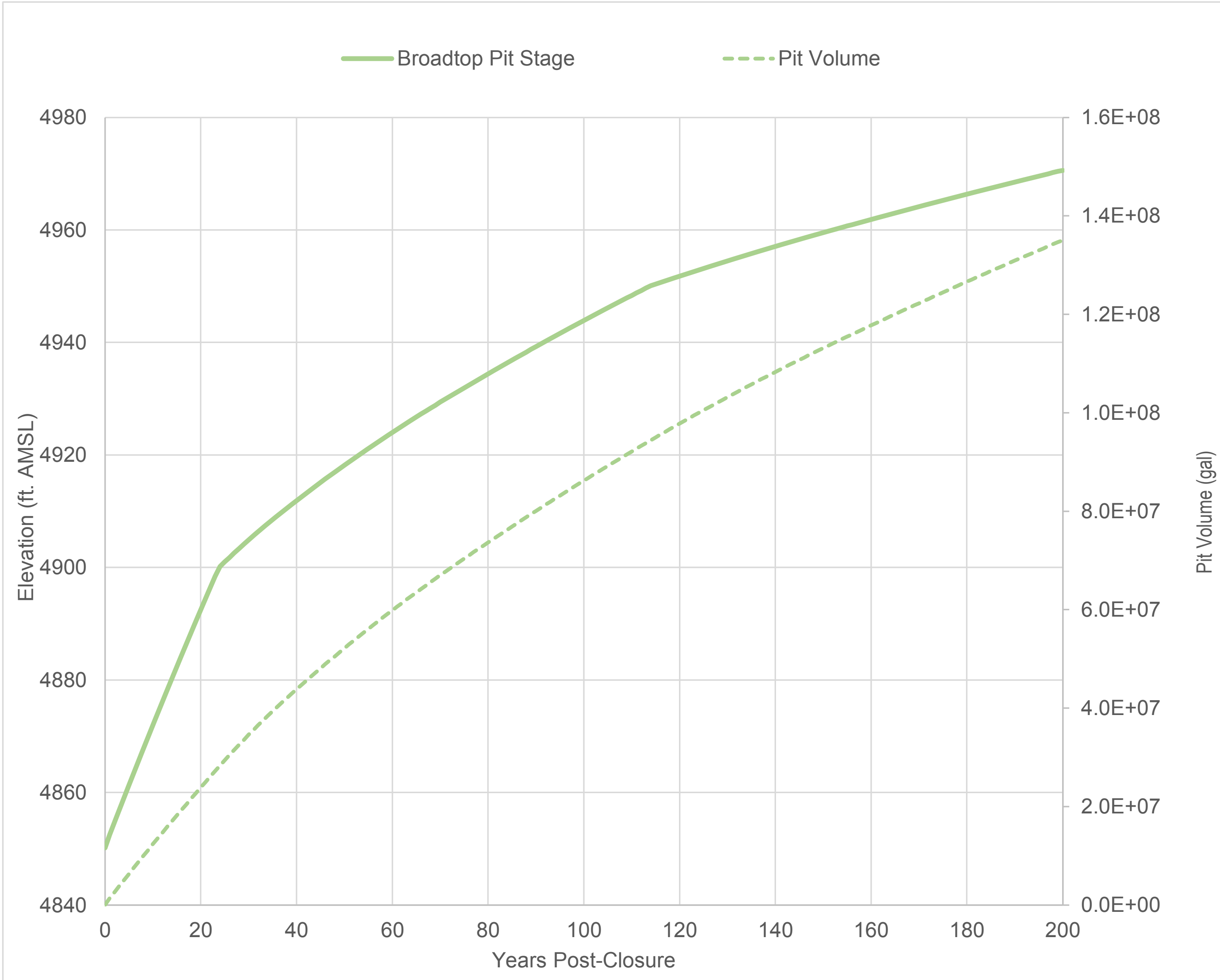




PITEAU ASSOCIATES

Broadtop Cumulative Wall Rock Composition Diagram

CLIENT:	Rosemont Copper Company	PROJECT:	Rosemont Copper World Project
JOB #:	4286	DRAWN:	WT
		CHECKED:	TC
DATE:	May 2022	FIGURE:	9.3



PITEAU ASSOCIATES
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A TETRA TECH COMPANY

Broadtop Butte Pit Backfill Recovery

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

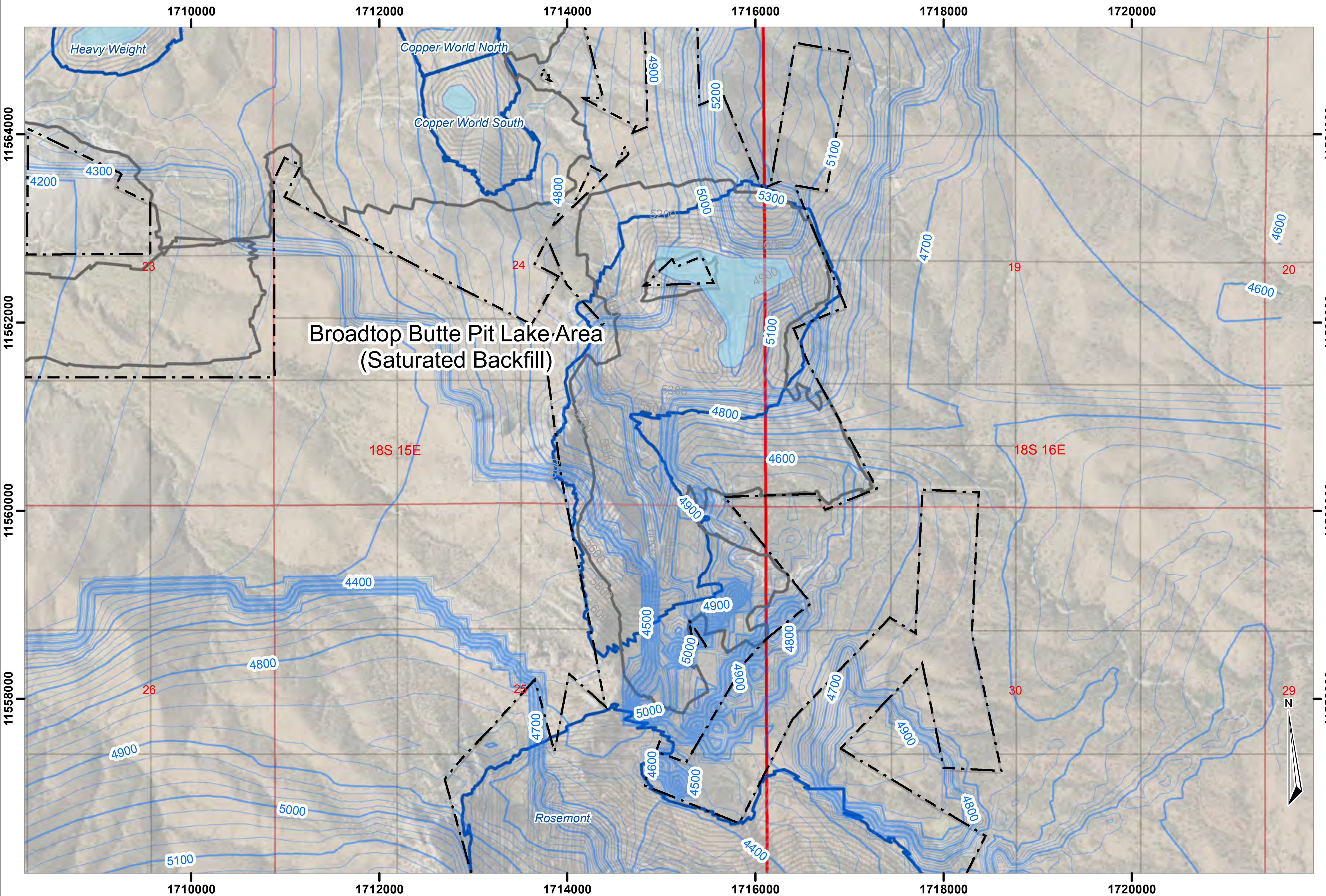
JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 9.4



1:14,000

0 625 1,250 2,500 3,750 5,000 Feet

Coordinate system: NAD 1983 BLM Zone 12

Private Land Boundaries
Pit Lake Area
Pit Contour - 50ft Interval
Facility Outlines
Pit Footprints
PLSS Sections
PLSS Second Division
PLSS Township

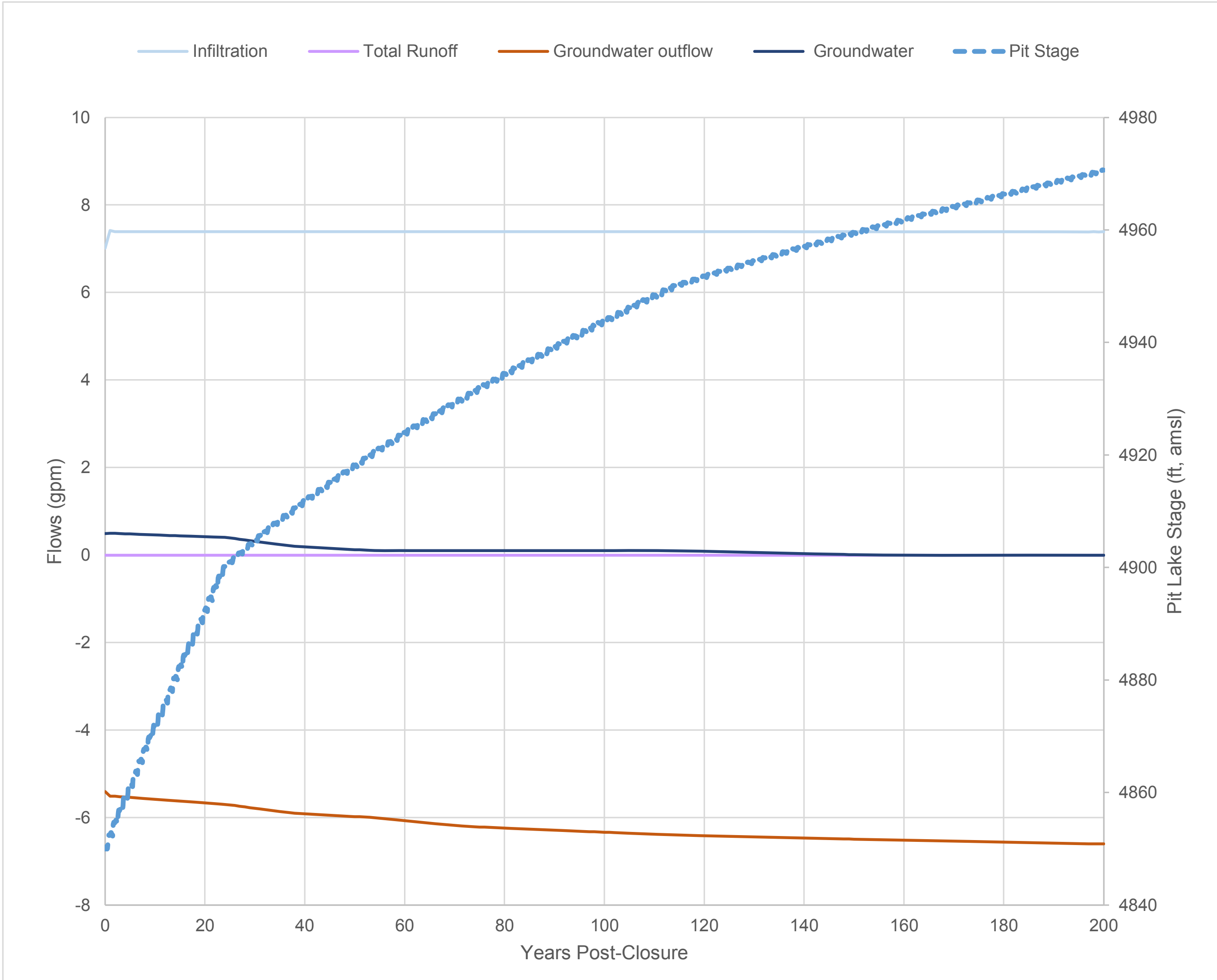
Simulated 200 Year Post-Closure Contours

Contour - 25ft Interval
Contour - 50ft Interval

Broadtop Butte Pit Modelled Piezometric Surface

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	WT
CHECKED:	TC
DATE:	May 2022
FIGURE:	9.5



Broadtop Butte Backfill Water Balance Components

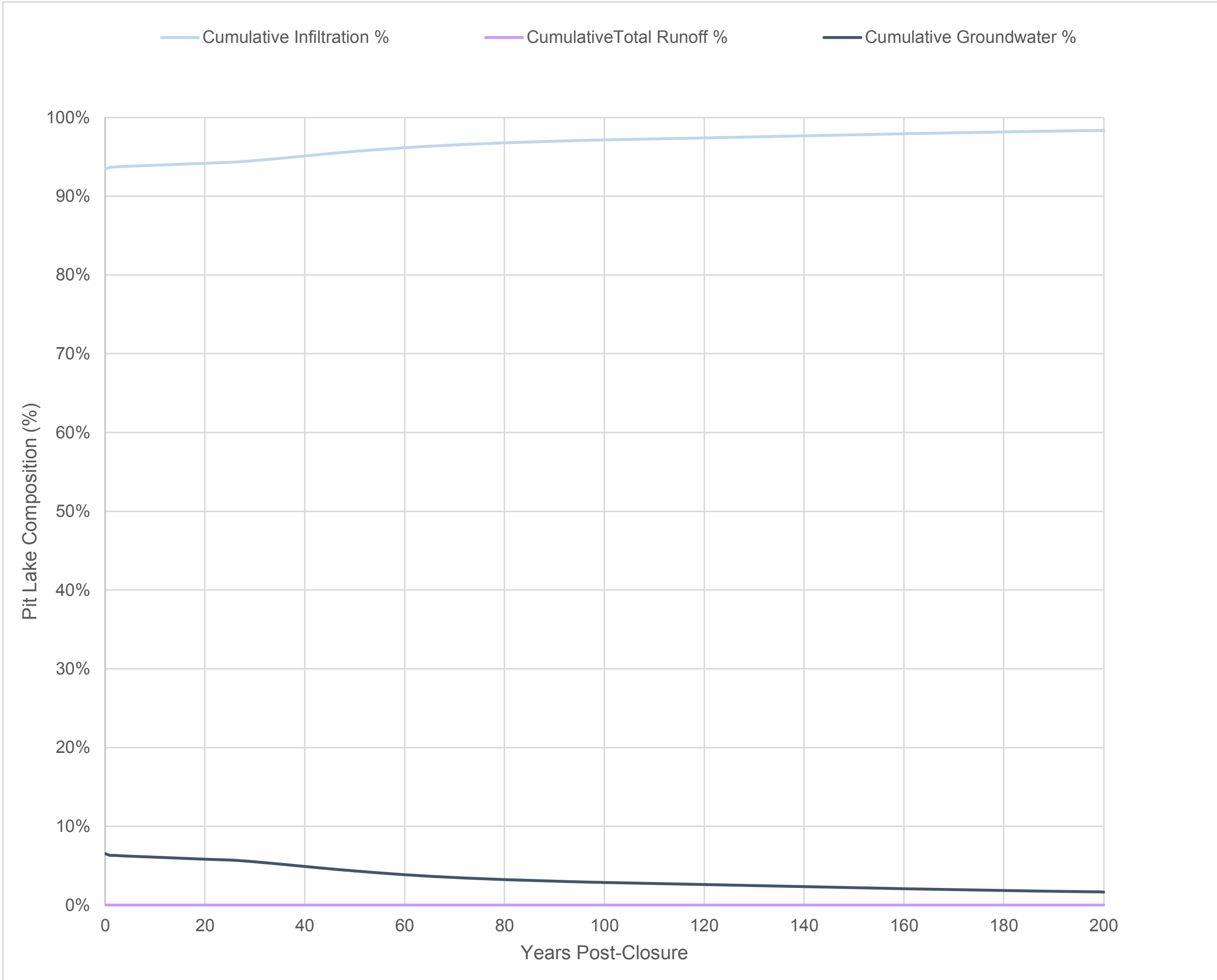
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

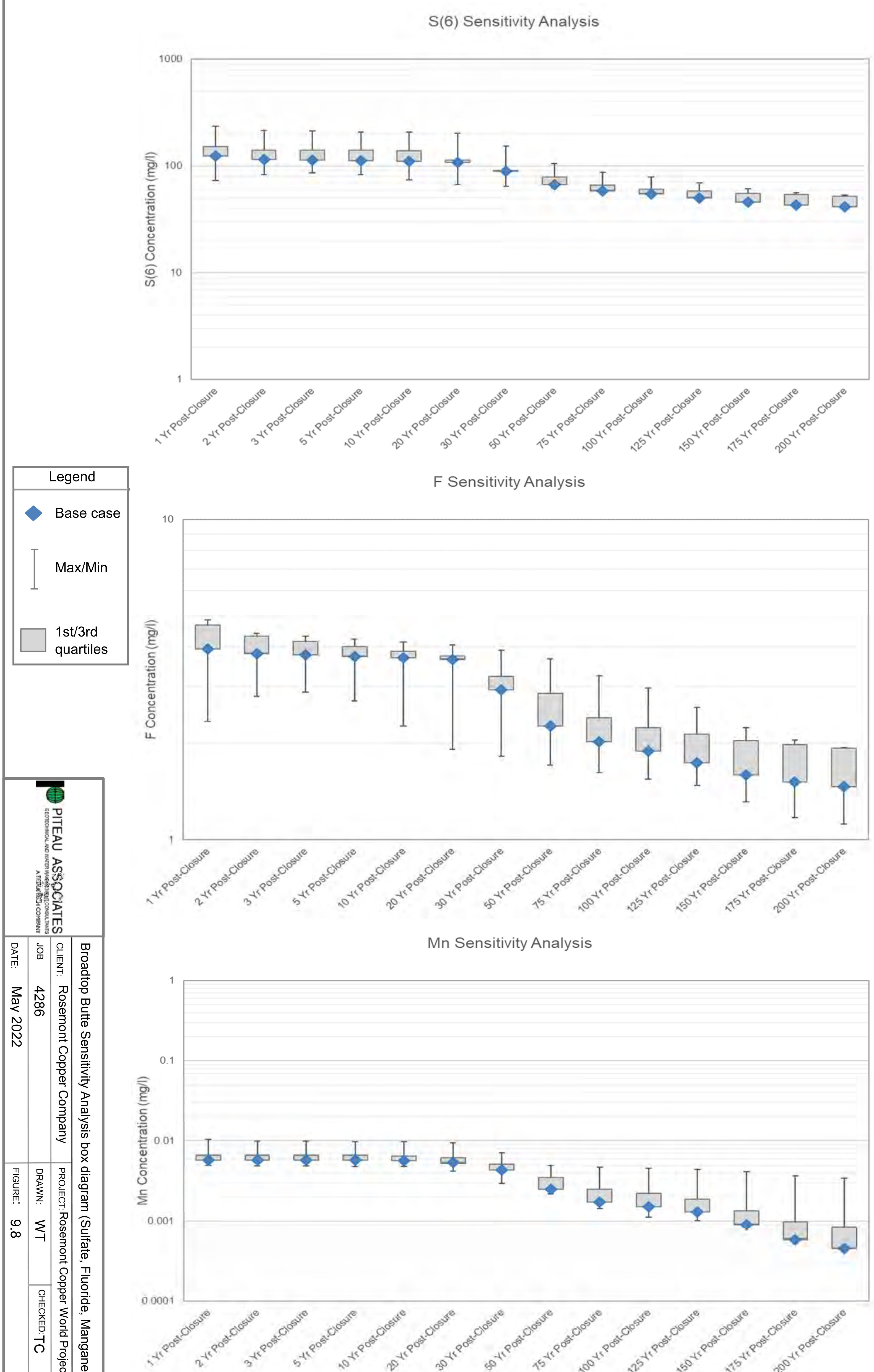
CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 9.6

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Broadtop Butte Pit Backfill Cumulative Percentage

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 9.7

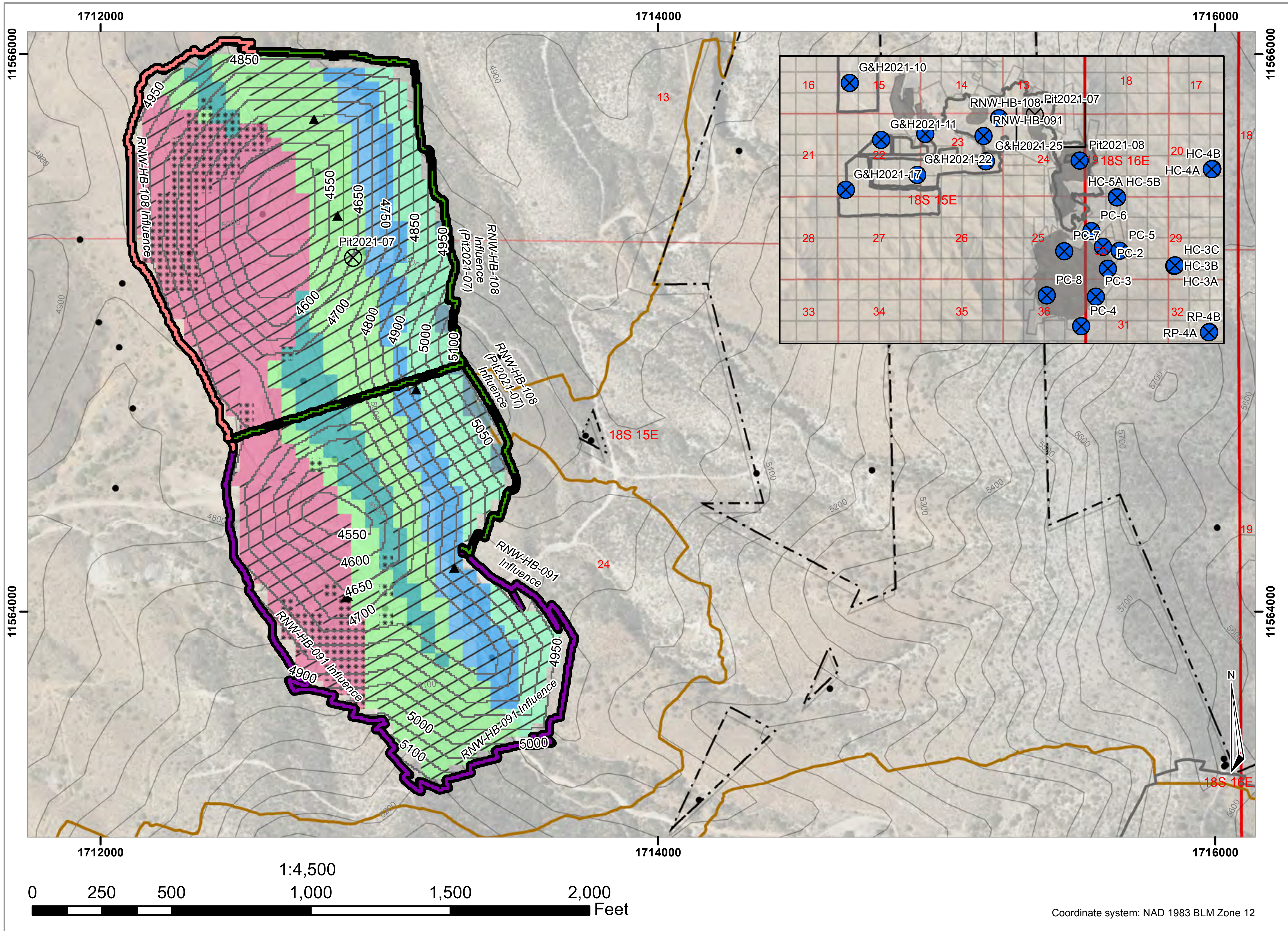




PITEAU ASSOCIATES

Broadtop Butte Sensitivity Analysis box diagram (Sulfate, Fluoride, Manganese)

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB 4286	DRAWN: WT
	CHECKED: TC
DATE: May 2022	FIGURE: 9.8



Geochemistry Wells
- Unsampled (1/4/22)
- Sampled (1/4/22)
- RP21 ABA Samples

ABA Samples
- AG
- PAG
- NAG
- Copper World Pit - 50 ft Contour

GW Well Influence
- RNW-HB-091 Influence
- RNW-HB-108 Influence
- RNW-HB-108 Influence (Pit2021-07)
- Broadtop Butte Pit
- Private Land Boundaries
- Waste Rock Facility
- Whole Rock Chemistry
- Topographic Elevation Contours
- PLSS Sections
- PLSS Second Division
- PLSS Township

Ultimate Pit Lithology
- ABRIGO:1.2-3.0
- ABRIGO:<1.2
- ABRIGO:>3.0
- BOLSA:1.2-3.0
- BOLSA:<1.2
- BOLSA:>3.0
- EARP:>3.0
- EPITAPH:>3.0
- GRANODIORITE:1.2-3.0
- GRANODIORITE:<1.2
- GRANODIORITE:>3.0
- HORQUILLA:>3.0
- MARTIN:>3.0

Copper World North/South Pit Configuration

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN:	WT
CHECKED:	TC
DATE:	May 2022
FIGURE:	10.1

PITEAU ASSOCIATES
A TETRA TECH COMPANY

Copper World North Stage-Area-Volume Curves

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

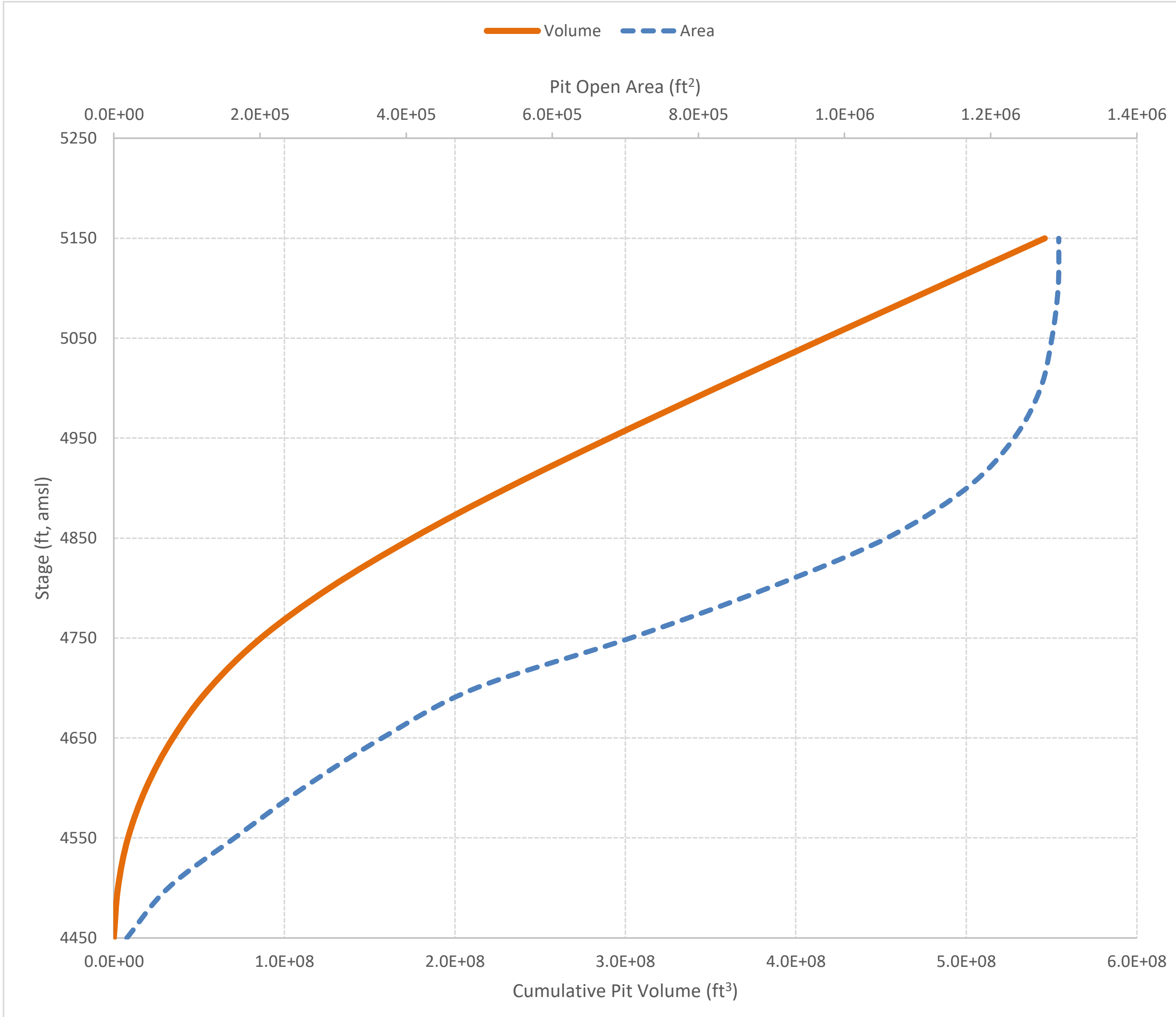
JOB#: 4286

DRAWN: WT

CHECKED: TC

DATE: May 2022

FIGURE: 10.2



PITEAU ASSOCIATES

Copper World South Stage-Area-Volume Curves

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

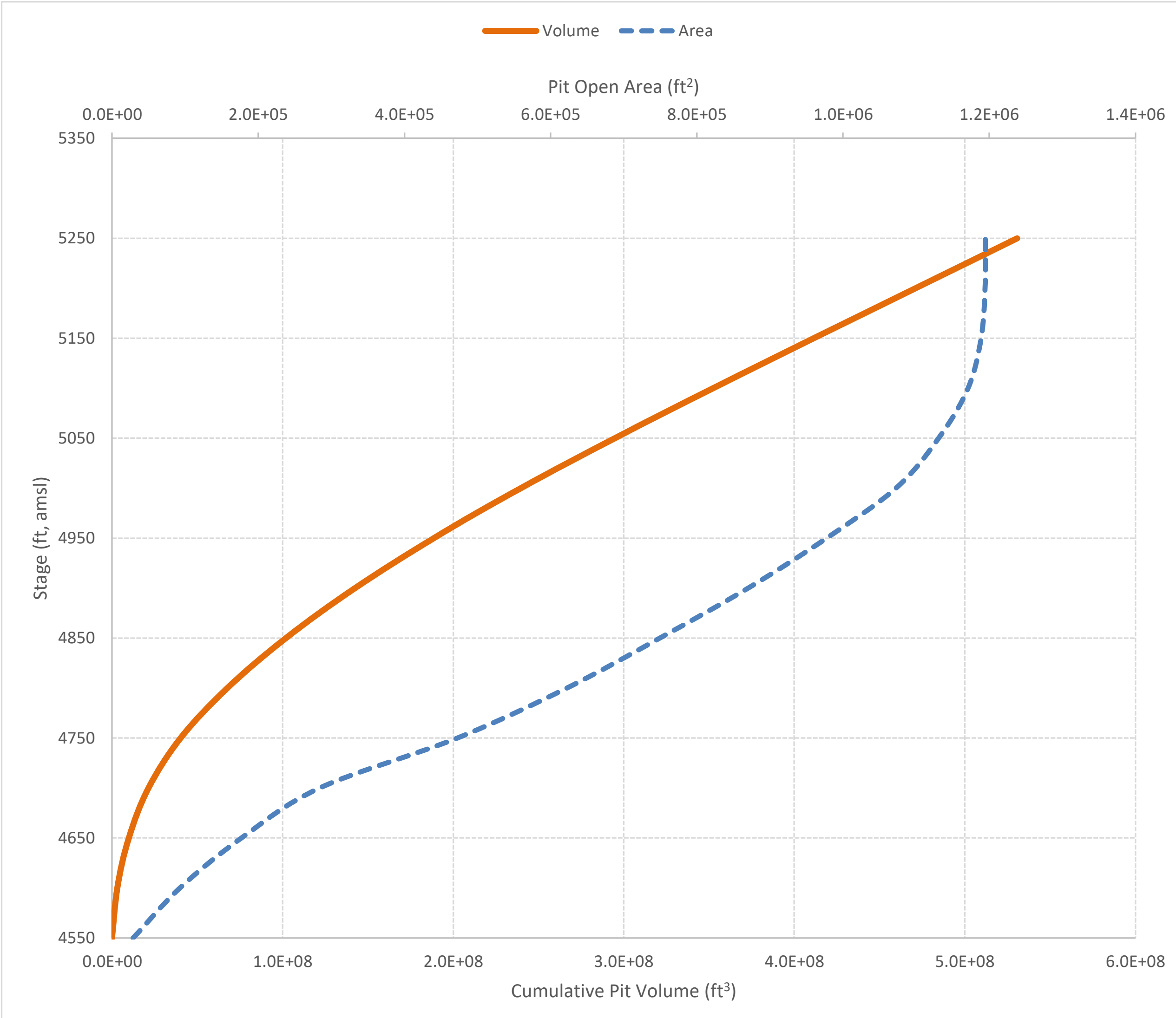
JOB#: 4286

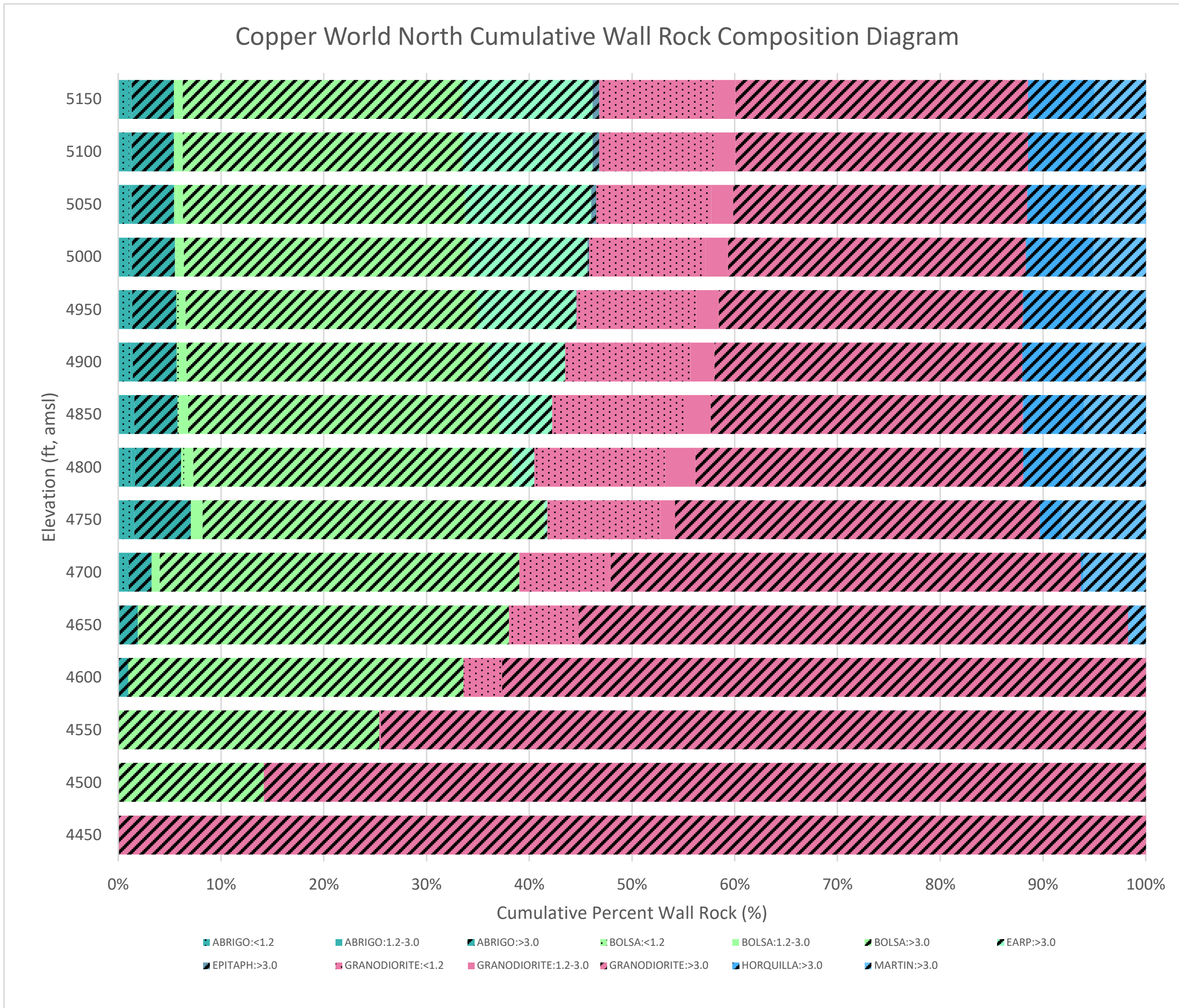
DRAWN: WT

CHECKED: TC

DATE: June 2022

FIGURE: 10.3

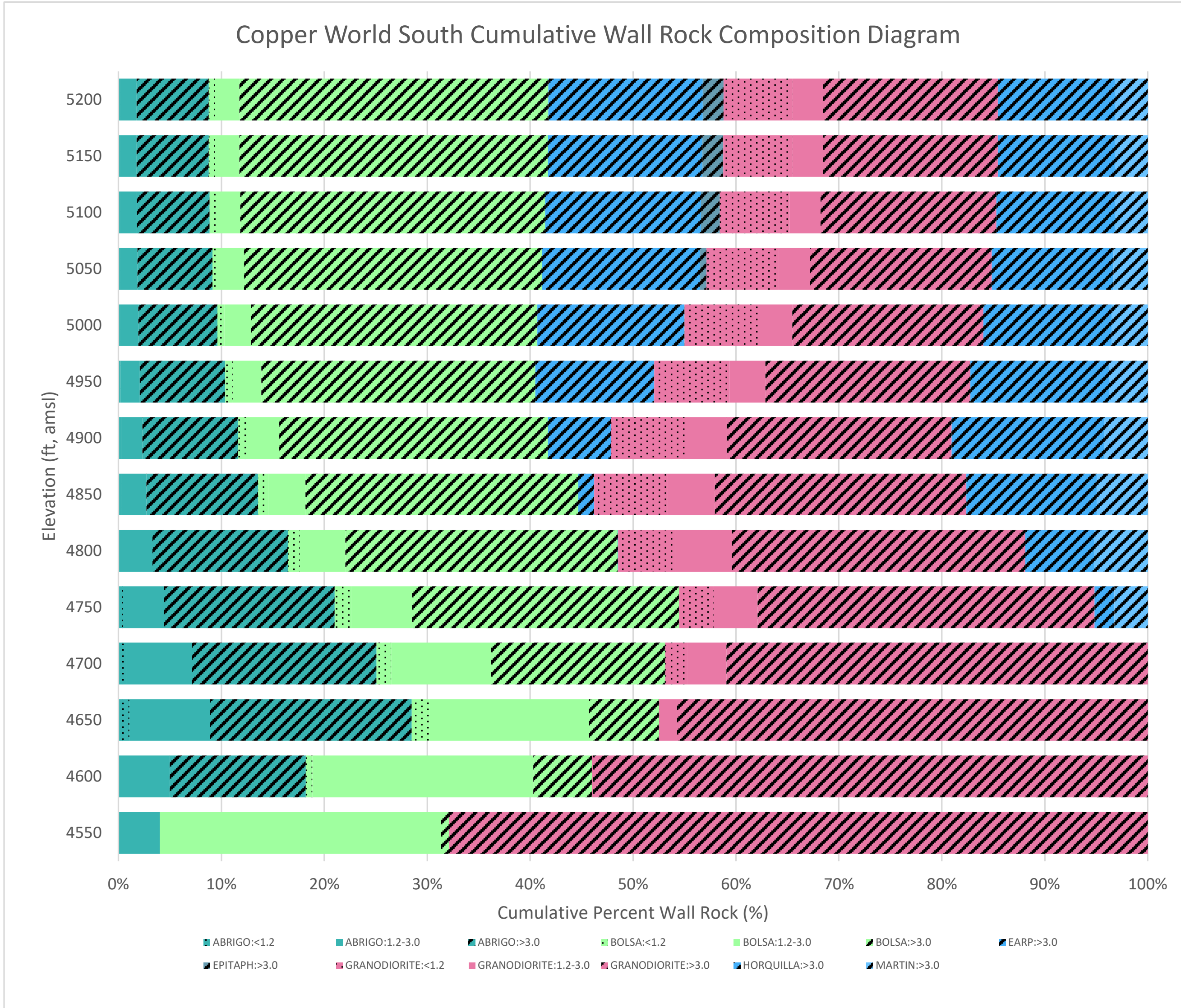




PITEAU ASSOCIATES
A TETRA TECH COMPANY

Copper World North Cumulative Wall Rock Composition Diagram

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB#:	4286
DRAWN:	WT
CHECKED:	TC
DATE:	May 2022
FIGURE:	10.4



PITEAU ASSOCIATES
A TETRA TECH COMPANY

Copper World South Cumulative Wall Rock Composition Diagram

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

JOB #: 4286

DRAWN: WT

CHECKED: TC

DATE: May 2022

FIGURE: 10.5

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Copper World North Pit Backfill Recovery

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

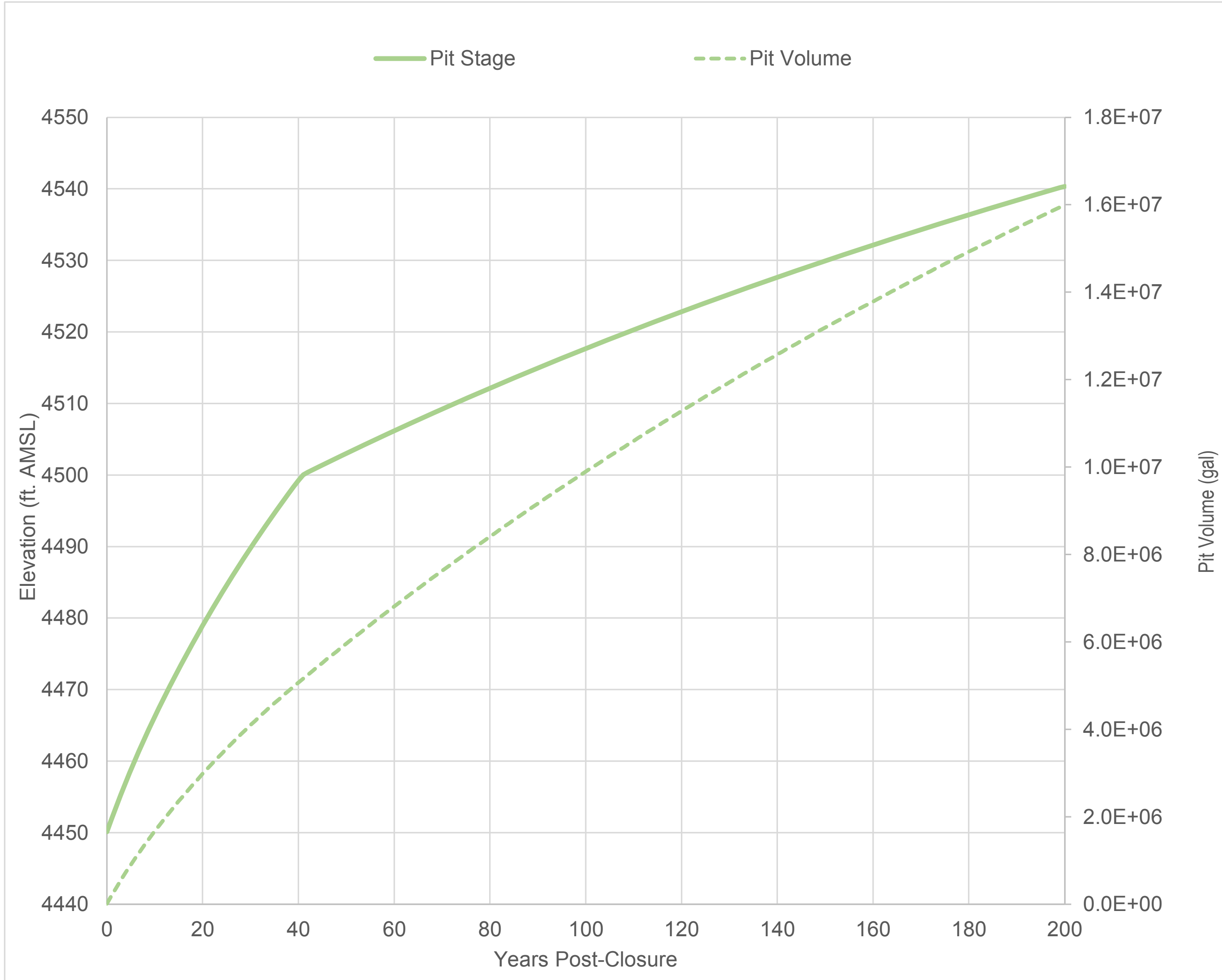
JOB #: 4286

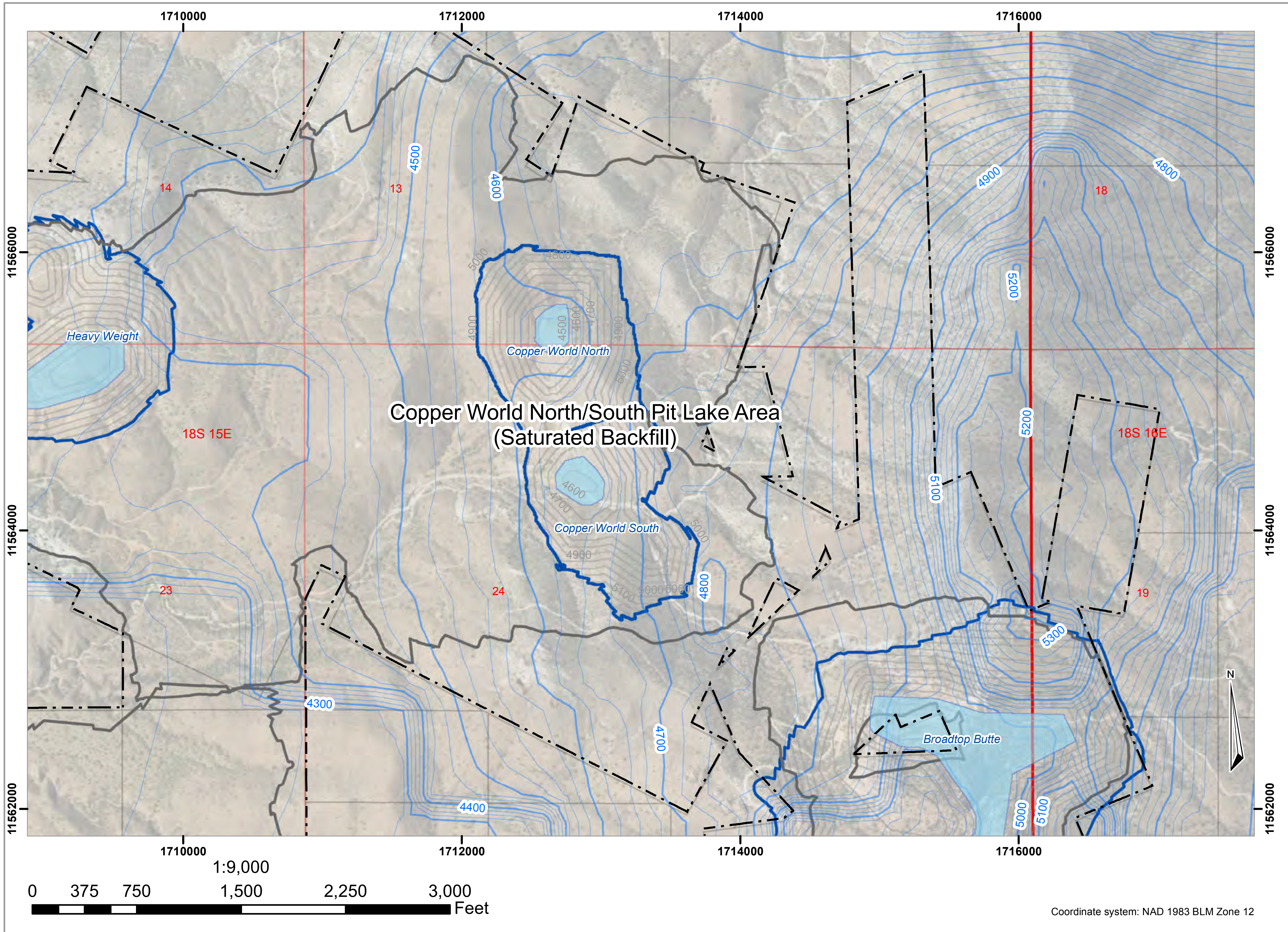
DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 10.6

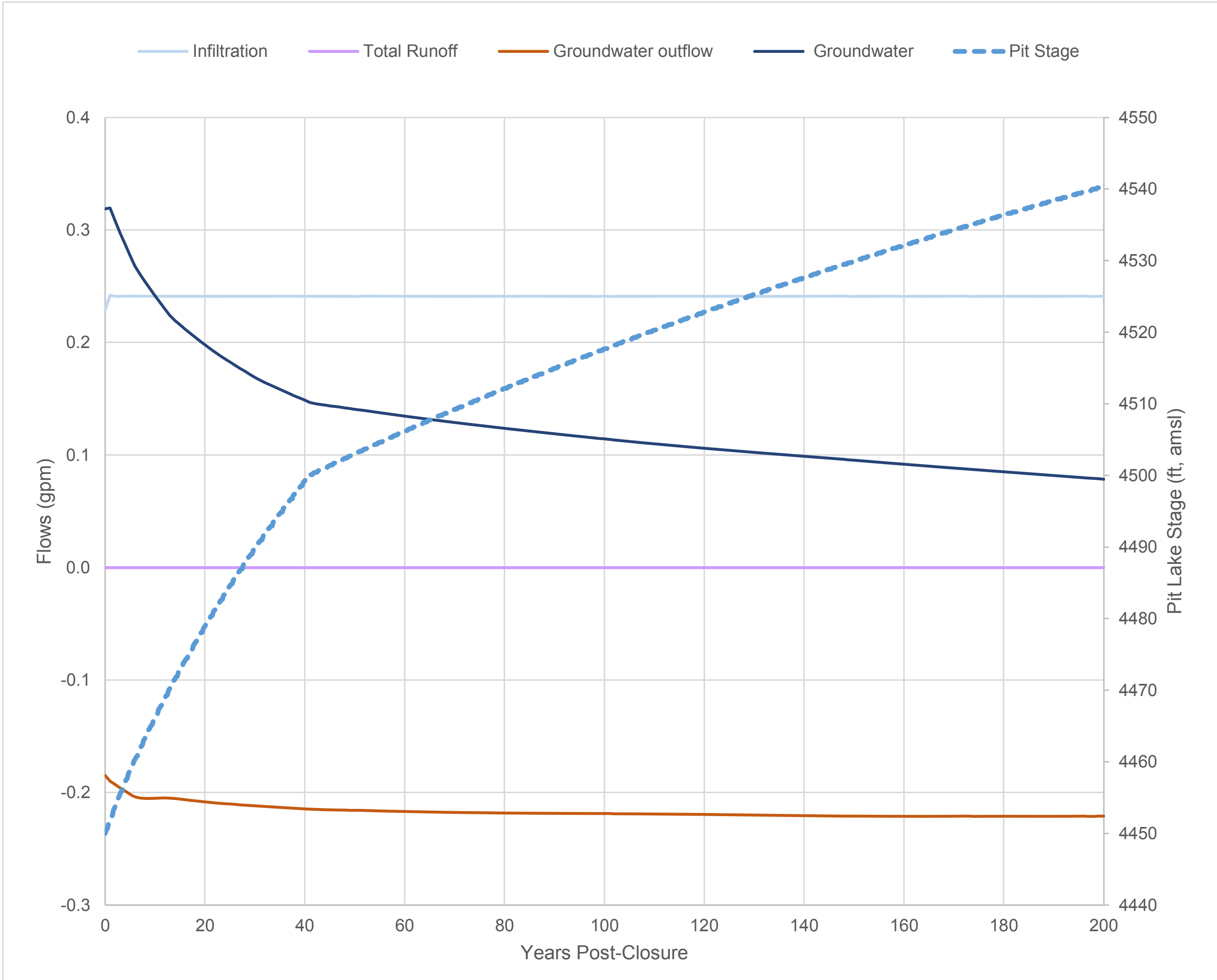




Copper World North/South Pit 200-year Post Closure Piezometric Surface

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: WT	CHECKED: TC
DATE:	May 2022
FIGURE:	10.7

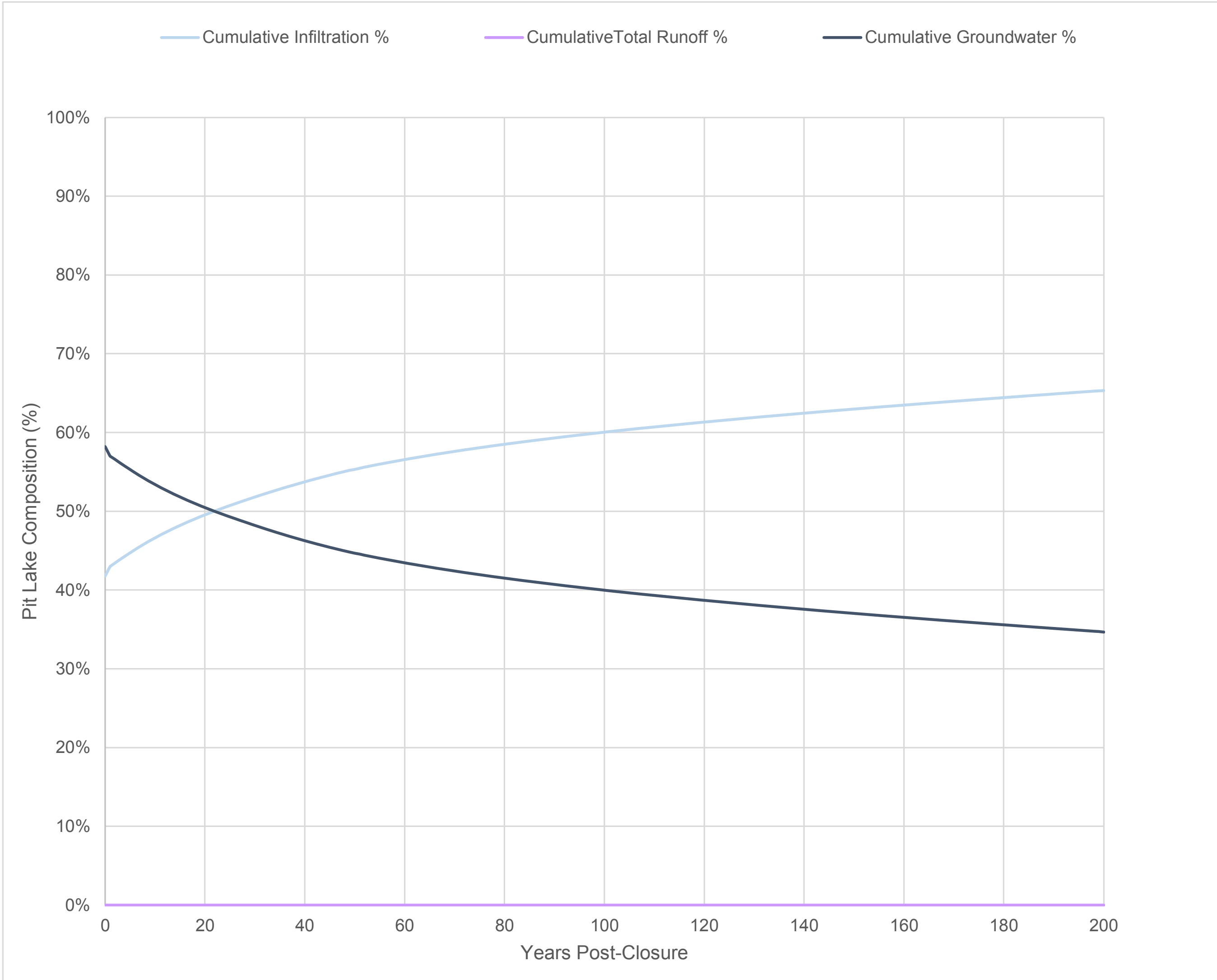


PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Copper World North Backfill Water Balance Components

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 10.8

Copper World North Backfill Cumulative Percentage



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: TC
	CHECKED: TC
DATE: May 2022	FIGURE: 10.9

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Copper World South Pit Backfill Recovery

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

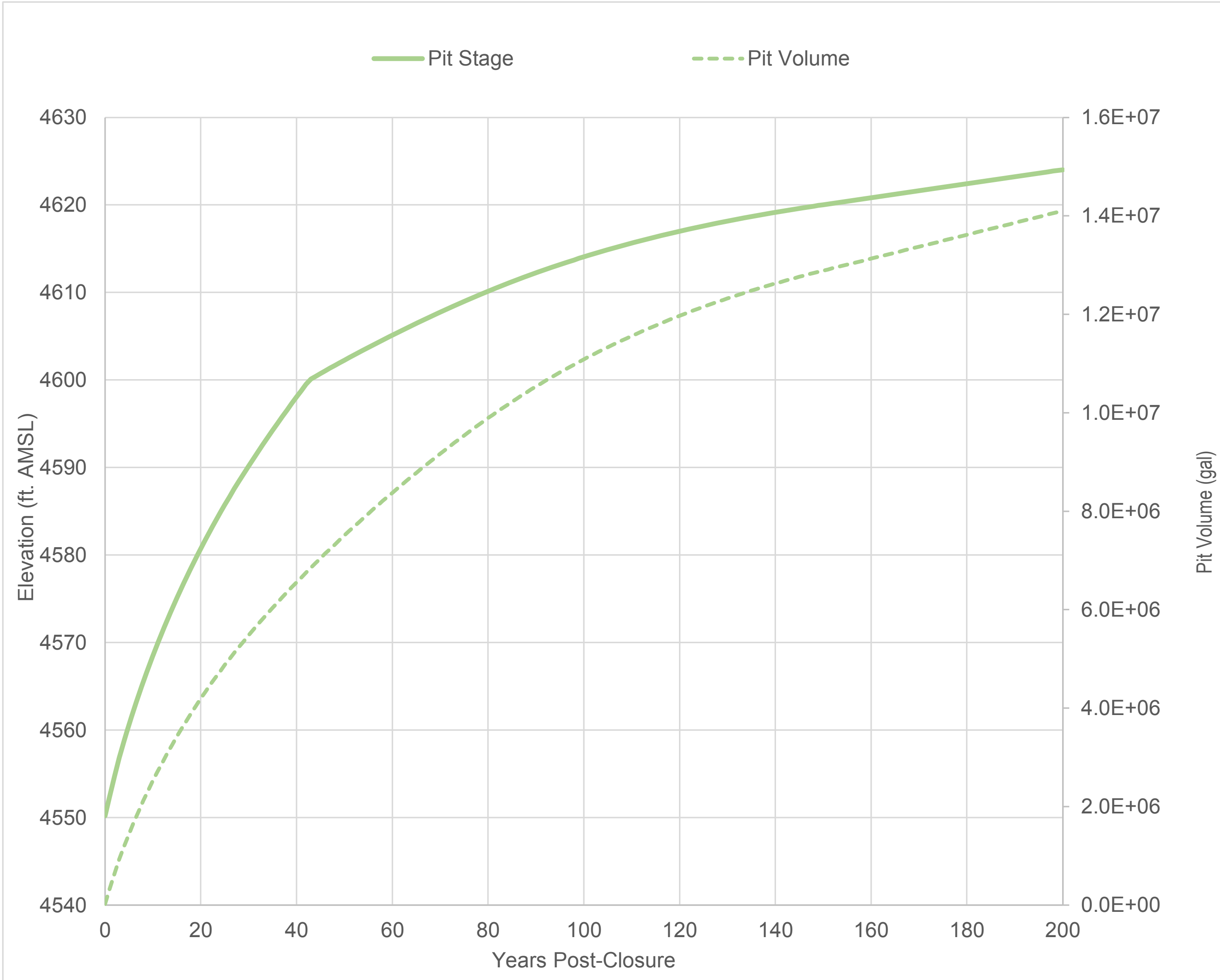
JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 10.10



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Copper World South Backfill Water Balance Components

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

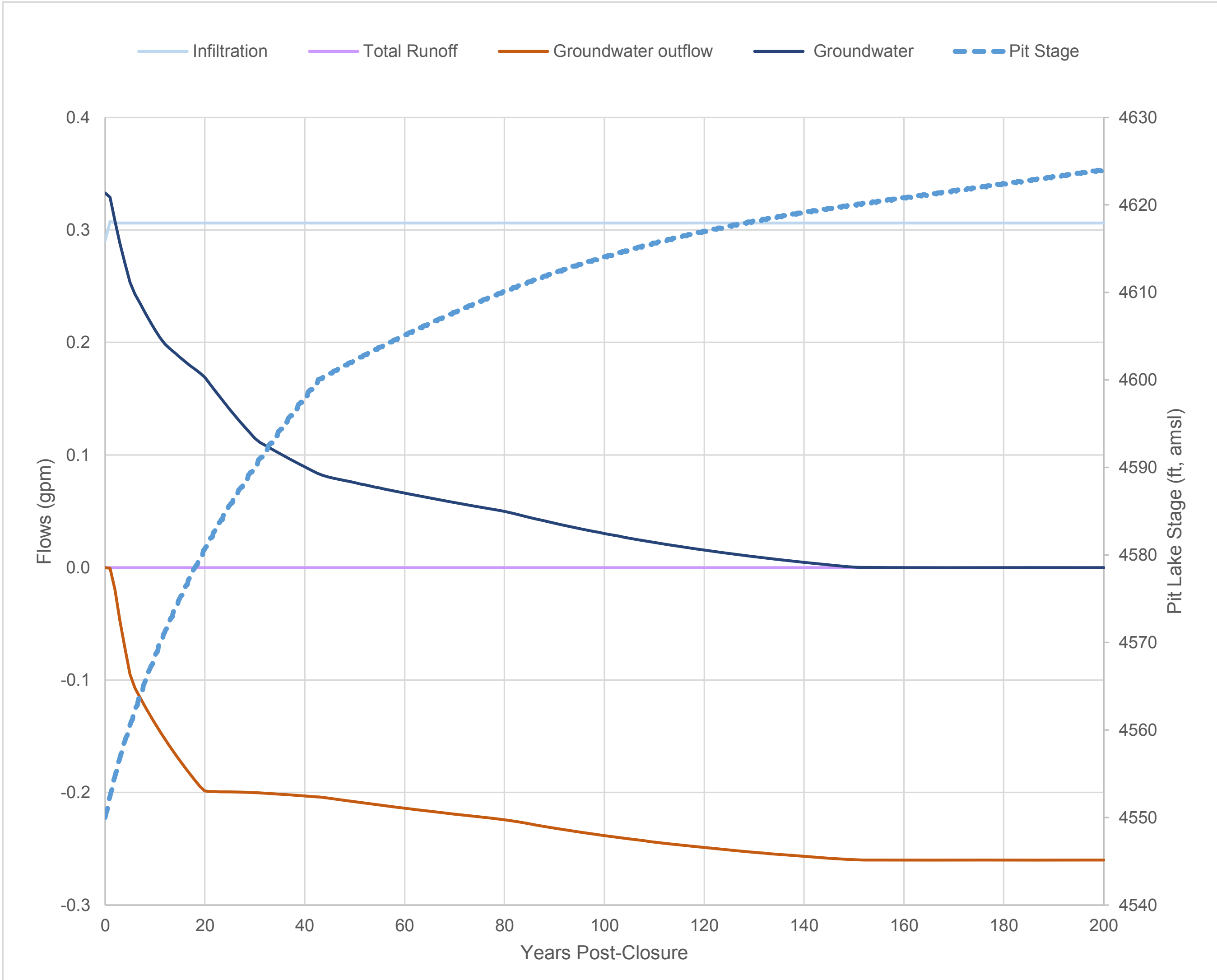
JOB #: 4286

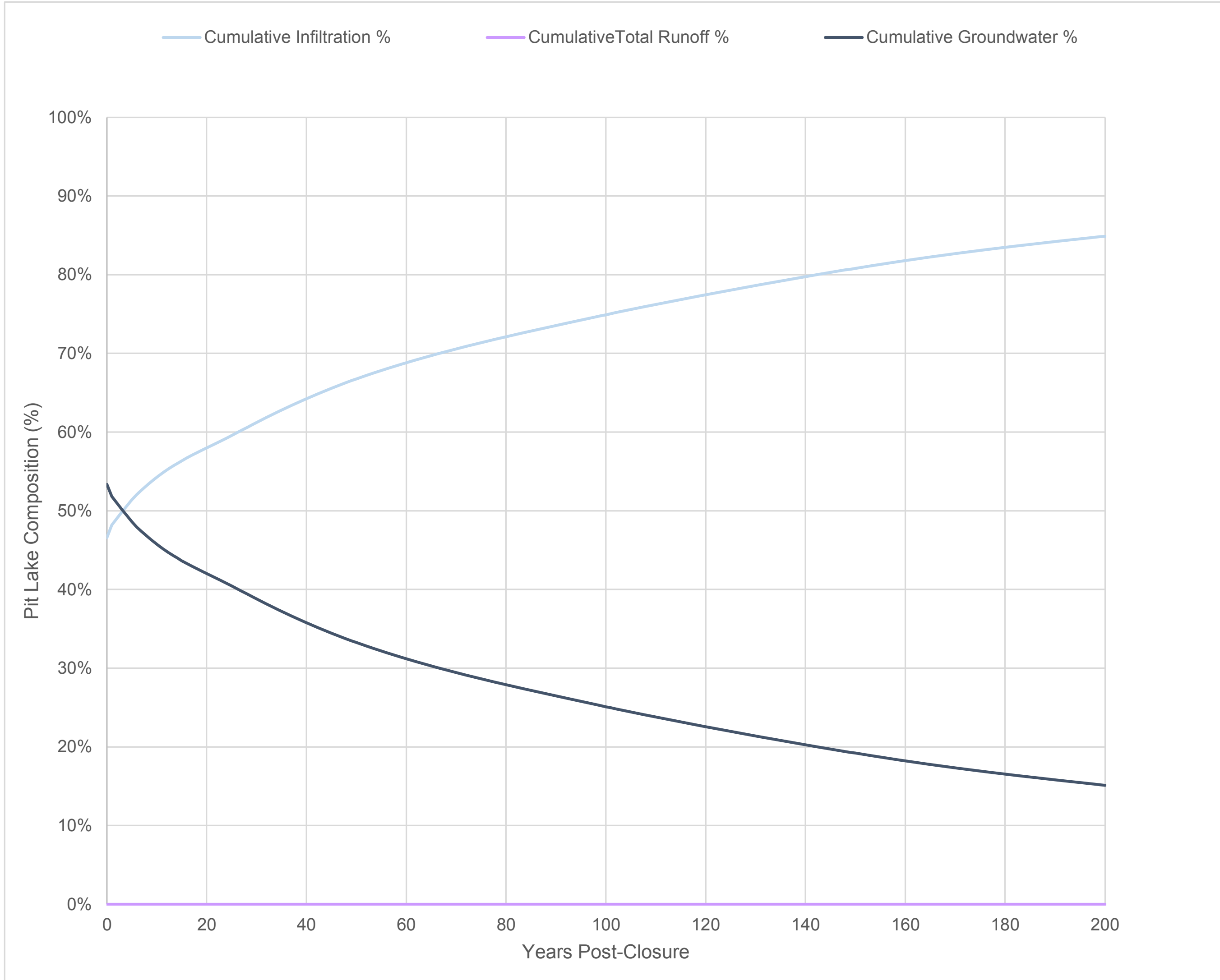
DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 10.11

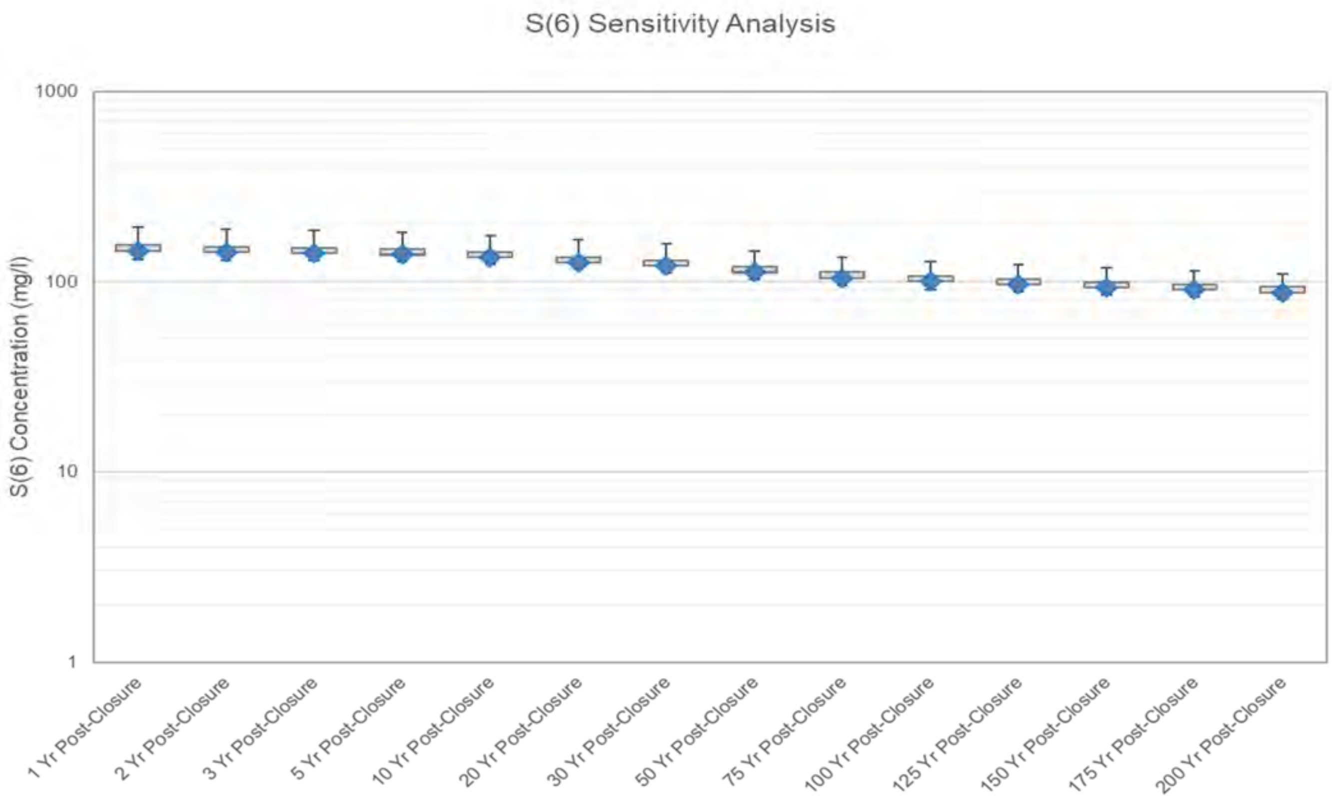




PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

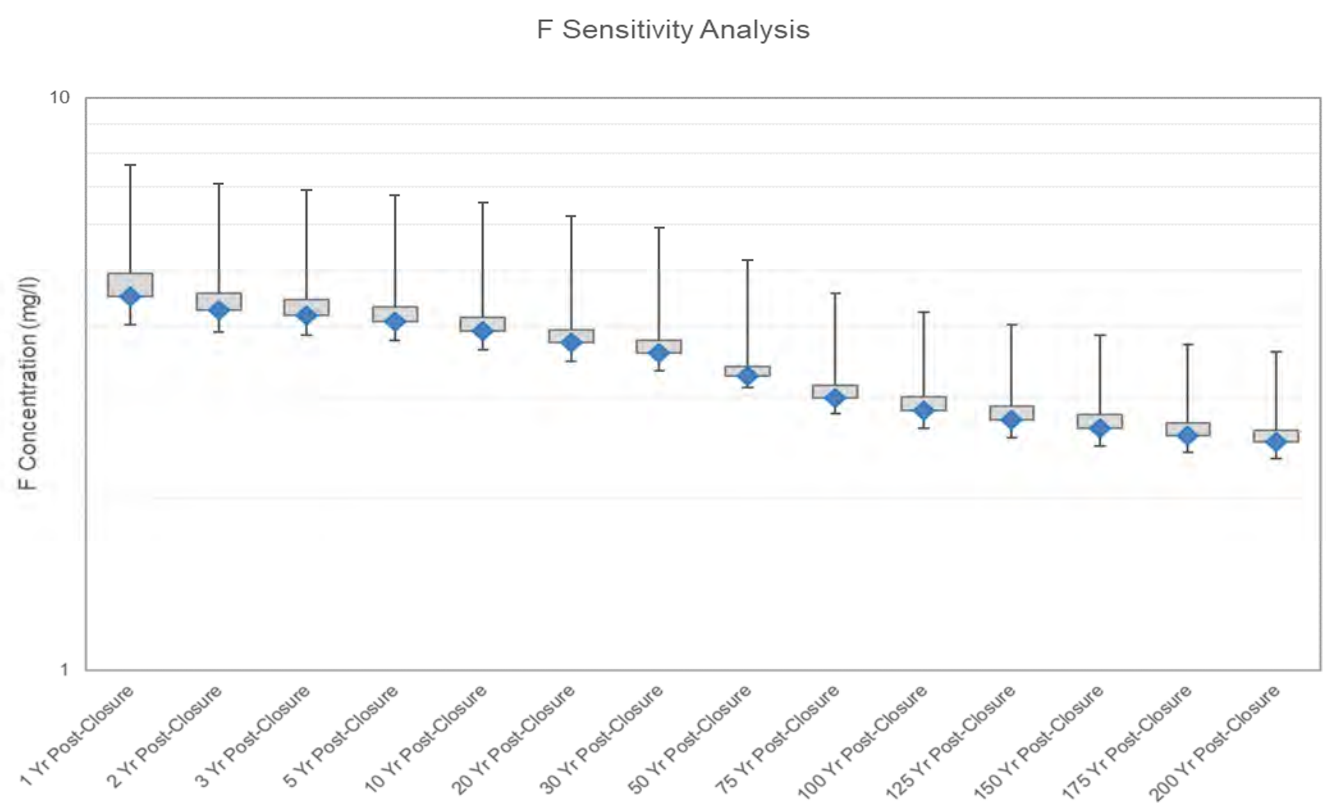
Copper World South Pit Backfill Cumulative Percentage

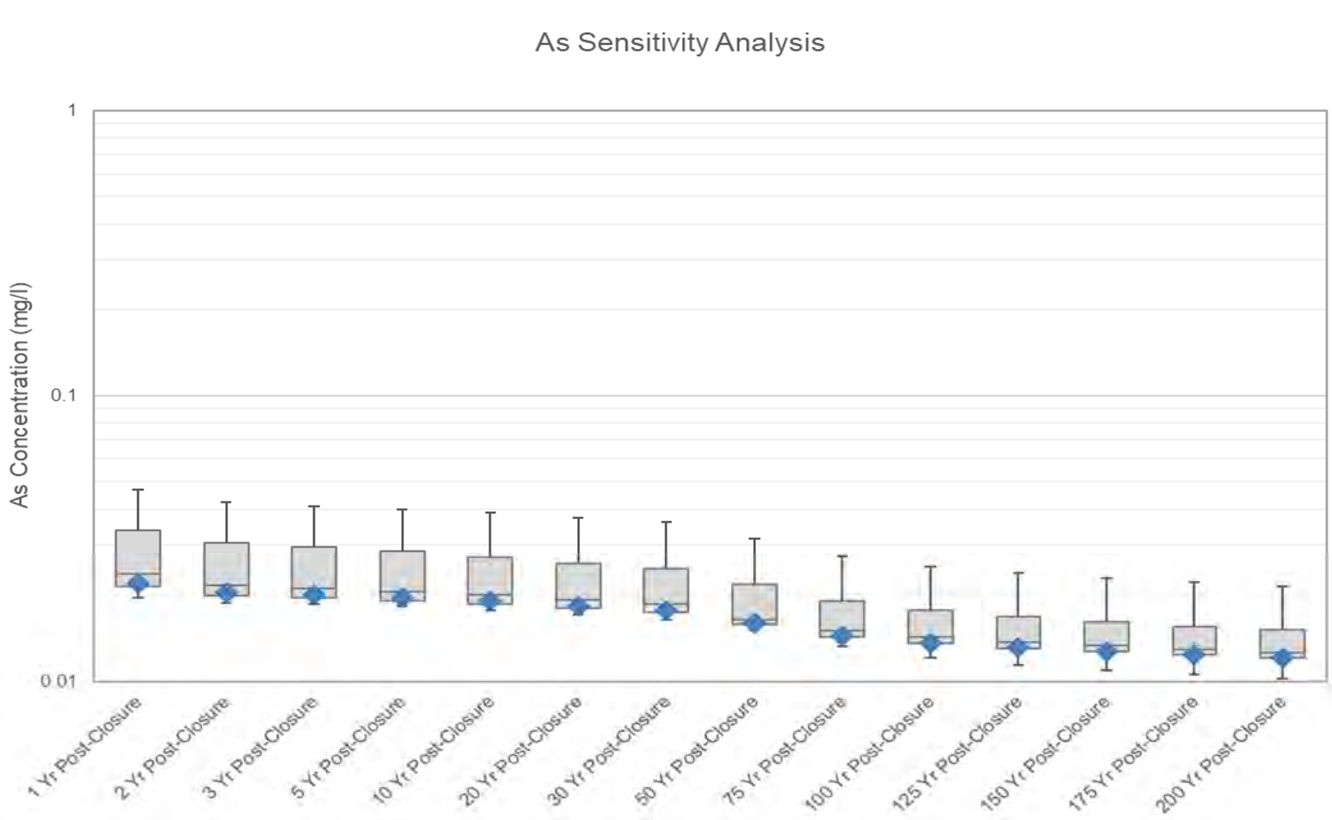
CLIENT:	Rosemont Copper Company	PROJECT:	Rosemont Copper World Project
JOB #:	4286	DRAWN:	TC
		CHECKED:	TC
DATE:	May 2022	FIGURE:	10.12



Legend

- Base case
- Max/Min
- 1st/3rd quartiles





PITEAU ASSOCIATES

Copper World North Sensitivity Analysis box diagram (Sulfate, Fluoride, Arsenic)

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

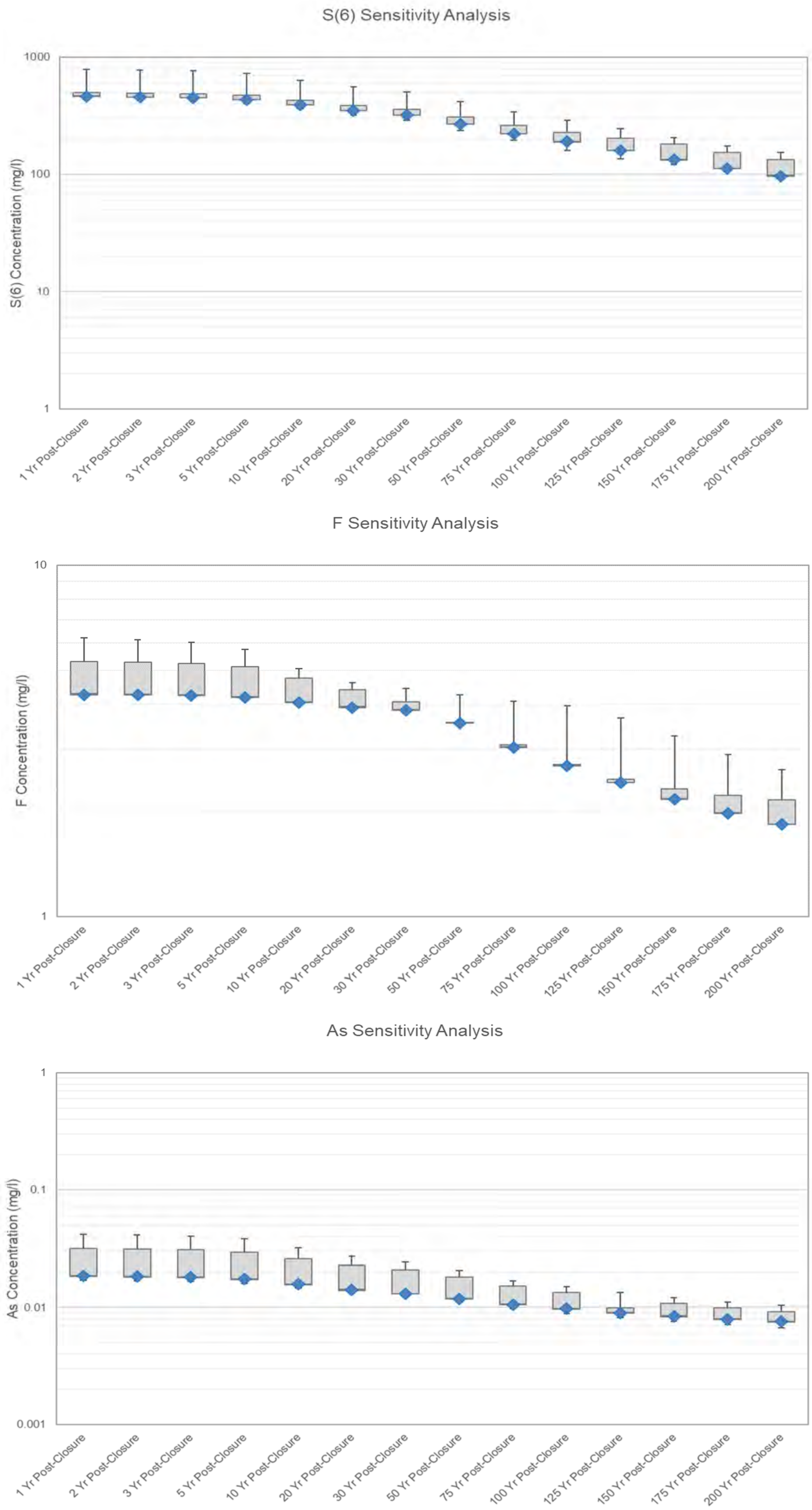
JOB 4286

DRAWN: WT

CHECKED: TC

DATE: May 2022

FIGURE: 10.13



PITEAU ASSOCIATES

Copper World South Sensitivity Analysis box diagram (Sulfate, Fluoride, Arsenic)

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

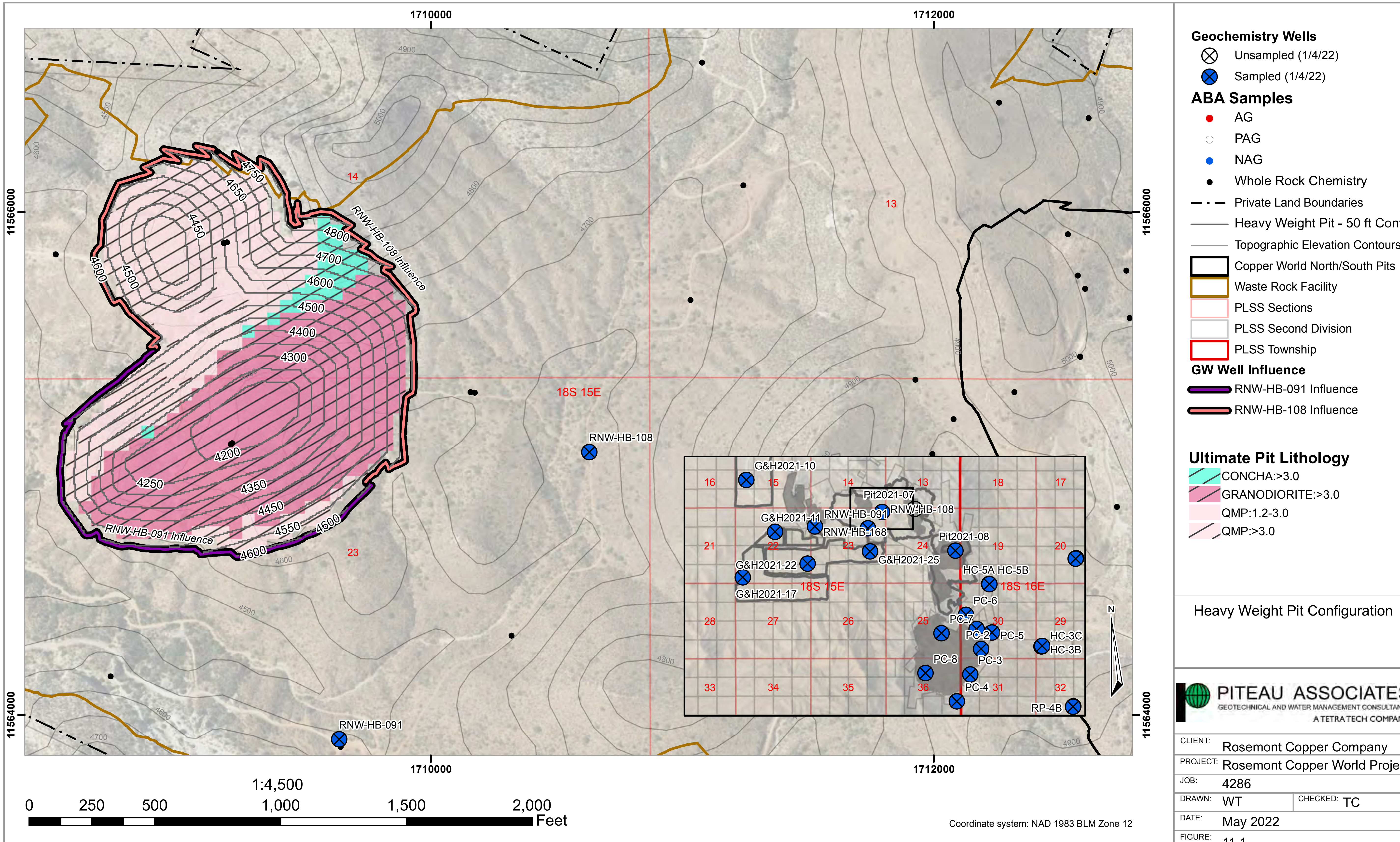
JOB 4286

DRAWN: WT

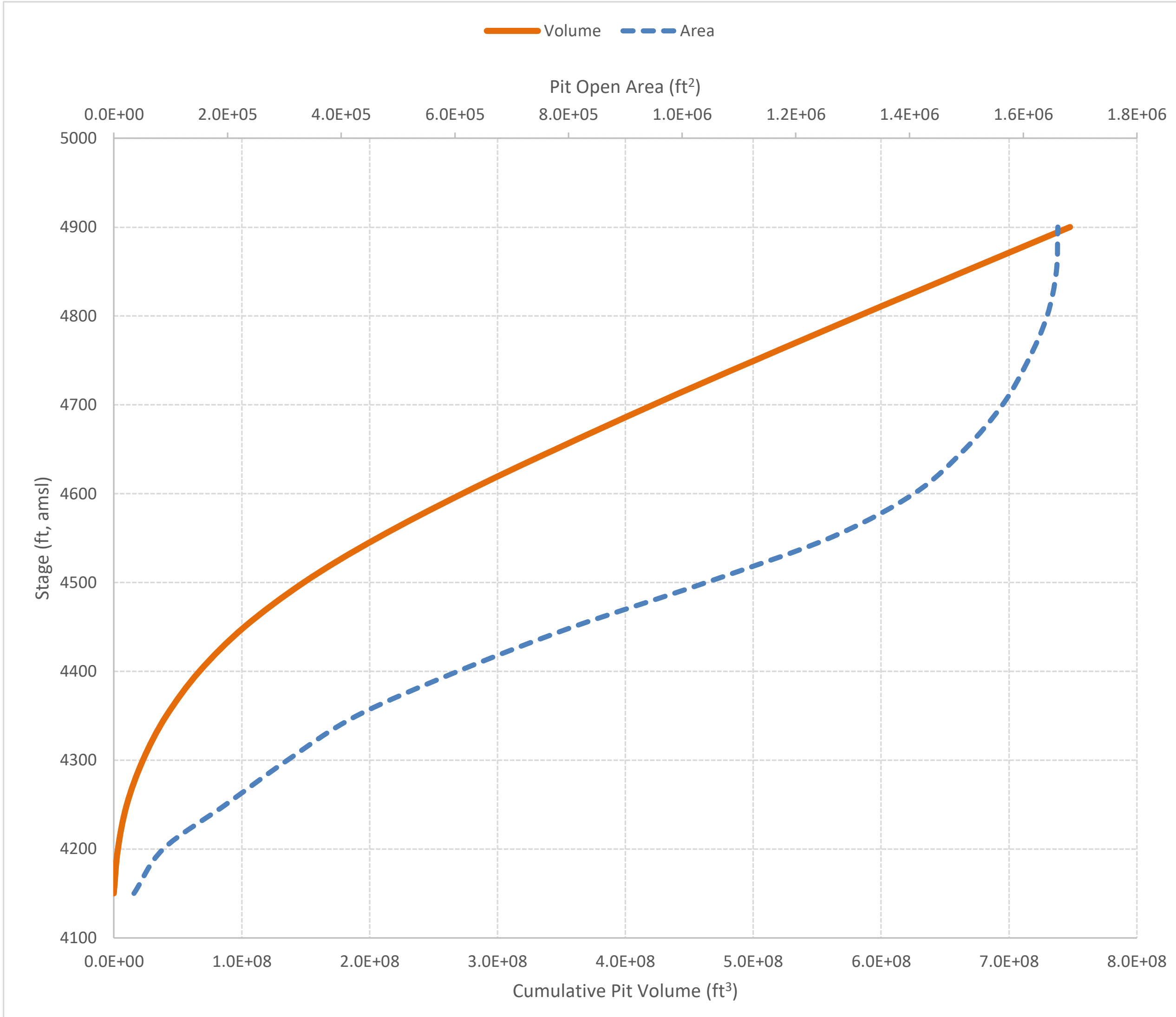
CHECKED: TC

DATE: May 2022

FIGURE: 10.14



Geochemistry Wells
Unsampled (1/4/22)
Sampled (1/4/22)
ABA Samples
AG
PAG
NAG
Whole Rock Chemistry
Private Land Boundaries
Heavy Weight Pit - 50 ft Contour
Topographic Elevation Contours
Copper World North/South Pits
Waste Rock Facility
PLSS Sections
PLSS Second Division
PLSS Township
GW Well Influence
RNW-HB-091 Influence
RNW-HB-108 Influence
Ultimate Pit Lithology
CONCHA:>3.0
GRANODIORITE:>3.0
QMP:1.2-3.0
QMP:>3.0
1710000
1712000
11566000
11564000
RNW-HB-108 Influence
RNW-HB-091 Influence
RNW-HB-108
RNW-HB-091
18S 15E
18S 16E
G&H2021-10
G&H2021-11
G&H2021-22
G&H2021-17
G&H2021-25
Pit2021-07
Pit2021-08
RNW-HB-168
HC-5A HC-5B
PC-6
PC-7
PC-2
PC-5
PC-8
PC-3
PC-4
HC-3C
HC-3B
RP-4B
1:4,500
0 250 500 1,000 1,500 2,000
Feet
Coordinate system: NAD 1983 BLM Zone 12
Heavy Weight Pit Configuration
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY
CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB: 4286
DRAWN: WT
CHECKED: TC
DATE: May 2022
FIGURE: 11.1



PITEAU ASSOCIATES

A TETRA TECH COMPANY

Heavy Weight Stage-Area-Volume Curves

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

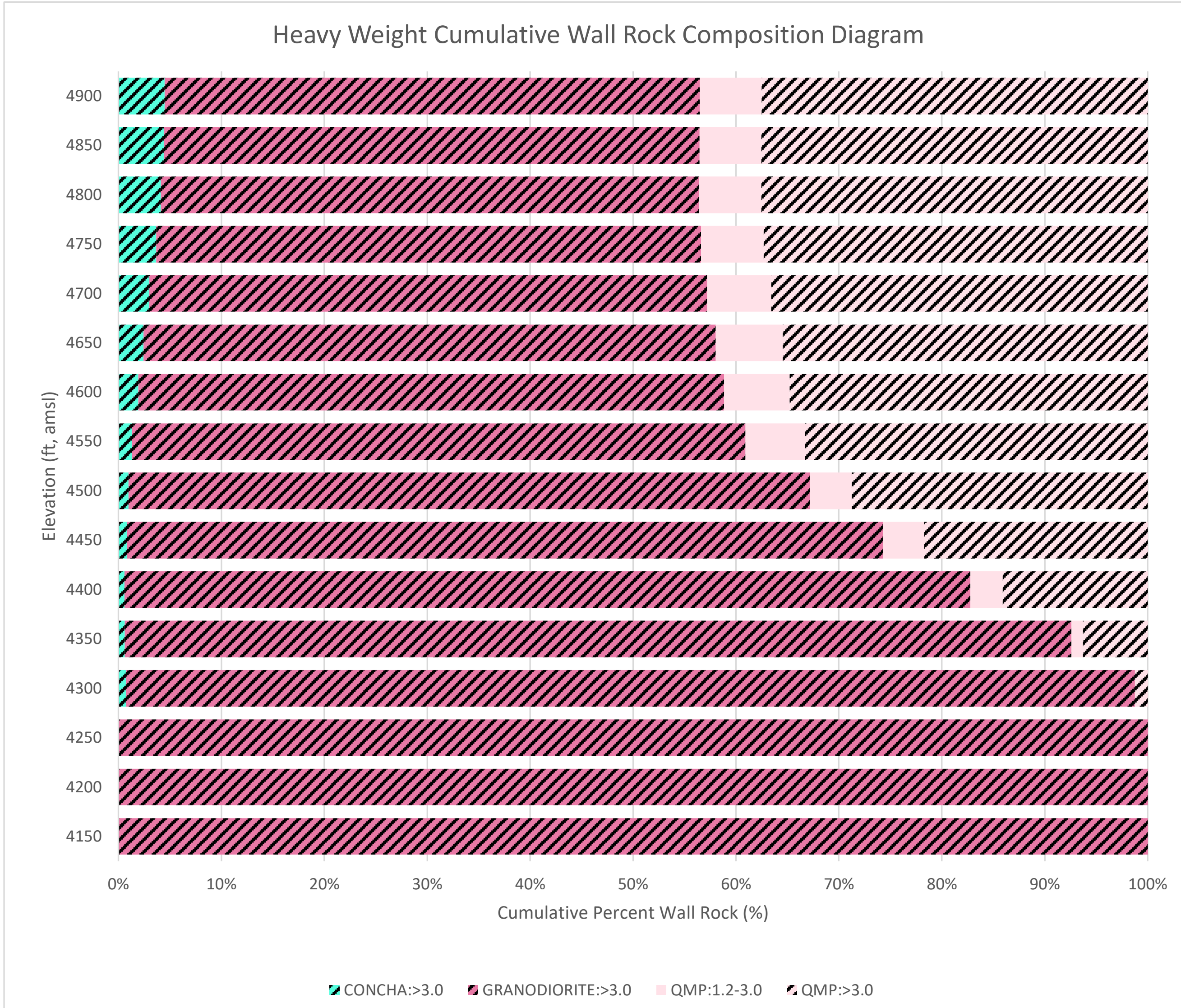
JOB #: 4286

DRAWN: WT

CHECKED: TC

DATE: May 2022

FIGURE: 11.2



PITEAU ASSOCIATES
A TETRA TECH COMPANY

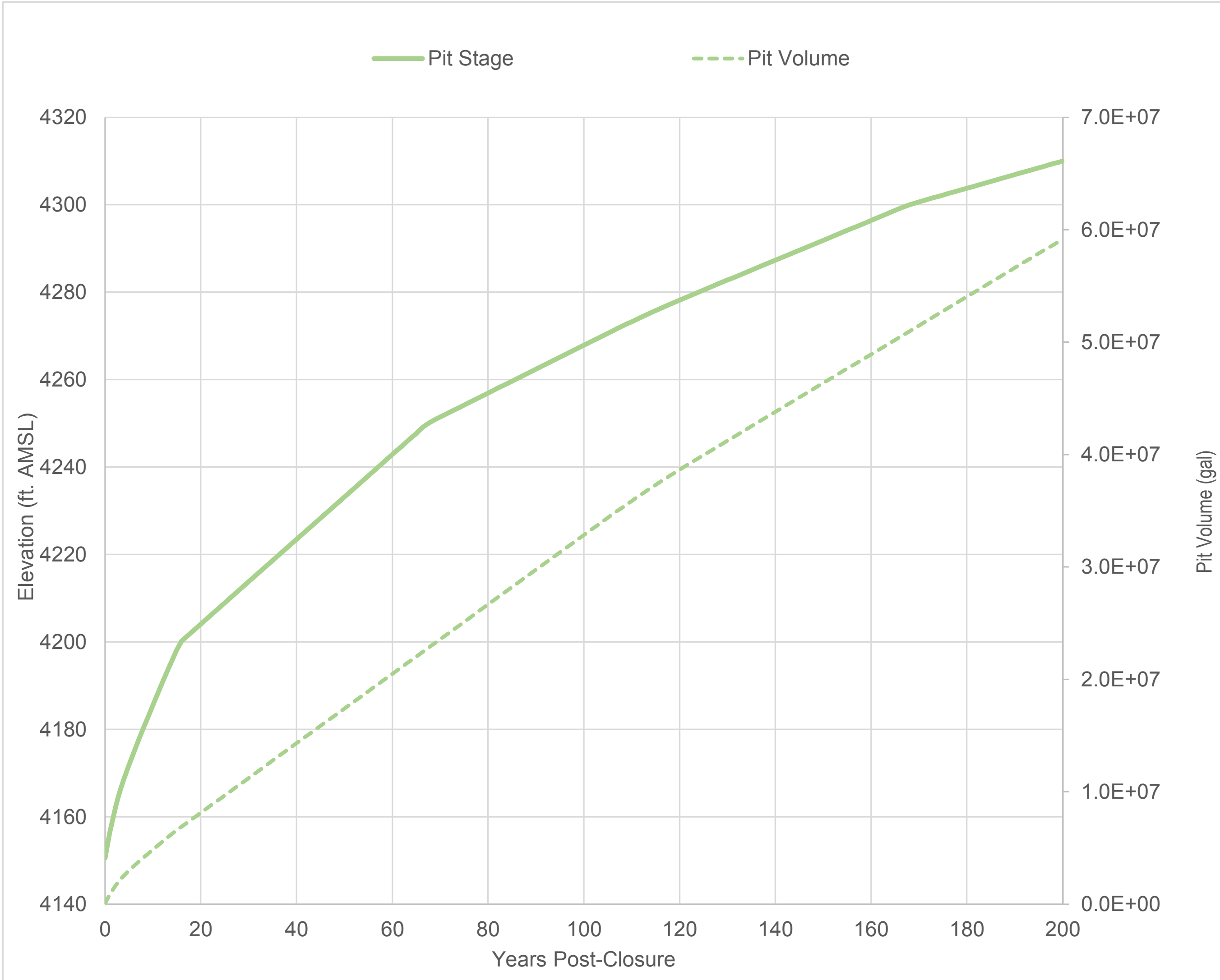
Heavy Weight Cumulative Wall Rock Composition Diagram

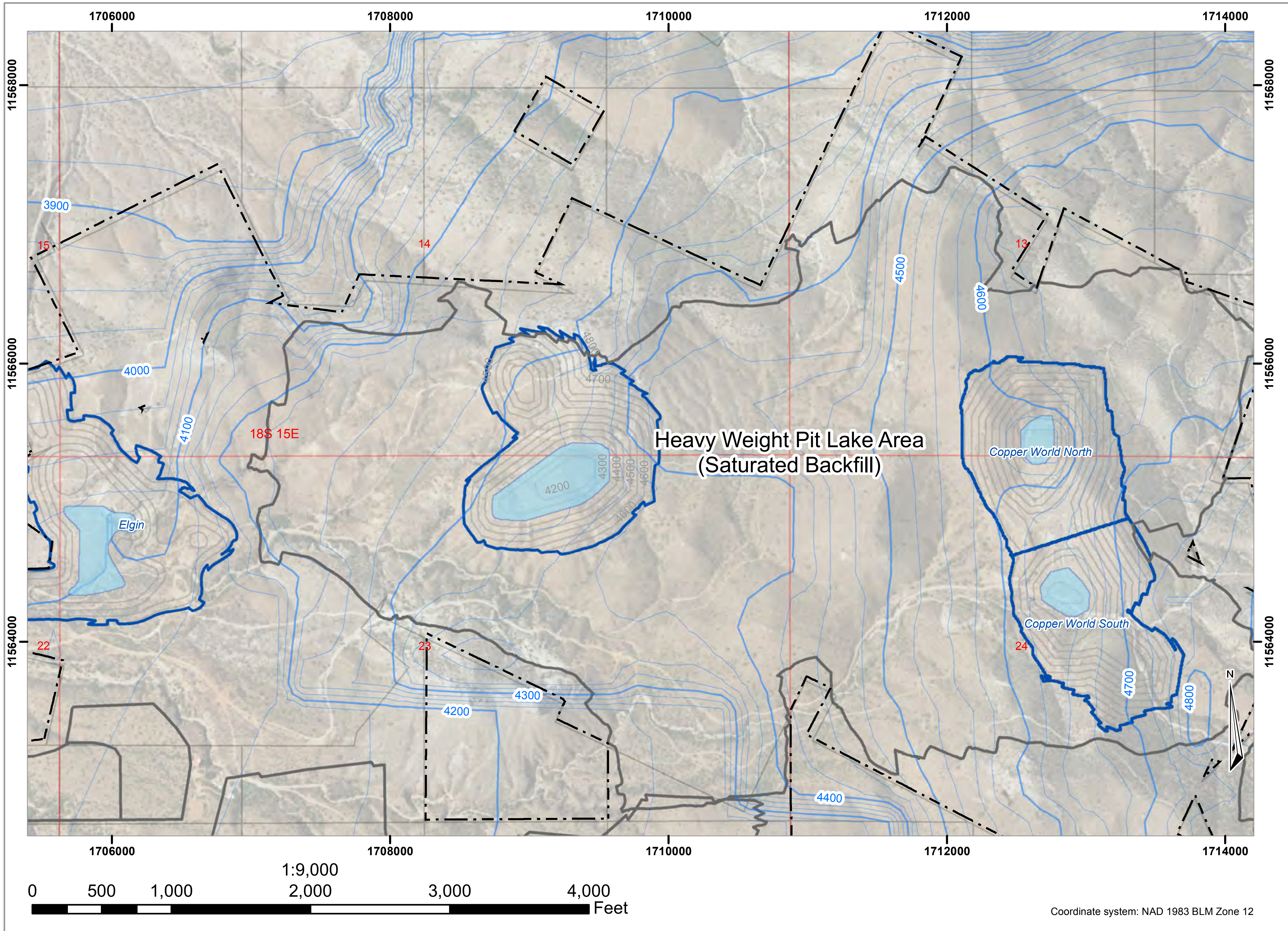
CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Prjoect
JOB #: 4286
DRAWN: WT
CHECKED: TC
DATE: May 2022
FIGURE: 11.3

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Heavy Weight Pit Backfill Recovery

CLIENT:	Rosemont Copper Company	PROJECT:	Rosemont Copper World Project
JOB #:	4286	DRAWN:	TC
		CHECKED:	TC
DATE:	May 2022	FIGURE:	11.4





Private Land Boundaries

Pit Lake Area

Pit Contour - 50ft Interval

Facility Outlines

Pit Footprints

PLSS Sections

PLSS Second Division

PLSS Township

Simulated 200 Year Post-Closure Contours

Contour - 25ft Interval

Contour - 50ft Interval

Heavy Weight Pit Modelled Piezometric Surface

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: WT	CHECKED: TC
DATE:	May 2022
FIGURE:	11.5

PITEAU ASSOCIATES
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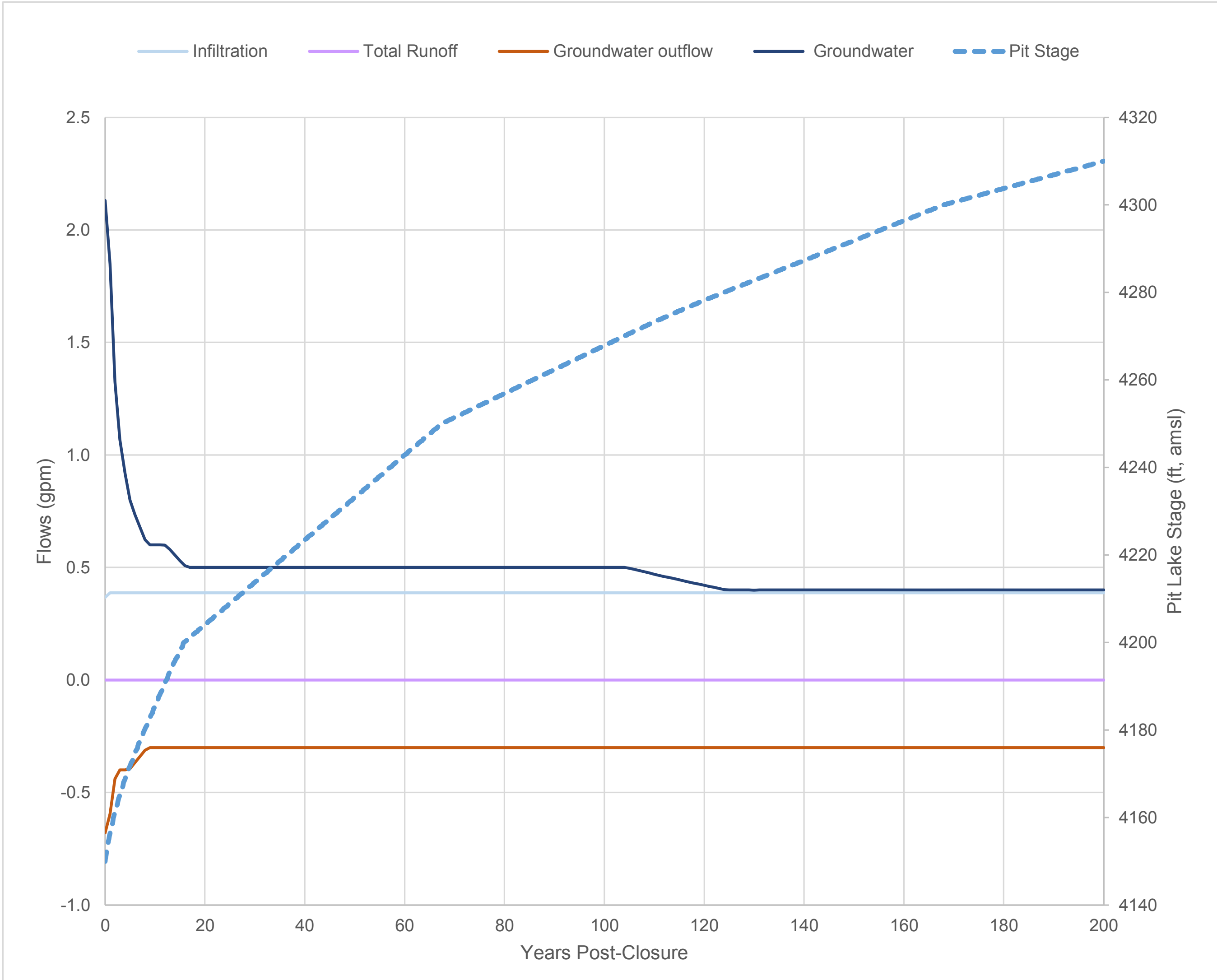
A TETRA TECH COMPANY

Heavy Weight Backfill Water Balance Components

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 11.6



PITEAU ASSOCIATES
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A TETRA TECH COMPANY

Heavy Weight Pit Backfill Cumulative Percentage

CLIENT: Rosemont Copper Company

PROJECT: Roseomont Copper World Project

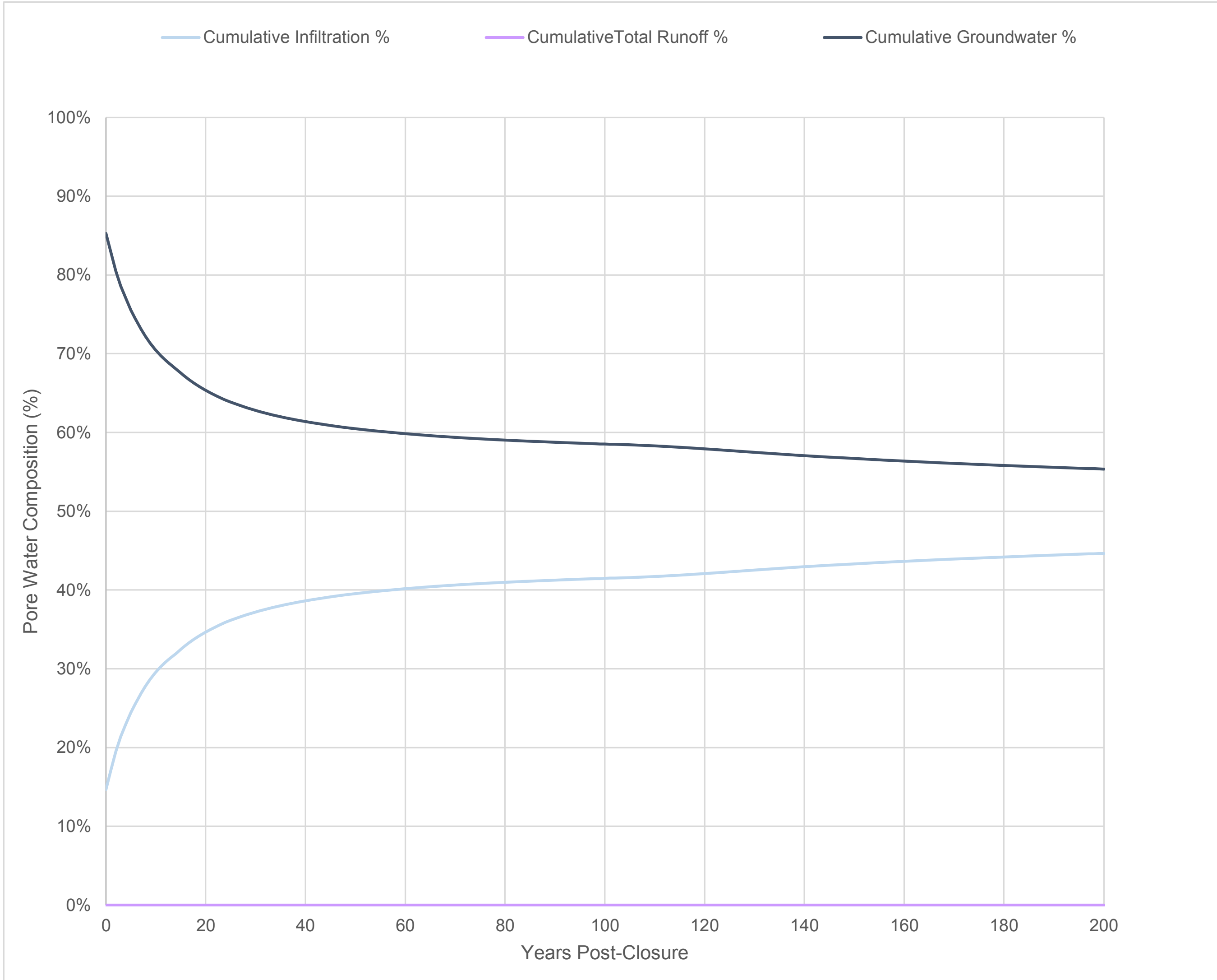
JOB #: 4286

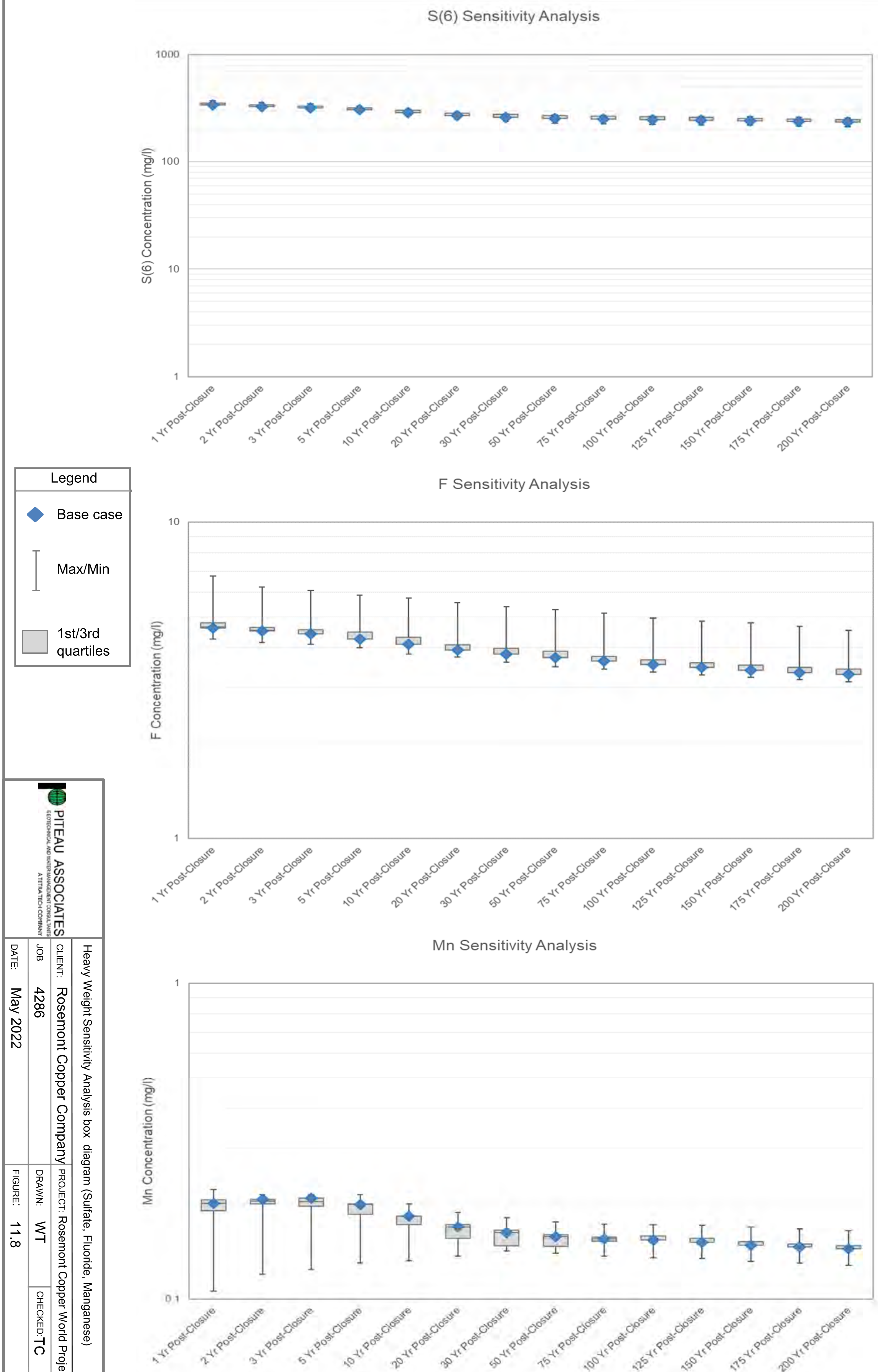
DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 11.7





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A TETRA TECH COMPANY

Heavy Weight Sensitivity Analysis box diagram (Sulfate, Fluoride, Manganese)

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

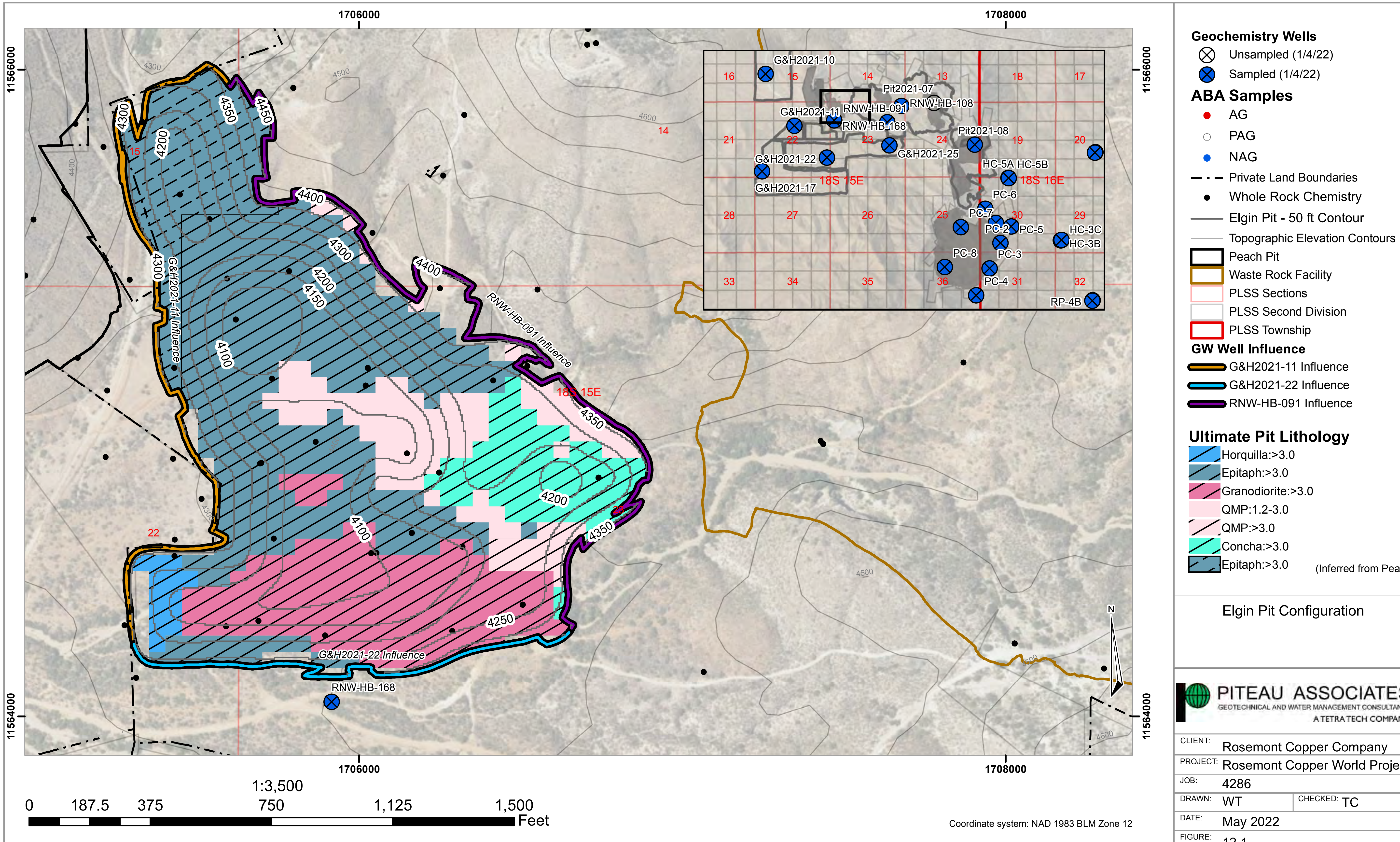
JOB: 4286

DRAWN: WT

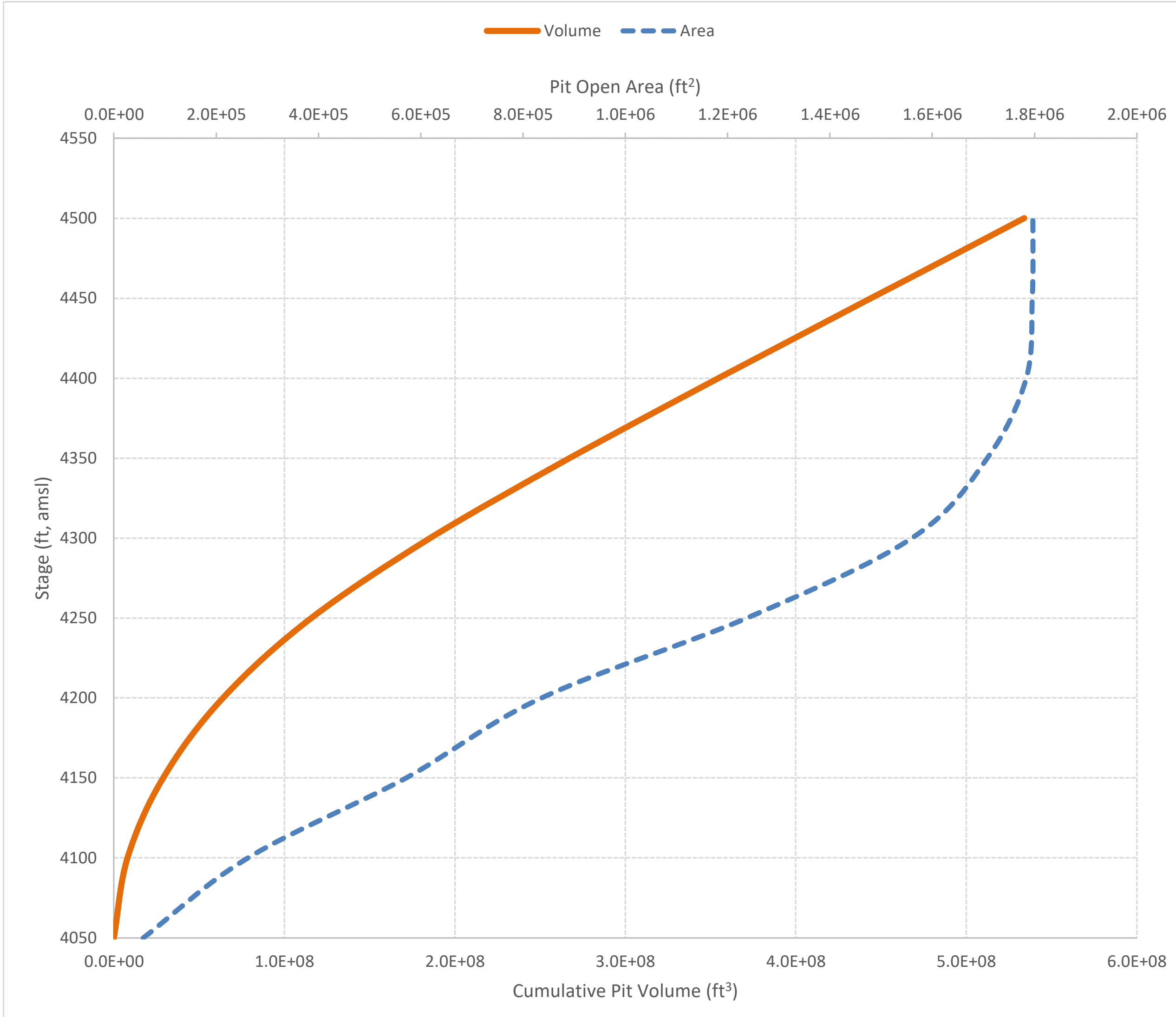
CHECKED: TC

DATE: May 2022

FIGURE: 11.8



Geochemistry Wells
Unsampled (1/4/22)
Sampled (1/4/22)
ABA Samples
AG
PAG
NAG
Private Land Boundaries
Whole Rock Chemistry
Elgin Pit - 50 ft Contour
Topographic Elevation Contours
Peach Pit
Waste Rock Facility
PLSS Sections
PLSS Second Division
PLSS Township
GW Well Influence
G&H2021-11 Influence
G&H2021-22 Influence
RNW-HB-091 Influence
Ultimate Pit Lithology
Horquilla:>3.0
Epitaph:>3.0
Granodiorite:>3.0
QMP:1.2-3.0
QMP:>3.0
Concha:>3.0
Epitaph:>3.0
(Inferred from Peach)
Elgin Pit Configuration
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY
CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB: 4286
DRAWN: WT
CHECKED: TC
DATE: May 2022
FIGURE: 12.1
1706000
1708000
1156600
1156400
1:3,500
0 187.5 375 750 1,125 1,500
Feet
Coordinate system: NAD 1983 BLM Zone 12
G&H2021-11 Influence
G&H2021-22 Influence
RNW-HB-091 Influence
RNW-HB-168
18S 15E
18S 16E
G&H2021-10
G&H2021-11
G&H2021-22
G&H2021-17
G&H2021-25
Pit2021-07
Pit2021-08
RNW-HB-091
RNW-HB-108
RNW-HB-168
HC-5A HC-5B
PC-6
PC-7
PC-2
PC-5
PC-3
PC-8
PC-4
HC-3C
HC-3B
RP-4B
N

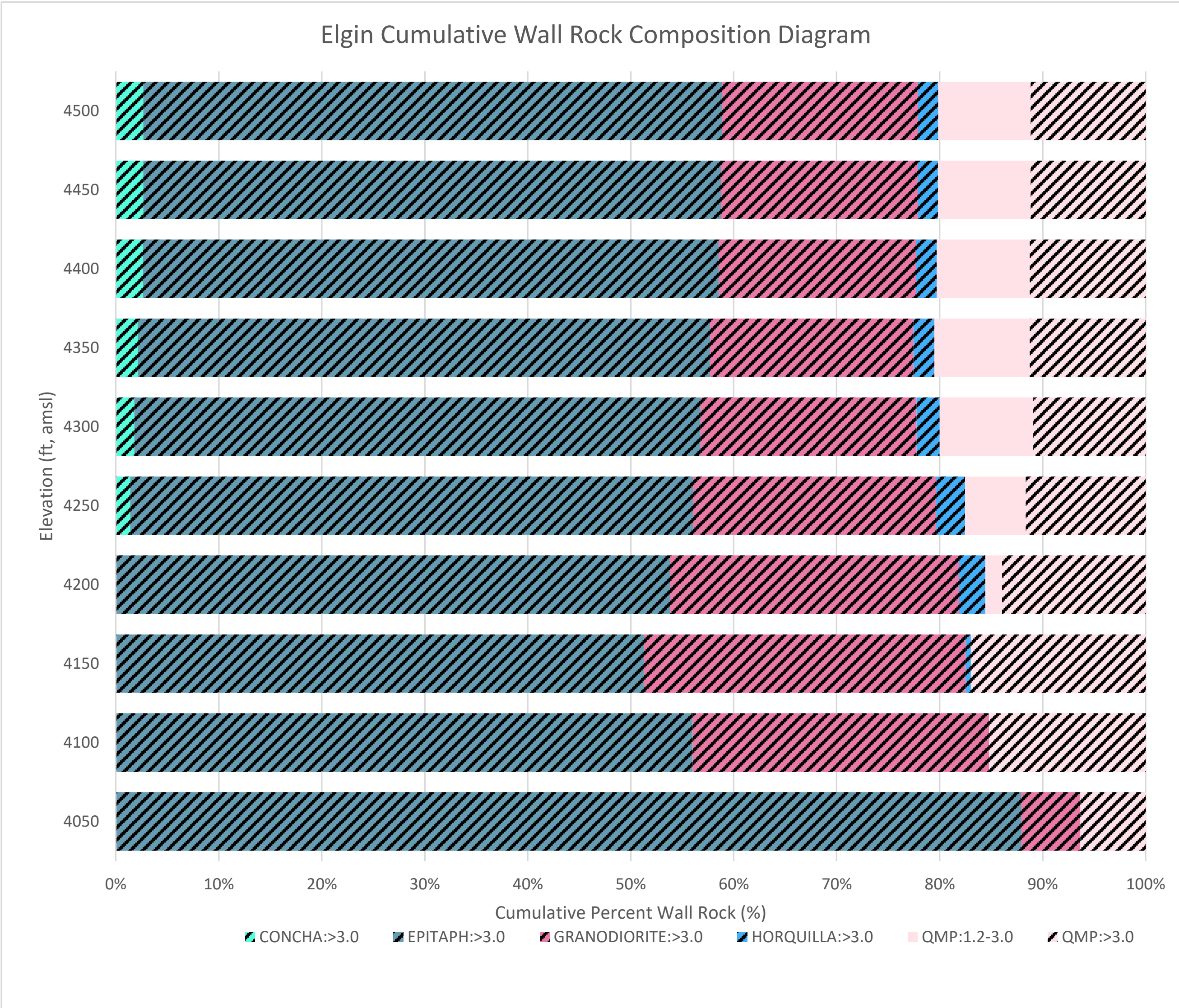


PITEAU ASSOCIATES

A TETRA TECH COMPANY

Elgin Stage-Area-Volume Curves

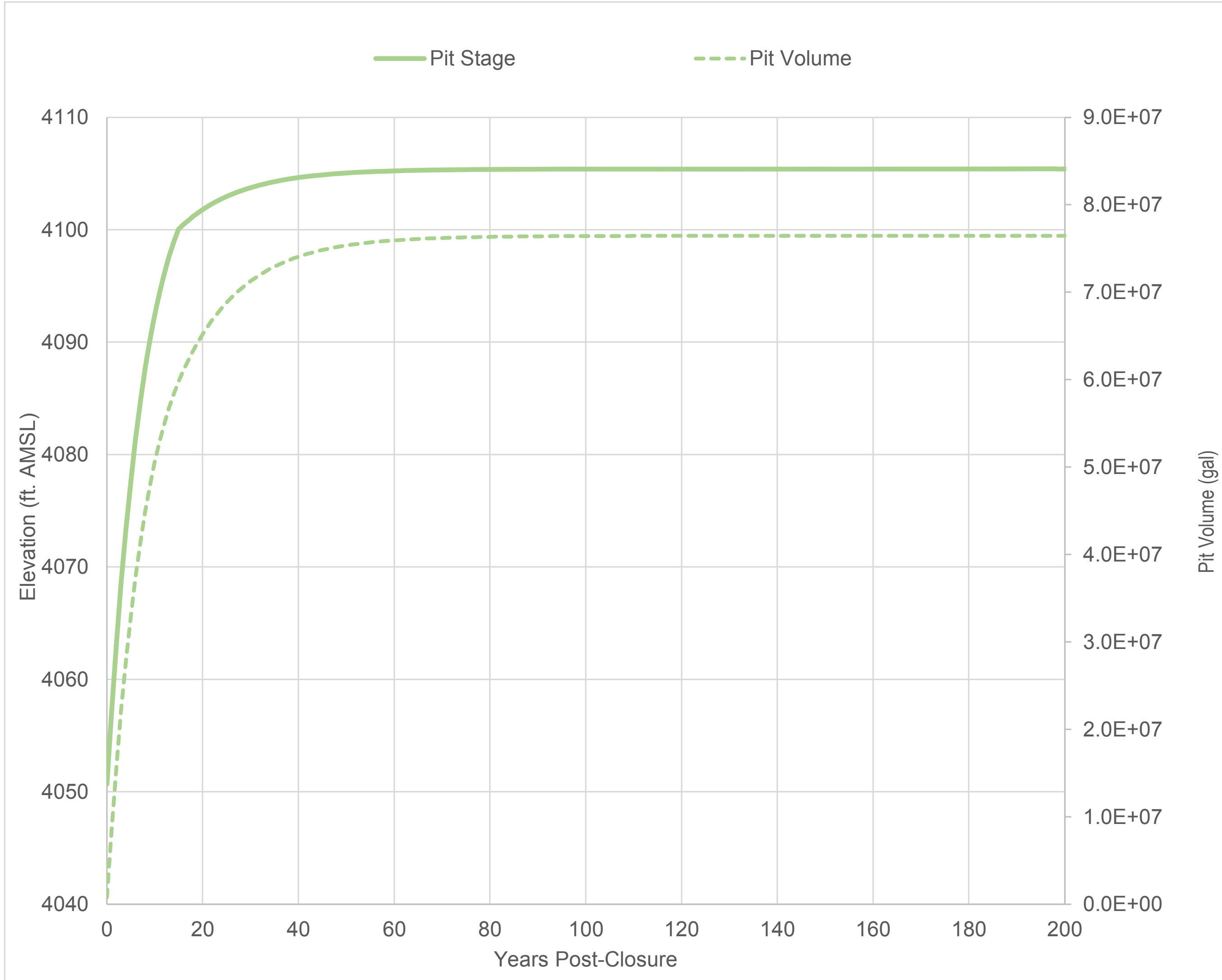
CLIENT:	Rosemont Copper Company	PROJECT:	Rosemont Copper World Project
JOB#:	4286	DRAWN:	WT
		CHECKED:	TC
DATE:	May 2022	FIGURE:	12.2



PITEAU ASSOCIATES
A TETRA TECH COMPANY

Elgin Cumulative Wall Rock Composition Diagram

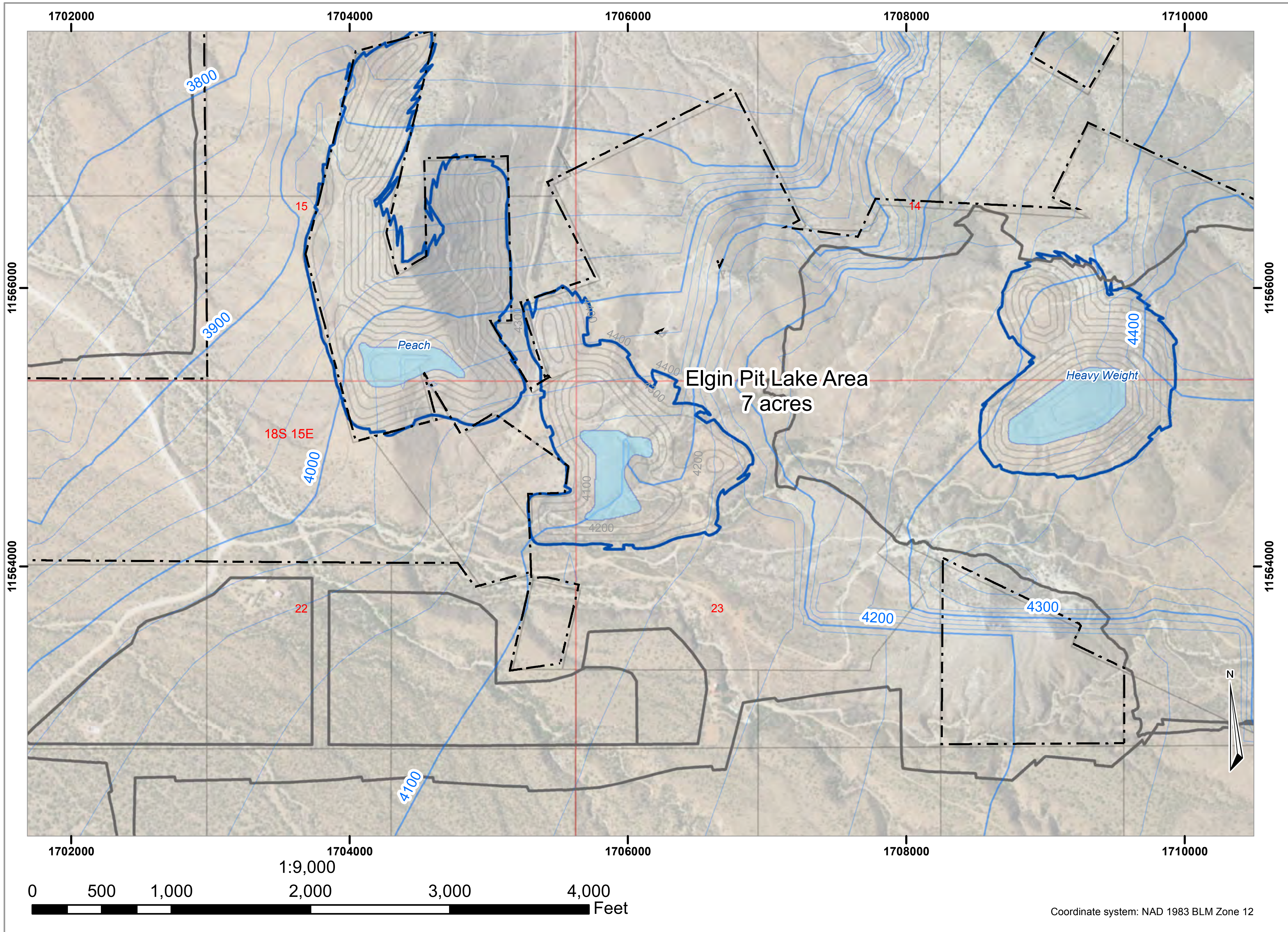
CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: WT
	CHECKED: TC
DATE: May 2022	FIGURE: 12.3



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Elgin Pit Lake Recovery

CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB #: 4286
DRAWN: TC
CHECKED: TC
DATE: May 2022
FIGURE: 12.4



Private Land Boundaries
Pit Lake Area
Pit Contour - 50ft Interval
Facility Outlines
Pit Footprints
PLSS Sections
PLSS Second Division
PLSS Township

Simulated 200 Year Post-Closure Contours

Contour - 25ft Interval
Contour - 50ft Interval

Elgin Pit Modelled Piezometric Surface

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: WT	CHECKED: TC
DATE:	May 2022
FIGURE:	12.5

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Elgin Water Balance Components

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

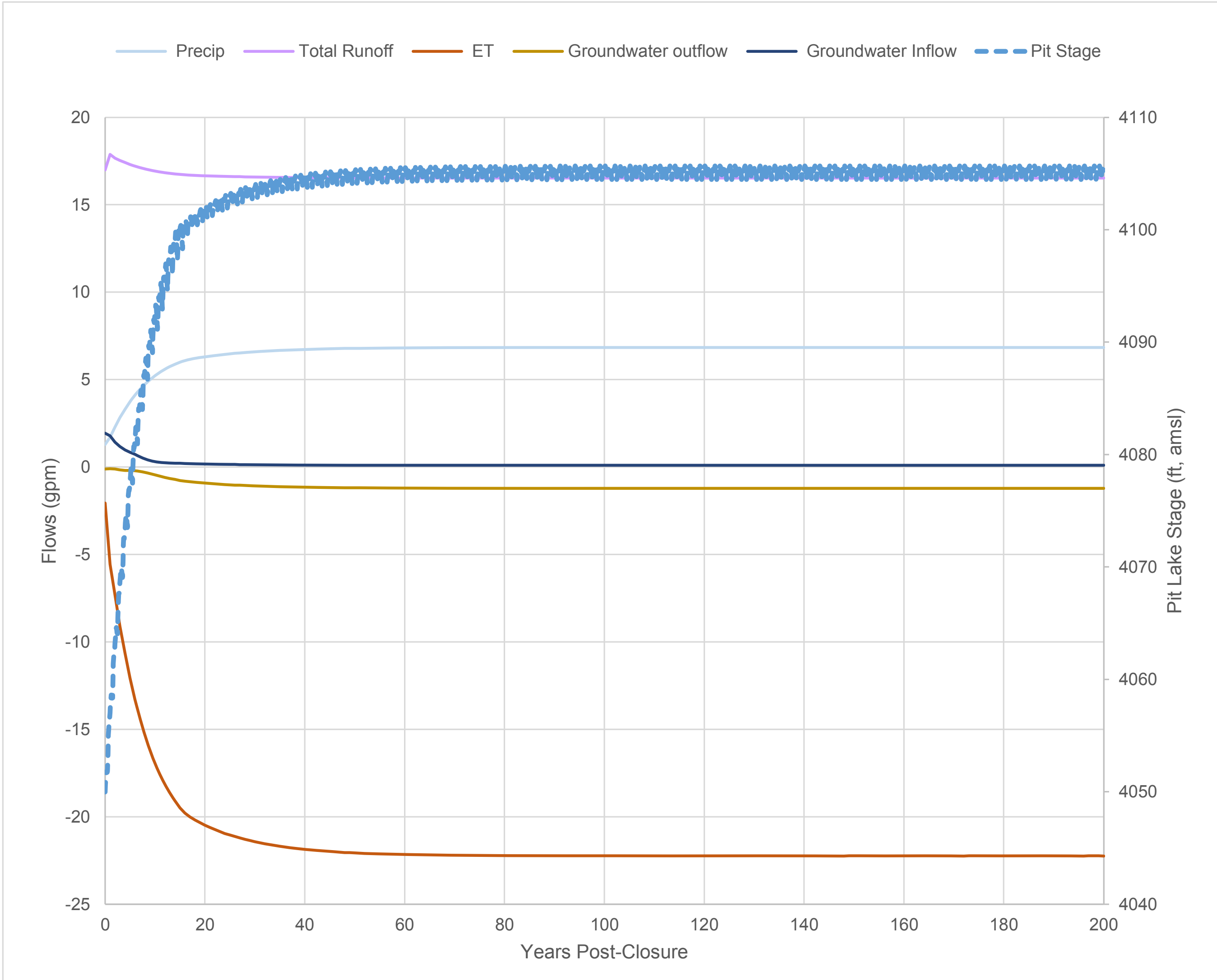
JOB #: 4286

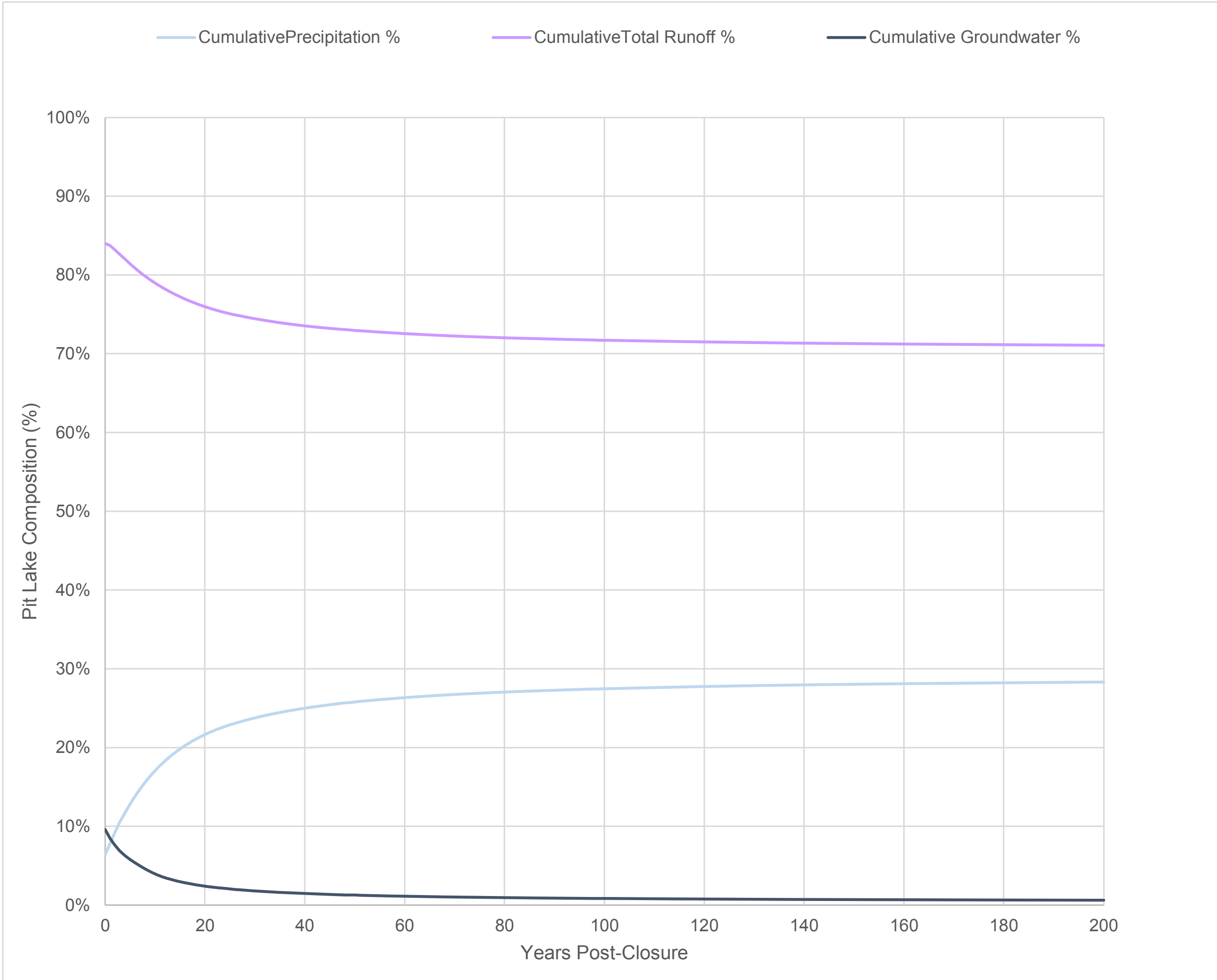
DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 12.6





PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Elgin Pit Lake Cumulative Percentage

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

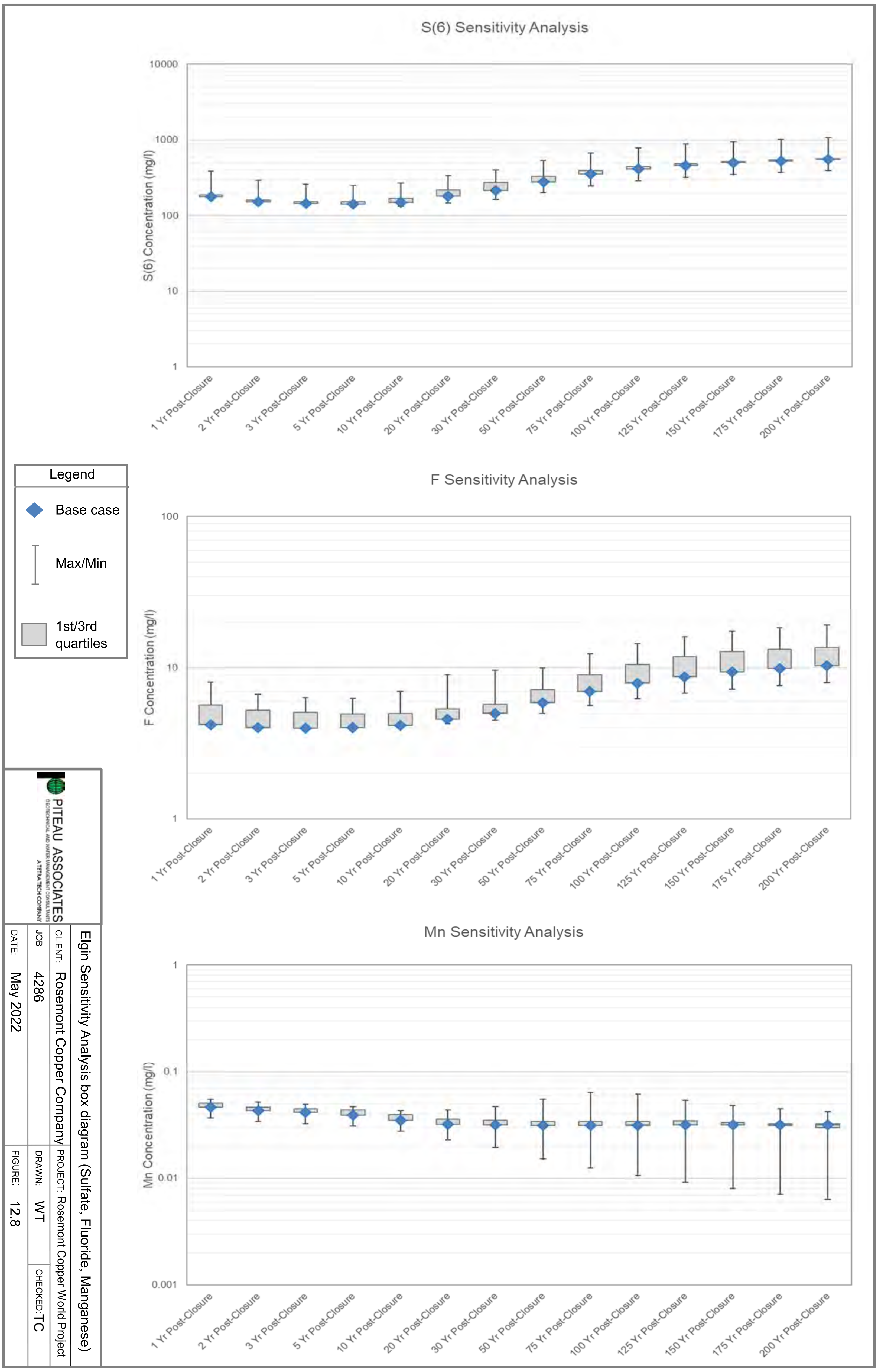
JOB #: 4286

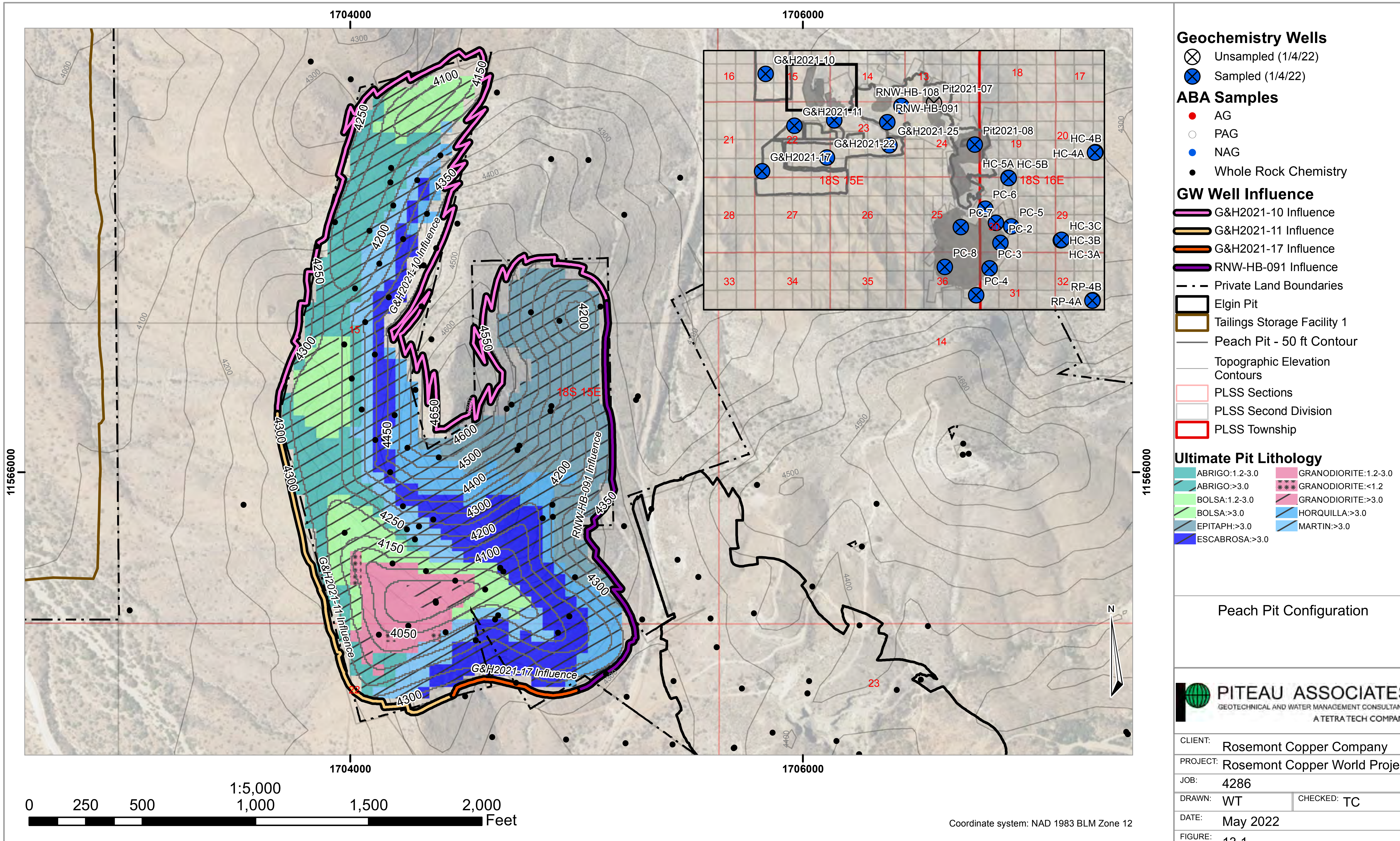
DRAWN: TC

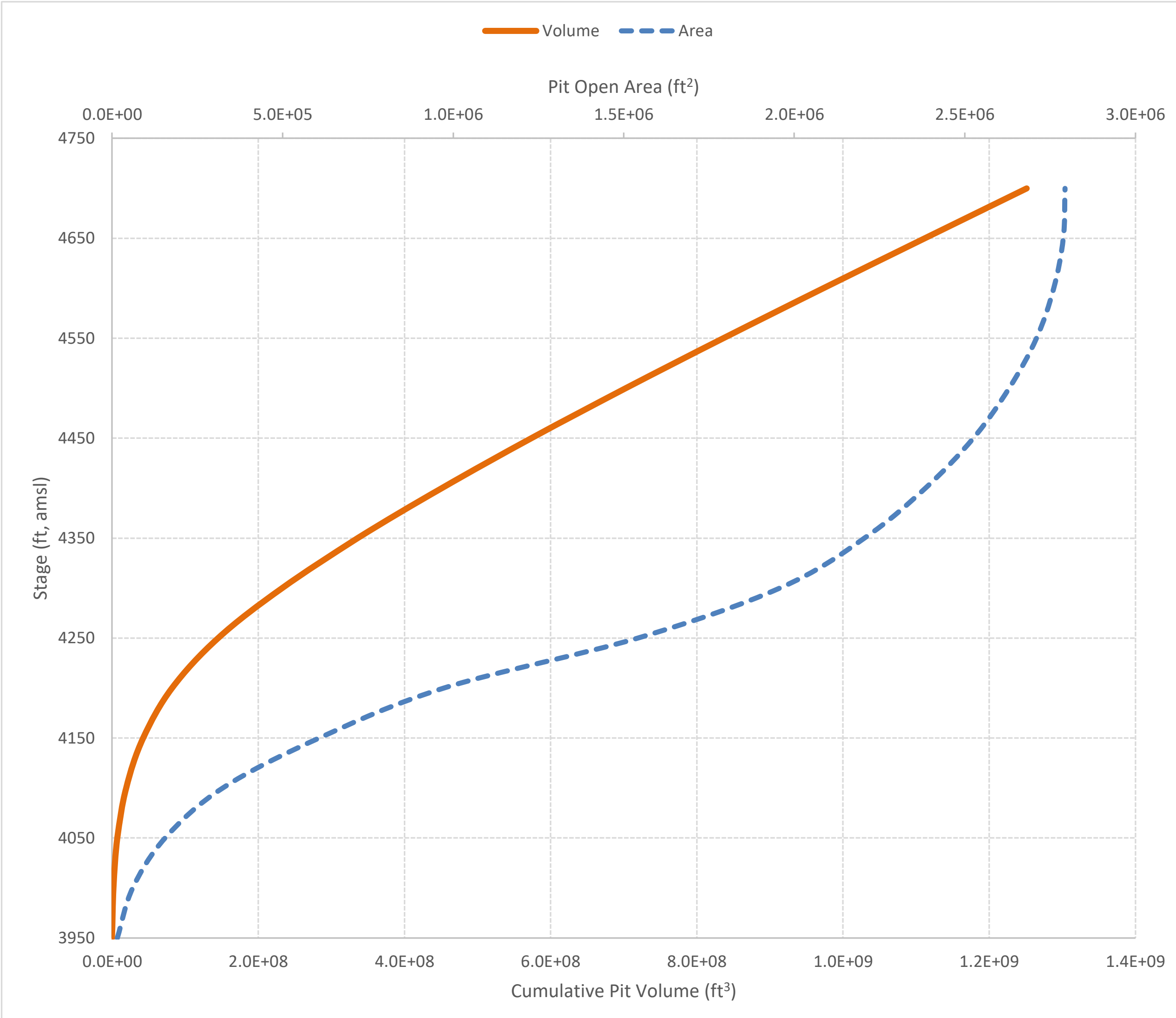
CHECKED: TC

DATE: May 2022

FIGURE: 12.7


S(6) Sensitivity Analysis
S(6) Concentration (mg/l)
10000
1000
100
10
1
F Sensitivity Analysis
F Concentration (mg/l)
100
10
1
Mn Sensitivity Analysis
Mn Concentration (mg/l)
1
0.1
0.01
0.001
1 Yr Post-Closure
2 Yr Post-Closure
3 Yr Post-Closure
5 Yr Post-Closure
10 Yr Post-Closure
20 Yr Post-Closure
30 Yr Post-Closure
50 Yr Post-Closure
75 Yr Post-Closure
100 Yr Post-Closure
125 Yr Post-Closure
150 Yr Post-Closure
175 Yr Post-Closure
200 Yr Post-Closure
Legend
Base case
Max/Min
1st/3rd quartiles
PITEAU ASSOCIATES
Elgin Sensitivity Analysis box diagram (Sulfate, Fluoride, Manganese)
CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB 4286
DRAWN: WT
CHECKED: TC
DATE: May 2022
FIGURE: 12.8


1704000
1706000
1156000
Geochemistry Wells
Unsampled (1/4/22)
Sampled (1/4/22)
ABA Samples
AG
PAG
NAG
Whole Rock Chemistry
GW Well Influence
G&H2021-10 Influence
G&H2021-11 Influence
G&H2021-17 Influence
RNW-HB-091 Influence
Private Land Boundaries
Elgin Pit
Tailings Storage Facility 1
Peach Pit - 50 ft Contour
Topographic Elevation Contours
PLSS Sections
PLSS Second Division
PLSS Township
Ultimate Pit Lithology
ABRIGO:1.2-3.0
ABRIGO:>3.0
BOLSA:1.2-3.0
BOLSA:>3.0
EPITAPH:>3.0
ESCABROSA:>3.0
GRANODIORITE:1.2-3.0
GRANODIORITE:<1.2
GRANODIORITE:>3.0
HORQUILLA:>3.0
MARTIN:>3.0
G&H2021-10
G&H2021-11
G&H2021-17
G&H2021-22
G&H2021-25
RNW-HB-108
RNW-HB-091
Pit2021-07
Pit2021-08
HC-4B
HC-4A
HC-5A
HC-5B
HC-3C
HC-3B
HC-3A
PC-2
PC-3
PC-4
PC-5
PC-6
PC-7
PC-8
RP-4B
RP-4A
18S 15E
18S 16E
G&H2021-10 Influence
G&H2021-11 Influence
G&H2021-17 Influence
RNW-HB-091 Influence
1:5,000
0 250 500 1,000 1,500 2,000
Feet
Coordinate system: NAD 1983 BLM Zone 12
N
Peach Pit Configuration
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY
CLIENT: Rosemont Copper Company
PROJECT: Rosemont Copper World Project
JOB: 4286
DRAWN: WT
CHECKED: TC
DATE: May 2022
FIGURE: 13.1

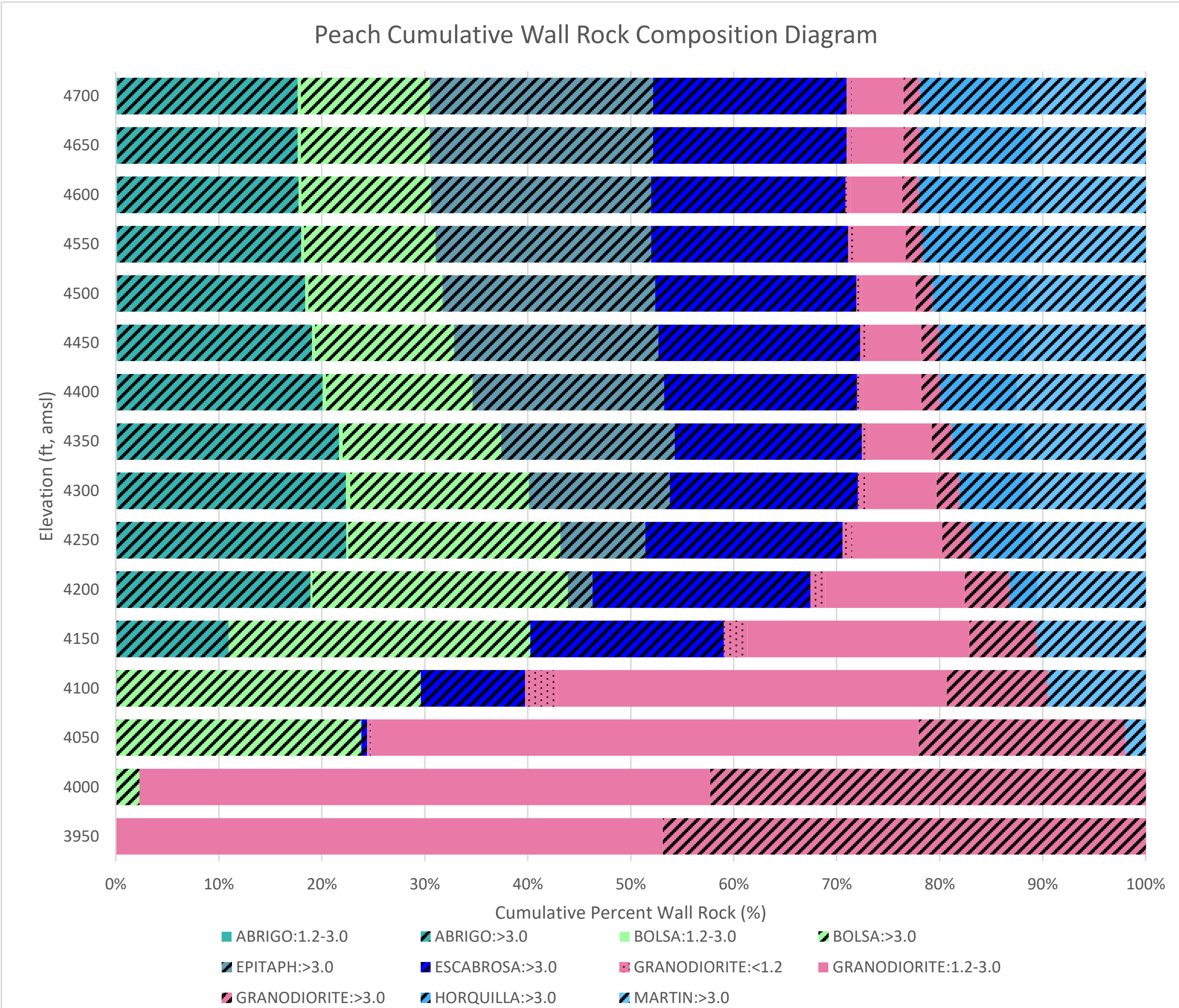


PITEAU ASSOCIATES

A TETRA TECH COMPANY

Peach Stage-Area-Volume Curves

CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project
JOB #: 4286	DRAWN: WT
	CHECKED: TC
DATE: May 2022	FIGURE: 13.2

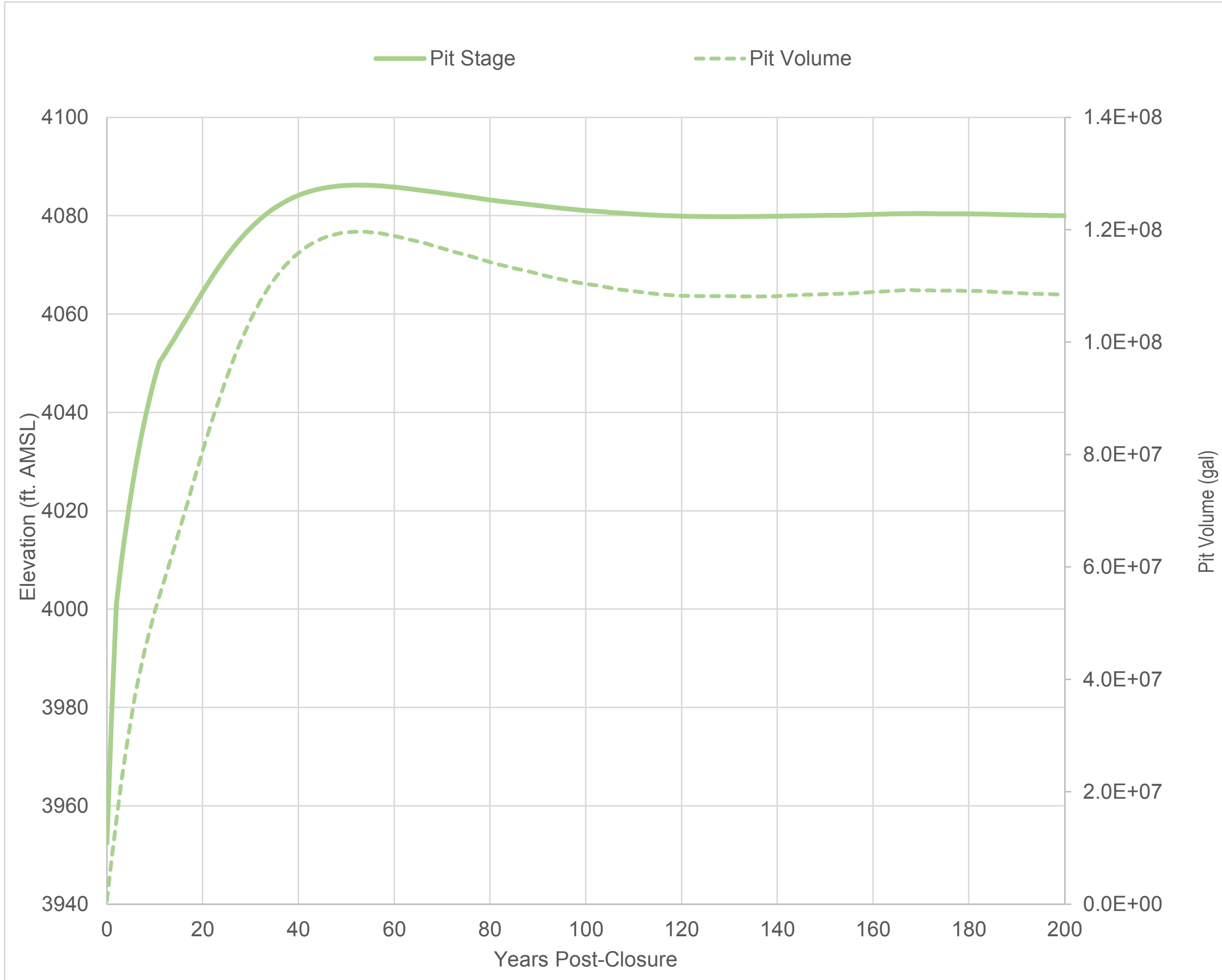


PITEAU ASSOCIATES

A TETRA TECH COMPANY

Peach Cumulative Wall Rock Composition Diagram

CLIENT:	Rosemont Copper Company
JOB#:	4286
DATE:	May 2022
PROJECT:	Rosemont Copper World Project
DRAWN:	WT
CHECKED:	TC
FIGURE:	13.3



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Peach Pit Lake Recovery

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

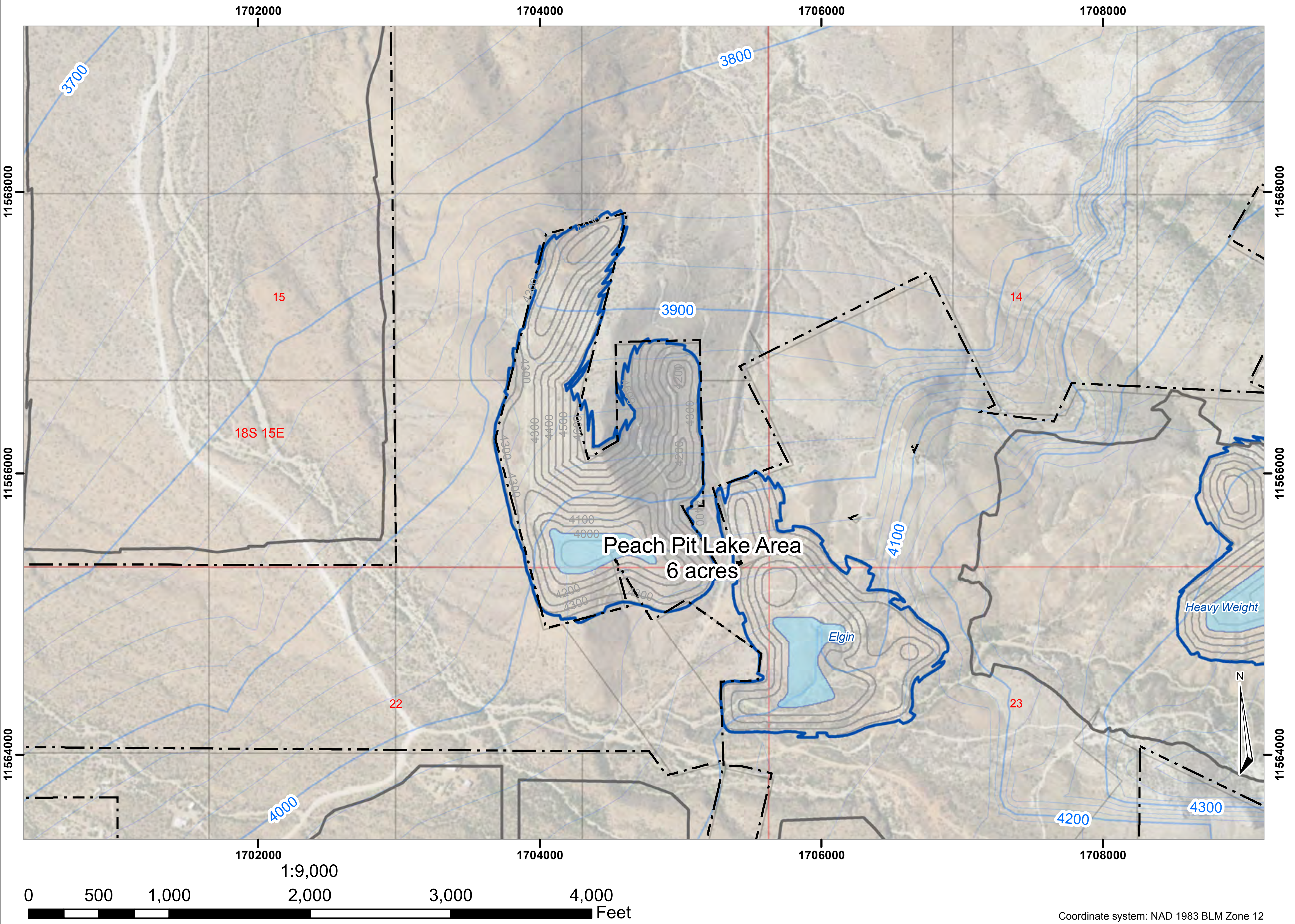
JOB #: 4286

DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 13.4



Private Land Boundaries
Pit Lake Area
Pit Contour - 50ft Interval
Facility Outlines
Pit Footprints
PLSS Sections
PLSS Second Division
PLSS Township

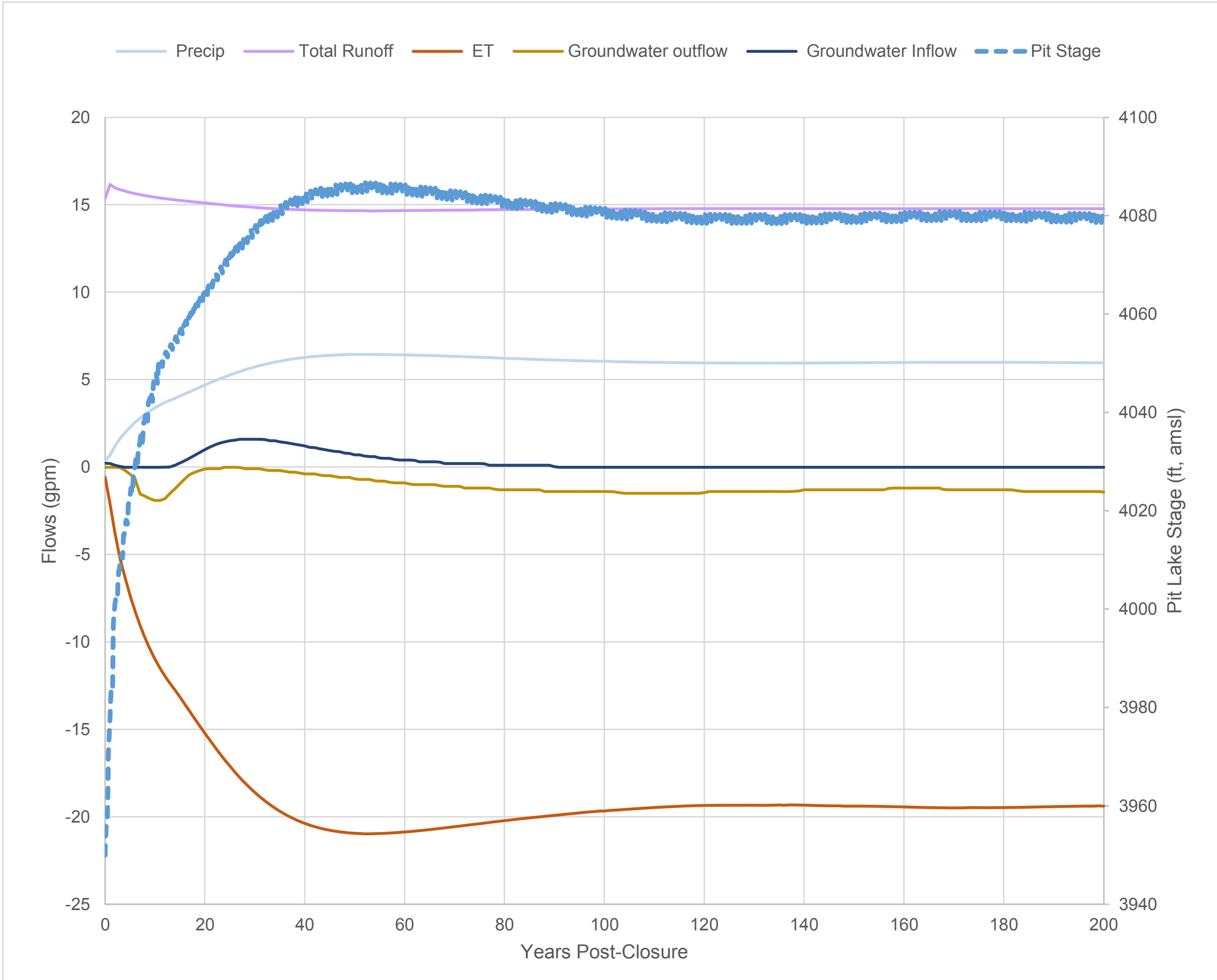
Simulated 200 Year Post-Closure Contours

Contour - 25ft Interval
Contour - 100ft Interval

Peach Pit Modelled Piezometric Surface

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company
PROJECT:	Rosemont Copper World Project
JOB:	4286
DRAWN: WT	CHECKED: TC
DATE:	May 2022
FIGURE:	13.5



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Peach Water Balance Components

CLIENT: Rosemont Copper Company

JOB #: 4286

DATE: May 2022

PROJECT: Rosemont Copper World Project

DRAWN: TC

CHECKED: TC

FIGURE: 13.6

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

Peach Pit Lake Cumulative Percentage

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

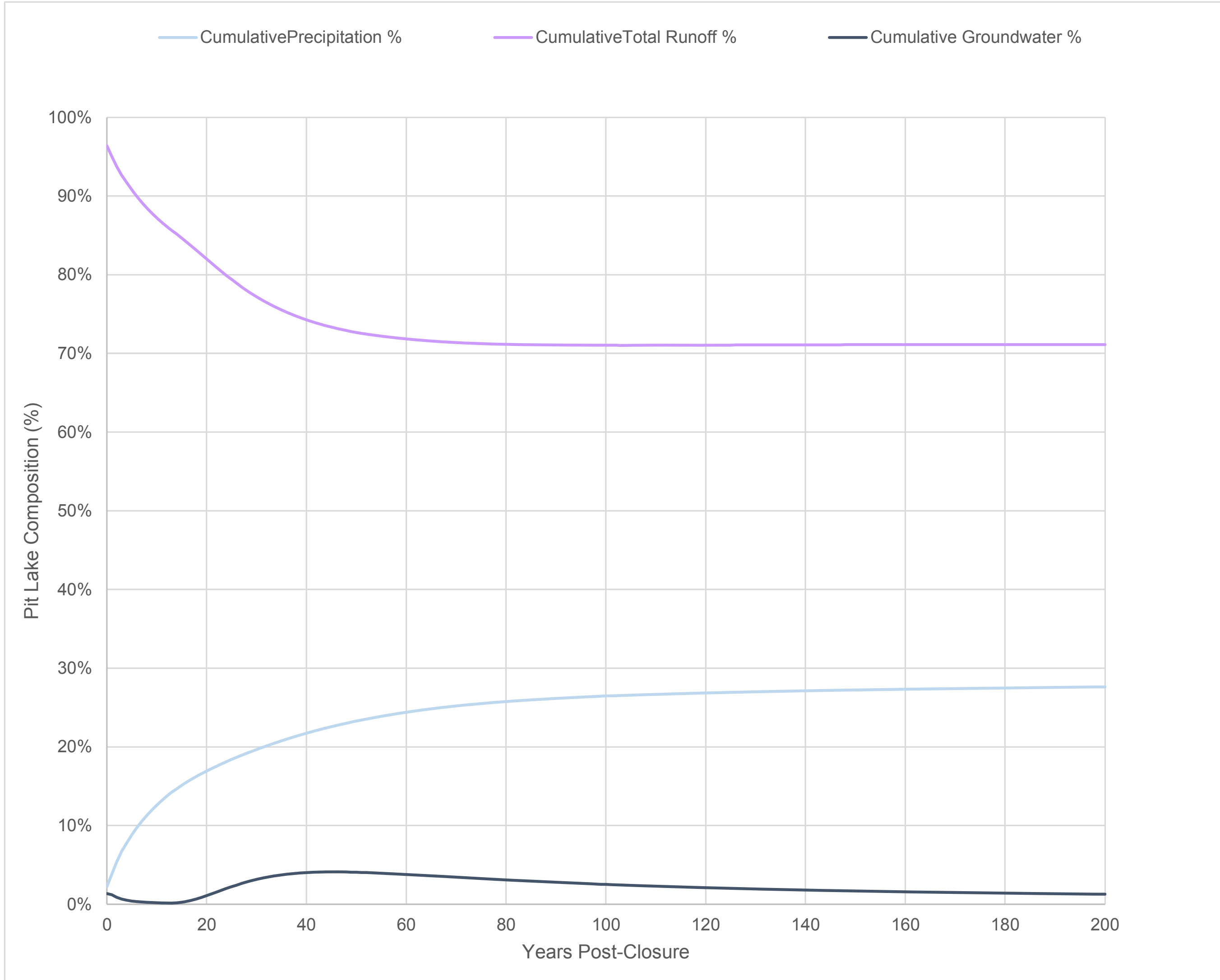
JOB #: 4286

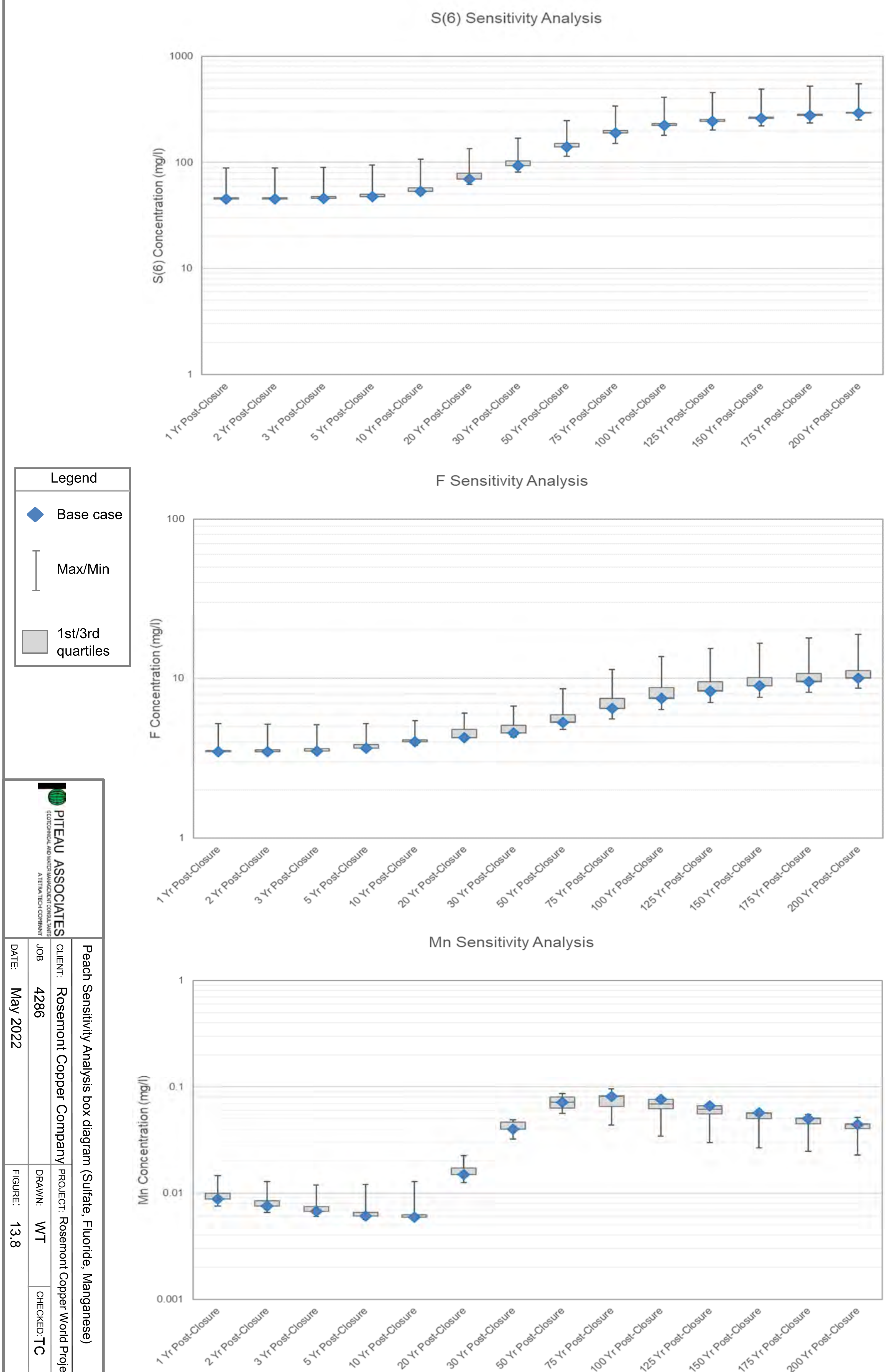
DRAWN: TC

CHECKED: TC

DATE: May 2022

FIGURE: 13.7





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Peach Sensitivity Analysis box diagram (Sulfate, Fluoride, Manganese)

CLIENT: Rosemont Copper Company

PROJECT: Rosemont Copper World Project

JOB 4286

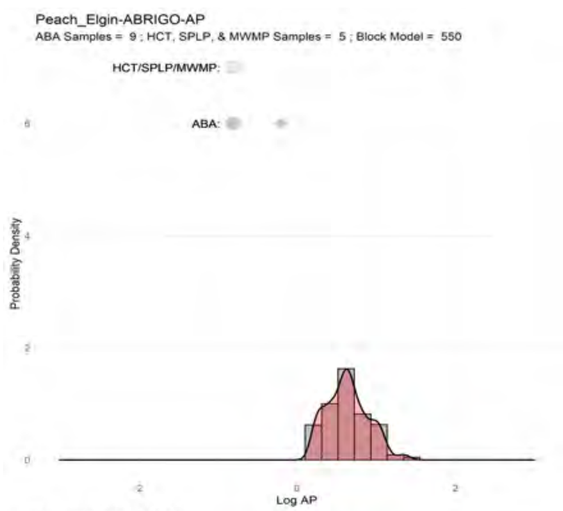
DRAWN: WT

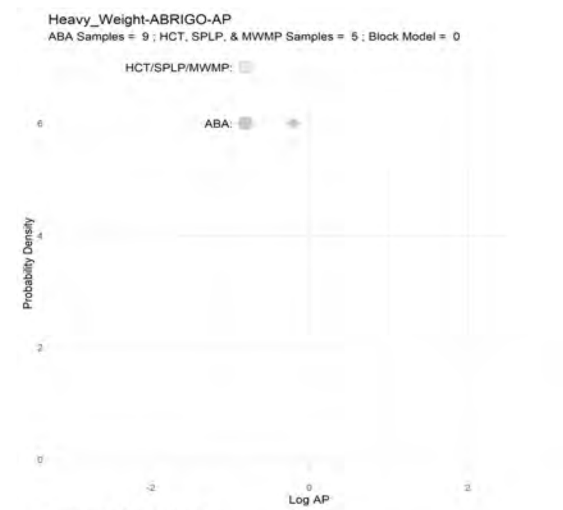
CHECKED: TC

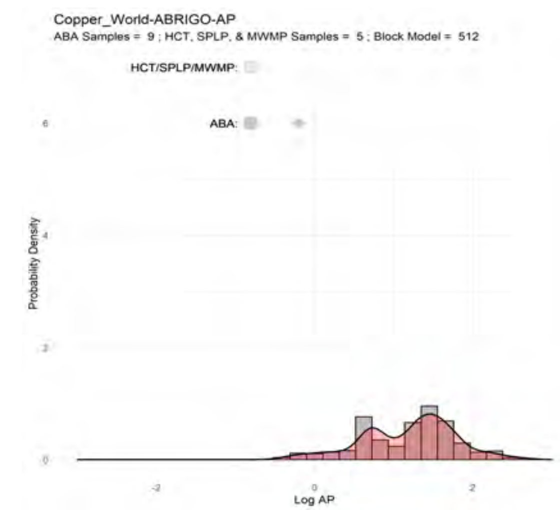
DATE: May 2022

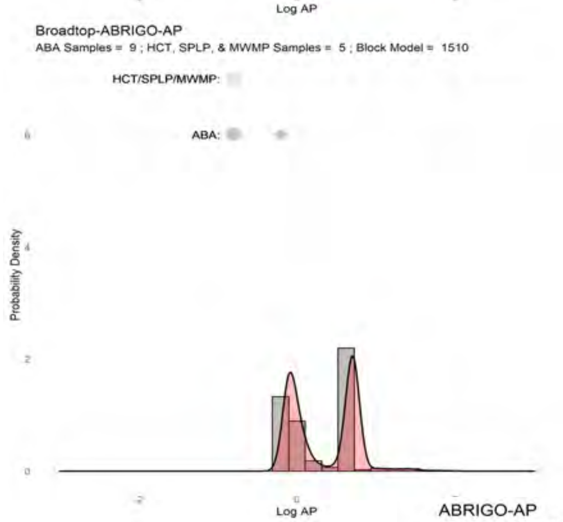
FIGURE: 13.8

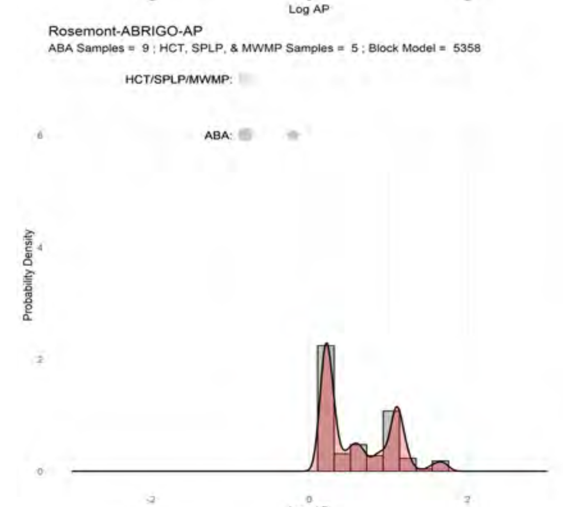
APPENDIX A
Pit specific geochemical unit comparisons

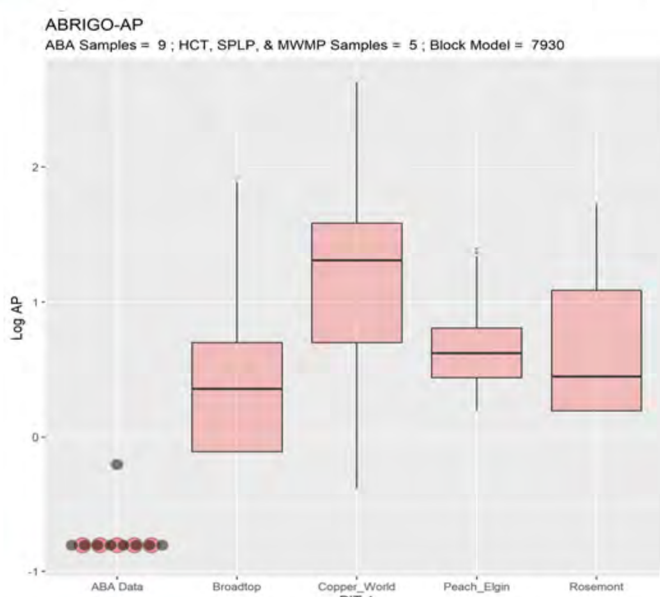












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ABRIGO AP Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 1	

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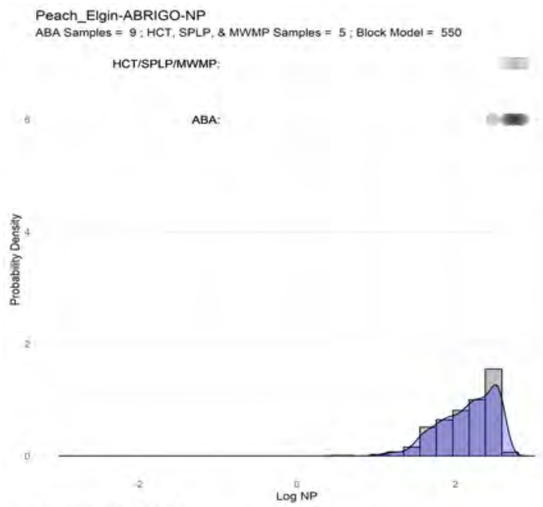

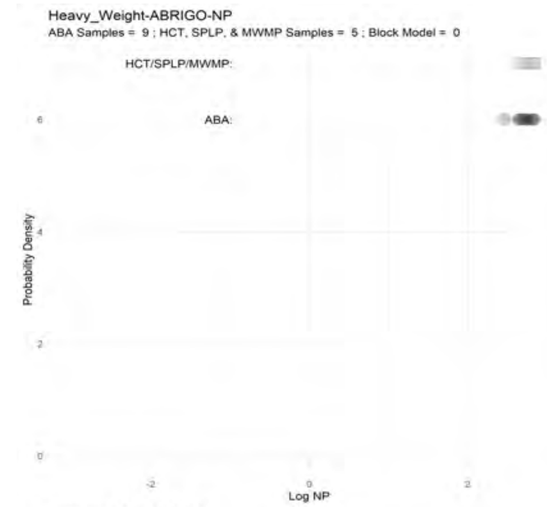

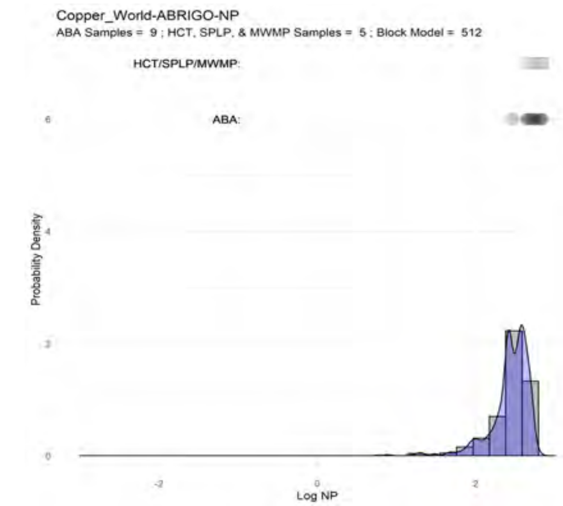

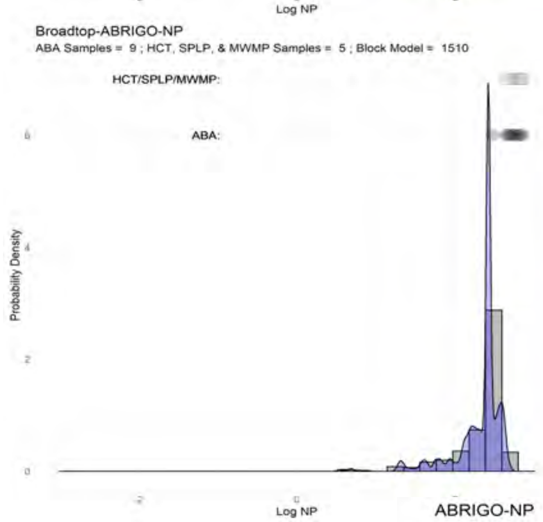

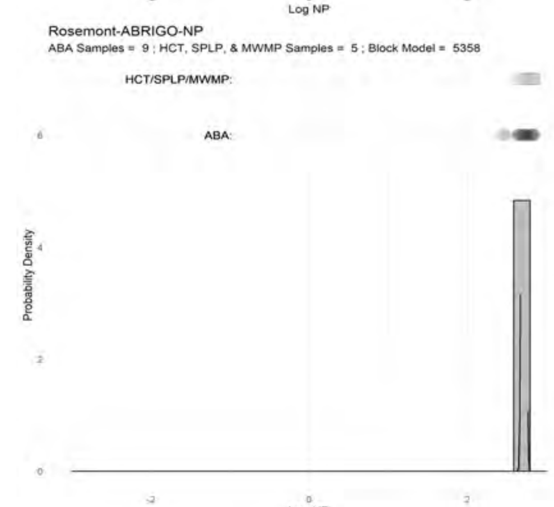

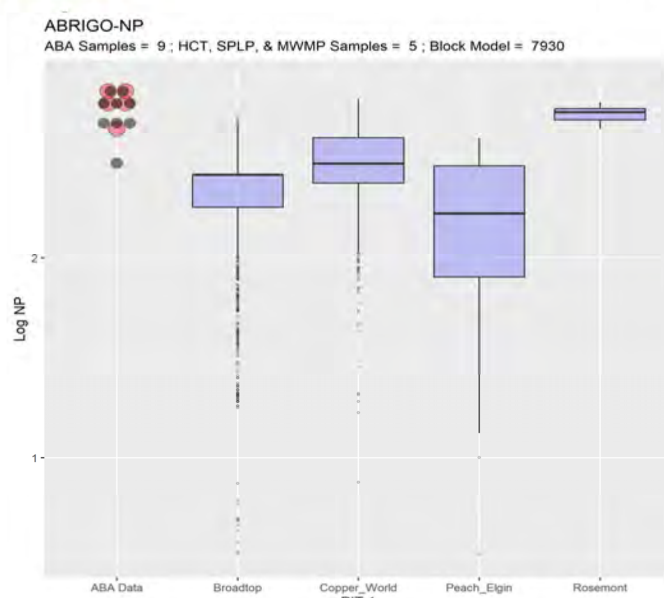

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ABRIGO NP Block Model and ABA Statistics

CLIENT:	Rosemont Copper Company	PROJECT:	Rosemont Copper World Project
JOB	4286	DRAWN: WT	CHECKED: TC
DATE:	May, 2022	APPENDIX:	A 1

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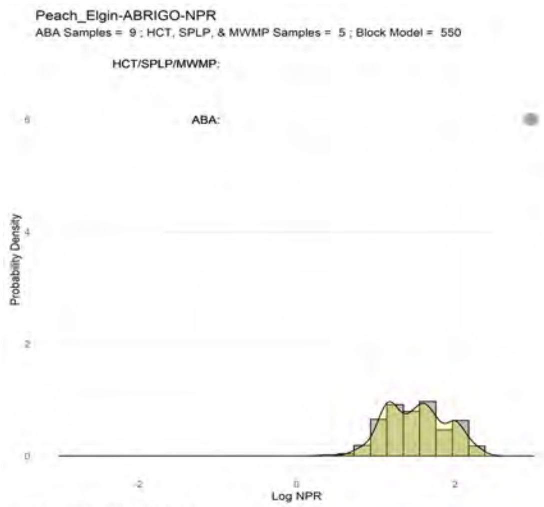

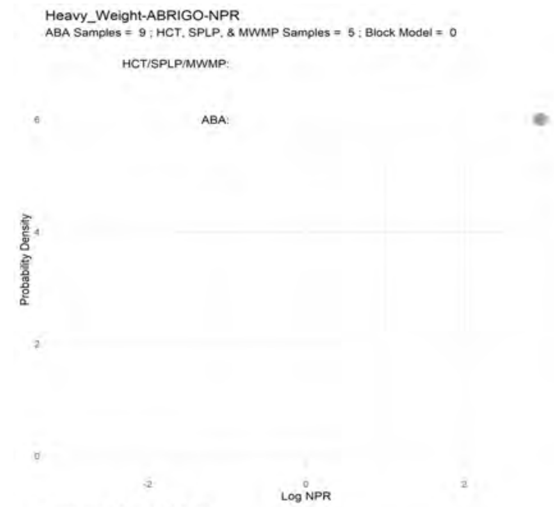

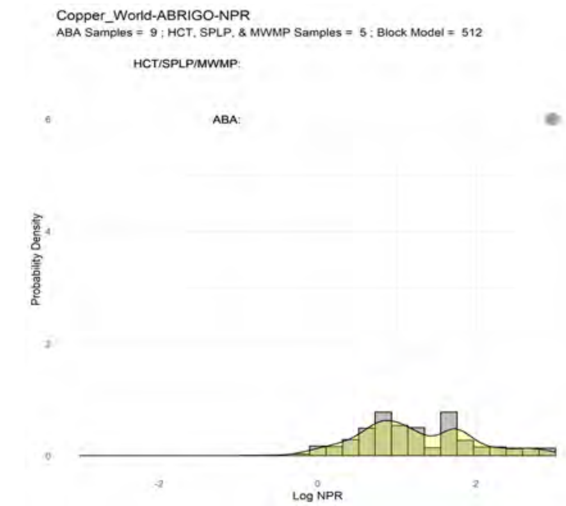

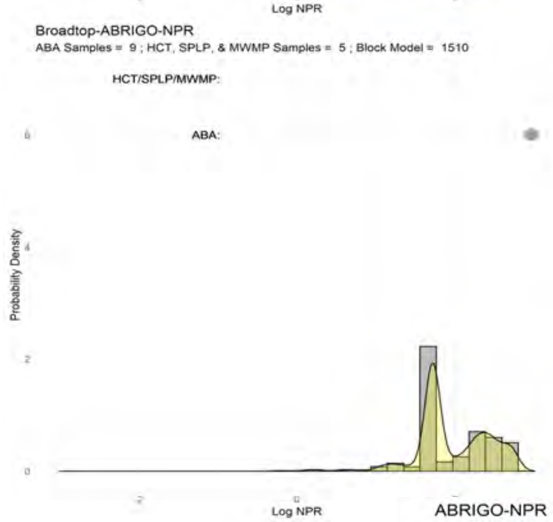

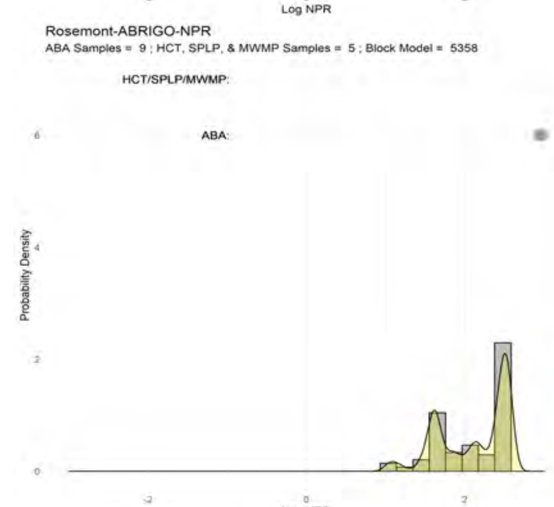

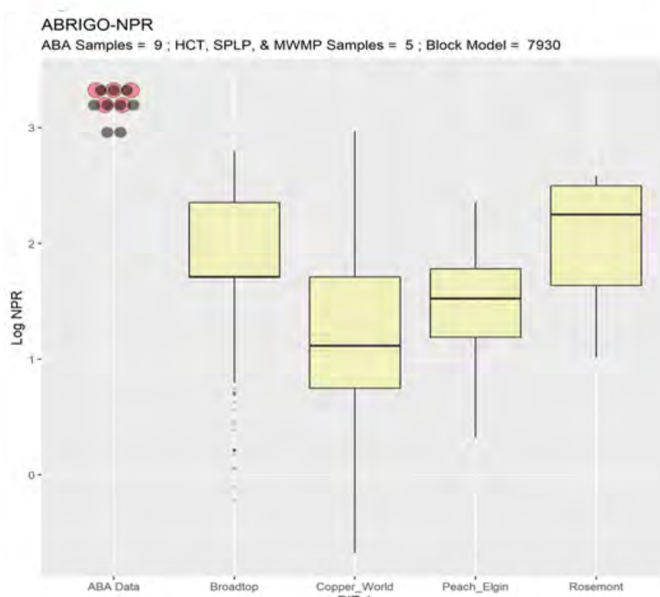

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	ABRIGO NPR Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 1	

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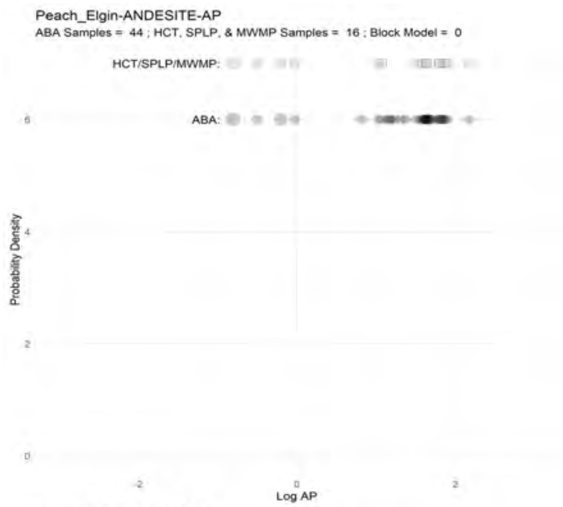

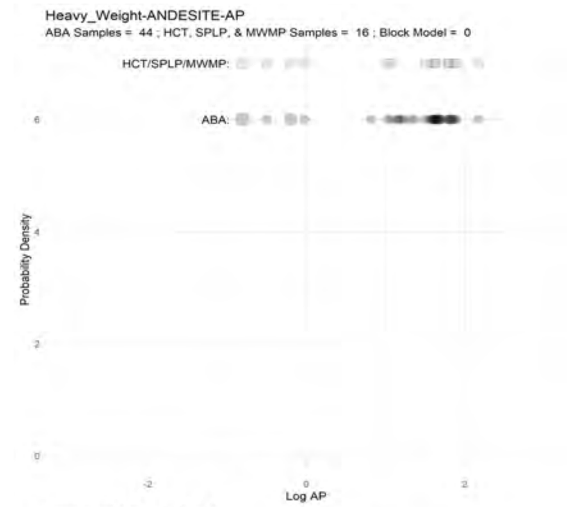

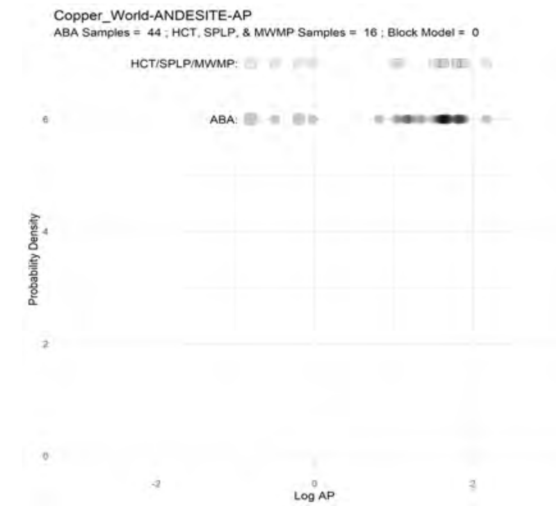

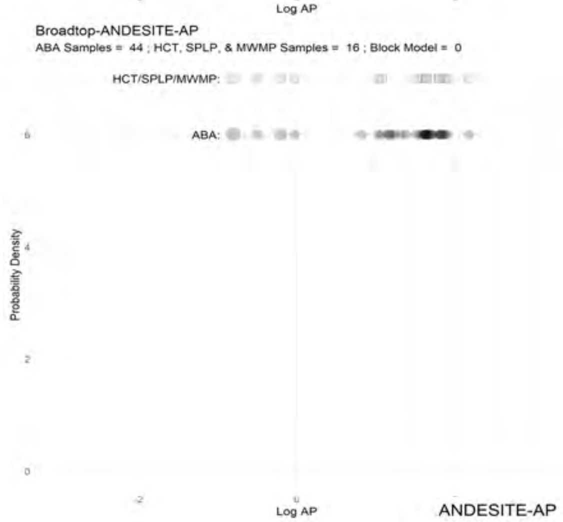

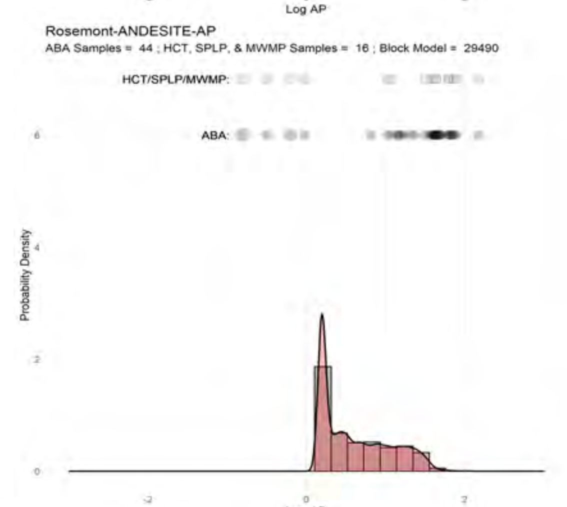

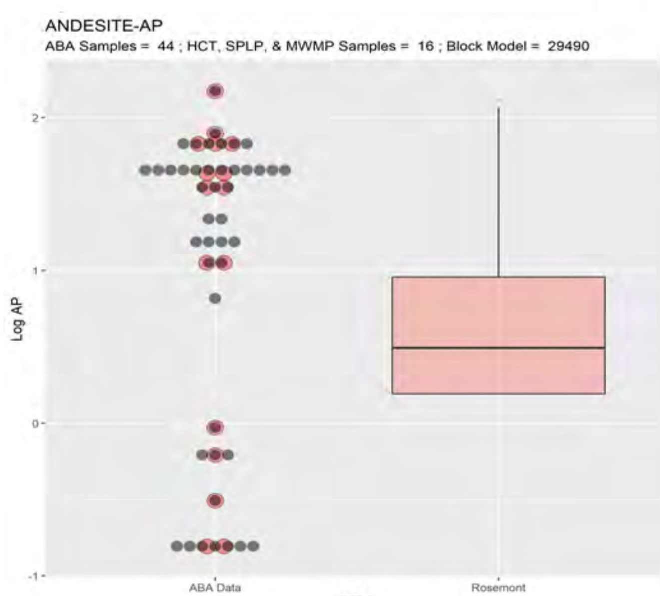

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	ANDESITE AP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 2	

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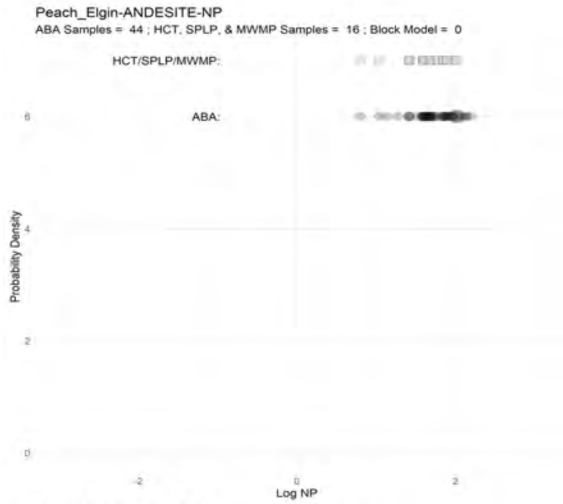

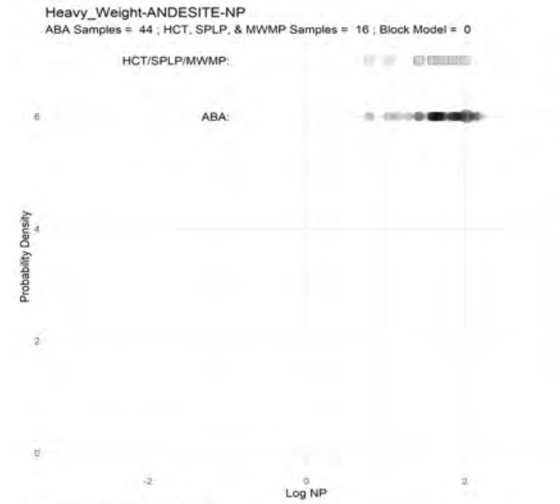

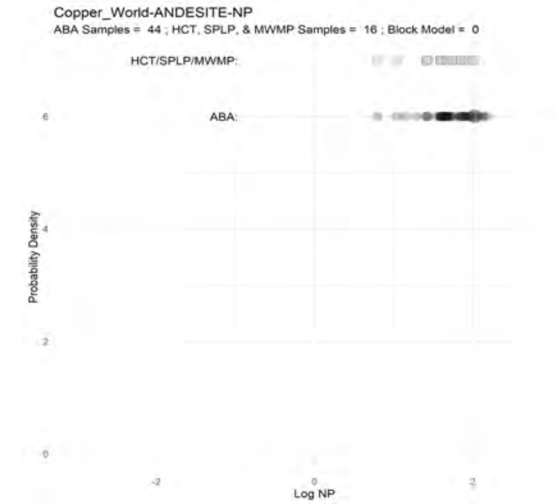

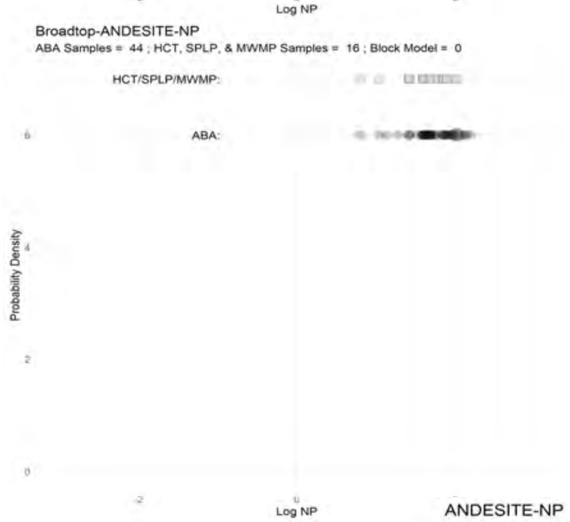

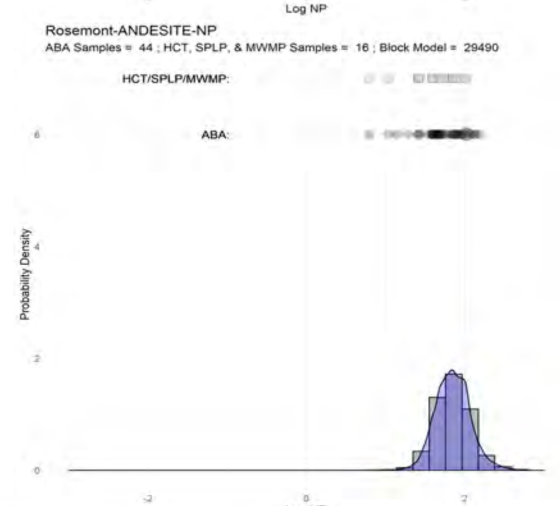

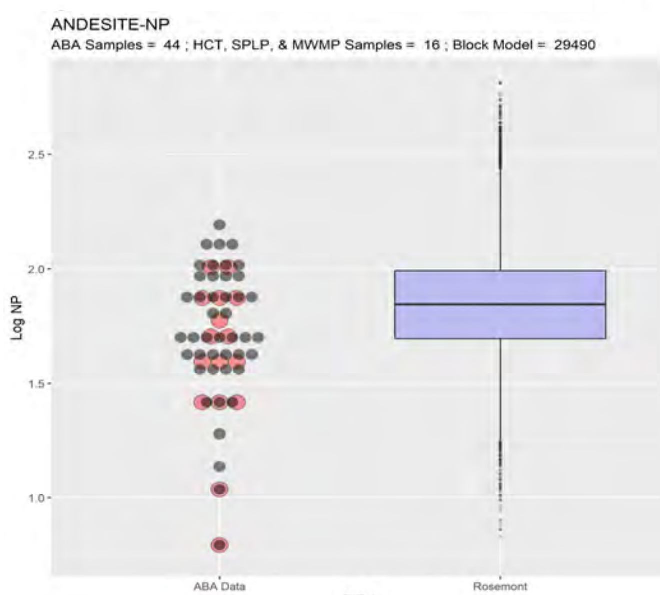

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A TETRA TECH COMPANY

ANDESITE NP Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 2	

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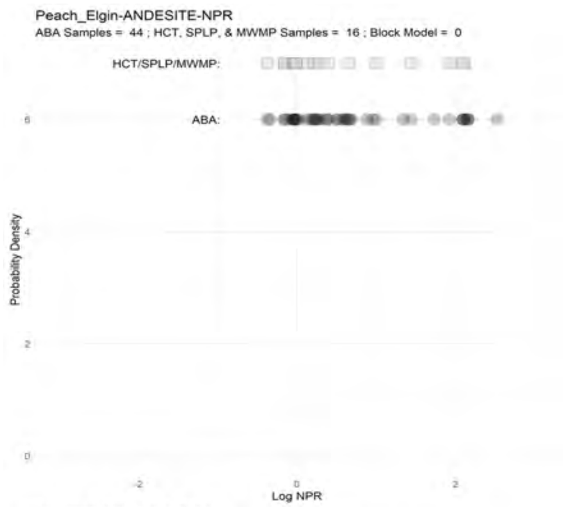

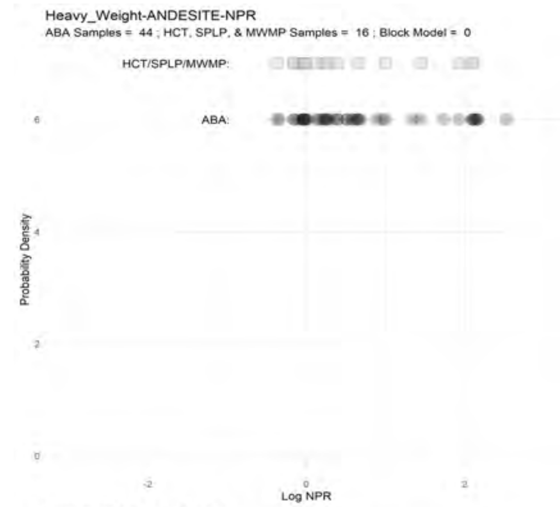

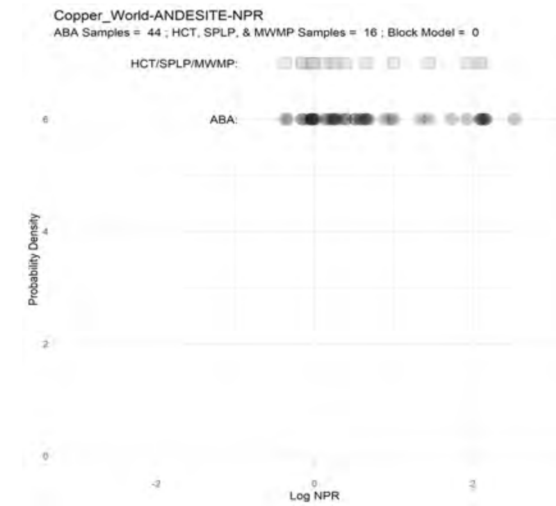

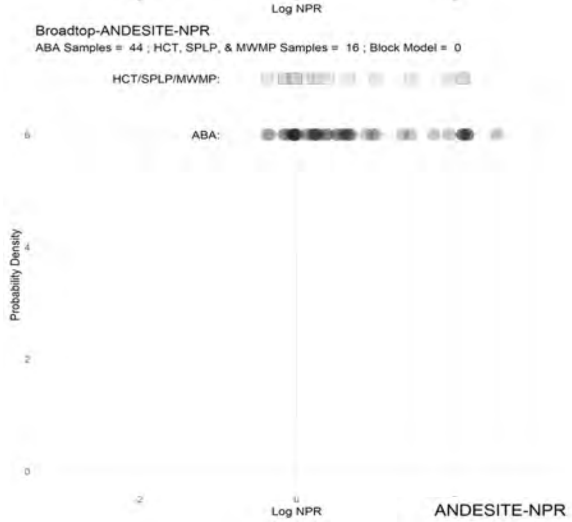

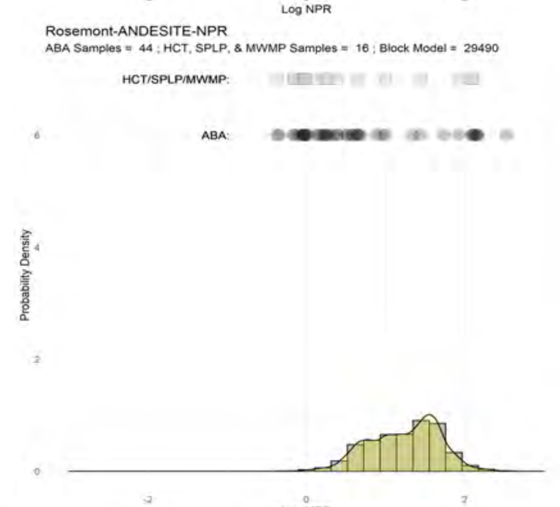

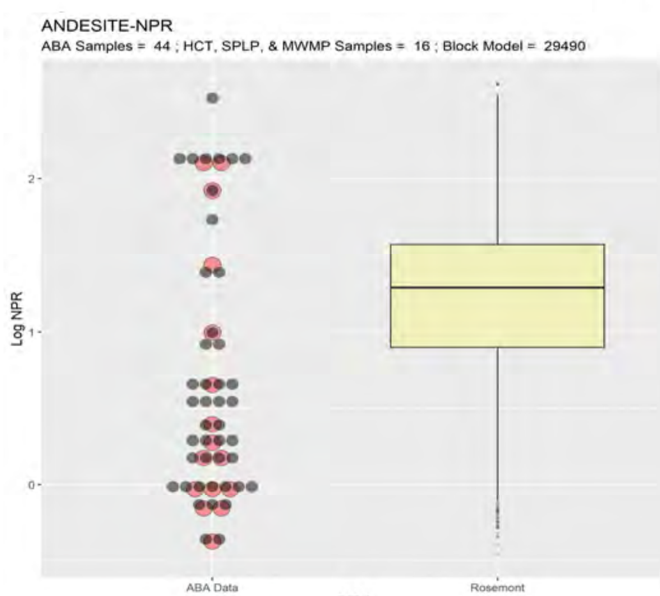

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	ANDESITE NPR Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 2	

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PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	ARKOSE AP Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 3	

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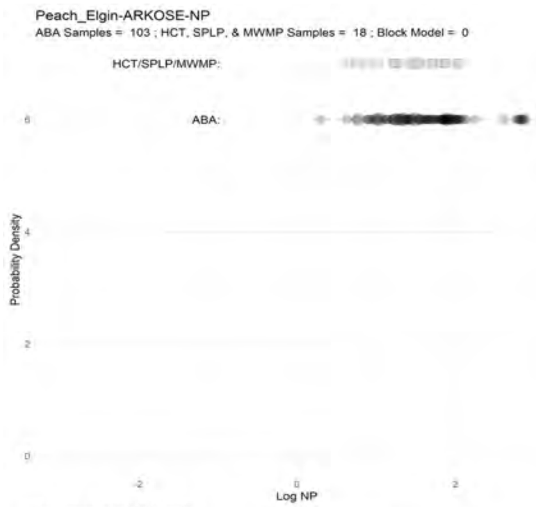

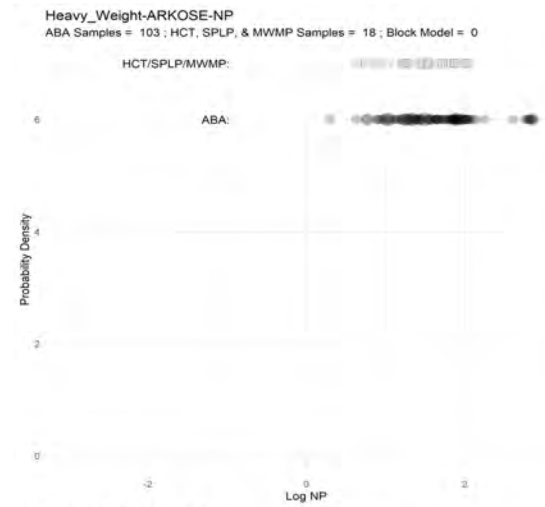

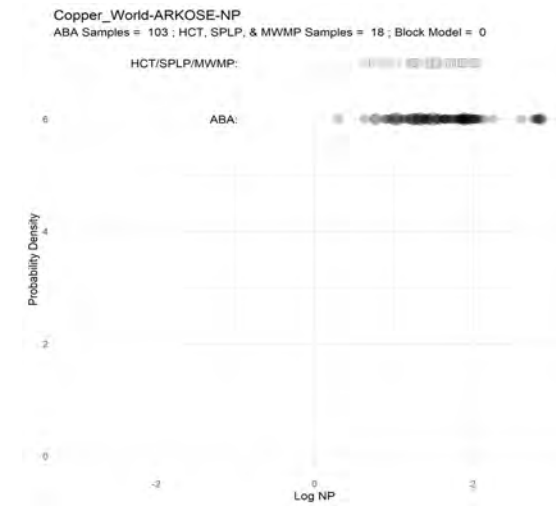

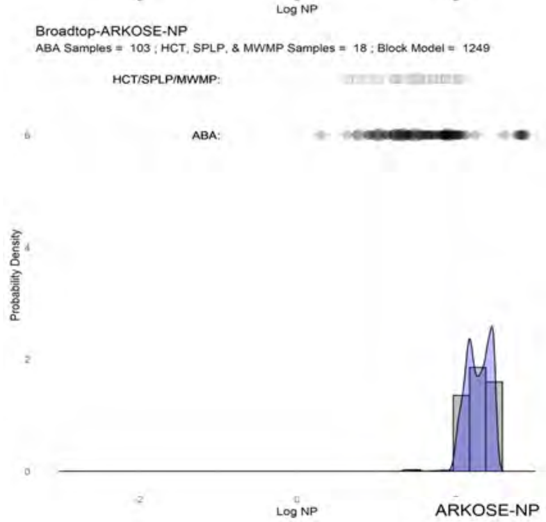

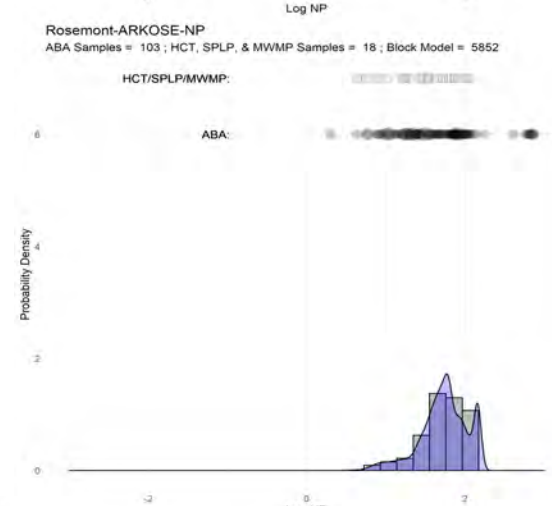

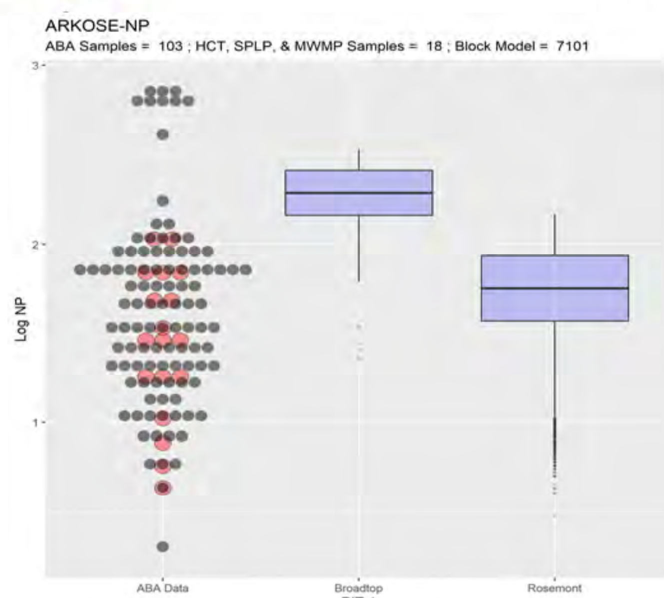

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	ARKOSE NP Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 3	

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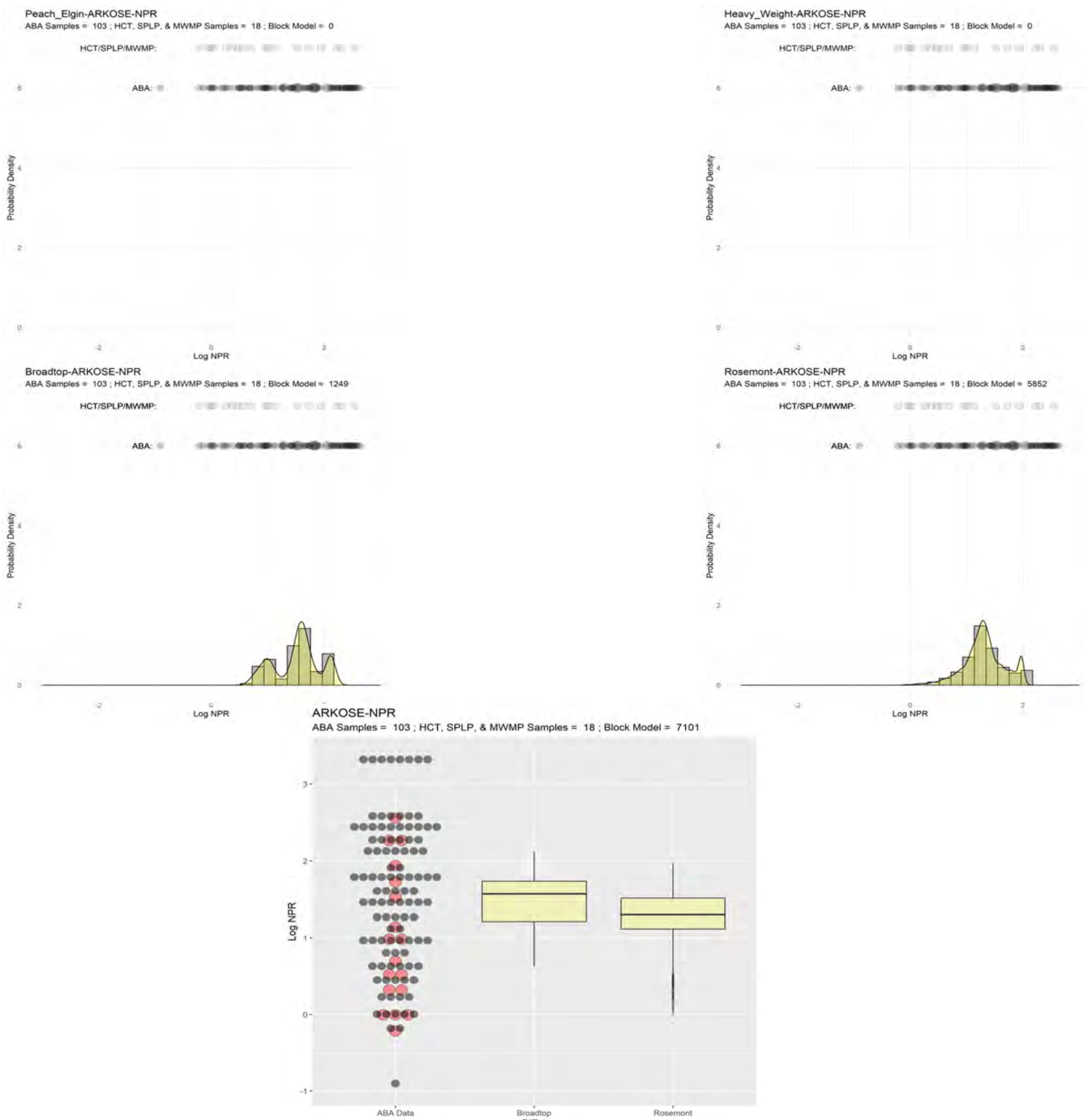

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	ARKOSE NPR Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project		
	JOB 4286	DRAWN: WT	CHECKED: TC	
	DATE: May, 2022	APPENDIX: A 3		

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Peach_Elgin-BOLSA-AP
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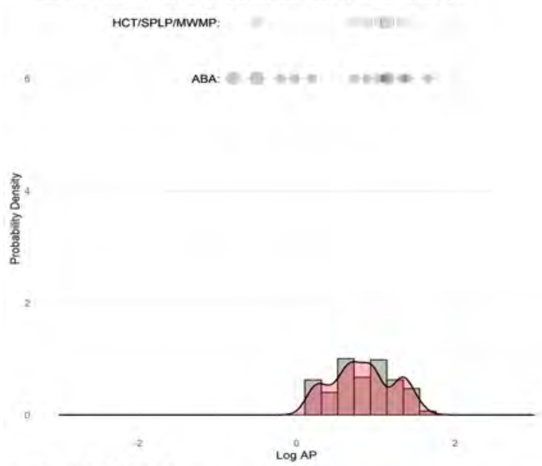

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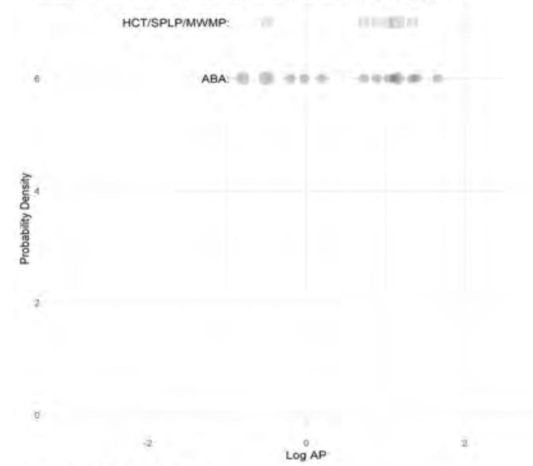
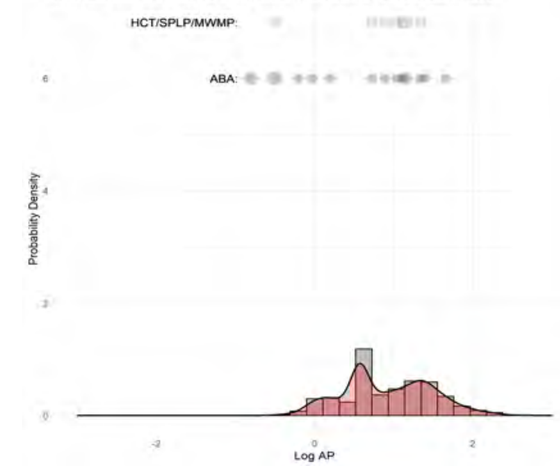
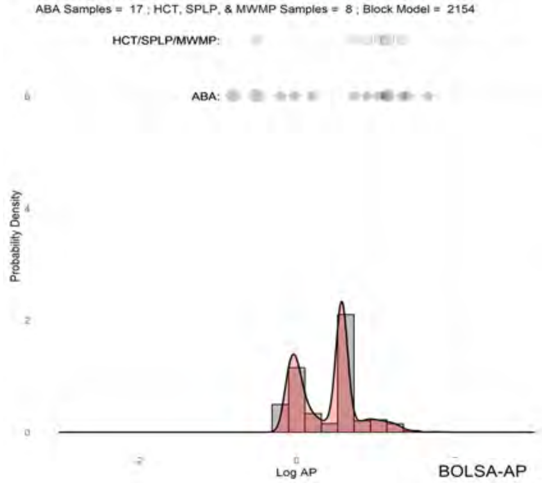


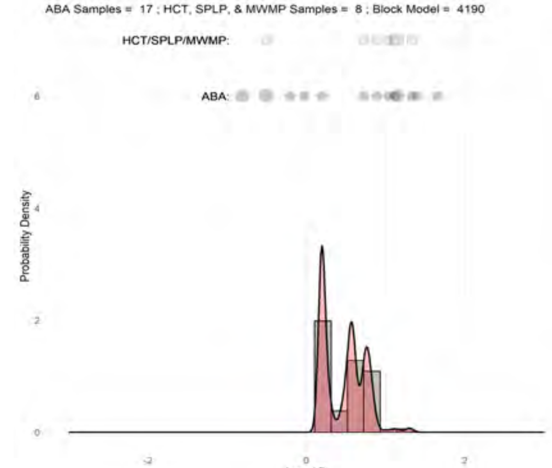
Copper_World-BOLSA-AP
ABA Samples = 17 ; HCT, SPLP, & MWMP Samples = 8 ; Block Model = 1826



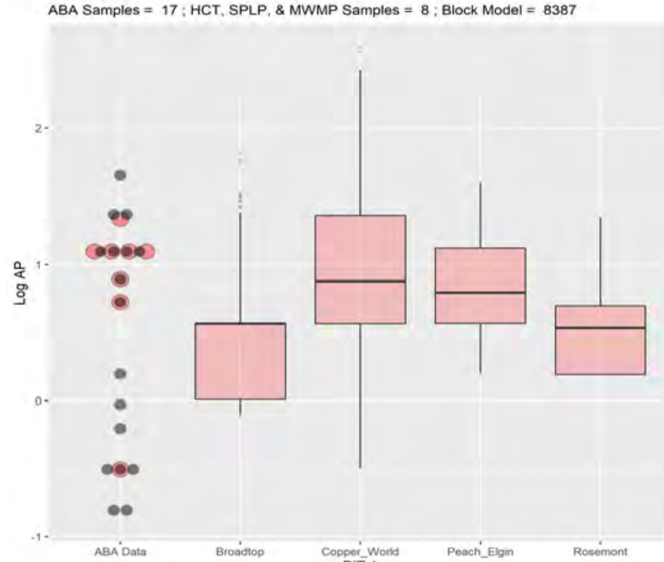
Broadtop-BOLSA-AP
ABA Samples = 17 ; HCT, SPLP, & MWMP Samples = 8 ; Block Model = 2154



Rosemont-BOLSA-AP
ABA Samples = 17 ; HCT, SPLP, & MWMP Samples = 8 ; Block Model = 4190



BOLSA-AP
ABA Samples = 17 ; HCT, SPLP, & MWMP Samples = 8 ; Block Model = 8387



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A TETRA TECH COMPANY

BOLSA AP Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 4	

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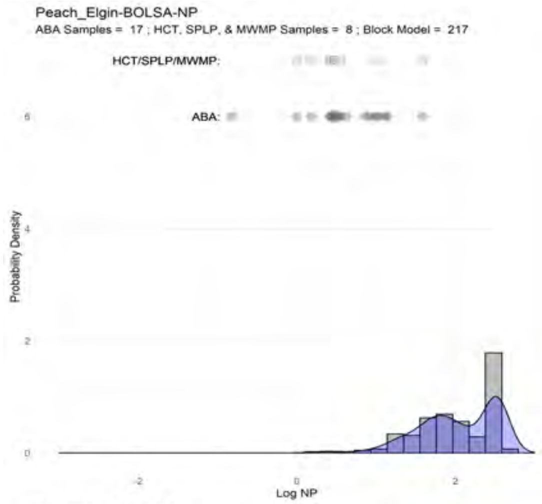

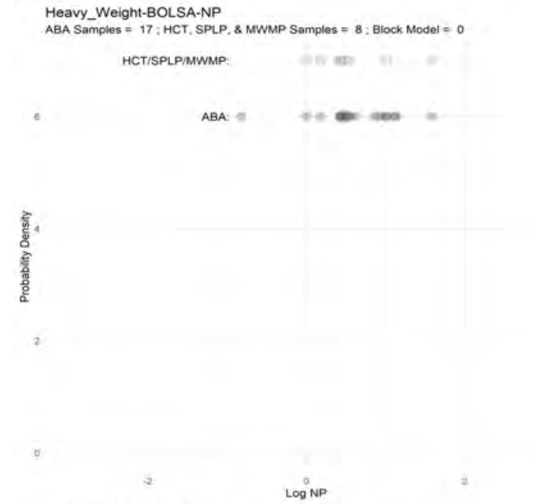

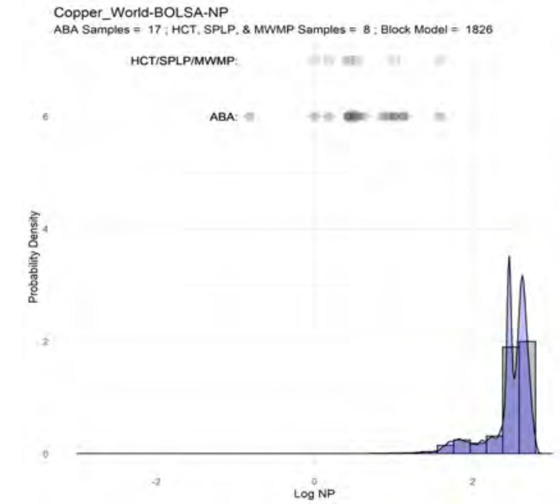

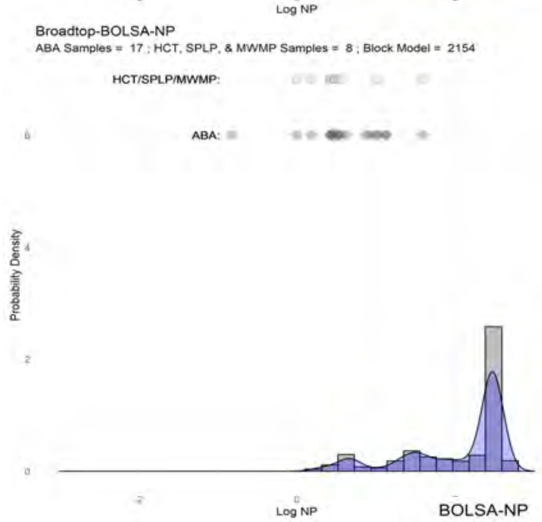

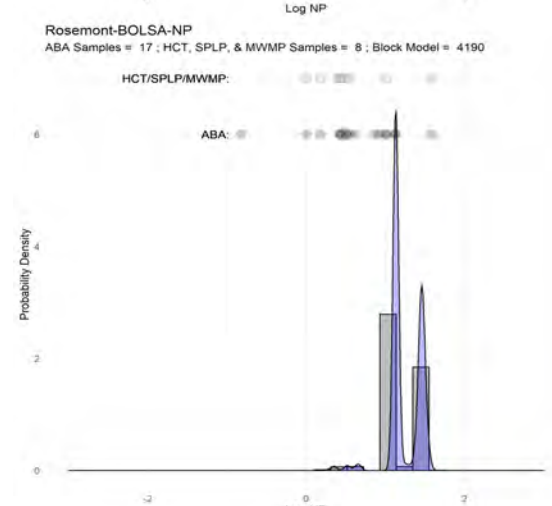

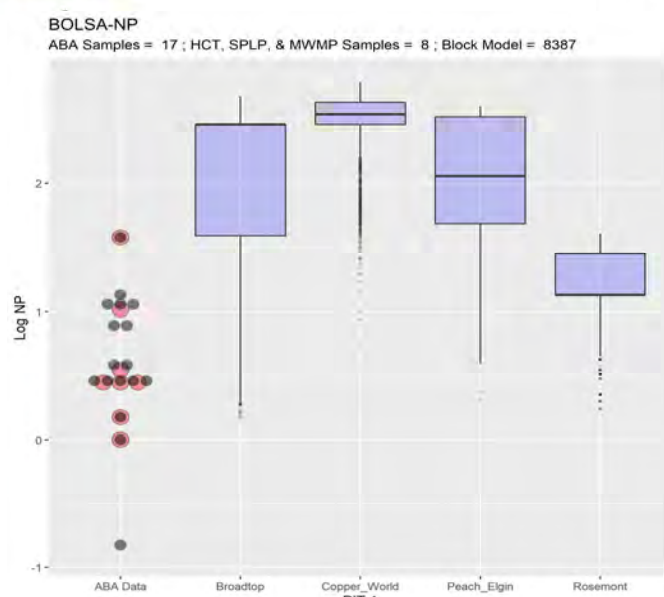

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	BOLSA NP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 4	

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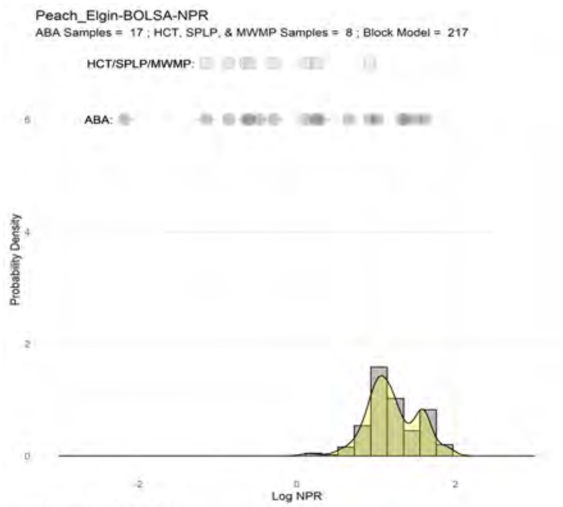

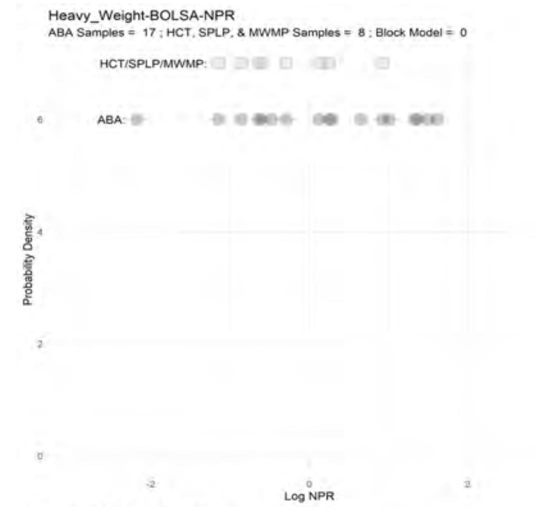

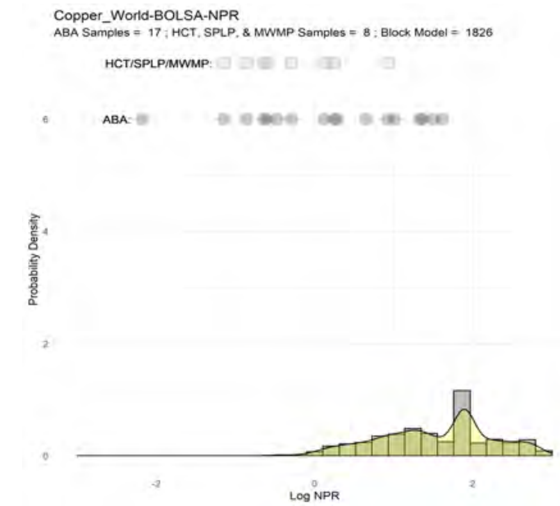

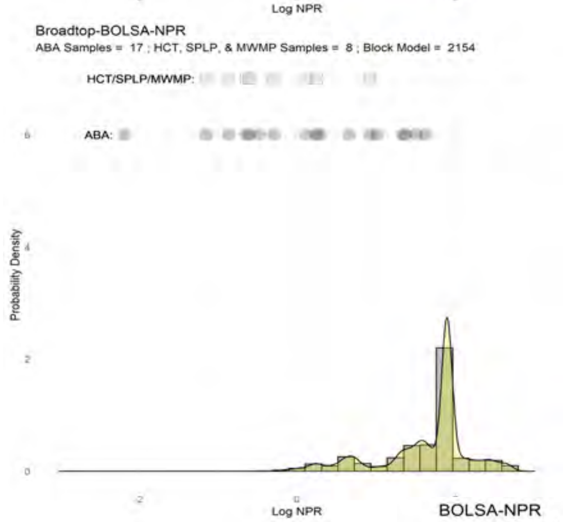

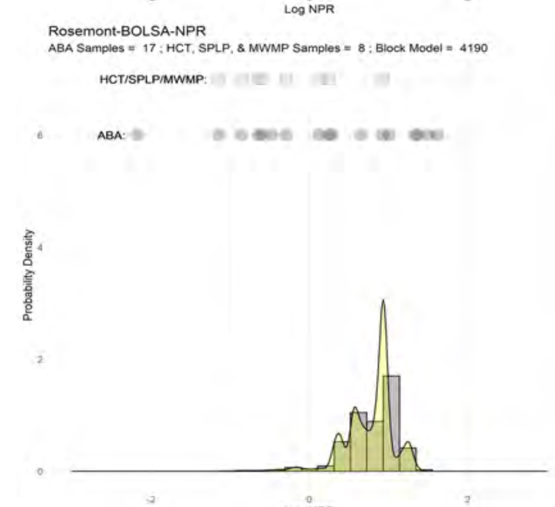

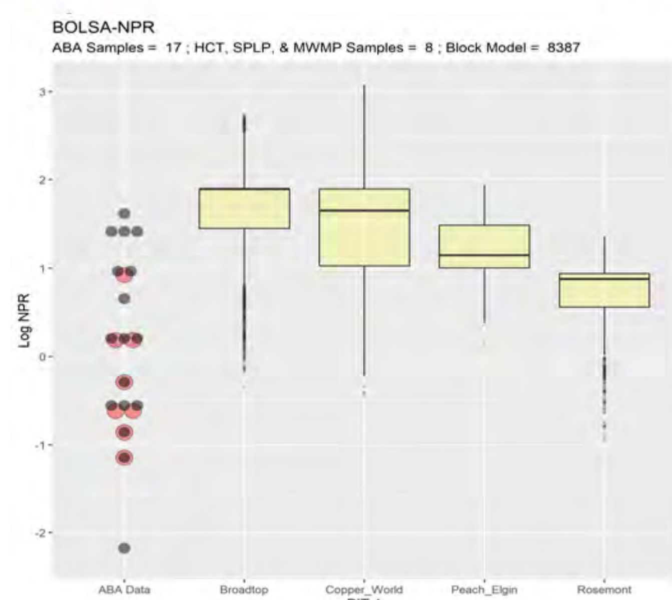

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BOLSA NPR Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB	4286	DRAWN: WT	CHECKED: TC
DATE:	May, 2022	APPENDIX: A 4	

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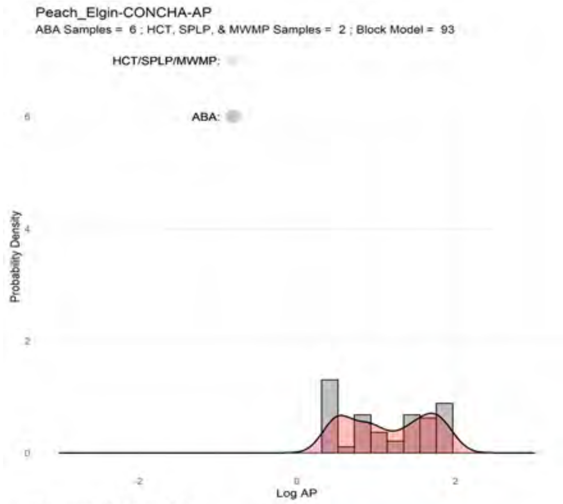

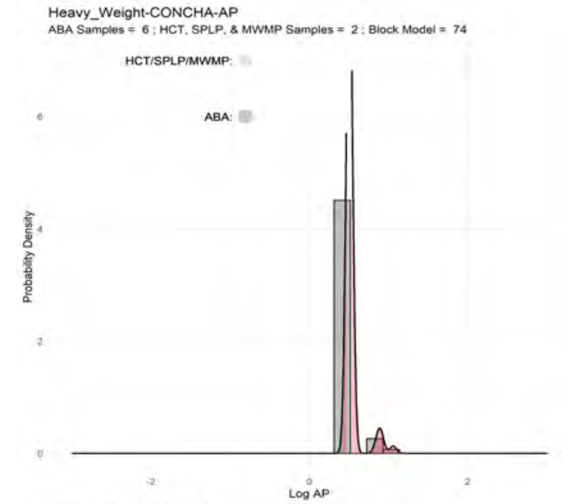

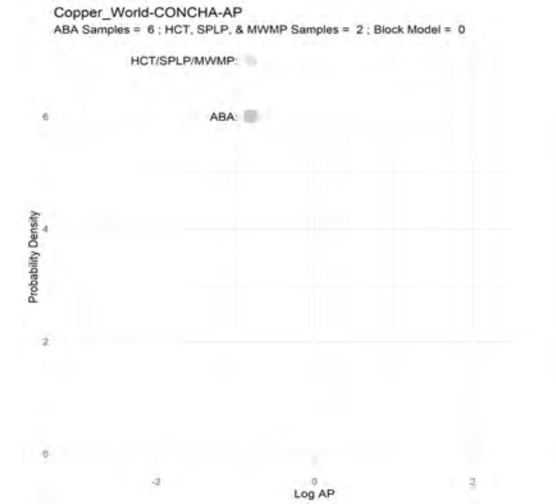

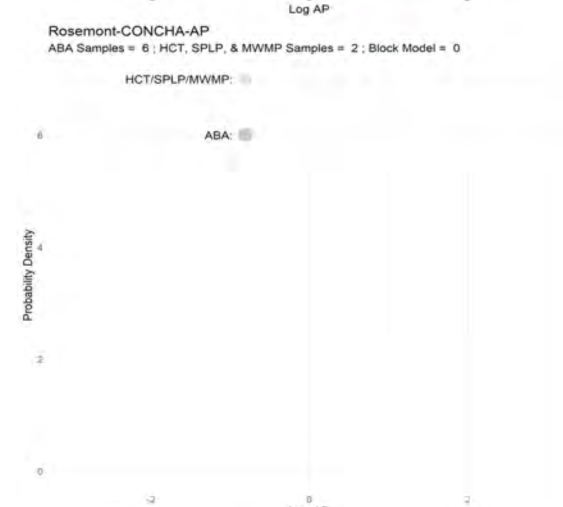

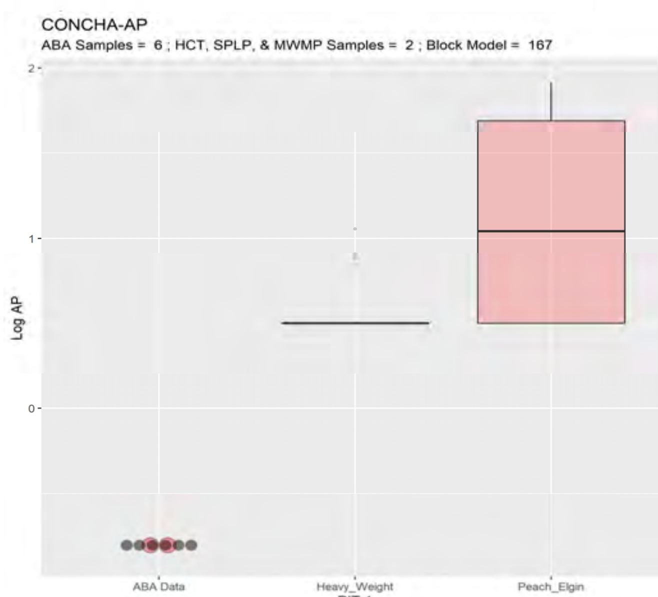

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CONCHA AP Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 5	

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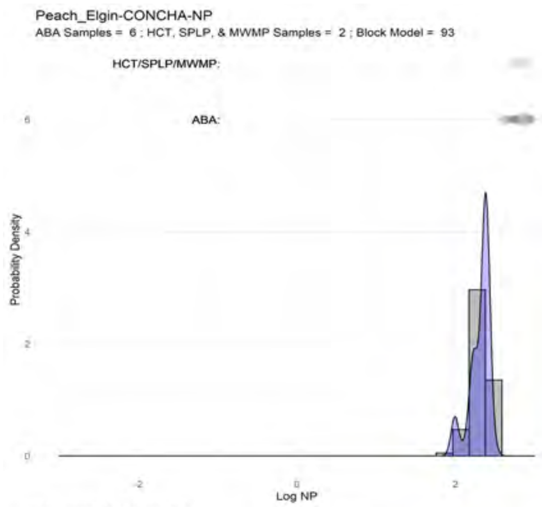
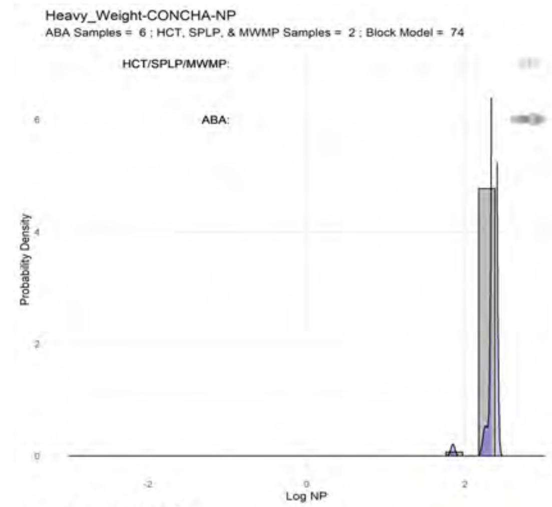
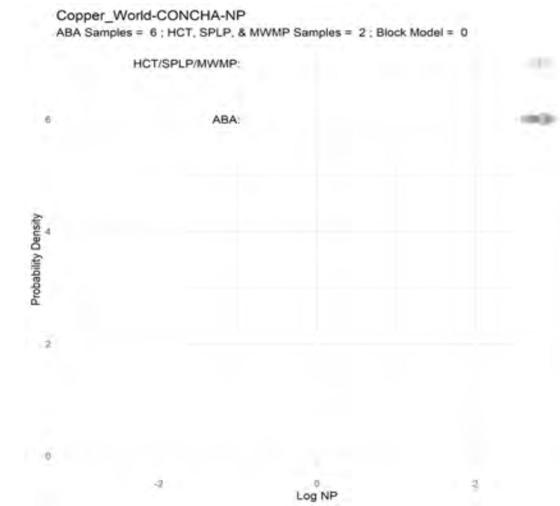
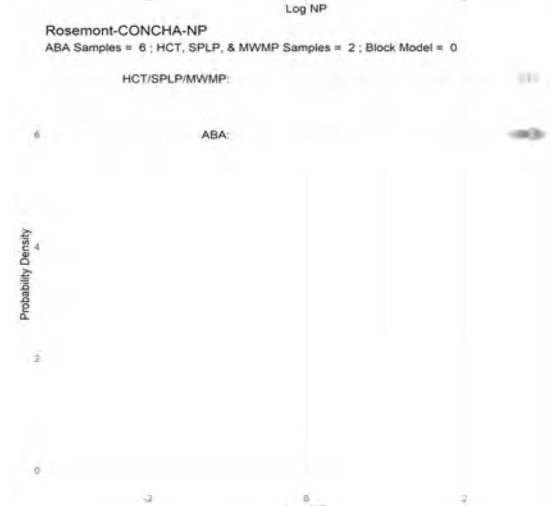
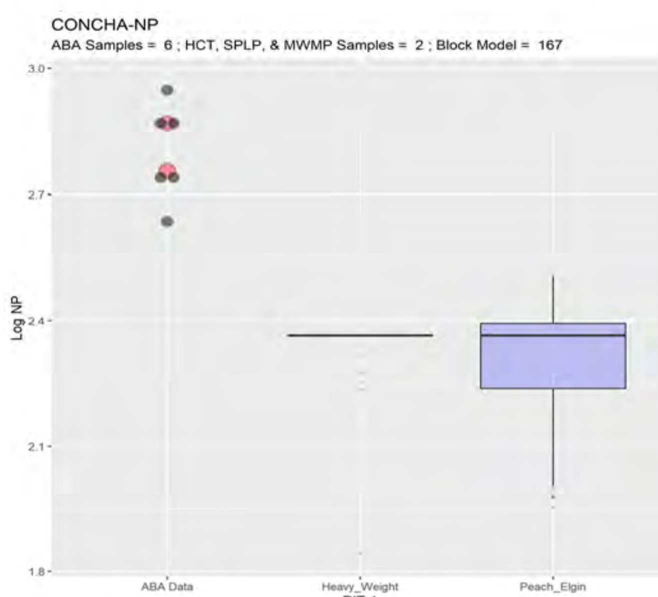


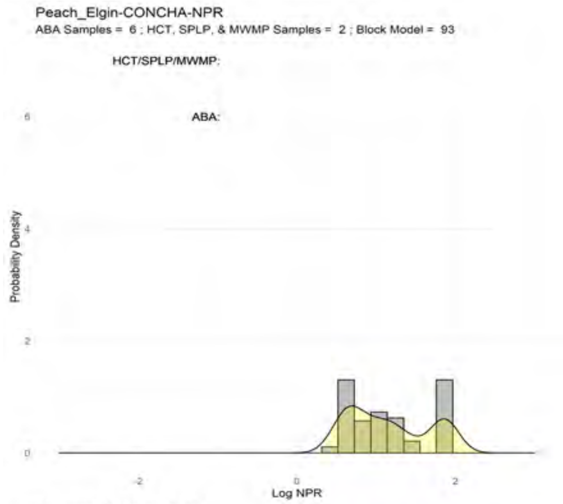


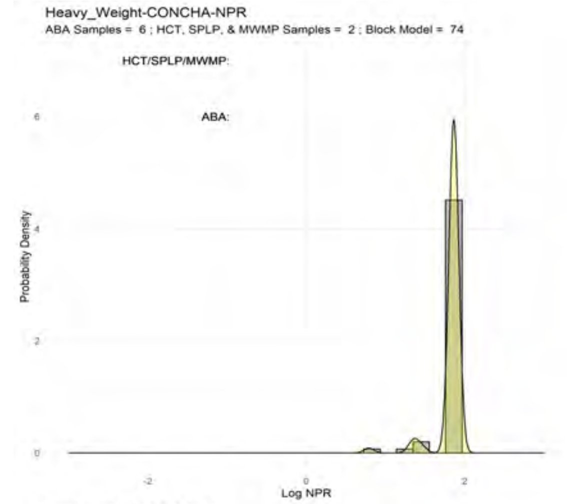


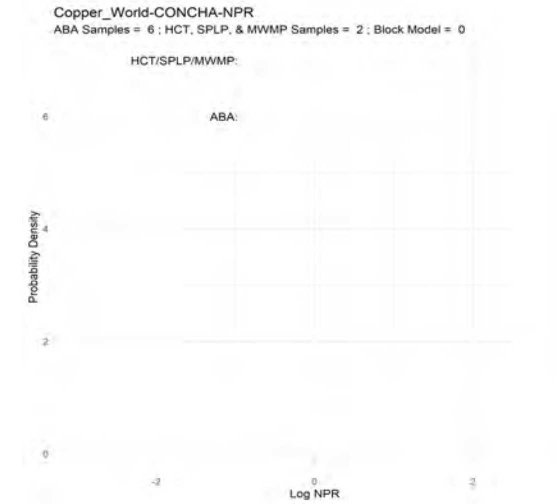


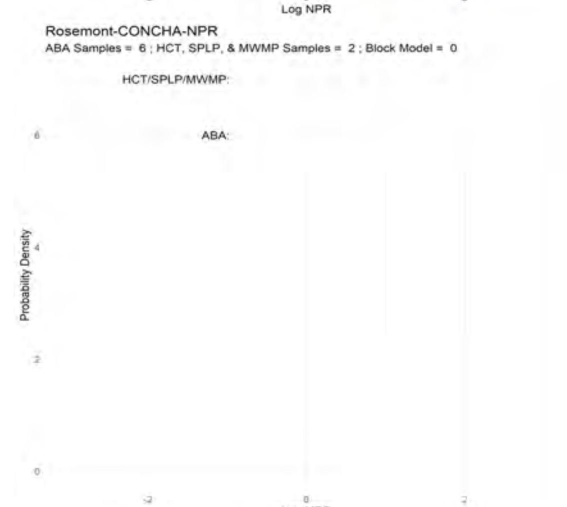


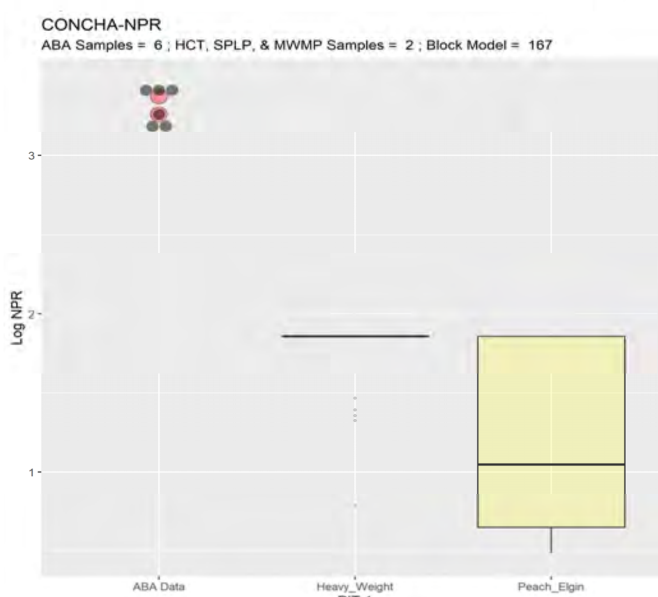
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	CONCHA NP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 5	











PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CONCHA NPR Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 5	

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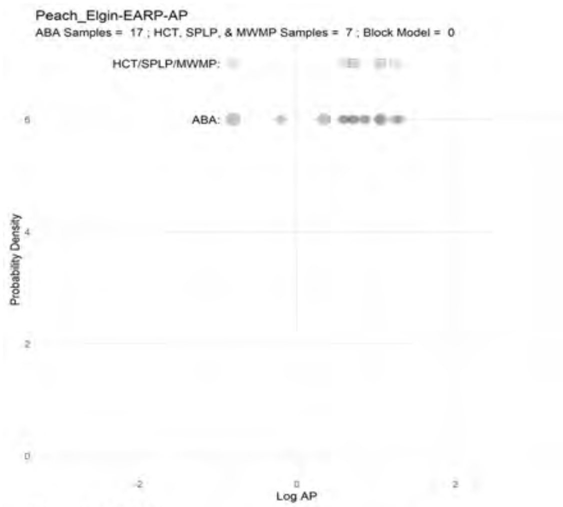
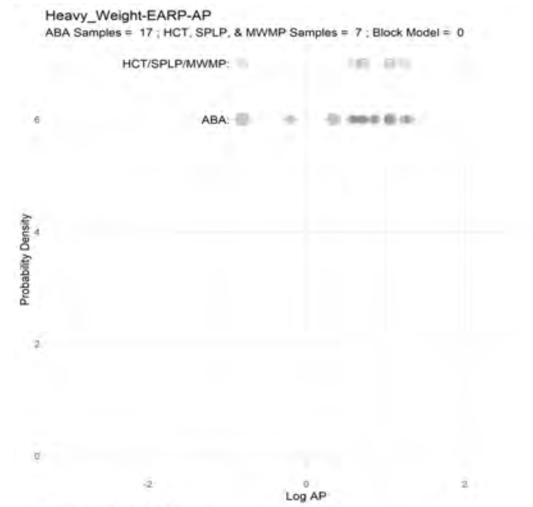
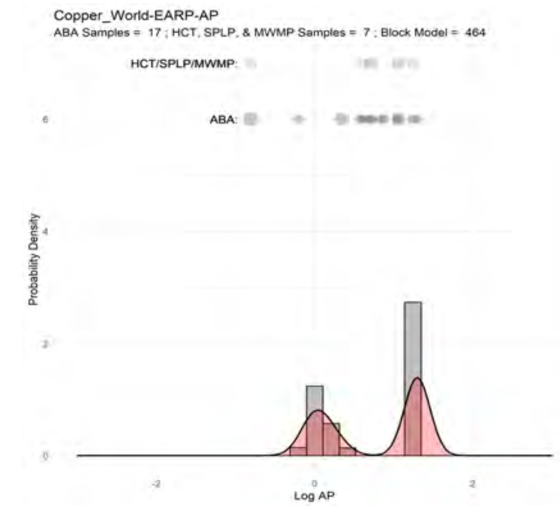
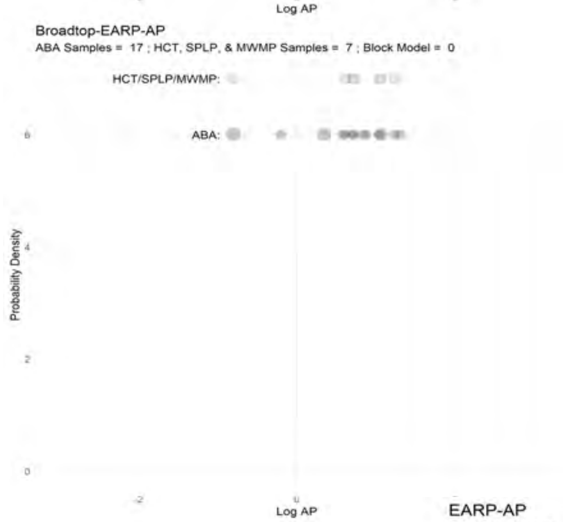
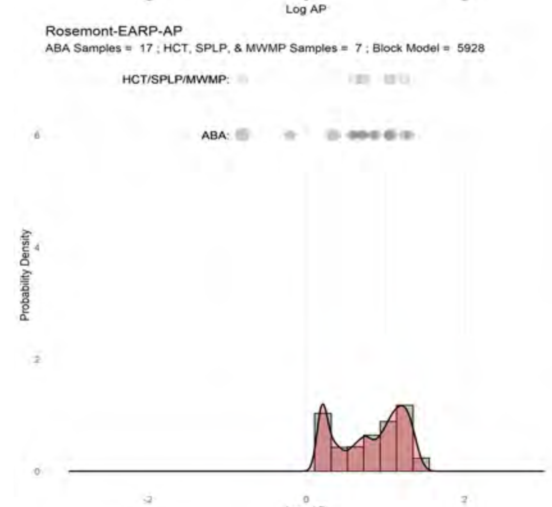
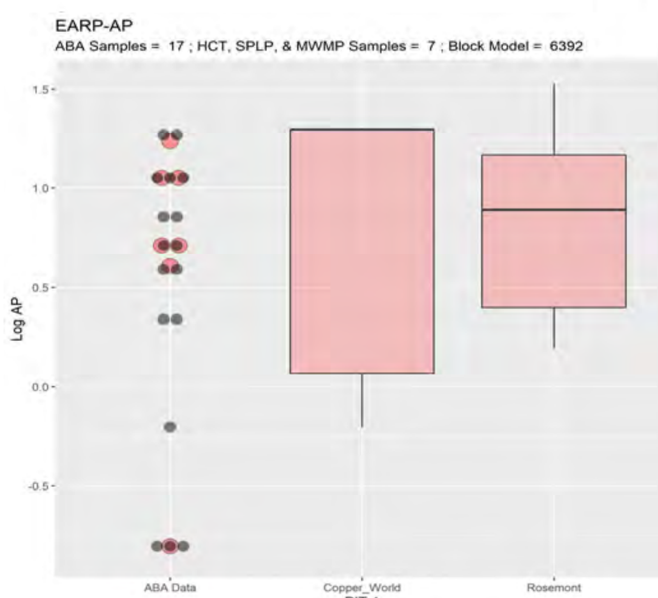






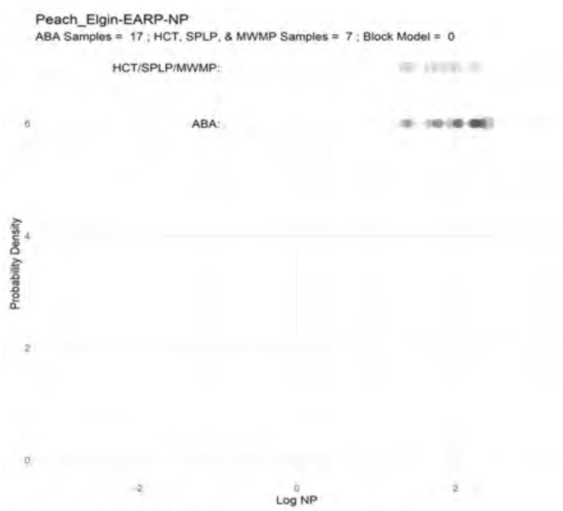


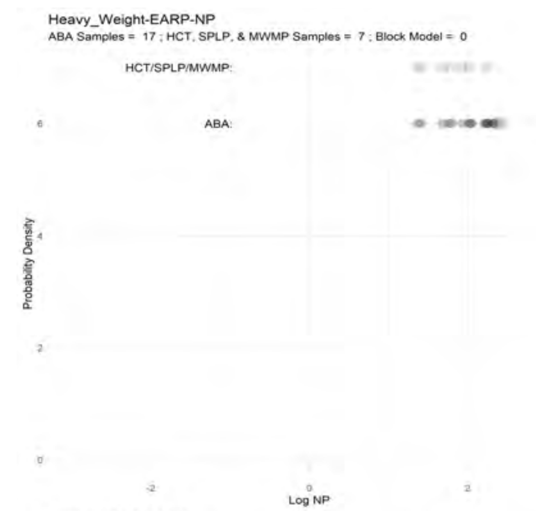


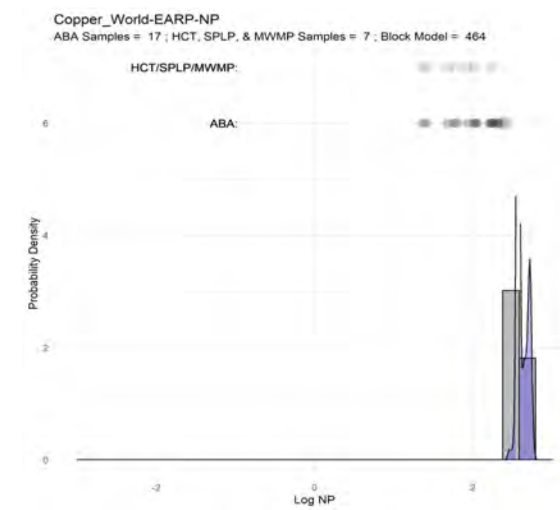


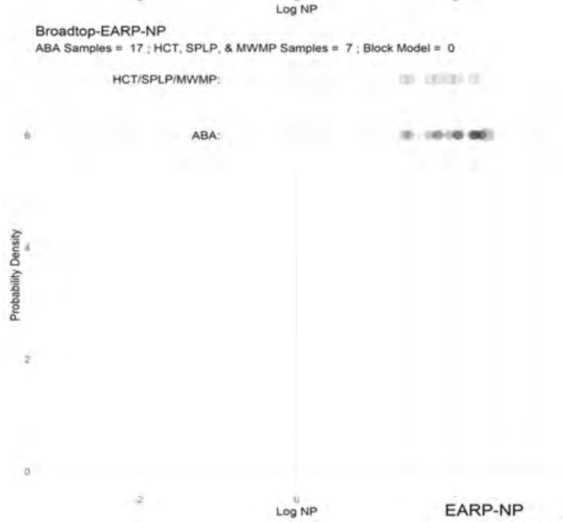
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	EARP AP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB	4286	DRAWN: WT	CHECKED: TC
	DATE:	May, 2022	APPENDIX: A 6	

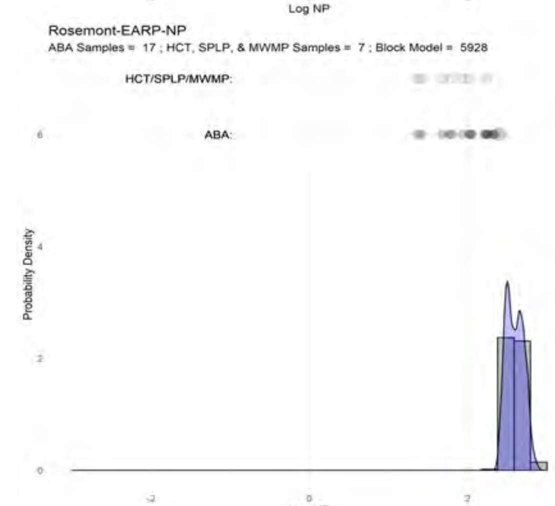
#VALUE!

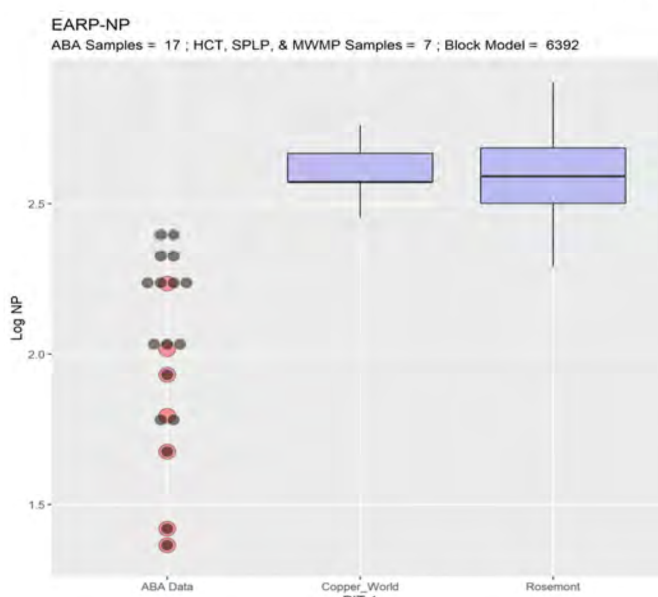












PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

EARP NP Block Model and ABA Statistics

CLIENT:	Rosemont Copper Company	PROJECT:	Rosemont Copper World Project
JOB	4286	DRAWN: WT	CHECKED: TC
DATE:	May, 2022	APPENDIX:	A 6

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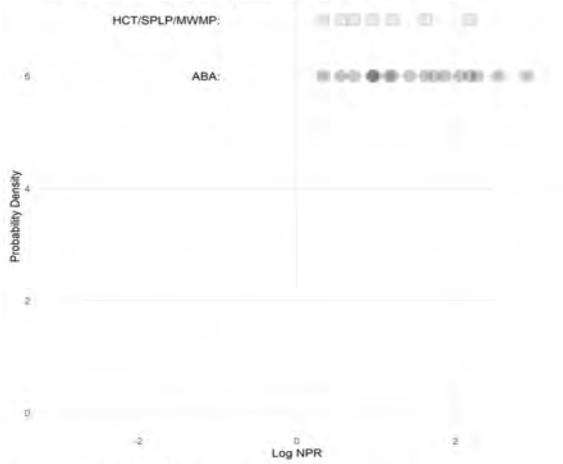
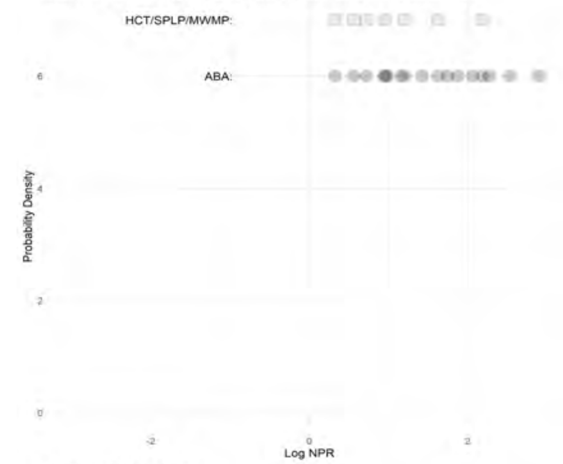
Peach_Elgin-EARP-NPR

ABA Samples = 17 ; HCT, SPLP, & MWMP Samples = 7 ; Block Model = 0



Heavy_Weight-EARP-NPR

ABA Samples = 17 ; HCT, SPLP, & MWMP Samples = 7 ; Block Model = 0



Copper_World-EARP-NPR

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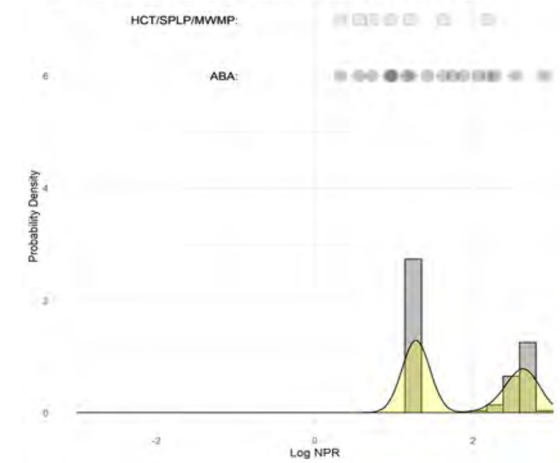
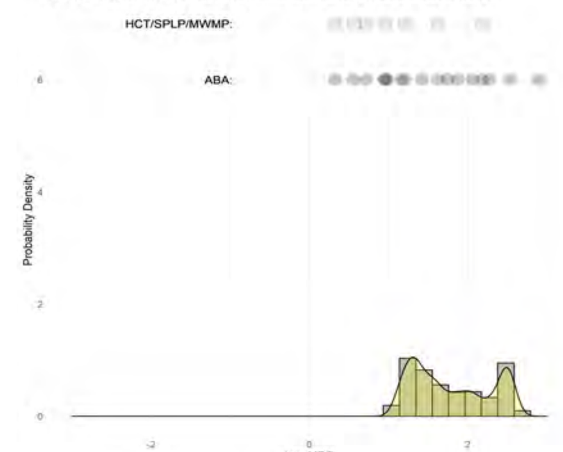


Broadtop-EARP-NPR

ABA Samples = 17 ; HCT, SPLP, & MWMP Samples = 7 ; Block Model = 0

Rosemont-EARP-NPR

ABA Samples = 17 ; HCT, SPLP, & MWMP Samples = 7 ; Block Model = 5928



EARP-NPR

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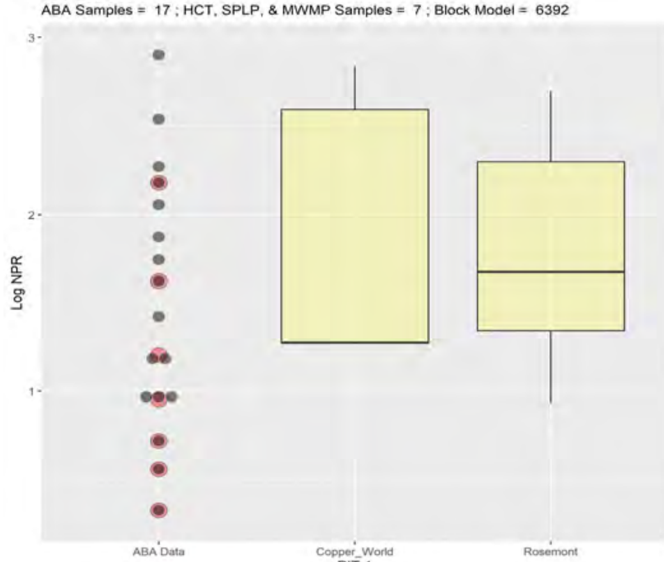
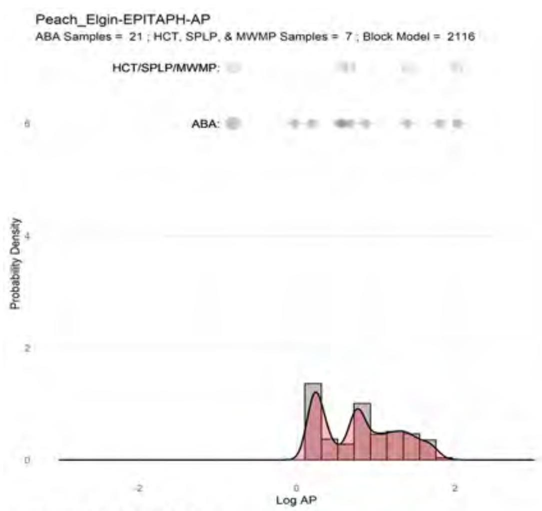
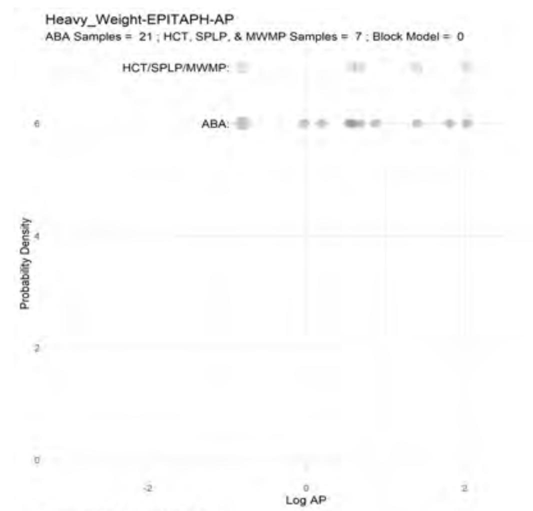
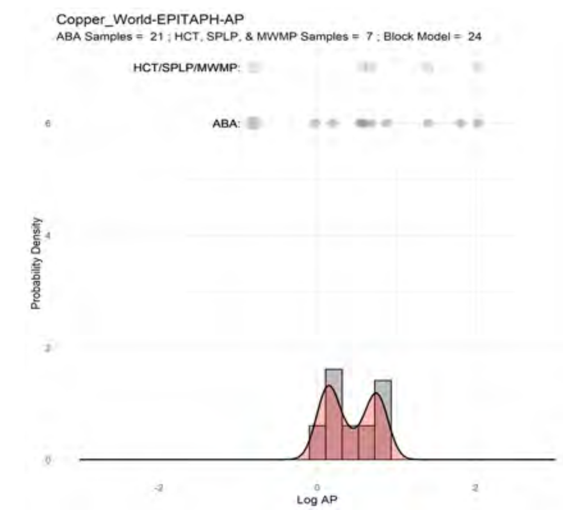
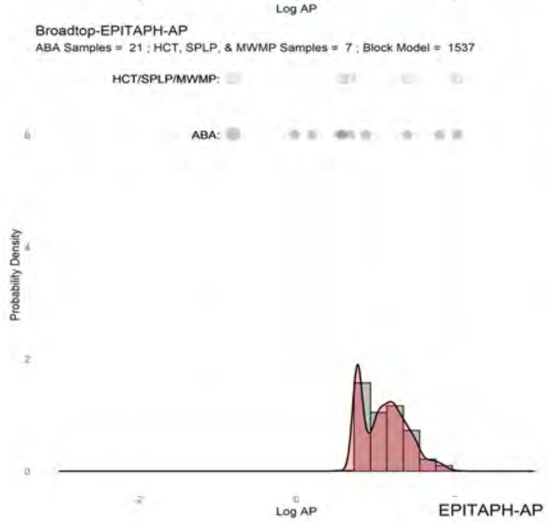


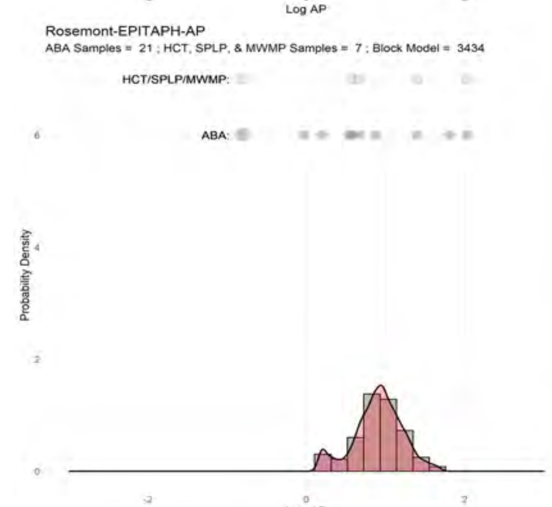
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	EARP NPR Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 6	

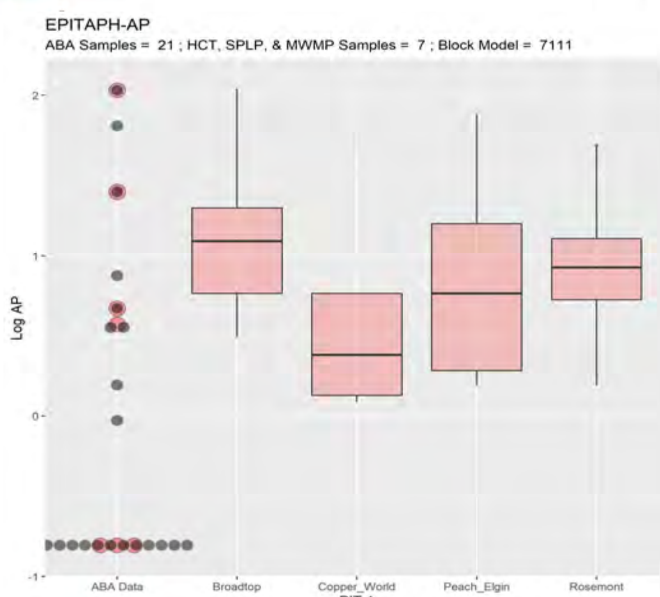












PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	EPITAPH AP Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 7	

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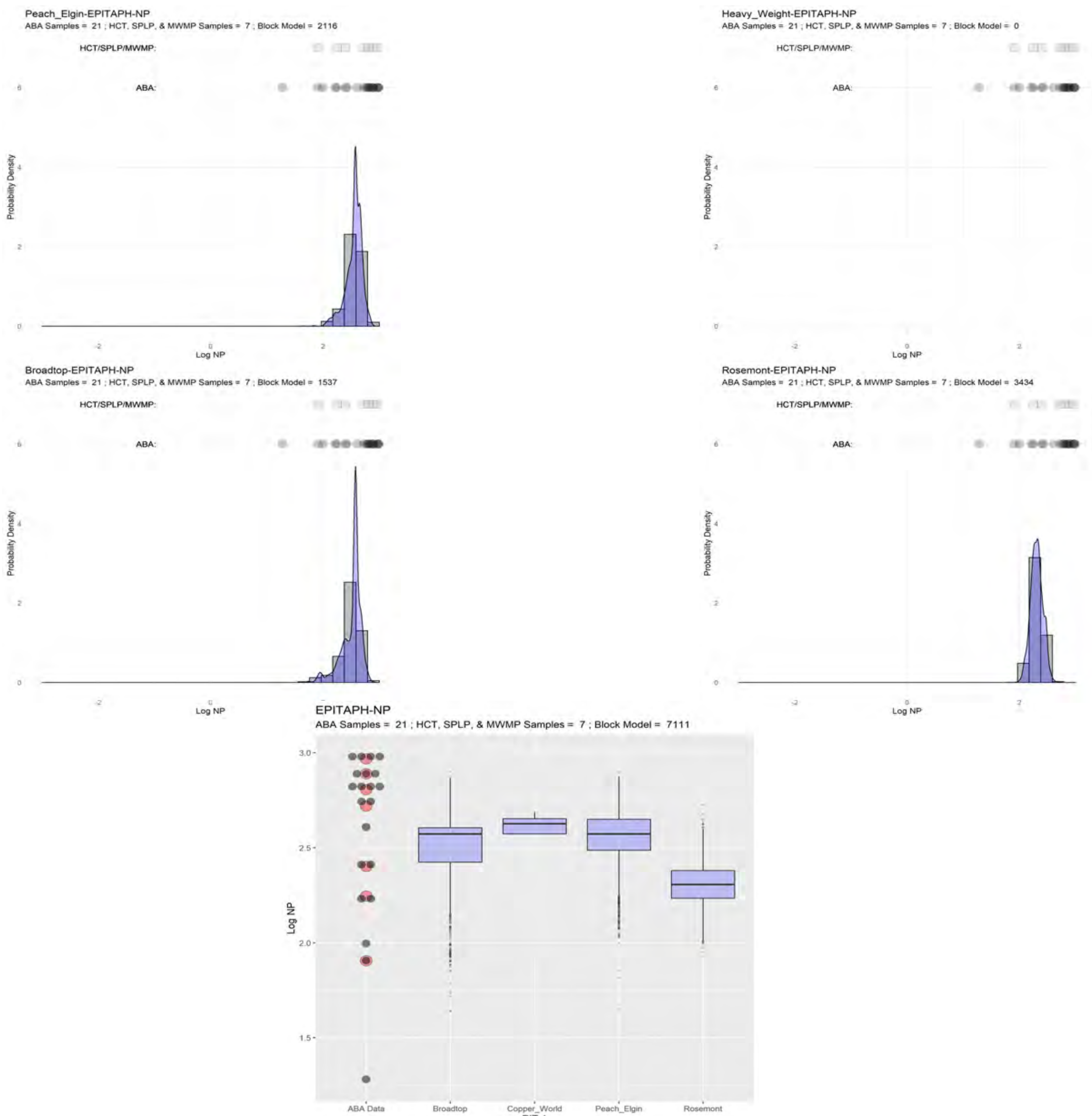

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

EPITAPH NP Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 7	

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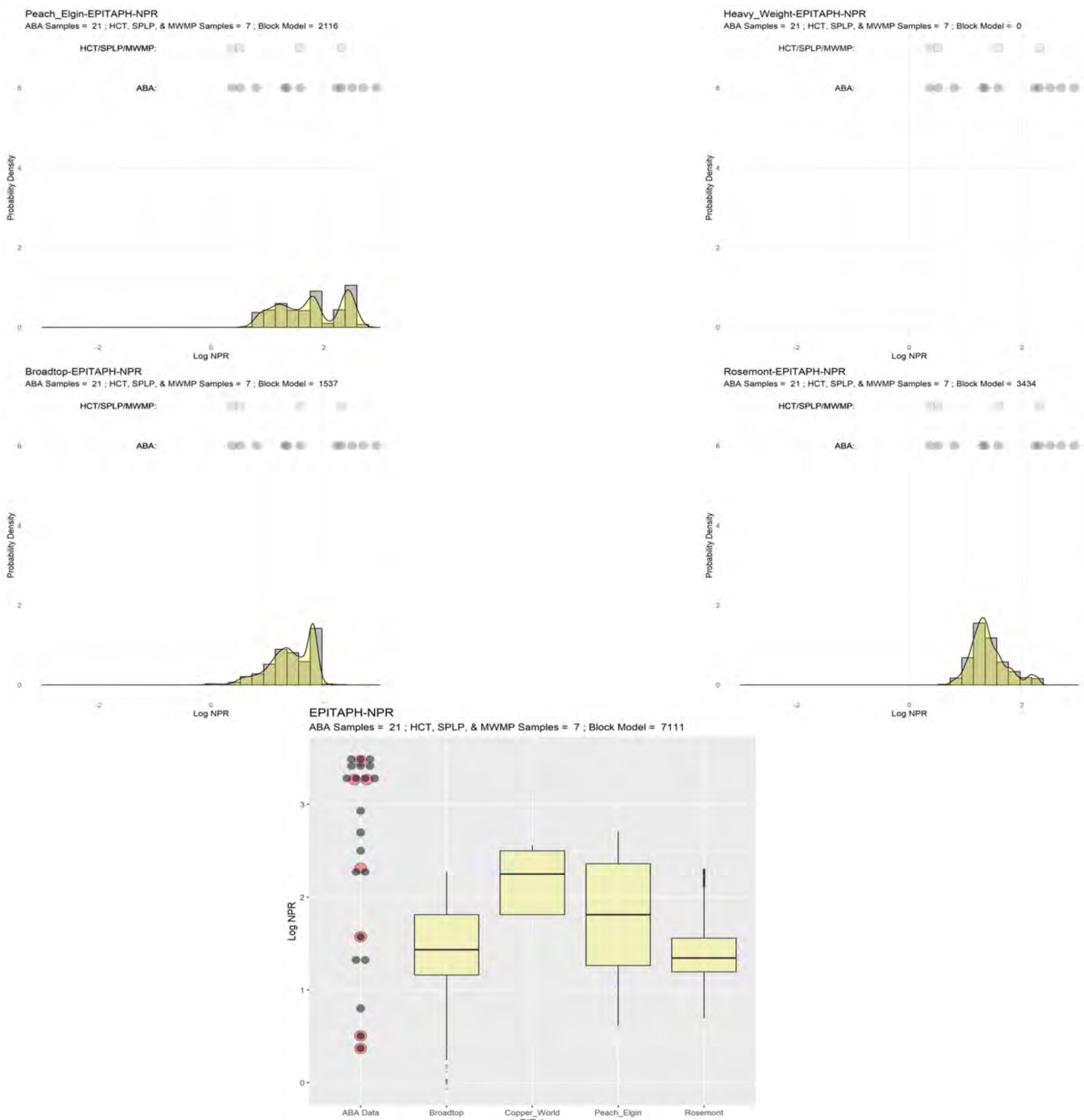

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	EPITAPH NPR Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 7	

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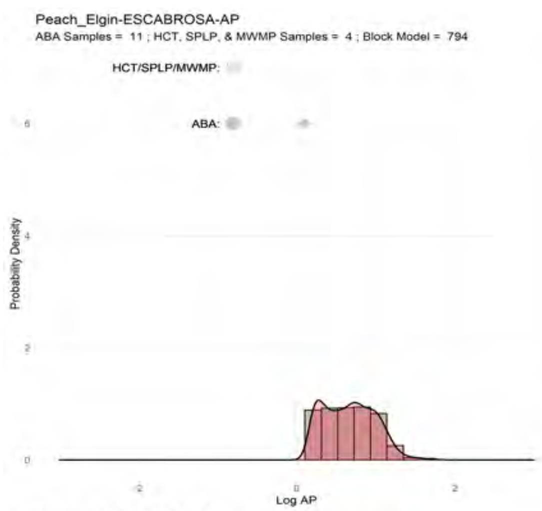

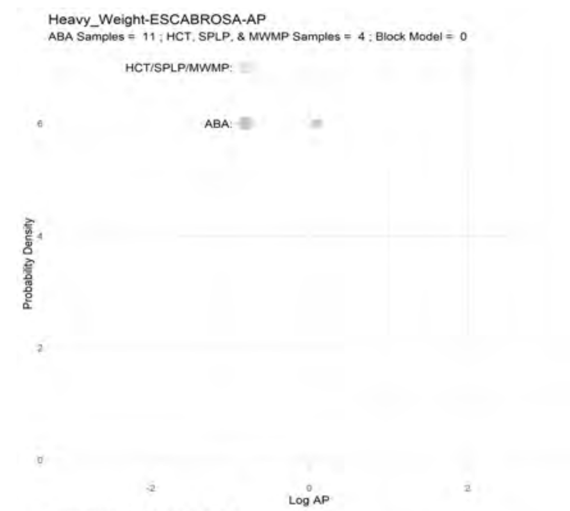

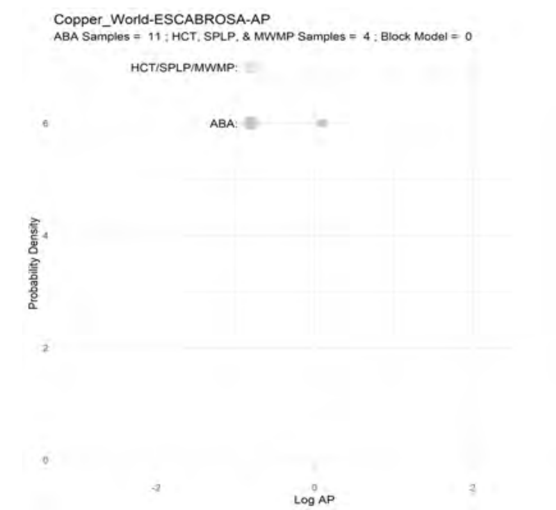

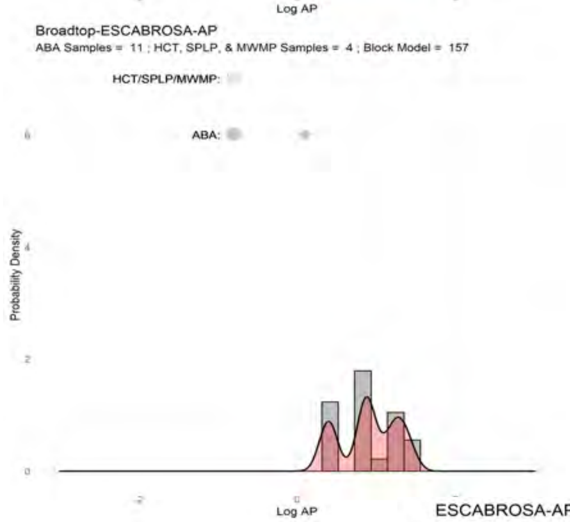

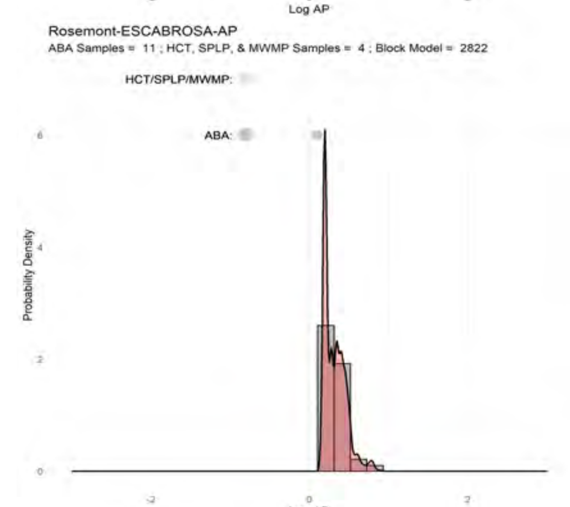

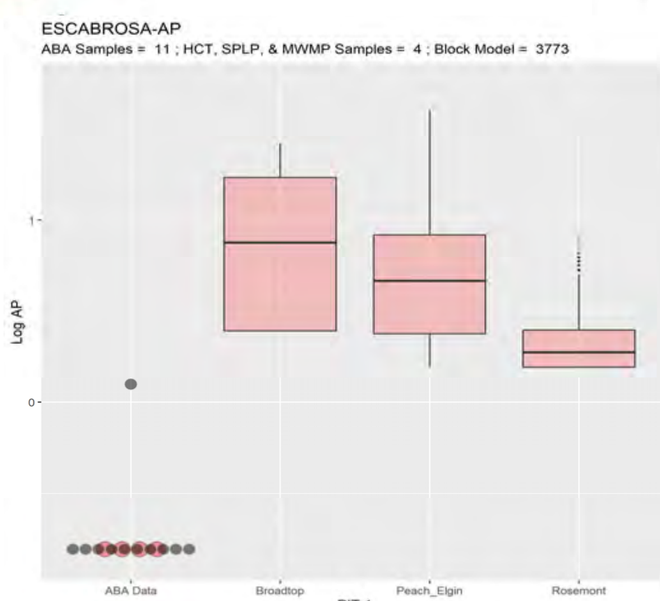

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	ESCABROSA AP Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 8	

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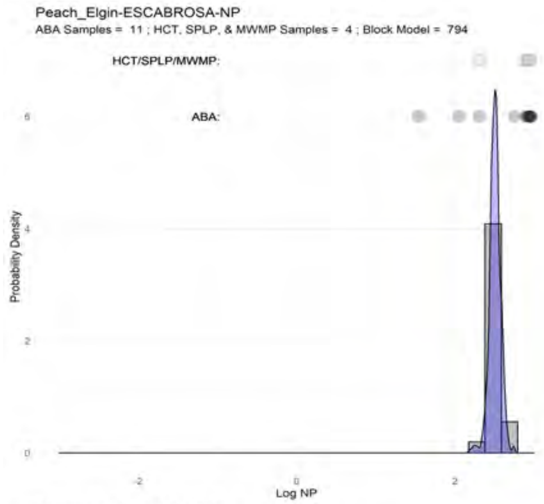

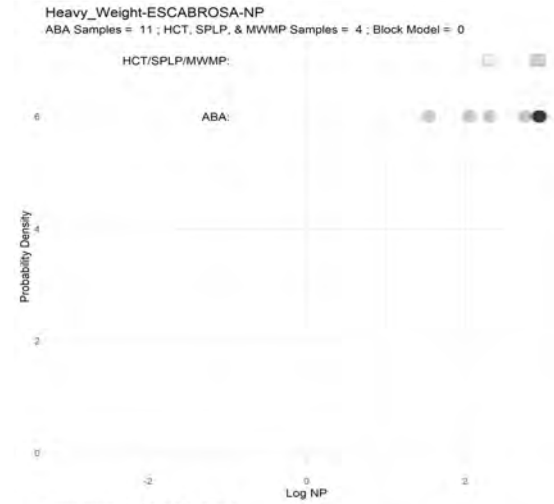

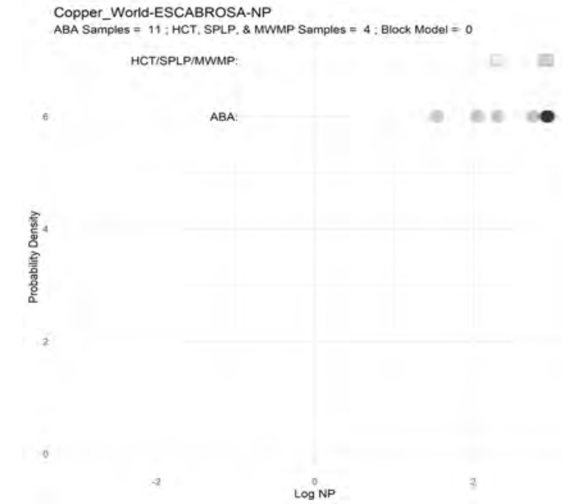

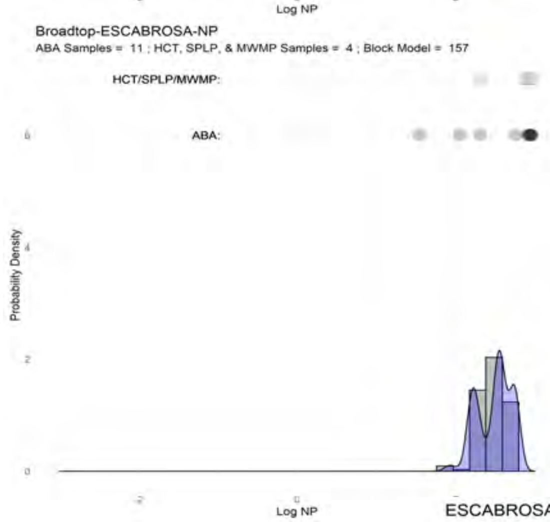

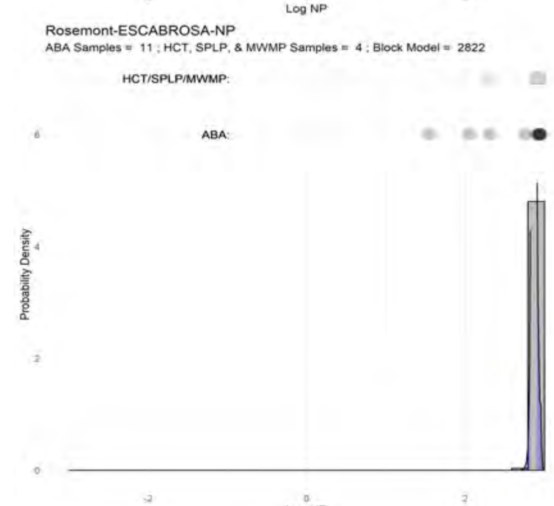

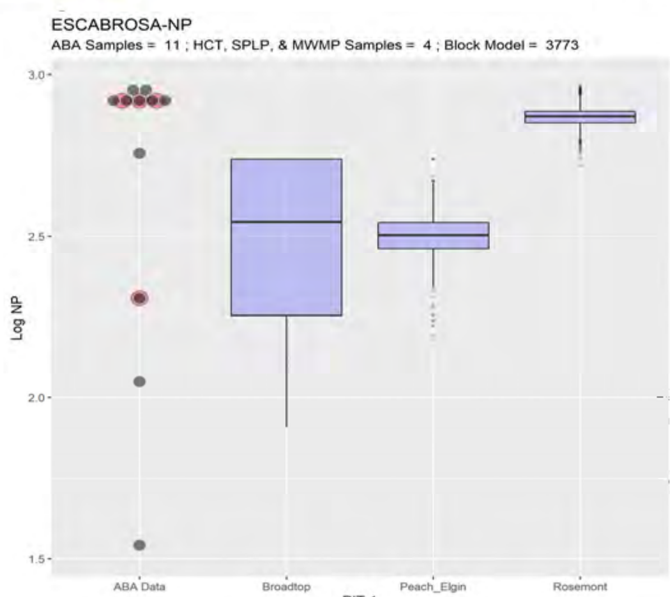

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	ESCABROSA NP Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 8	

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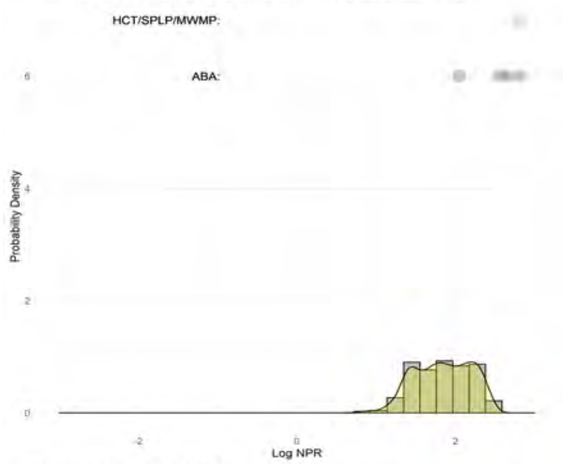
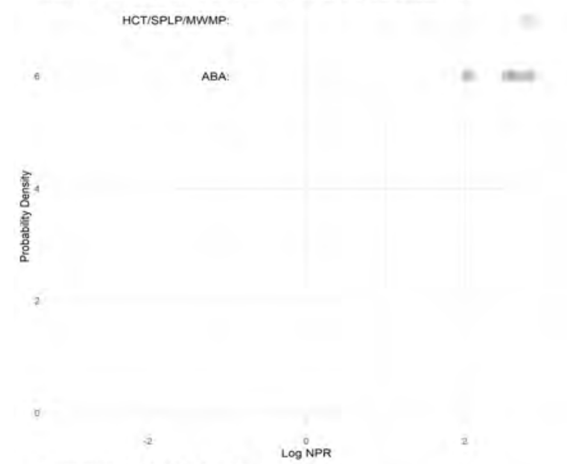
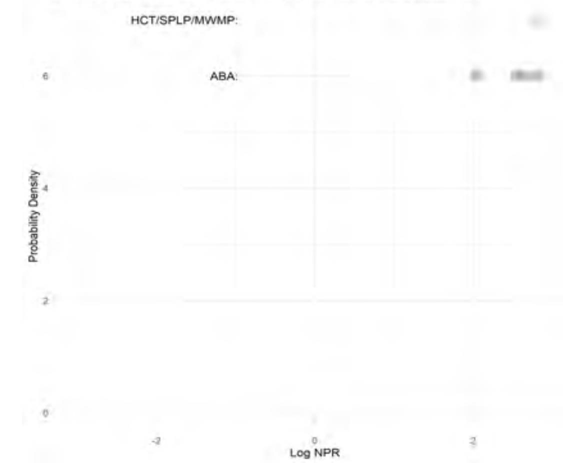


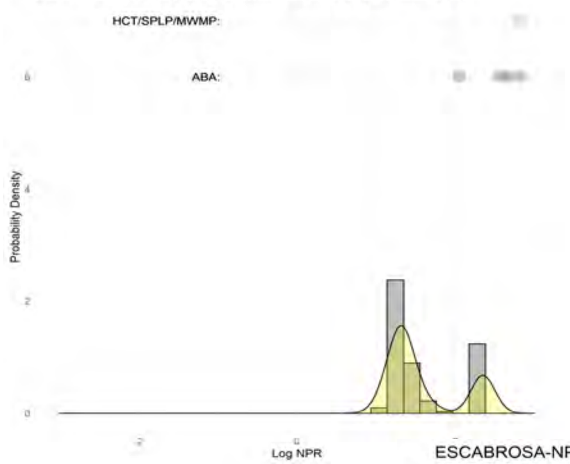
Heavy_Weight-ESCABROSA-NPR
ABA Samples = 11 ; HCT, SPLP, & MWMP Samples = 4 ; Block Model = 0



Copper_World-ESCABROSA-NPR
ABA Samples = 11 ; HCT, SPLP, & MWMP Samples = 4 ; Block Model = 0



Broadtop-ESCABROSA-NPR
ABA Samples = 11 ; HCT, SPLP, & MWMP Samples = 4 ; Block Model = 157



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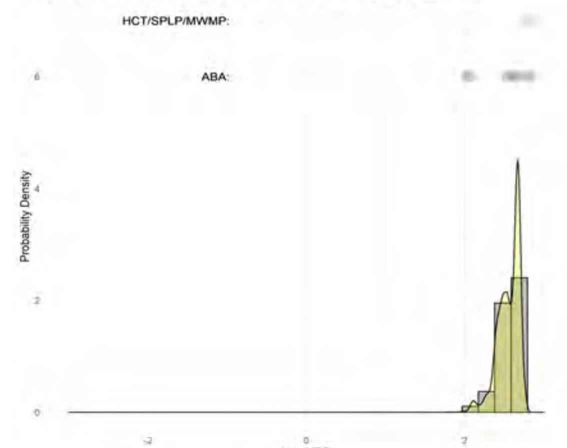

ESCABROSA-NPR
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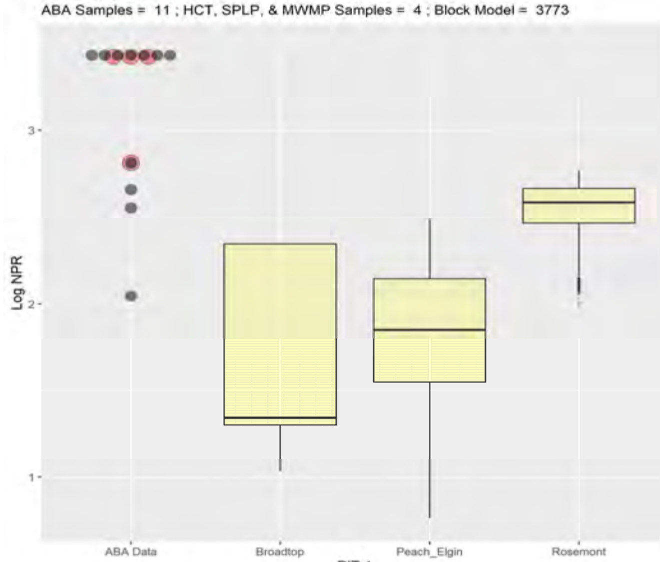
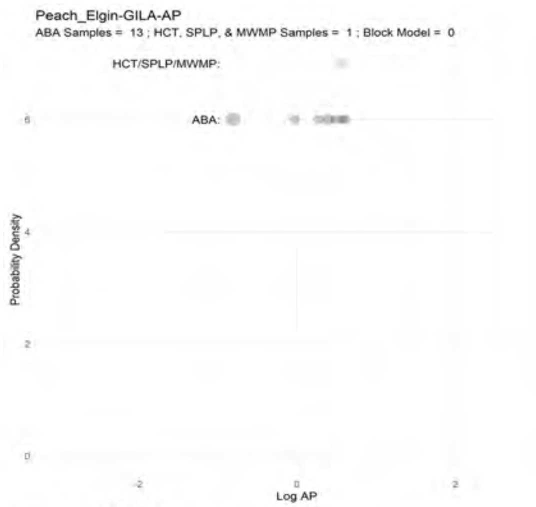
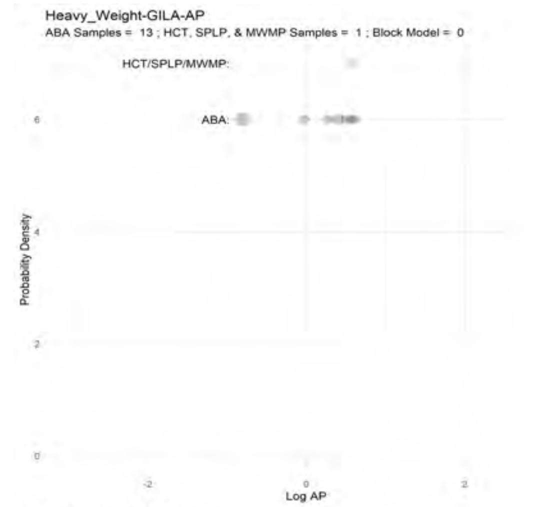
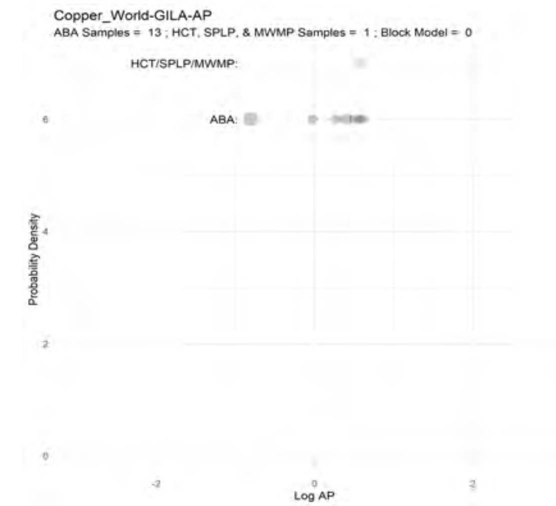


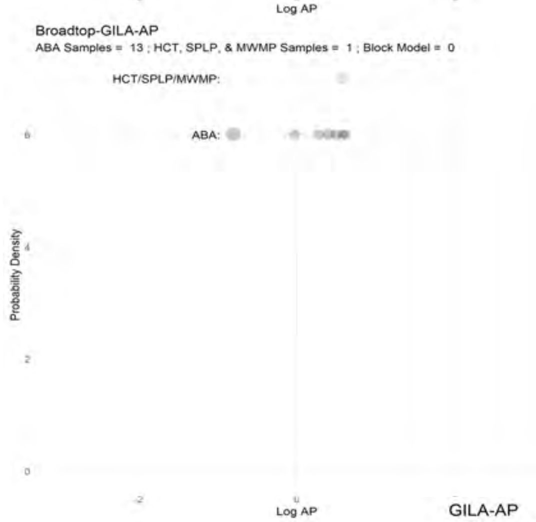
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	ESCABROSA NPR Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project		
	JOB 4286	DRAWN: WT	CHECKED: TC	
	DATE: May, 2022	APPENDIX: A 8		

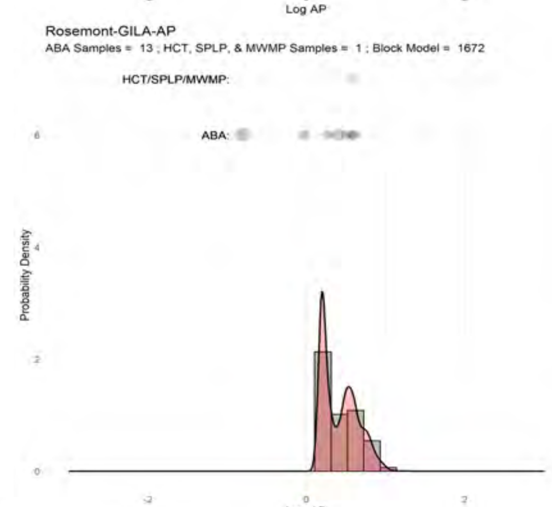
#VALUE!

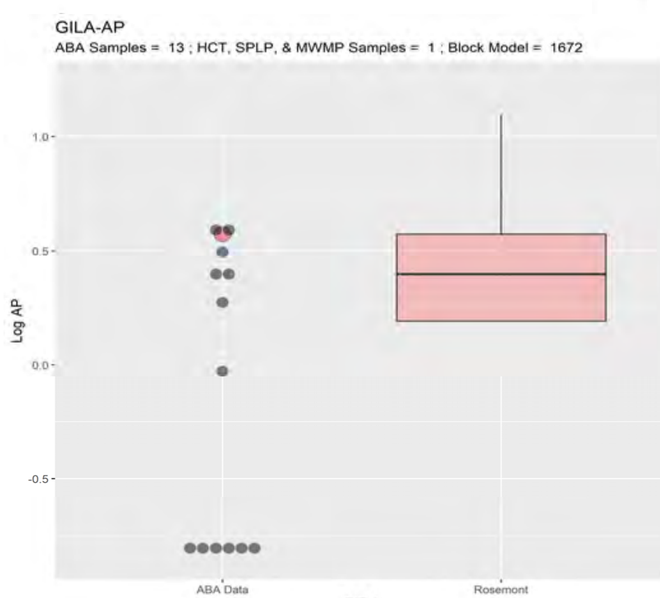












PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	GILA AP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 9	

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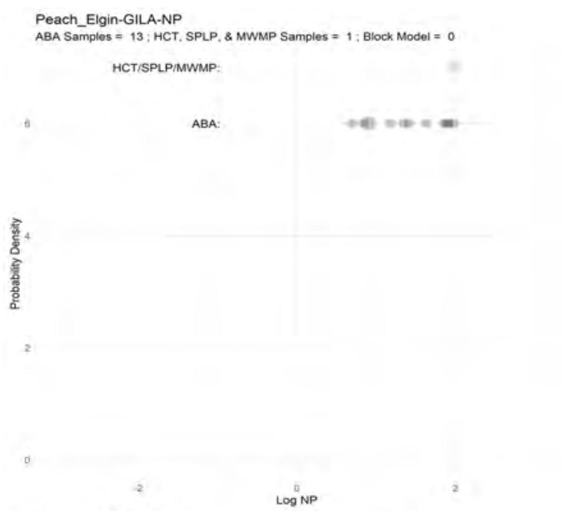

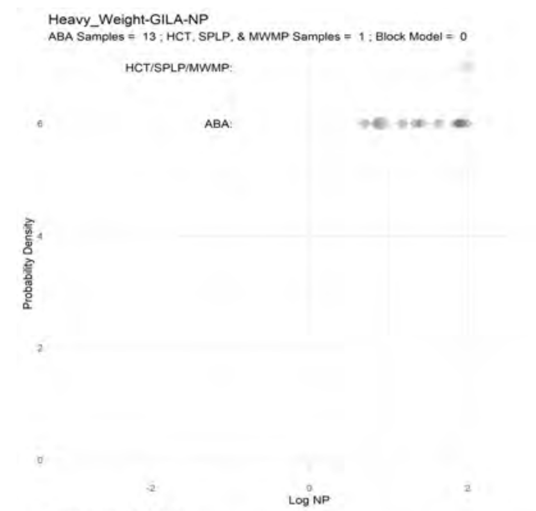

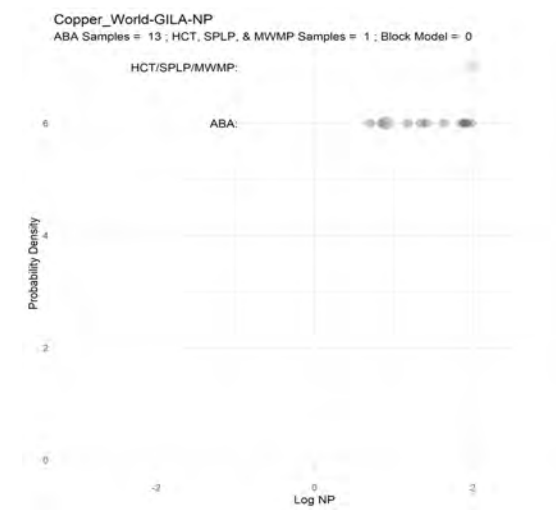

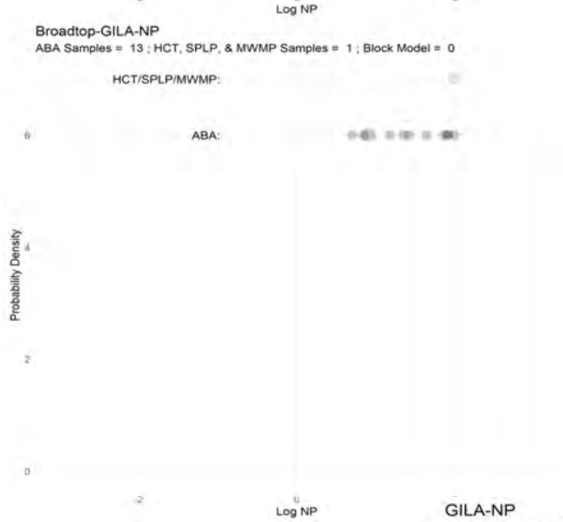

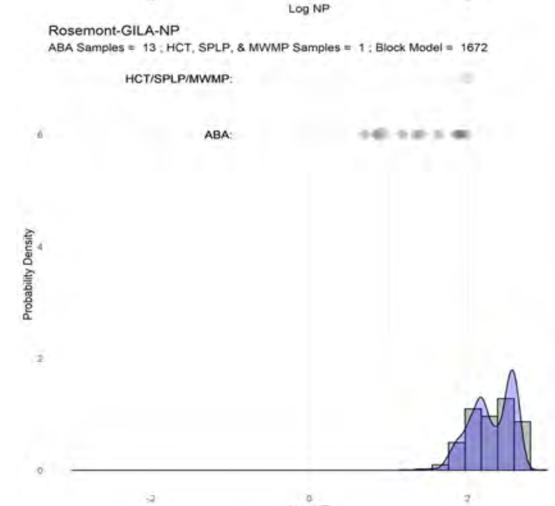

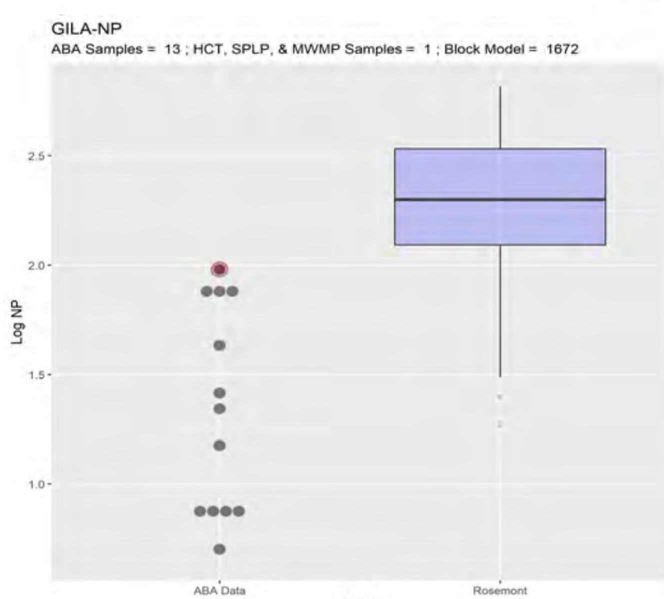

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	GILA NP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 9	

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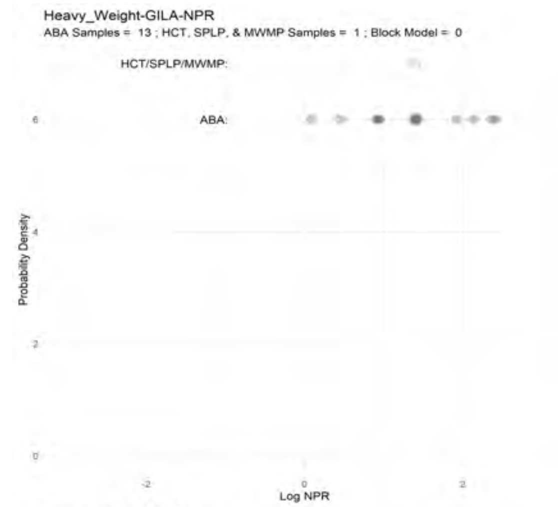

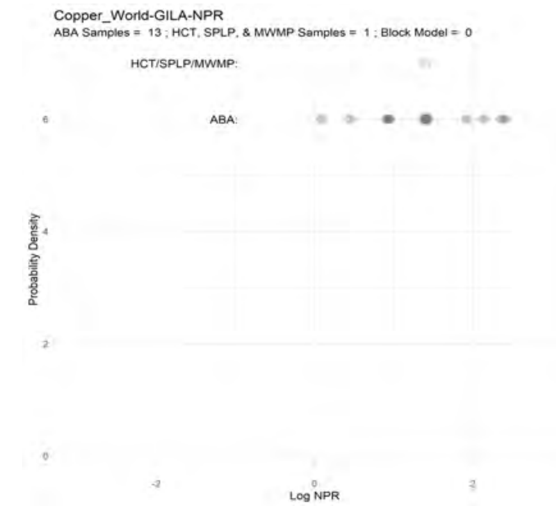

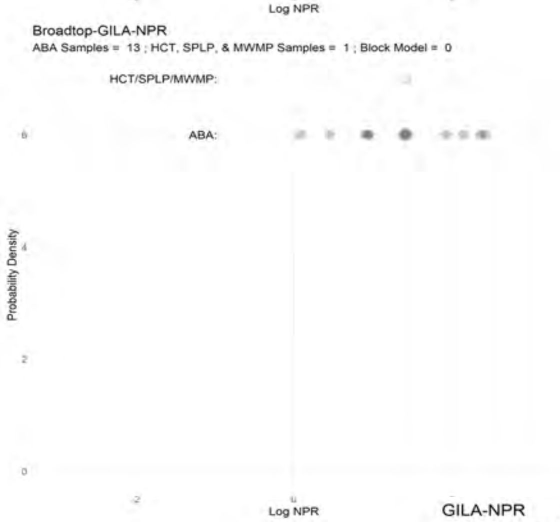

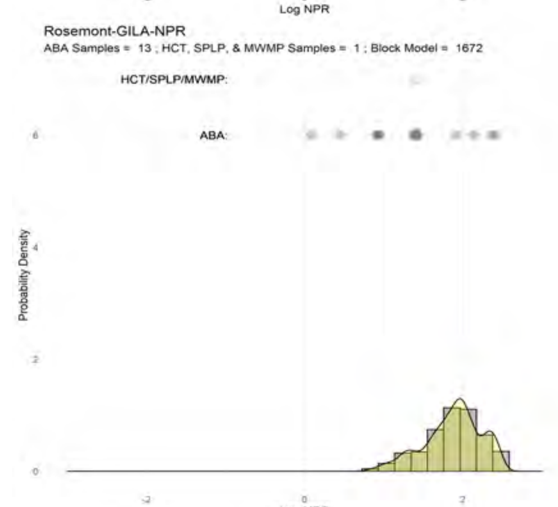

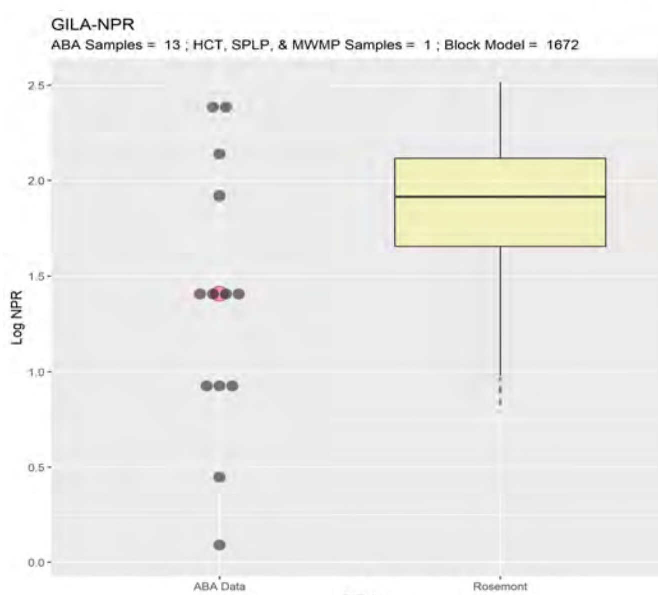

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	GILA NPR Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 9	

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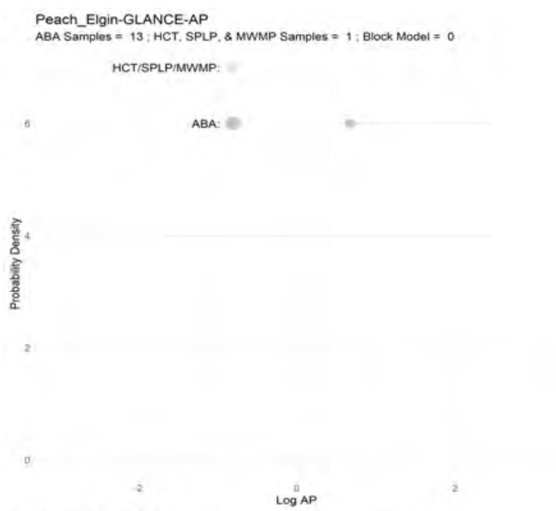
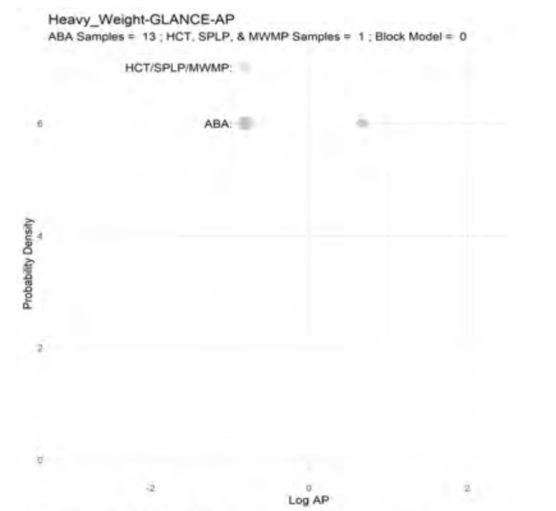
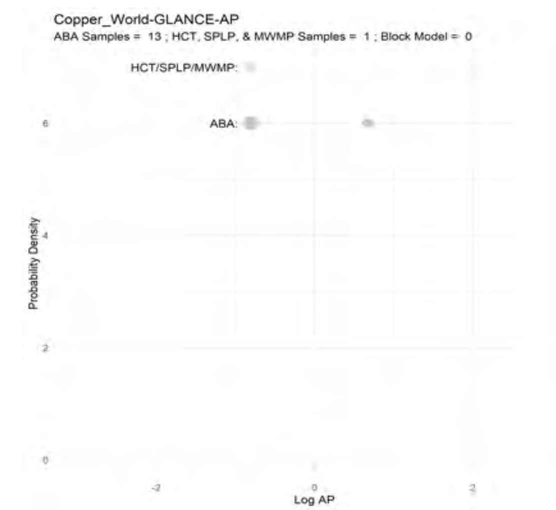
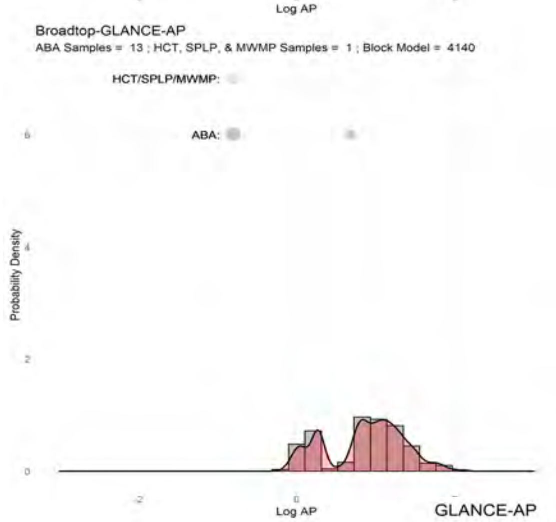
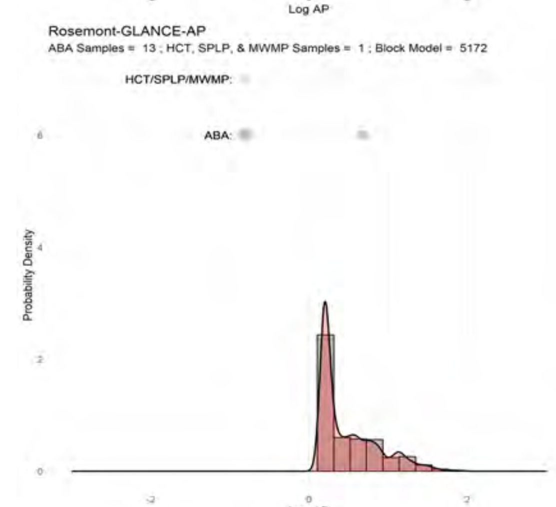
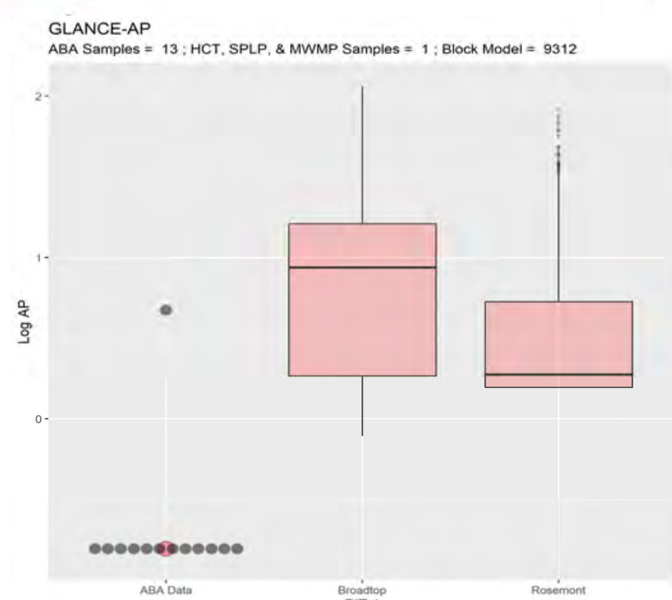




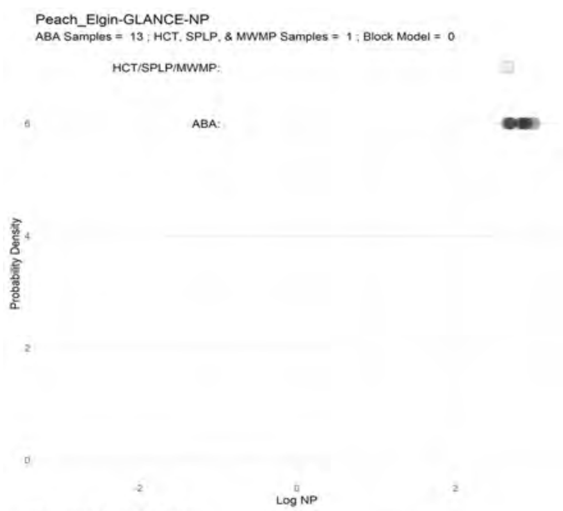


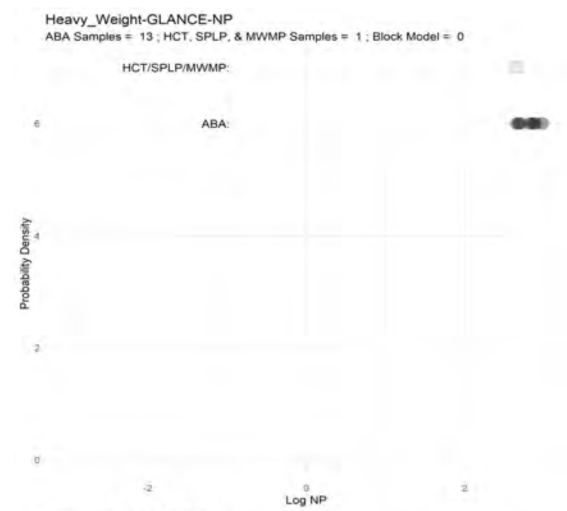


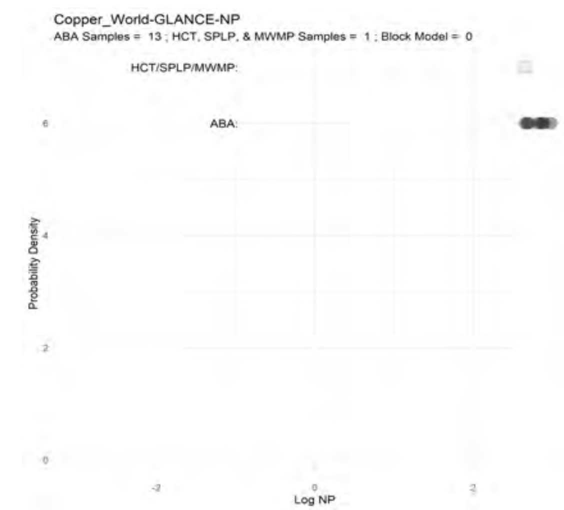


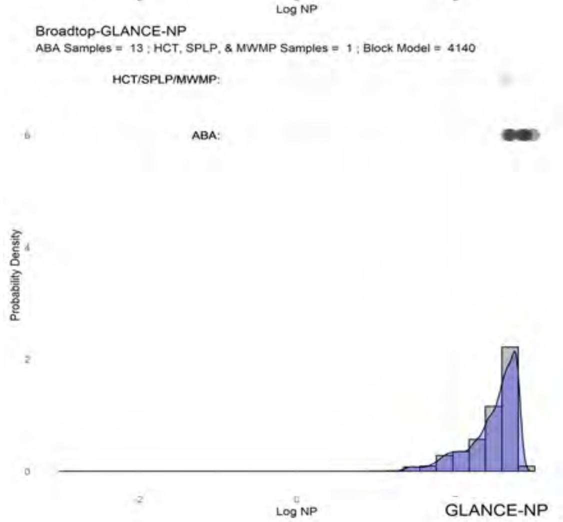


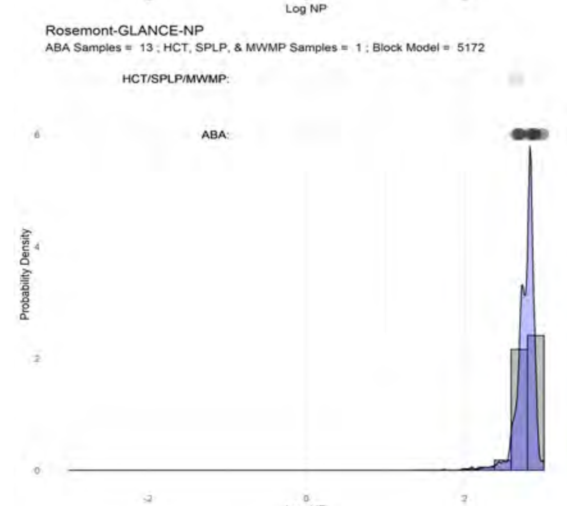
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	GLANCE AP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 10	

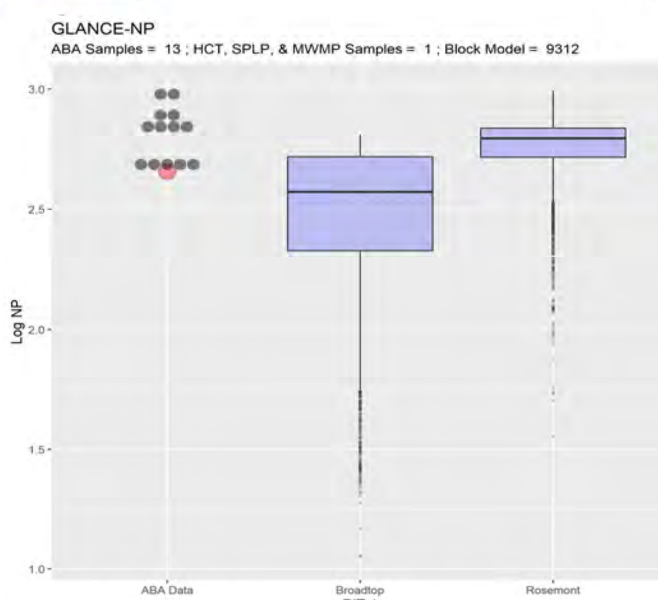










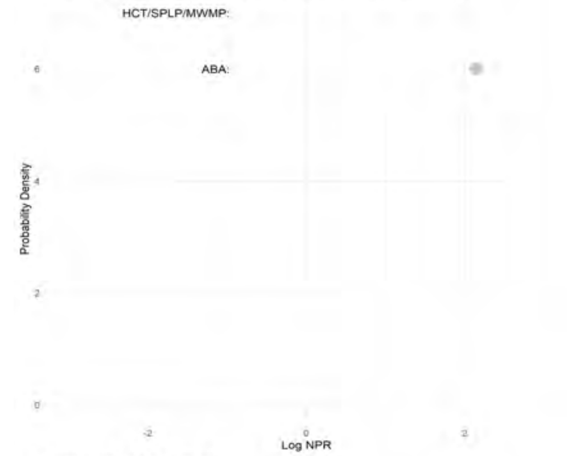


PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

GLANCE NP Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 10	

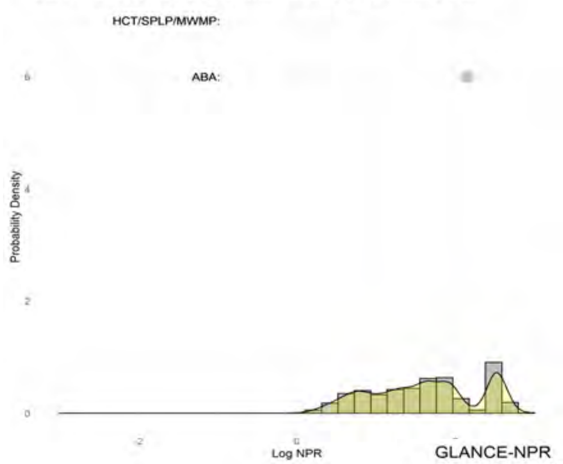
Peach_Elgin-GLANCE-NPR
ABA Samples = 13 ; HCT, SPLP, & MWMP Samples = 1 ; Block Model = 0

Heavy_Weight-GLANCE-NPR
ABA Samples = 13 ; HCT, SPLP, & MWMP Samples = 1 ; Block Model = 0

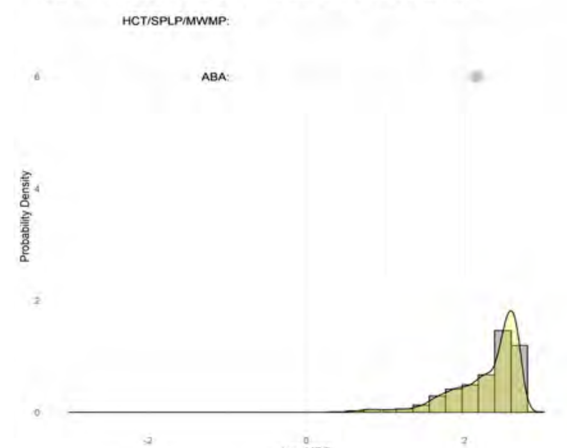


Copper_World-GLANCE-NPR
ABA Samples = 13 ; HCT, SPLP, & MWMP Samples = 1 ; Block Model = 0

Broadtop-GLANCE-NPR
ABA Samples = 13 ; HCT, SPLP, & MWMP Samples = 1 ; Block Model = 4140



Rosemont-GLANCE-NPR
ABA Samples = 13 ; HCT, SPLP, & MWMP Samples = 1 ; Block Model = 5172



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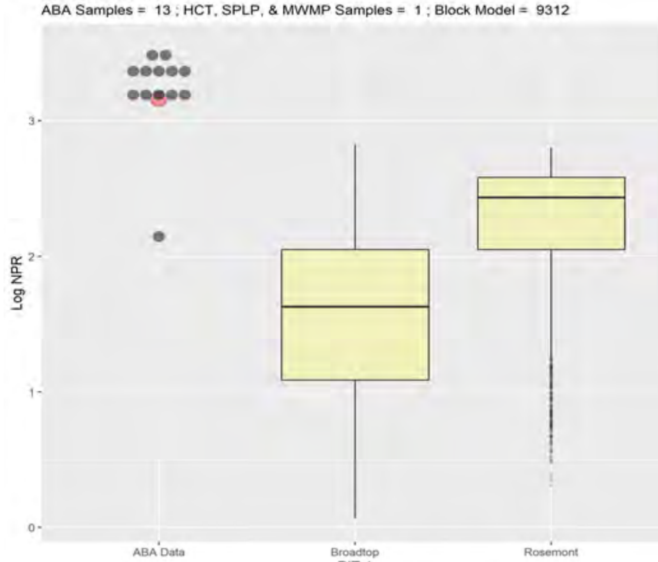
ABA Samples = 13 ; HCT, SPLP, & MWMP Samples = 1 ; Block Model = 9312



PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	GLANCE NPR Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 10	

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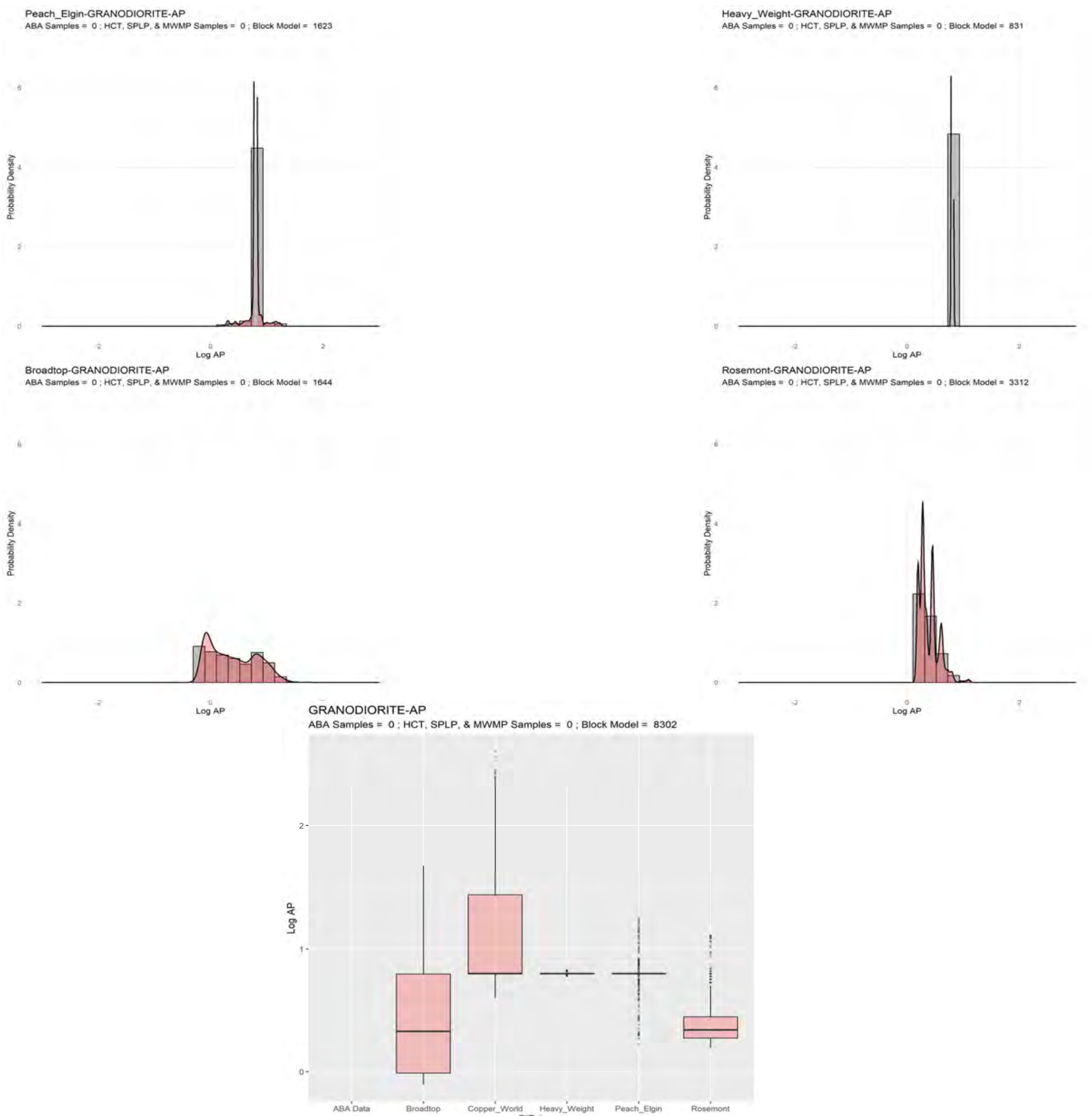

GRANODIORITE AP Block Model and ABA Statistics

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

CLIENT:	Rosemont Copper Company	PROJECT:	Rosemont Copper World Project
JOB	4286	DRAWN: WT	CHECKED: TC
DATE:	May, 2022	APPENDIX:	A 11

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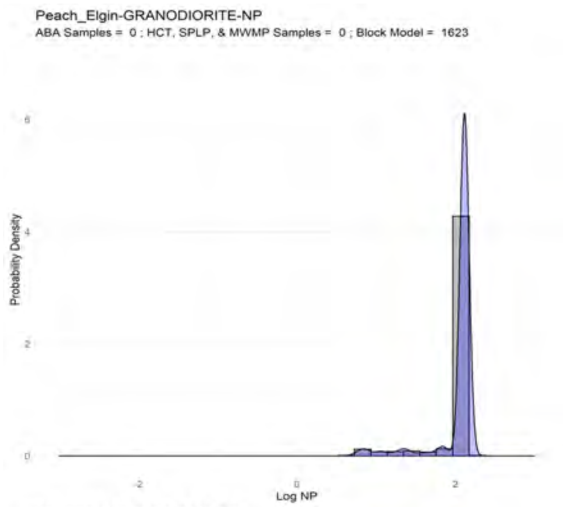

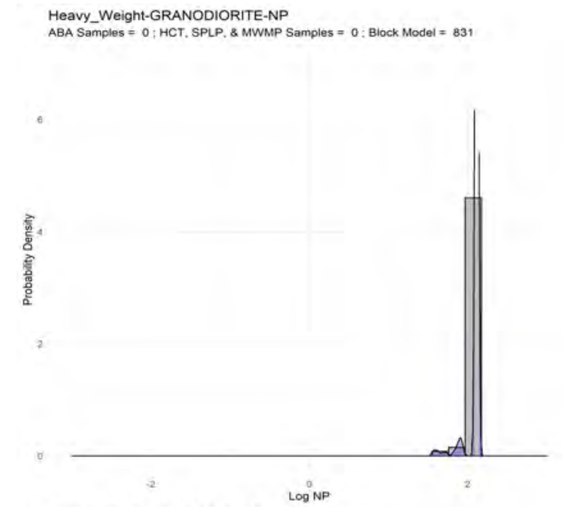

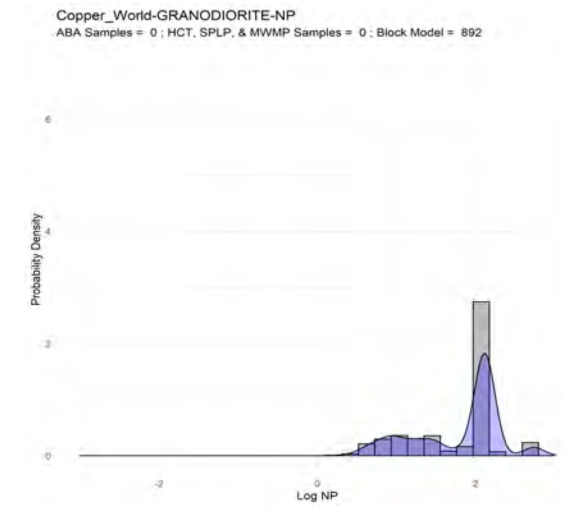

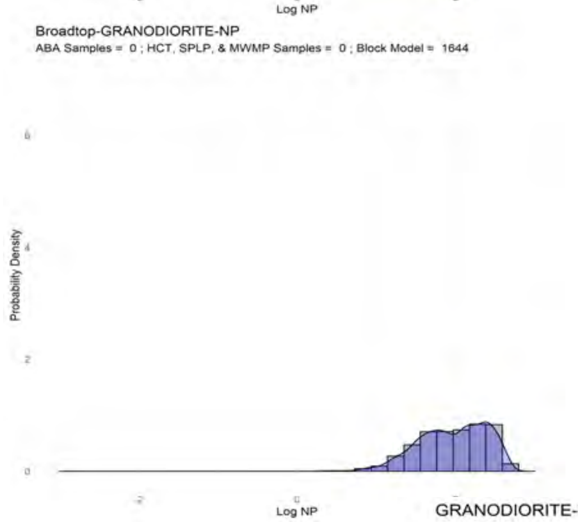

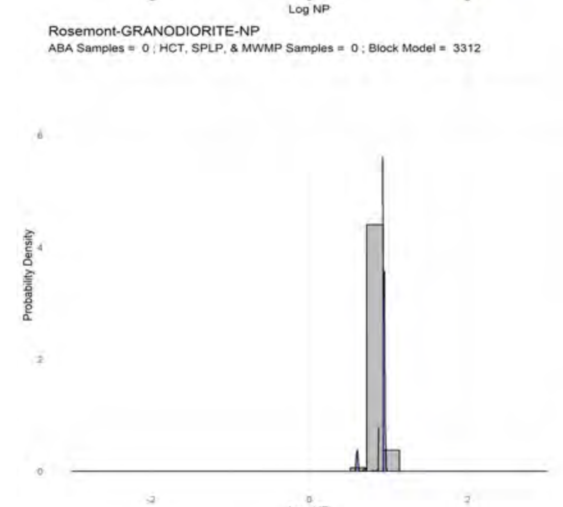

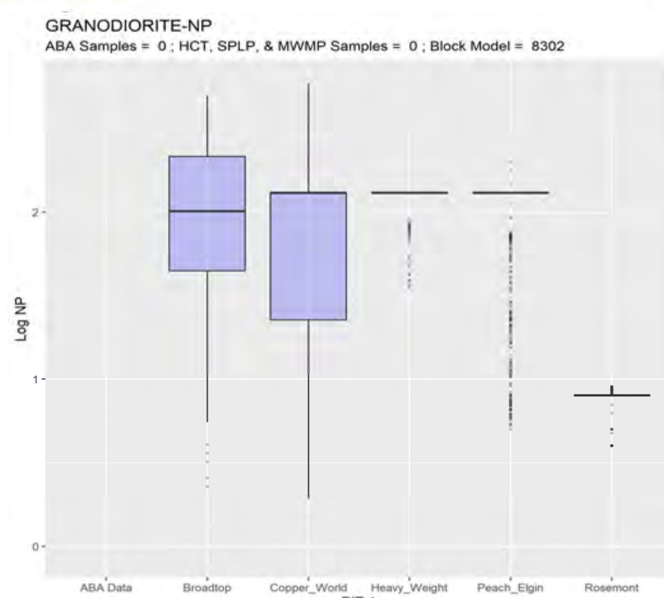

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	GRANODIORITE NP Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 11	

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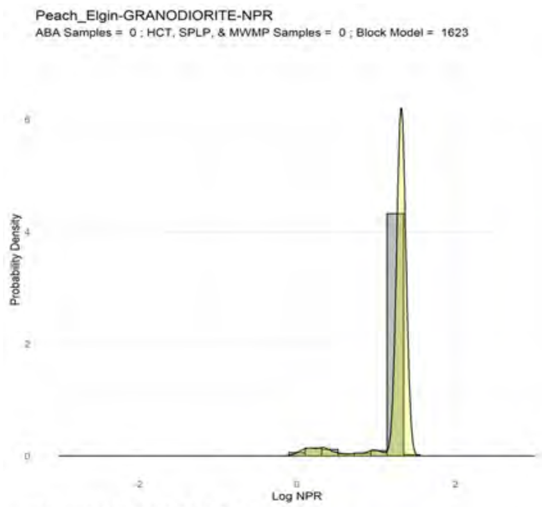

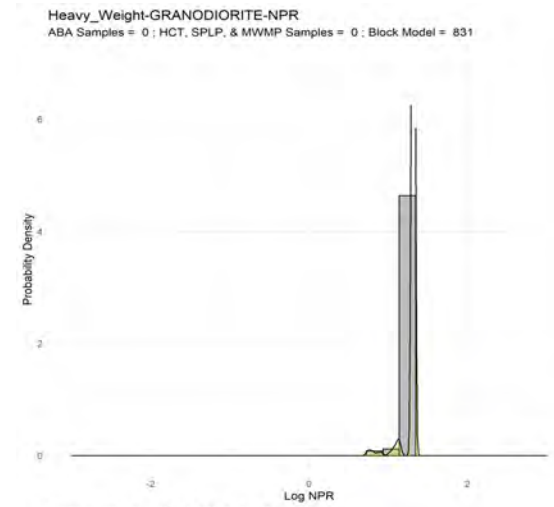

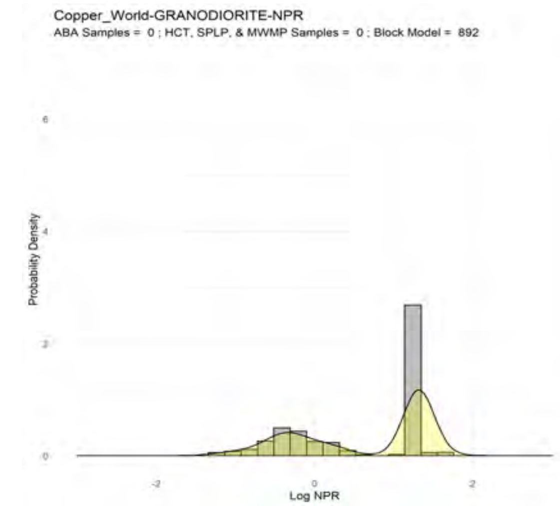

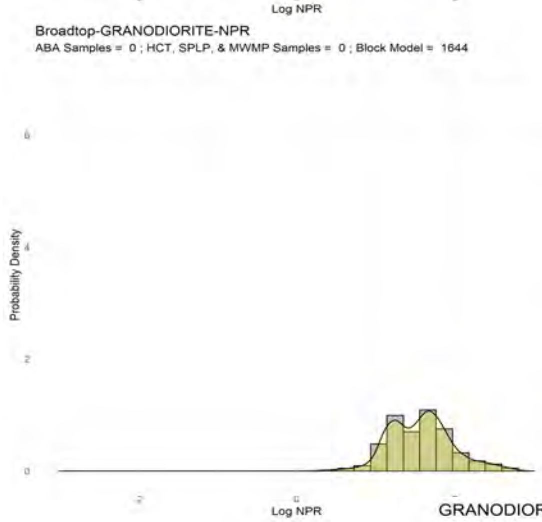

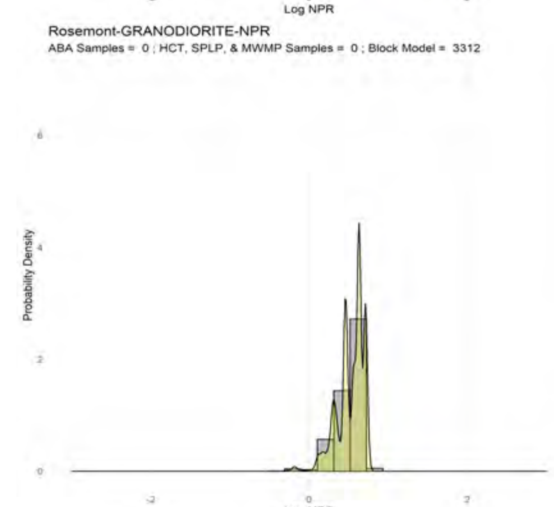

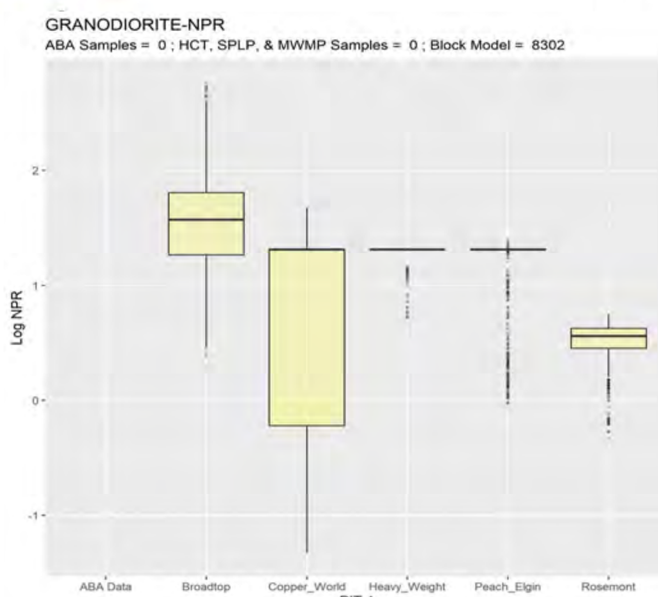

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

GRANODIORITE NPR Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 11	

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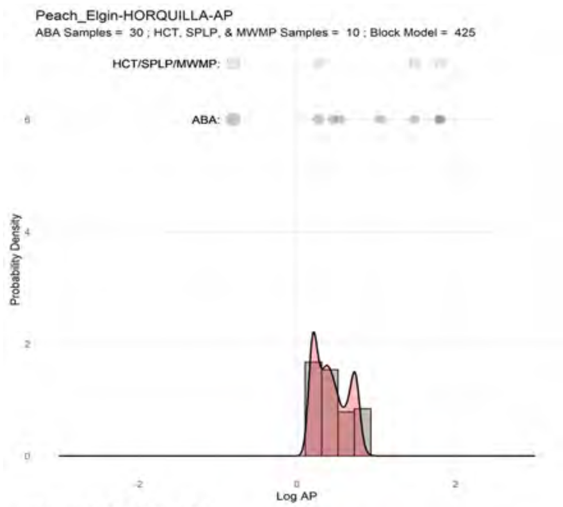

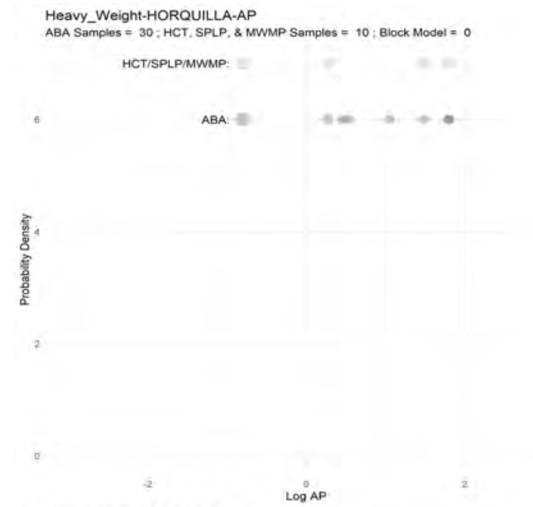

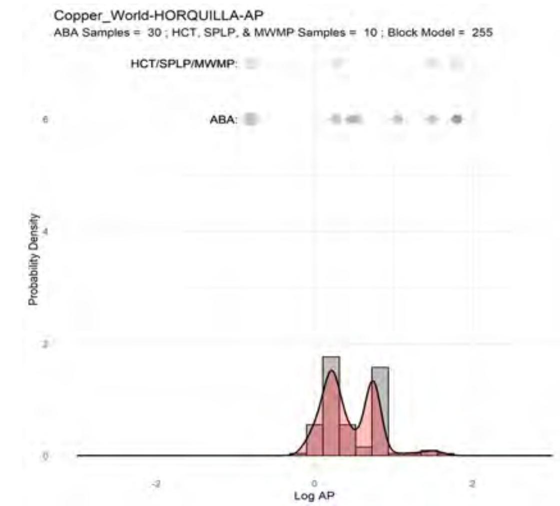

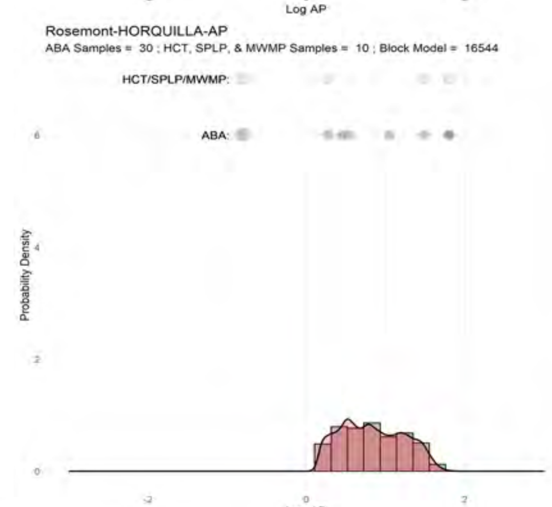

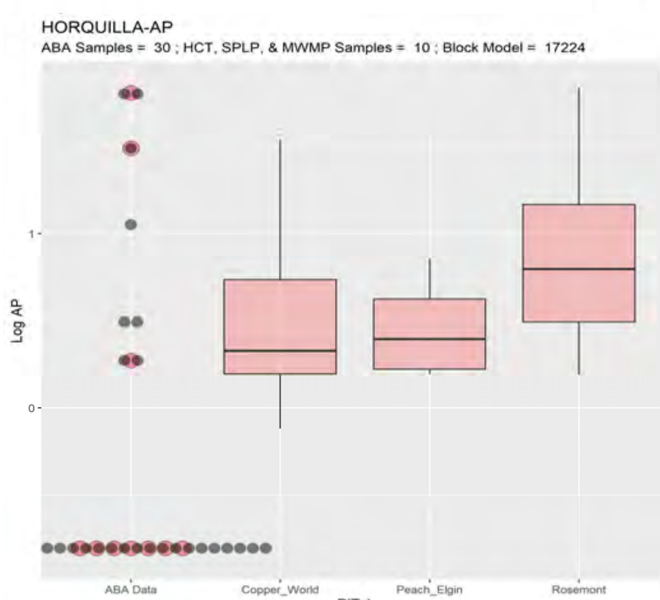

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

HORQUILLA AP Block Model and ABA Statistics

CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 12	

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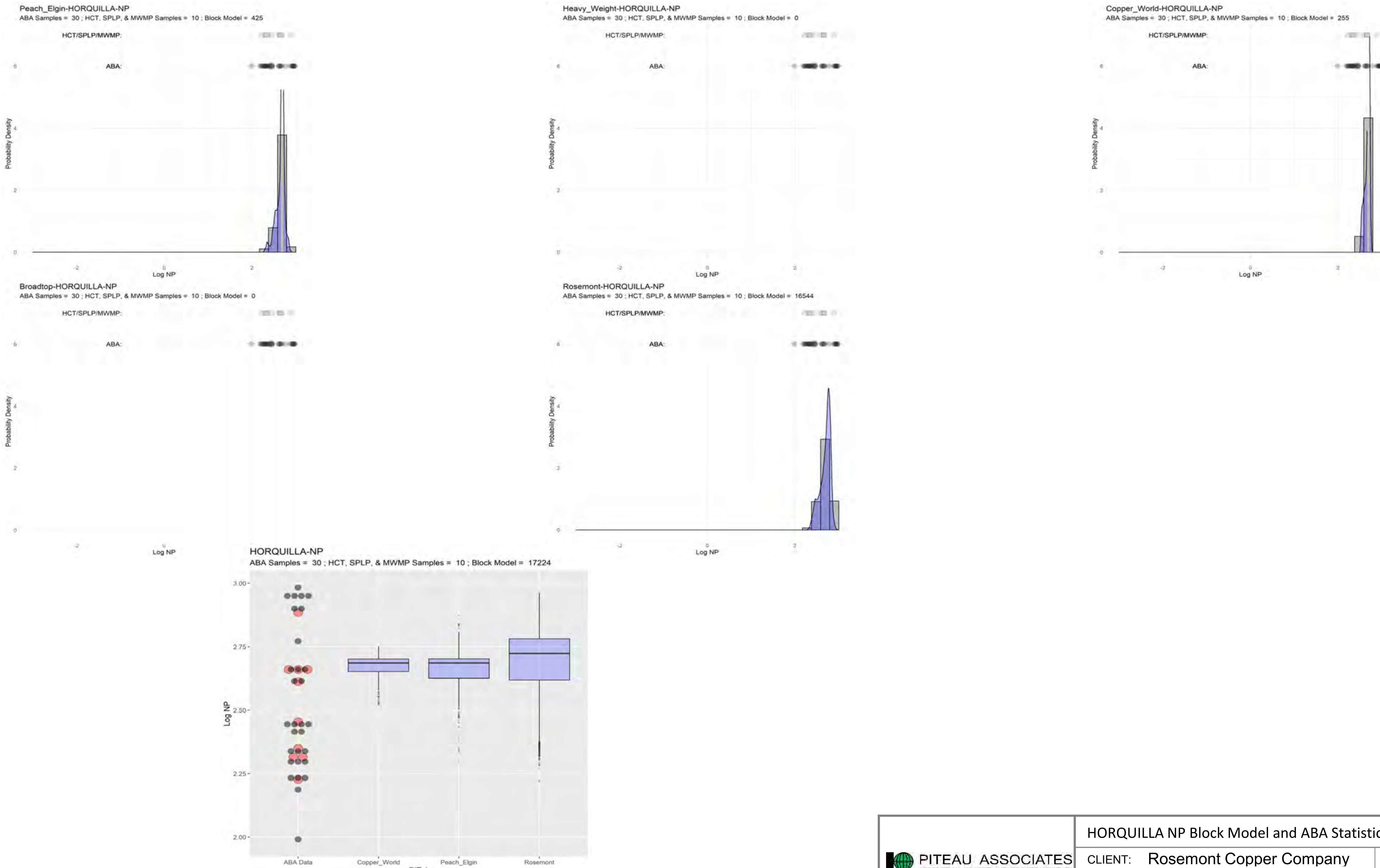

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	HORQUILLA NP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 12	

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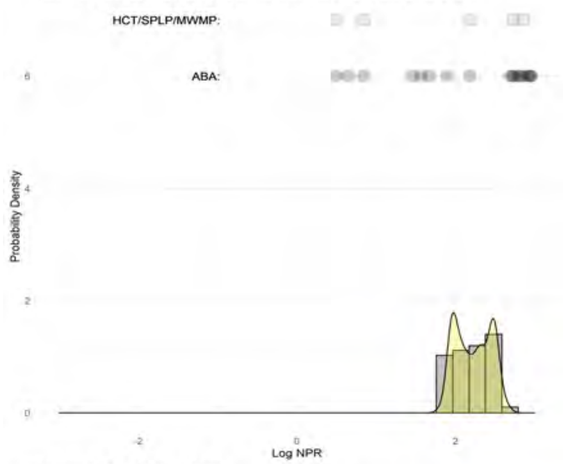
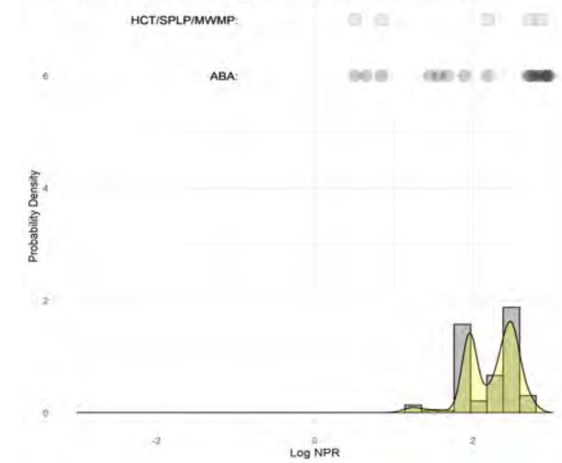
ABA Samples = 30 ; HCT, SPLP, & MWMP Samples = 10 ; Block Model = 425

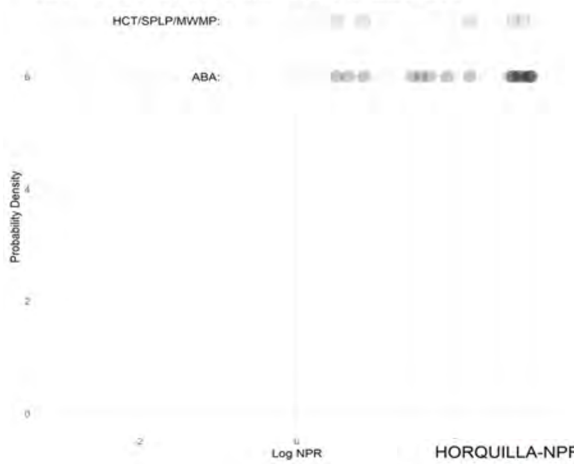


Heavy_Weight-HORQUILLA-NPR
ABA Samples = 30 ; HCT, SPLP, & MWMP Samples = 10 ; Block Model = 0

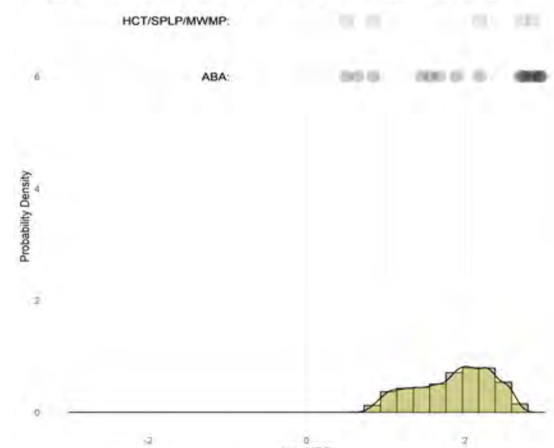
Copper_World-HORQUILLA-NPR
ABA Samples = 30 ; HCT, SPLP, & MWMP Samples = 10 ; Block Model = 255



Broadtop-HORQUILLA-NPR
ABA Samples = 30 ; HCT, SPLP, & MWMP Samples = 10 ; Block Model = 0



Rosemont-HORQUILLA-NPR
ABA Samples = 30 ; HCT, SPLP, & MWMP Samples = 10 ; Block Model = 16544



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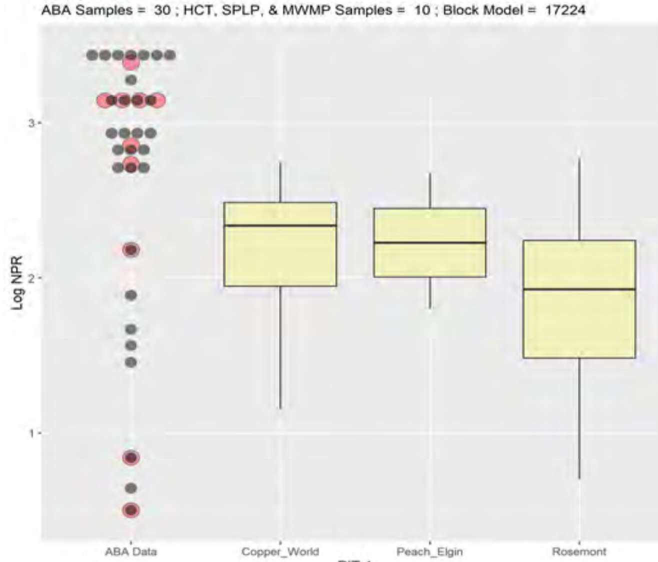

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	HORQUILLA NPR Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 12	

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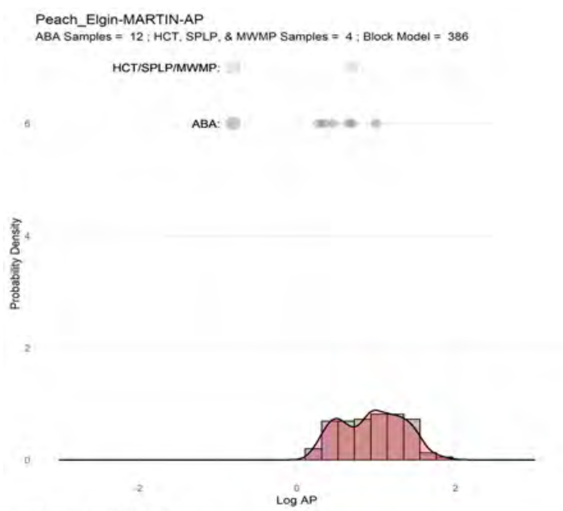
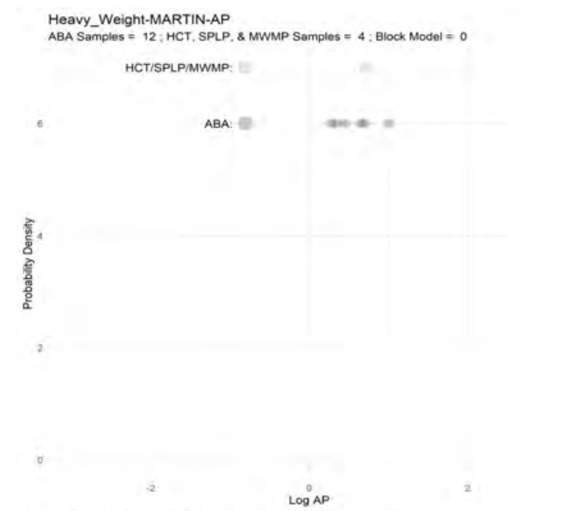
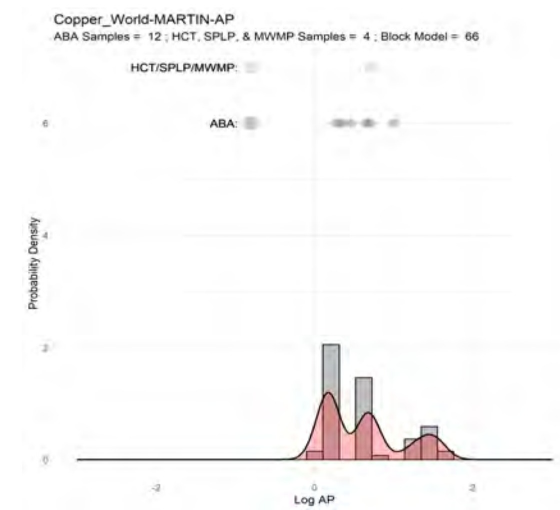
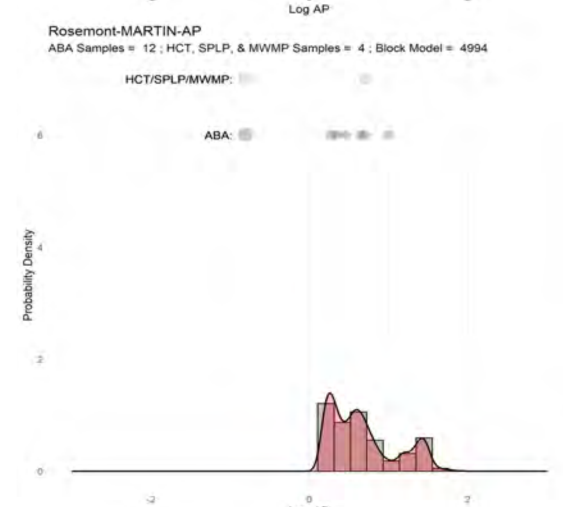
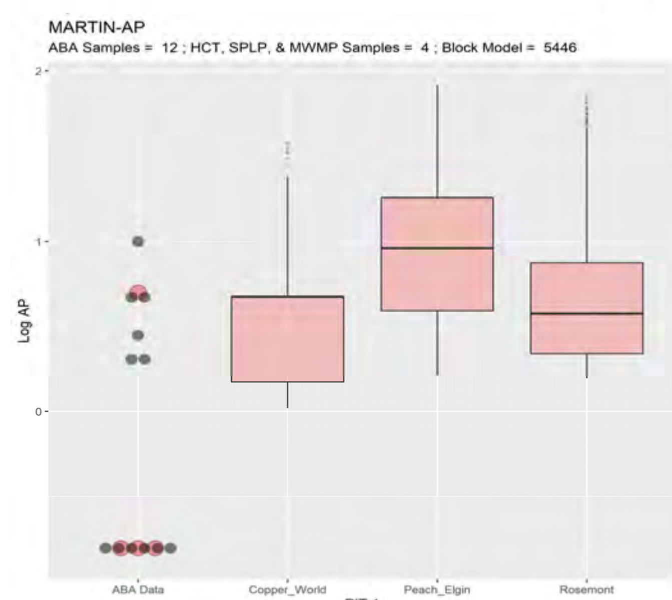


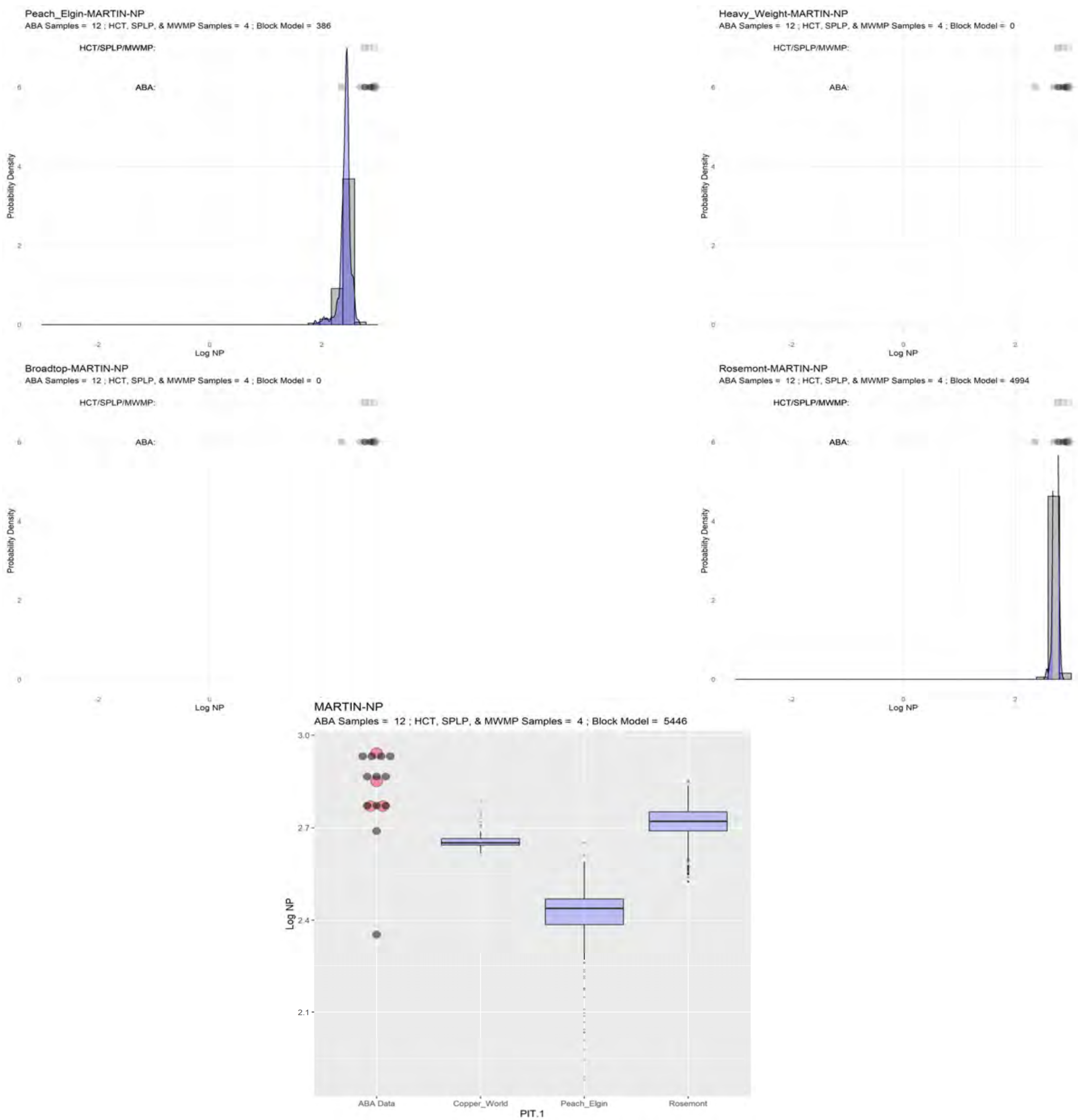








PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	MARTIN AP Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 13	



PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	MARTIN NP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 13	

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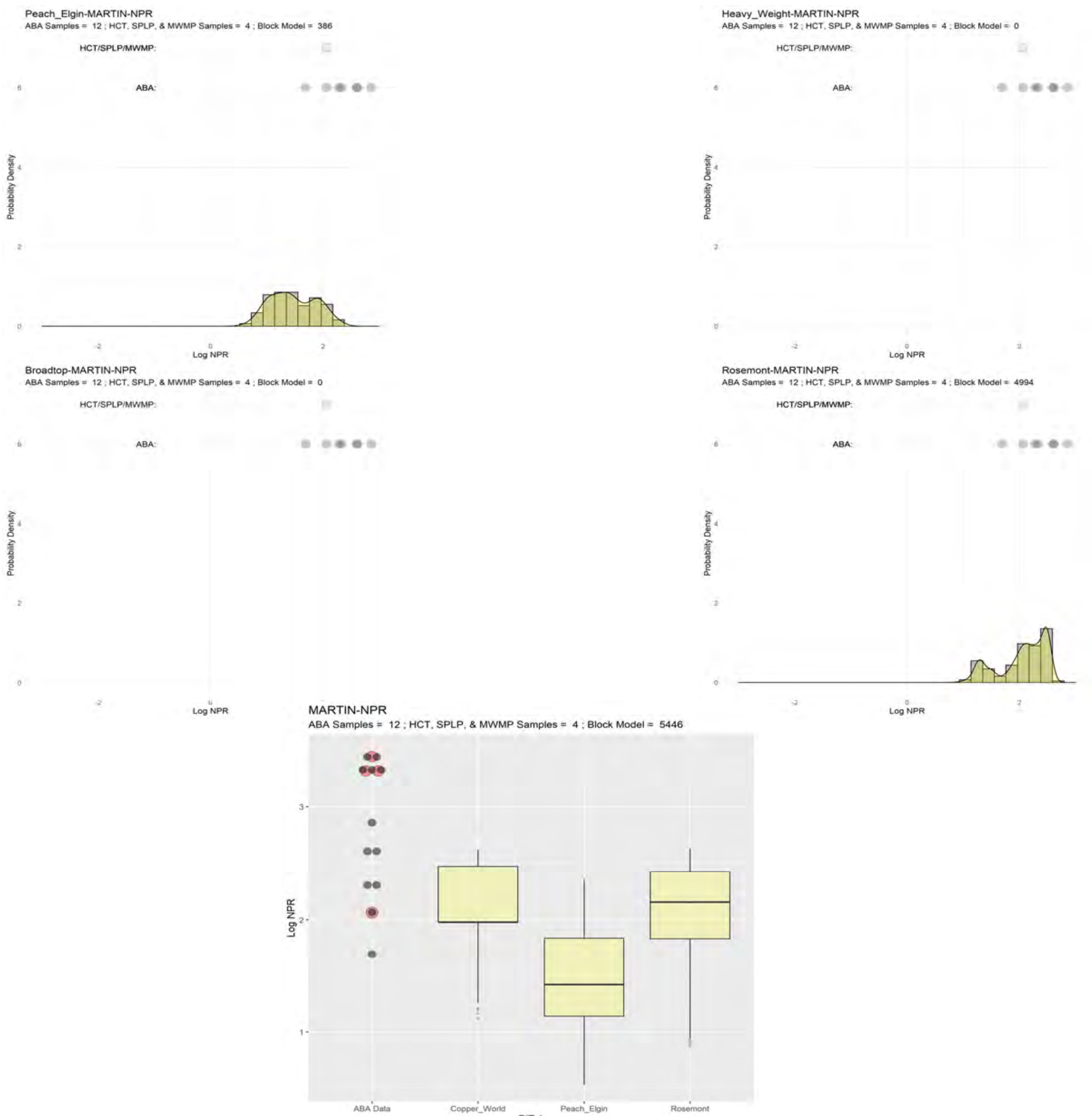

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	MARTIN NPR Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project		
	JOB 4286	DRAWN: WT	CHECKED: TC	
	DATE: May, 2022	APPENDIX: A 13		

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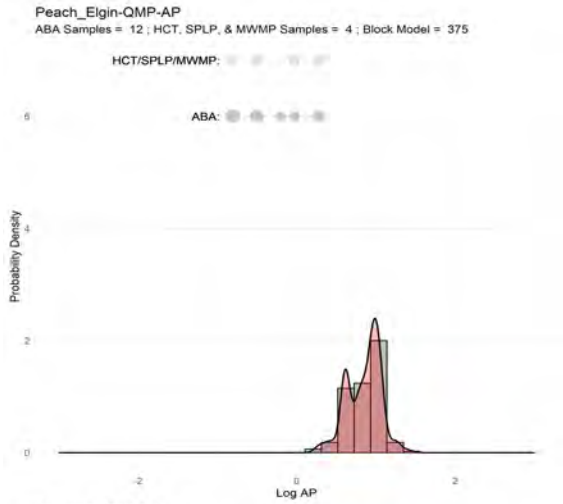

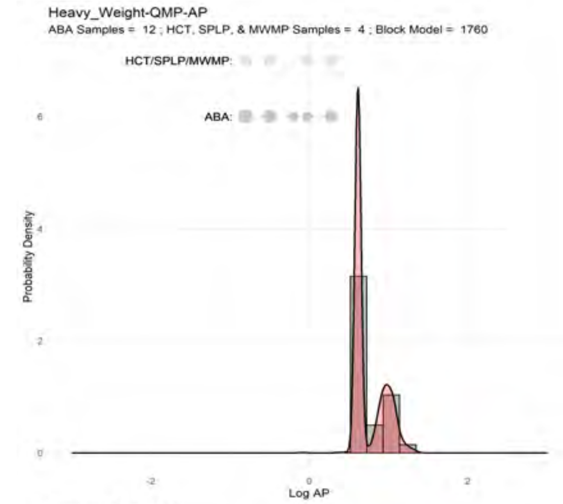

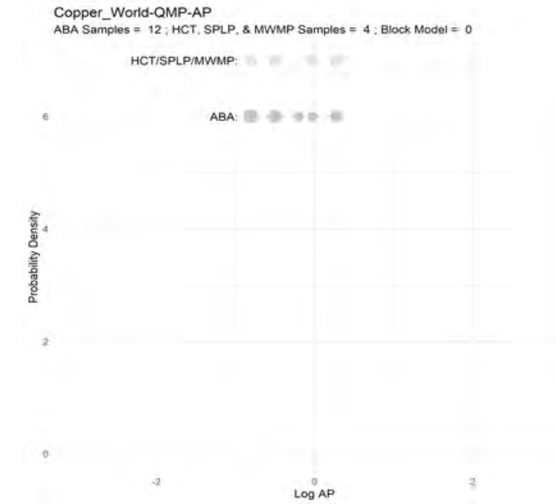

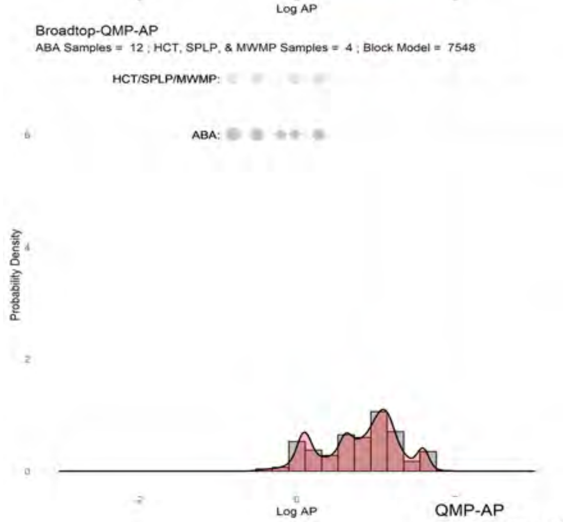

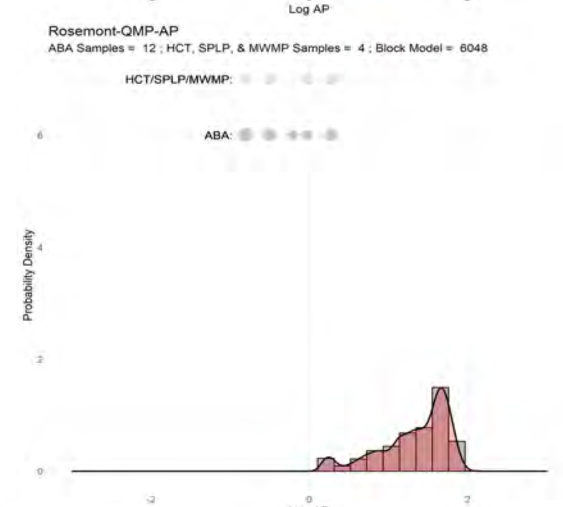

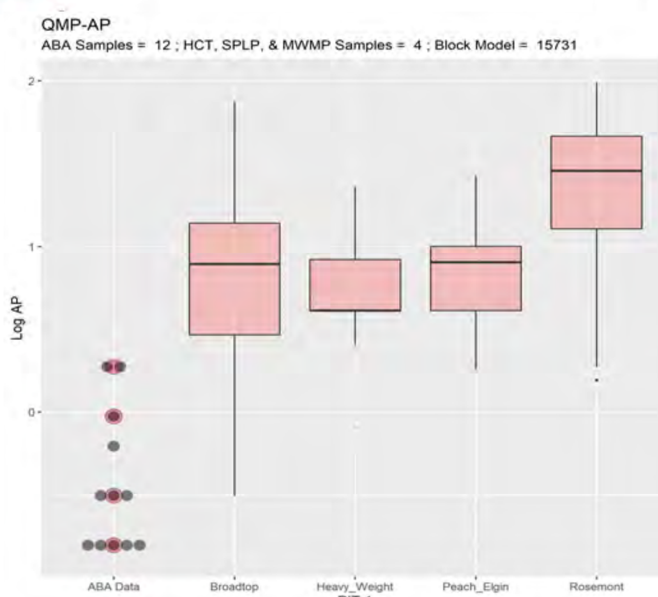

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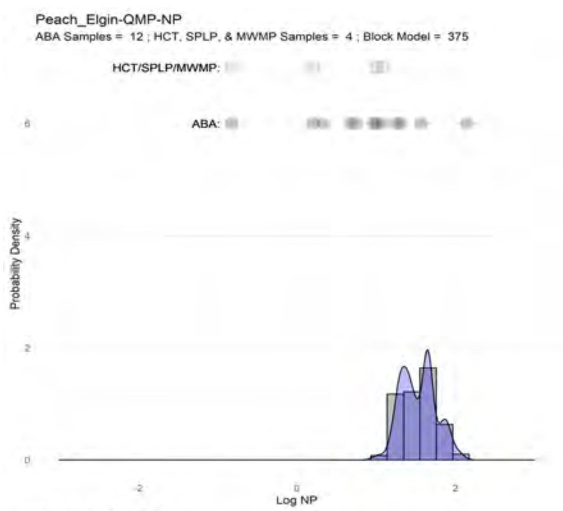
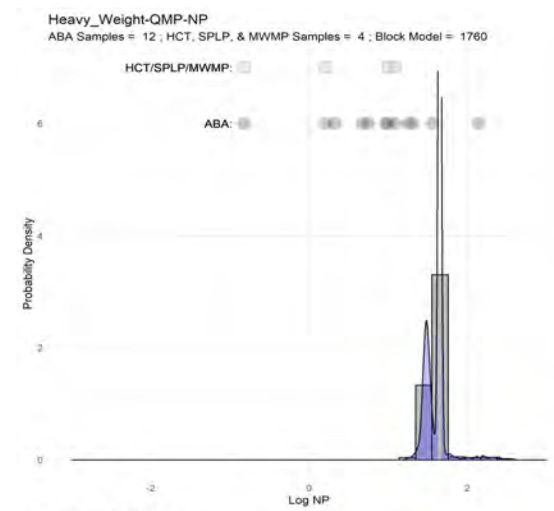
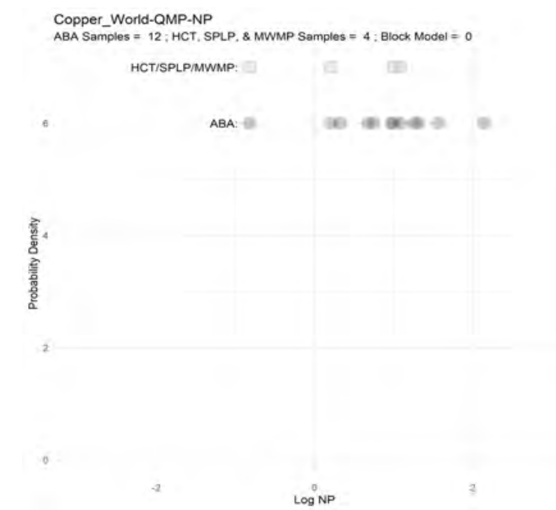
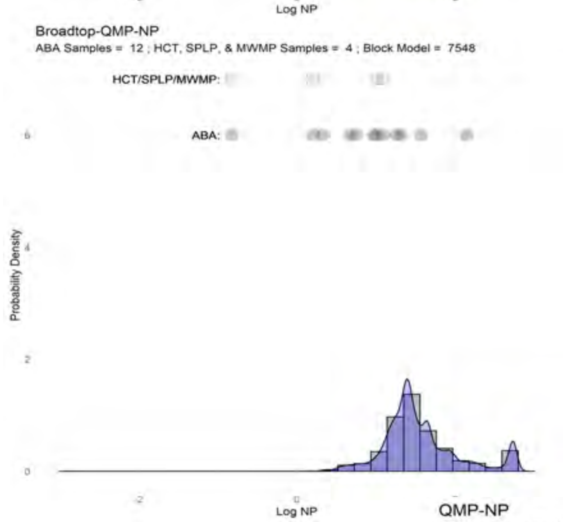
A TETRA TECH COMPANY

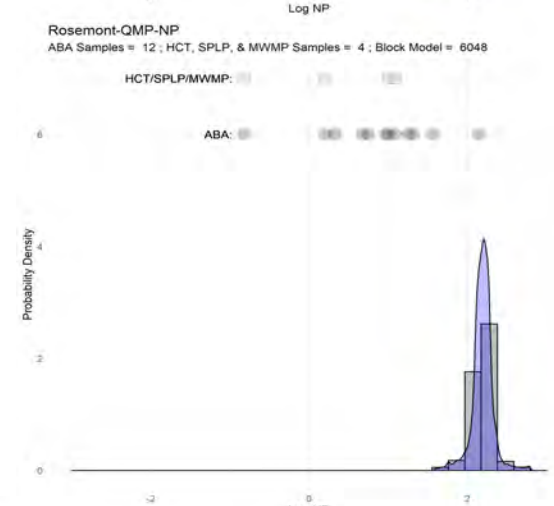
QMP AP Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 14	

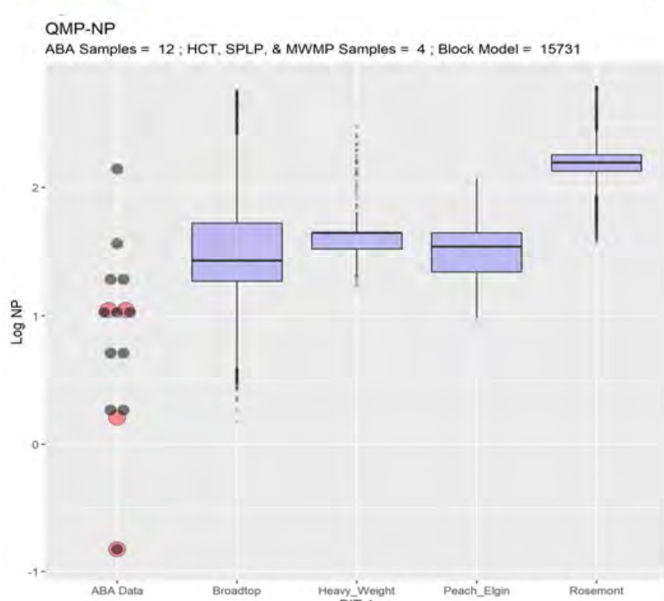




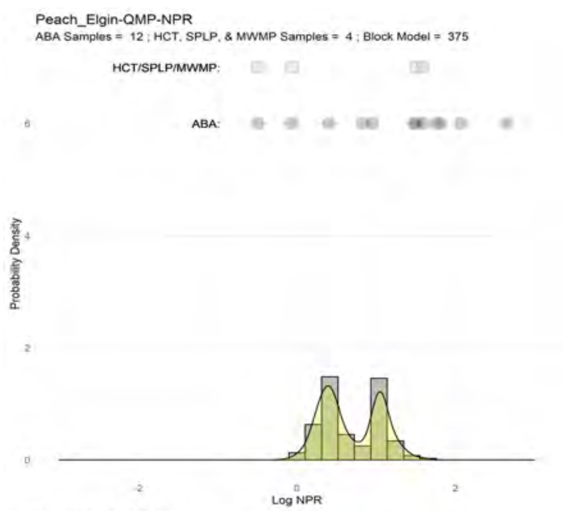


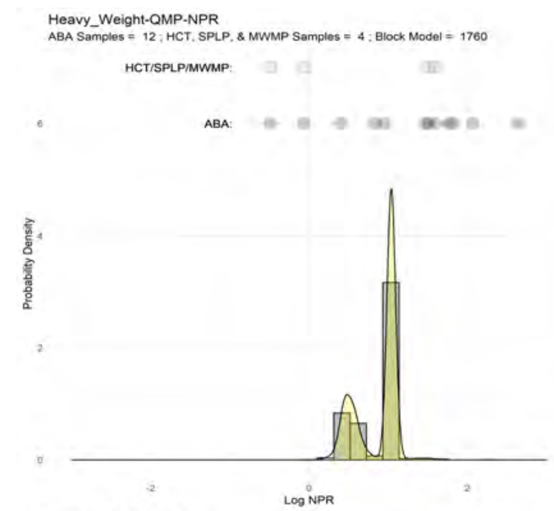


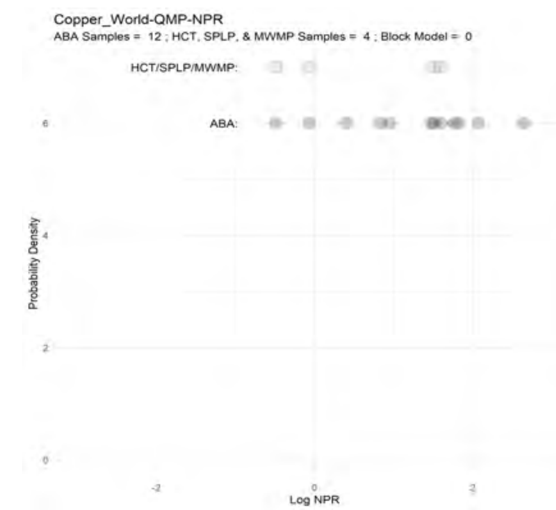


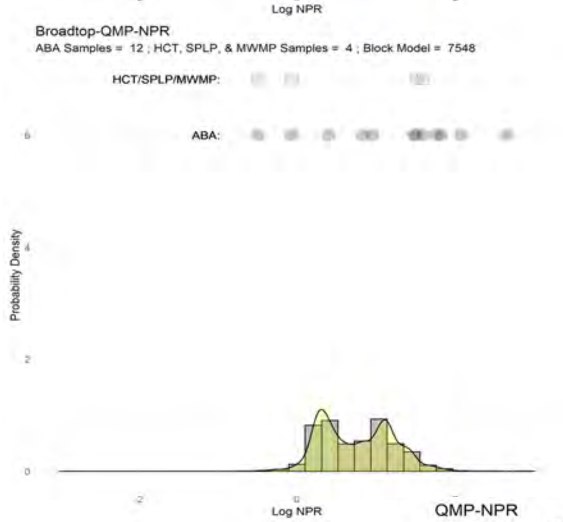


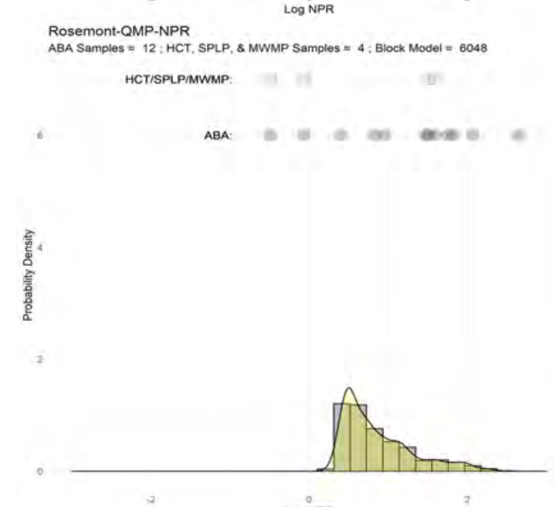
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	QMP NP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 14	

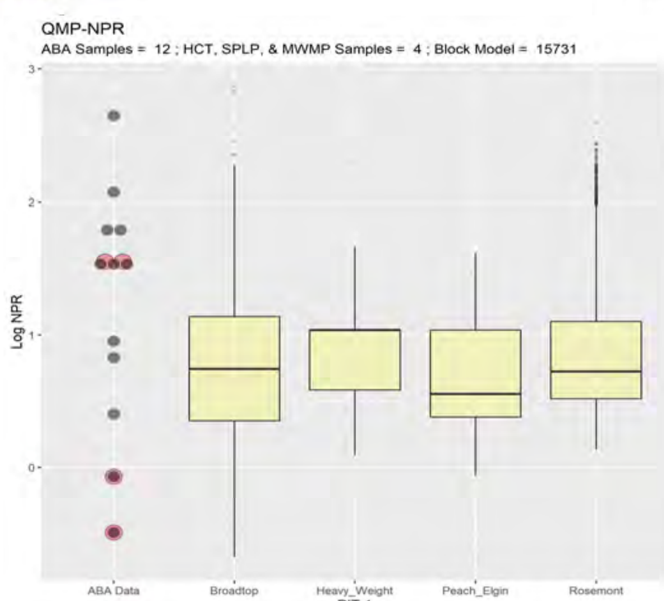












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A TETRA TECH COMPANY

QMP NPR Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 14	

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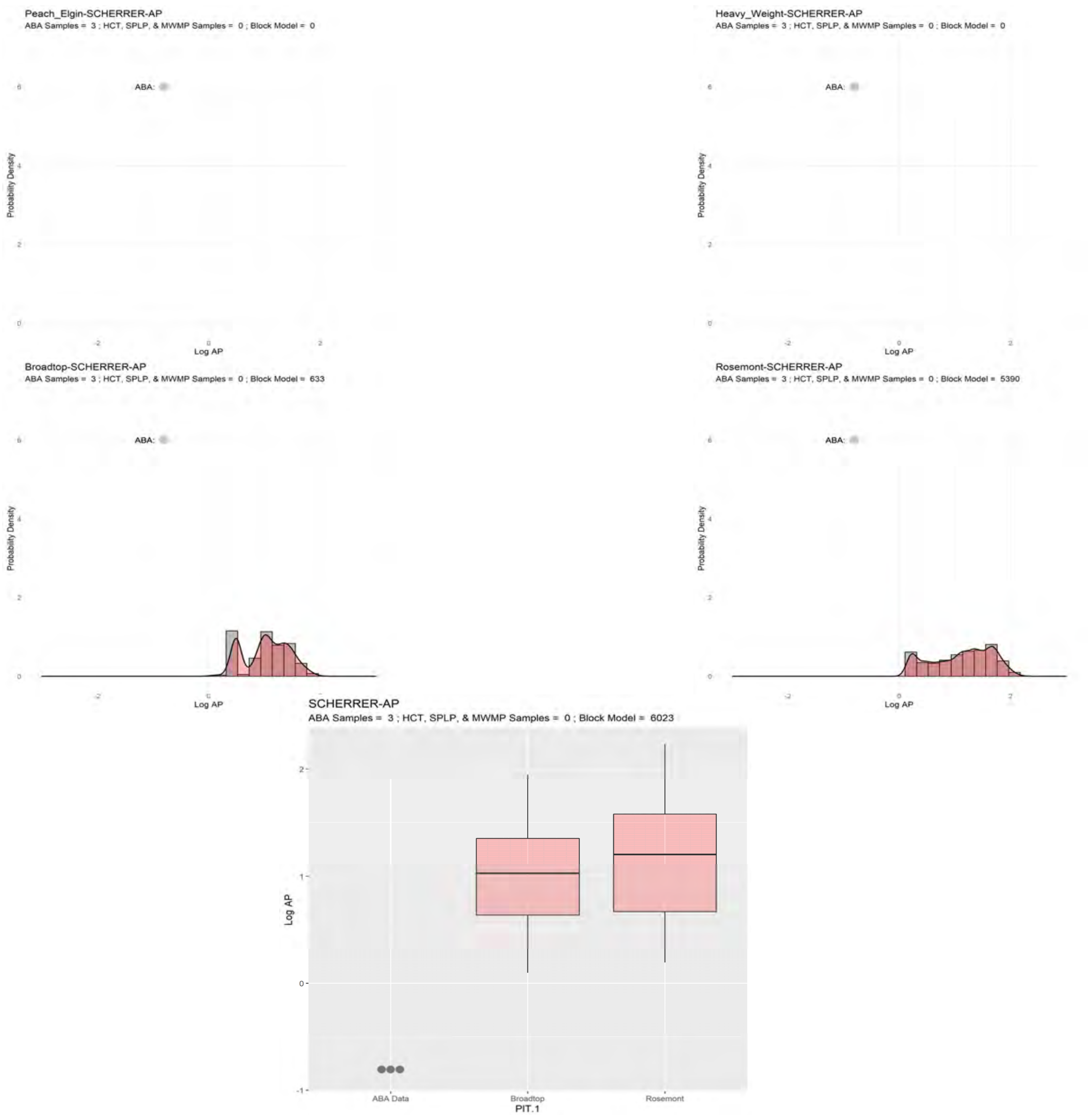

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	SCHERRER AP Block Model and ABA Statistics		
	CLIENT: Rosemont Copper Company	PROJECT: Rosemont Copper World Project	
	JOB 4286	DRAWN: WT	CHECKED: TC
	DATE: May, 2022	APPENDIX: A 15	

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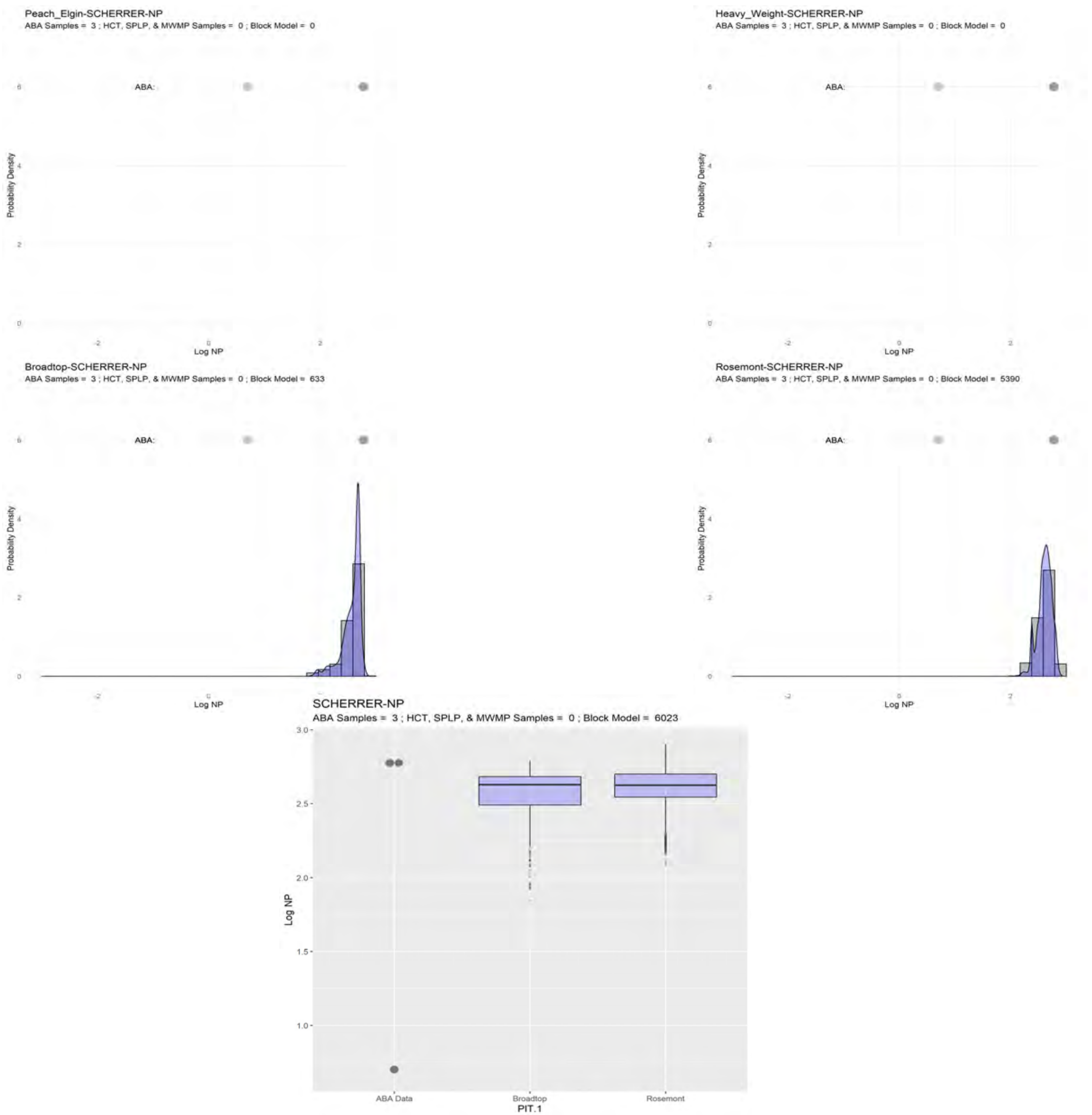

PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS A TETRA TECH COMPANY	SCHERRER NP Block Model and ABA Statistics			
	CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
	JOB 4286		DRAWN: WT	CHECKED: TC
	DATE: May, 2022		APPENDIX: A 15	

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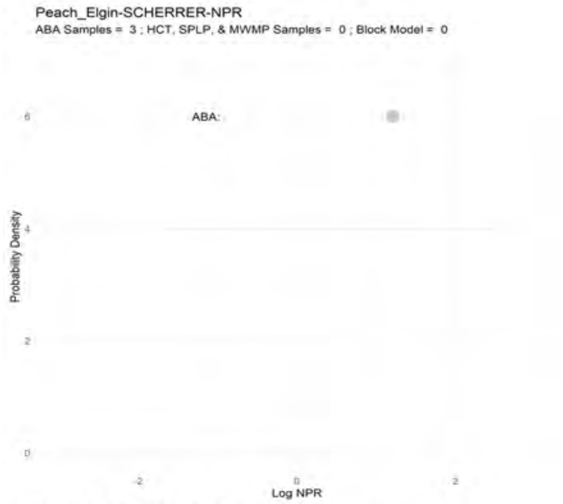

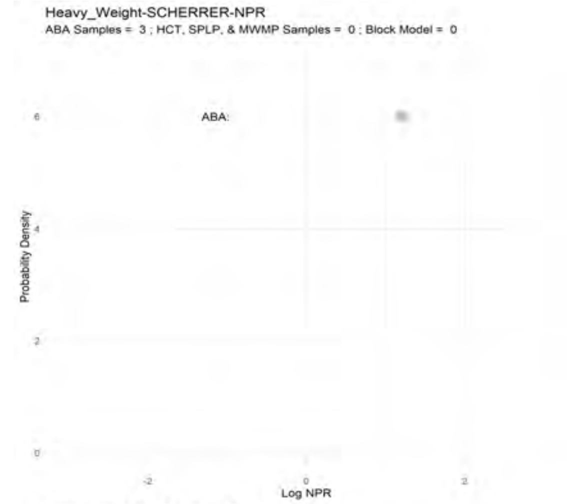

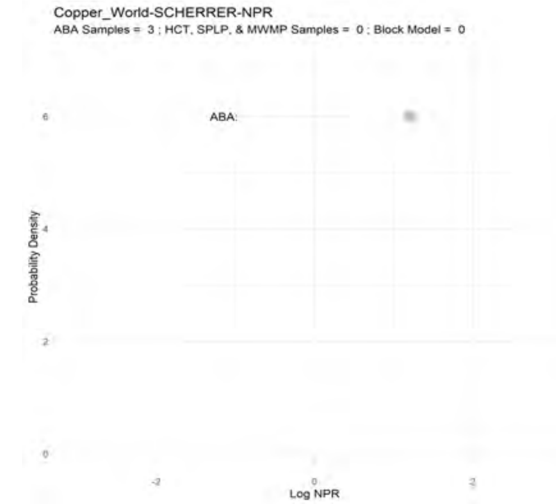

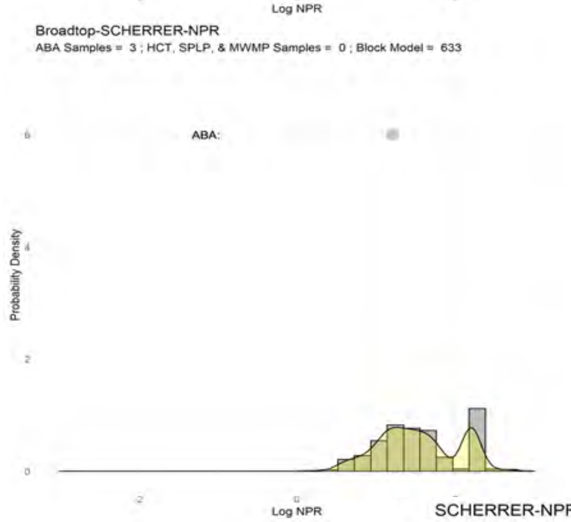

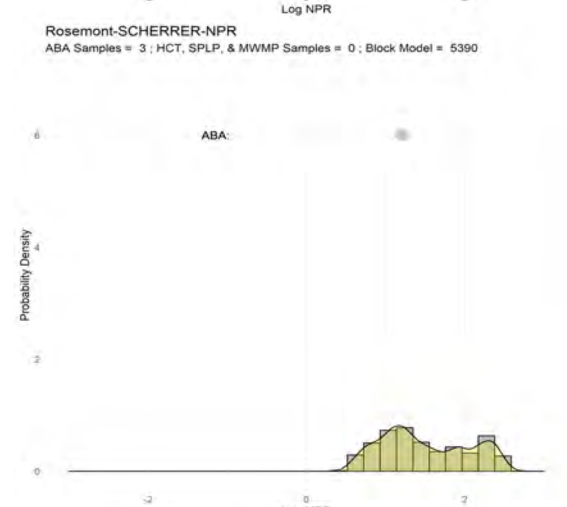

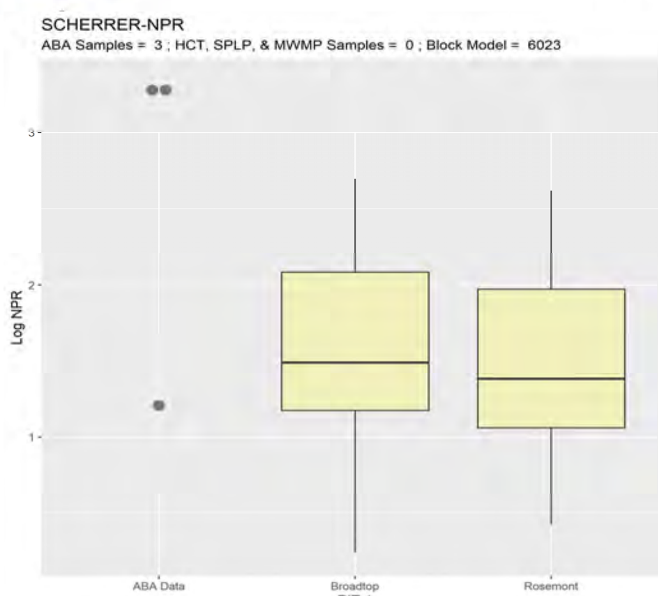

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GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS
A TETRA TECH COMPANY

SCHERRER NPR Block Model and ABA Statistics			
CLIENT: Rosemont Copper Company		PROJECT: Rosemont Copper World Project	
JOB 4286		DRAWN: WT	CHECKED: TC
DATE: May, 2022		APPENDIX: A 15	

#VALUE!

APPENDIX B
ABA testing results

Appendix B
ABA Testing Results

Sample_ID	Units	2263686	2263699	2263717	1561-01	1561-03	1916-02	1926-02	A780-01
Hole	-	HB-2148	HB-2166	HB-2166	1561	1561	1916	1926	A780
From	ft	394	514	575	50	540	1822	770	260
To	ft	399	519	580	95	545	1827	825	270
Formation	-	Abrigo	Abrigo	Abrigo	Abrigo	Abrigo	Abrigo	Abrigo	Abrigo
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	0.9	<0.3125	<0.3125	<0.3	<0.3	<0.3	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	0.6	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	549	461	295	439	665	630	550	501
ANP/AGP - Pyritic Sulfur	-	585.60	1475.20	944.00	1463.33	2216.67	2100.00	1833.33	1670.00
ANP/AGP - Total Sulfur	-	878.40	1475.20	944.00	1404.80	2128.00	2016.00	1760.00	1603.20
NNP	Pyritic S-Recalculated	548.06	460.69	294.69	438.70	664.70	629.70	549.70	500.70
Total Sulfur	%	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyritic Sulfur	%	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulfate Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Non-extractable Sulfur	%	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01
NAG pH	s.u.	-	-	-	8.39	-	-	8.36	8.21

Sample_ID	Units	A818-01	2263626	2263659	2263692	2263693	2263694	1535-01	A808-01
Hole	-	A818	HB-2089	HB-2110	HB-2160	HB-2160	HB-2162	1535	A808
From	ft	1057	110	320	189	413	592	407	180
To	ft	1062	115	325	194	418	597	428	220
Formation	-	Abrigo	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	35.625	51.875	59.6875	11.5625	15	34.1	36.9
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	41.6	70.9	67.2	14.7	20.3	45.9	41.9
ANP	$TCaCO_3$/ kT	693	136	103	53	133	91	41	19
ANP/AGP - Pyritic Sulfur	-	2310.00	3.82	1.99	0.89	11.50	6.07	1.20	0.51
ANP/AGP - Total Sulfur	-	2217.60	3.27	1.45	0.79	9.06	4.48	0.89	0.45
NNP	Pyritic S-Recalculated	692.70	100.38	51.13	<6.6875	121.44	76.00	6.90	<17.9
Total Sulfur	%	<0.01	1.33	2.27	2.15	0.47	0.65	1.47	1.34
Pyritic Sulfur	%	<0.01	1.14	1.66	1.91	0.37	0.48	1.09	1.18
Sulfate Sulfur	%	<0.01	0.19	0.6	0.17	0.1	0.17	0.37	0.16
Non-extractable Sulfur	%	<0.01	-	-	-	-	-	<0.01	<0.01
NAG pH	s.u.	-	-	-	-	-	-	8.08	2.84

Sample_ID	Units	A-816 569...	A817-01	A-820 245.5...	A-882 109...	A-886 888...	Andesite Col. Leach	AR2009-03	AR2010-03
Hole	-	A816	A817	A820	A882	A886	Leach	AR2009	AR2010
From	ft	569	602	245.5	109	888	-	750	763
To	ft	614	642	302	173	937	-	800	808
Formation	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	28.9	45	18.2	12	27.6	7.5	64.1	52.2
AGP-Total Sulfur	$TCaCO_3$/ kT	50.3	47.8	23.4	16.9	40.3	11.9	72.8	62.8
ANP	$TCaCO_3$/ kT	121	46.8	87.7	71.6	156	10.9	99.1	26.6
ANP/AGP - Pyritic Sulfur	-	4.19	1.04	4.82	5.97	5.65	1.45	1.55	0.51
ANP/AGP - Total Sulfur	-	2.40	0.98	3.74	4.24	3.87	0.92	1.36	0.42
NNP	Pyritic S-Recalculated	92.10	1.80	69.50	59.60	128.40	3.40	35.00	<25.6
Total Sulfur	%	1.61	1.53	0.75	0.54	1.29	0.38	2.33	2.01
Pyritic Sulfur	%	0.92	1.44	0.58	0.38	0.88	0.24	2.05	1.67
Sulfate Sulfur	%	0.57	0.09	0.07	0.1	0.32	0.12	0.26	0.34
Non-extractable Sulfur	%	0.12	<0.01	0.09	0.05	0.09	0.02	0.02	<0.01
NAG pH	s.u.	-	7.72	-	-	-	4.01	7.49	7.43

Sample_ID	Units	AR2011-03	AR2013-01	AR2013-02	AR2013-03	AR2014-02	AR2014-03	AR2016-01	AR2017-01
Hole	-	AR2011	AR2013	AR2013	AR2013	AR2014	AR2014	AR2016	AR2017
From	ft	700	150	350	500	650	800	250	200
To	ft	750	200	400	550	700	850	280	260
Formation	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	68.8	48.4	33.1	31.9	123	29.7	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	78.4	61.9	42.5	31.9	149.1	38.1	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	54.2	59.7	70.2	79	105	71.7	26.2	45.3
ANP/AGP - Pyritic Sulfur	-	0.79	1.23	2.12	2.48	0.85	2.41	87.33	151.00
ANP/AGP - Total Sulfur	-	0.69	0.96	1.65	2.48	0.70	1.88	83.84	144.96
NNP	Pyritic S-Recalculated	<14.6	11.30	37.10	47.10	<18	42.00	25.90	45.00
Total Sulfur	%	2.51	1.98	1.36	1.02	4.77	1.22	<0.01	<0.01
Pyritic Sulfur	%	2.2	1.55	1.06	1.02	3.92	0.95	<0.01	<0.01
Sulfate Sulfur	%	0.31	0.4	0.3	<0.01	0.81	0.23	<0.01	<0.01
Non-extractable Sulfur	%	<0.01	0.03	<0.01	<0.01	0.04	0.04	<0.01	<0.01
NAG pH	s.u.	7.43	7.55	7.89	8.35	3.75	8.95	8.82	8.29

Appendix B
ABA Testing Results

Sample_ID	Units	AR2017-05	AR2017-06	AR2019-02	AR2020-02	AR2021-01	AR2022-01	AR2025-01	AR2025-03
Hole	-	AR2017	AR2017	AR2019	AR2020	AR2021	AR2022	AR2025	AR2025
From	ft	50	200	310	335	55	725	30	30
To	ft	85	210	360	380	105	770	80	80
Formation	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	0.6	<0.3	<0.3	5.3	35.3	34.1	30.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	0.9	<0.3125	<0.3125	6.6	45.0	50.0	40.6	43.4
ANP	$TCaCO_3$/ kT	25.7	39.6	44.2	50.1	47.3	88.5	37.8	39.1
ANP/AGP - Pyritic Sulfur	-	42.83	132.00	147.33	9.45	1.34	2.60	1.25	130.33
ANP/AGP - Total Sulfur	-	27.41	126.72	141.44	7.63	1.05	1.77	0.93	0.90
NNP	Pyritic S-Recalculated	25.10	39.30	43.90	44.80	12.00	54.40	7.50	38.80
Total Sulfur	%	0.03	<0.01	<0.01	0.21	1.44	1.6	1.3	1.39
Pyritic Sulfur	%	0.02	<0.01	<0.01	0.17	1.13	1.09	0.97	<0.01
Sulfate Sulfur	%	0.01	<0.01	<0.01	0.04	0.31	0.51	0.33	1.39
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
NAG pH	s.u.	8.04	8.21	8.78	8.64	7.87	7.93	8.12	7.66

Sample_ID	Units	AR2026-01	AR2028B-01	AR2029-01	AR2030-03	AR2030-05	AR2030-06	AR2032-01	AR2037-01
Hole	-	AR2026	AR2028B	AR2029	AR2030	AR2030	AR2030	AR2032	AR2037
From	ft	215	645	205	135	135	95	535	210
To	ft	255	700	210	180	185	125	540	265
Formation	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	14.4	29.4	<0.3	11.9	5.3	<0.3	<0.3	36.3
AGP-Total Sulfur	$TCaCO_3$/ kT	15.3	35.3	<0.3125	14.1	10.6	0.6	0.3	45.0
ANP	$TCaCO_3$/ kT	48.3	75.7	105	68.5	47.7	33.9	39.8	80.4
ANP/AGP - Pyritic Sulfur	-	3.35	2.57	350.00	5.76	9.00	113.00	132.67	2.21
ANP/AGP - Total Sulfur	-	3.15	2.14	336.00	4.87	4.49	54.24	127.36	1.79
NNP	Pyritic S-Recalculated	33.90	46.30	104.70	56.60	42.40	33.60	39.50	44.10
Total Sulfur	%	0.49	1.13	<0.01	0.45	0.34	0.02	0.01	1.44
Pyritic Sulfur	%	0.46	0.94	<0.01	0.38	0.17	<0.01	<0.01	1.16
Sulfate Sulfur	%	0.03	0.19	<0.01	0.07	0.11	0.02	0.01	0.28
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	<0.01
NAG pH	s.u.	8.14	7.89	8.04	8.65	8.42	8.01	8.11	8.14

Sample_ID	Units	AR2038-01	AR2038-03	AR2038-04	AR2038-06	AR2043-01	2263601	2263607	2263608
Hole	-	AR2038	AR2038	AR2038	AR2038	AR2043	1456	A-811	A-860
From	ft	100	600	100	600	670	64	233	664
To	ft	150	650	150	650	715	69	238	669
Formation	-	Andesite	Andesite	Andesite	Andesite	Andesite	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	0.3	<0.3	<0.3	<0.3	47.5	<0.3125	<0.3125	<0.3125
AGP-Total Sulfur	$TCaCO_3$/ kT	0.6	<0.3125	0.6	<0.3125	65.0	<0.3125	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	13.7	43.5	6.2	38.9	103	10	733	696
ANP/AGP - Pyritic Sulfur	-	45.67	145.00	20.67	129.67	2.17	32.00	2345.60	2227.20
ANP/AGP - Total Sulfur	-	21.92	139.20	9.92	124.48	1.58	32.00	2345.60	2227.20
NNP	Pyritic S-Recalculated	13.40	43.20	5.90	38.60	55.50	9.69	732.69	695.69
Total Sulfur	%	0.02	<0.01	0.02	<0.01	2.08	<0.01	<0.01	<0.01
Pyritic Sulfur	%	0.01	<0.01	<0.01	<0.01	1.52	<0.01	<0.01	<0.01
Sulfate Sulfur	%	0.01	<0.01	0.02	<0.01	0.55	<0.01	<0.01	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-
NAG pH	s.u.	9.42	9.53	8.66	8.63	7.54	-	-	-

Sample_ID	Units	2263616	2263619	2263620	2263621	2263622	2263623	2263627	2263628
Hole	-	AR-2005	AR-2068	AR-2069	AR-2074	AR-2074	AR-2074	HB-2091A	HB-2091A
From	ft	730	555	435	275	500	645	123	888
To	ft	735	560	440	280	505	650	128	893
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	12.5	1.9	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	15.0
AGP-Total Sulfur	$TCaCO_3$/ kT	15.3	1.6	<0.3125	<0.3125	1.3	<0.3125	<0.3125	18.4
ANP	$TCaCO_3$/ kT	50	411	631	17	11	114	6	88
ANP/AGP - Pyritic Sulfur	-	4.00	219.20	2019.20	54.40	35.20	364.80	19.20	5.87
ANP/AGP - Total Sulfur	-	3.27	263.04	2019.20	54.40	8.80	364.80	19.20	4.77
NNP	Pyritic S-Recalculated	37.50	409.13	630.69	16.69	10.69	113.69	5.69	73.00
Total Sulfur	%	0.49	0.05	<0.01	<0.01	0.04	<0.01	<0.01	0.59
Pyritic Sulfur	%	0.4	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	0.48
Sulfate Sulfur	%	0.09	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.11
Non-extractable Sulfur	%	-	-	-	-	-	-	-	-
NAG pH	s.u.	-	-	-	-	-	-	-	-

Appendix B
ABA Testing Results

Sample_ID	Units	2263629	2263631	2263632	2263633	2263634	2263636	2263640	2263642
Hole	-	HB-2092	HB-2094	HB-2094	HB-2095	HB-2095	HB-2097	HB-2098	HB-2099
From	ft	811	185	335	185	537	455	1021	1077
To	ft	816	190	340	190	542	460	1026	1082
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	7.5	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	0.3125	<0.3125
AGP-Total Sulfur	$TCaCO_3$/ kT	9.1	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	48.1	1.3
ANP	$TCaCO_3$/ kT	78	21	61	11	8	10	6	24
ANP/AGP - Pyritic Sulfur	-	10.40	67.20	195.20	35.20	25.60	32.00	19.20	76.80
ANP/AGP - Total Sulfur	-	8.61	67.20	195.20	35.20	25.60	32.00	0.12	19.20
NNP	Pyritic S-Recalculated	70.50	20.69	60.69	10.69	7.69	9.69	5.69	23.69
Total Sulfur	%	0.29	<0.01	<0.01	<0.01	<0.01	<0.01	1.54	0.04
Pyritic Sulfur	%	0.24	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Sulfate Sulfur	%	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	1.53	0.04
Non-extractable Sulfur	%	-	-	-	-	-	-	-	-
NAG pH	s.u.	-	-	-	-	-	-	-	-

Appendix B
ABA Testing Results

Sample_ID	Units	2263643	2263644	2263646	2263649	2263652	2263653	2263654	2263657
Hole	-	HB-2100	HB-2100	HB-2101	HB-2103	HB-2105	HB-2107	HB-2108	HB-2109
From	ft	760	920	341	425	770	333	34	264
To	ft	765	925	346	430	775	338	39	269
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3125	0.3	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	31.875
AGP-Total Sulfur	$TCaCO_3$/ kT	0.6	1.3	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	40.6
ANP	$TCaCO_3$/ kT	17	22	22	644	105	54	13	78
ANP/AGP - Pyritic Sulfur	-	54.40	70.40	70.40	2060.80	336.00	172.80	41.60	2.45
ANP/AGP - Total Sulfur	-	27.20	17.60	70.40	2060.80	336.00	172.80	41.60	1.92
NNP	Pyritic S-Recalculated	16.69	21.69	21.69	643.69	104.69	53.69	12.69	46.13
Total Sulfur	%	0.02	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	1.3
Pyritic Sulfur	%	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.02
Sulfate Sulfur	%	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.28
Non-extractable Sulfur	%	-	-	-	-	-	-	-	-
NAG pH	s.u.	-	-	-	-	-	-	-	-

Sample_ID	Units	2263658	2263660	2263661	2263662	2263663	2263664	2263666	2263668
Hole	-	HB-2109	HB-2110	HB-2112	HB-2114	HB-2117	HB-2119A	HB-2119A	HB-2121
From	ft	738	737	435	214	503	100	290	77
To	ft	743	742	440	219	508	105	295	82
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3125	49.7	0.6	<0.3125	<0.3125	<0.3125	<0.3125	0.6
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	66.3	2.2	<0.3125	<0.3125	<0.3125	<0.3125	2.8
ANP	$TCaCO_3$/ kT	83	75	16	78	681	36	22	2
ANP/AGP - Pyritic Sulfur	-	265.60	1.51	25.60	249.60	2179.20	115.20	70.40	3.20
ANP/AGP - Total Sulfur	-	265.60	1.13	7.31	249.60	2179.20	115.20	70.40	0.71
NNP	Pyritic S-Recalculated	82.69	25.31	15.38	77.69	680.69	35.69	21.69	1.38
Total Sulfur	%	<0.01	2.12	0.07	<0.01	<0.01	<0.01	<0.01	0.09
Pyritic Sulfur	%	<0.01	1.59	0.02	<0.01	<0.01	<0.01	<0.01	0.02
Sulfate Sulfur	%	<0.01	0.51	0.03	<0.01	<0.01	<0.01	<0.01	0.02
Non-extractable Sulfur	%	-	-	-	-	-	-	-	-
NAG pH	s.u.	-	-	-	-	-	-	-	-

Sample_ID	Units	2263669	2263671	2263683	2263684	2263698	2263700	2263701	2263704
Hole	-	HB-2122	HB-2122	HB-2145	HB-2145	HB-2165	HB-2169	HB-2169	HB-2173
From	ft	105	732	70	252	733	311	588	375
To	ft	110	737	75	257	738	316	593	380
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3125	15.3	<0.3125	<0.3125	10.9375	2.5	<0.3125	<0.3125
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	20.6	<0.3125	<0.3125	15.9	4.1	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	126	64	11	36	75	27	21	708
ANP/AGP - Pyritic Sulfur	-	403.20	4.18	35.20	115.20	6.86	10.80	67.20	2265.60
ANP/AGP - Total Sulfur	-	403.20	3.10	35.20	115.20	4.71	6.65	67.20	2265.60
NNP	Pyritic S-Recalculated	125.69	48.69	10.69	35.69	64.06	24.50	20.69	707.69
Total Sulfur	%	<0.01	0.66	<0.01	<0.01	0.51	0.13	<0.01	<0.01
Pyritic Sulfur	%	<0.01	0.49	<0.01	<0.01	0.35	0.08	<0.01	<0.01
Sulfate Sulfur	%	<0.01	0.17	<0.01	<0.01	0.16	0.05	<0.01	<0.01
Non-extractable Sulfur	%	-	-	-	-	-	-	-	-
NAG pH	s.u.	-	-	-	-	-	-	-	-

Appendix B
ABA Testing Results

Sample_ID	Units	2263706	2263707	2263711	2263718	1596-01	1920-01	A814-01	A830-03
Hole	-	HB-2174	HB-2174	HB-2122	HB-2167	1596	1920	A814	A830
From	ft	225	510	502	705	115	412	68	690
To	ft	230	515	507	710	162	461	94	740
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	39.6875	<0.3	<0.3	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	54.4	<0.3125	<0.3125	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	579	708	14	90	65.6	45.3	90	17.6
ANP/AGP - Pyritic Sulfur	-	1852.80	2265.60	44.80	2.27	218.67	151.00	300.00	58.67
ANP/AGP - Total Sulfur	-	1852.80	2265.60	44.80	1.66	209.92	144.96	288.00	56.32
NNP	Pyritic S-Recalculated	578.69	707.69	13.69	50.31	65.30	45.00	89.70	17.30
Total Sulfur	%	<0.01	<0.01	<0.01	1.74	<0.01	<0.01	<0.01	<0.01
Pyritic Sulfur	%	<0.01	<0.01	<0.01	1.27	<0.01	<0.01	<0.01	<0.01
Sulfate Sulfur	%	<0.01	<0.01	<0.01	0.47	<0.01	<0.01	<0.01	<0.01
Non-extractable Sulfur	%	-	-	-	-	<0.01	<0.01	<0.01	<0.01
NAG pH	s.u.	-	-	-	-	8.96	7.95	8.26	8.16

Appendix B
ABA Testing Results

Sample_ID	Units	A831-01	A857-01	A873-01	A886-01	AH4-01	AR2000-01	AR2001-01	AR2001-02
Hole	-	A831	A857	A873	A886	AH4	AR2000	AR2001	AR2001
From	ft	142	280	218	425	169	14.5	200	400
To	ft	169	299	243	475	205	63.5	250	445
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	0.3	<0.3	<0.3	1.9	<0.3	<0.3	<0.3	0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	0.6	<0.3125	<0.3125	0.9	<0.3125	<0.3125	<0.3125	2.8
ANP	$TCaCO_3$/ kT	29	91.6	78.9	9.1	43.2	42.7	27.1	26.1
ANP/AGP - Pyritic Sulfur	-	96.67	305.33	263.00	4.79	144.00	142.33	90.33	87.00
ANP/AGP - Total Sulfur	-	46.40	293.12	252.48	9.71	138.24	136.64	86.72	9.28
NNP	Pyritic S-Recalculated	28.70	91.30	78.60	7.20	42.90	42.40	26.80	25.80
Total Sulfur	%	0.02	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	0.09
Pyritic Sulfur	%	0.01	<0.01	<0.01	0.06	<0.01	<0.01	<0.01	0.01
Sulfate Sulfur	%	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02
NAG pH	s.u.	8.32	8.25	8.22	7.77	8.13	8.08	8.19	8.44

Sample_ID	Units	AR2002-01	AR2003-01	AR2003-02	AR2003-03	AR2004-01	AR2005-01	AR2005-02	AR2007-01
Hole	-	AR2002	AR2003	AR2003	AR2003	AR2004	AR2005	AR2005	AR2007
From	ft	100	200	400	600	50	155	650	150
To	ft	150	250	450	650	100	195	700	195
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	1.6	<0.3	<0.3	20.6	<0.3	<0.3	29.4	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	2.2	<0.3125	<0.3125	28.8	<0.3125	1.9	37.8	<0.3125
ANP	$TCaCO_3$/ kT	27.1	37.6	24.1	31.1	56.2	35.6	34.1	74
ANP/AGP - Pyritic Sulfur	-	16.94	125.33	80.33	1.51	187.33	118.67	1.16	246.67
ANP/AGP - Total Sulfur	-	12.39	120.32	77.12	1.08	179.84	18.99	0.90	236.80
NNP	Pyritic S-Recalculated	25.50	37.30	23.80	10.50	55.90	35.30	4.70	73.70
Total Sulfur	%	0.07	<0.01	<0.01	0.92	<0.01	0.06	1.21	<0.01
Pyritic Sulfur	%	0.05	<0.01	<0.01	0.66	<0.01	<0.01	0.94	<0.01
Sulfate Sulfur	%	0.02	<0.01	<0.01	0.26	<0.01	0.02	0.27	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01
NAG pH	s.u.	8.46	8.84	8.9	7.6	8.06	8.37	7.64	8.66

Sample_ID	Units	AR2009-01	AR2009-02	AR2010-01	AR2010-02	AR2011-01	AR2011-02	AR2013-04	AR2013-05
Hole	-	AR2009	AR2009	AR2010	AR2010	AR2011	AR2011	AR2013	AR2013
From	ft	400	550	200	550	50	500	700	850
To	ft	450	600	235	600	100	550	750	900
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	<0.3	13.8	0.3	<0.3	6.9	9.1
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	17.8	0.3	<0.3125	8.8	15.0
ANP	$TCaCO_3$/ kT	52.7	19.6	19.6	17.6	10.5	21.6	70.2	82.8
ANP/AGP - Pyritic Sulfur	-	175.67	65.33	65.33	1.28	35.00	72.00	10.17	9.10
ANP/AGP - Total Sulfur	-	168.64	62.72	62.72	0.99	33.60	69.12	8.02	5.52
NNP	Pyritic S-Recalculated	52.40	19.30	19.30	3.80	10.20	21.30	63.30	73.70
Total Sulfur	%	<0.01	<0.01	<0.01	0.57	0.01	<0.01	0.28	0.48
Pyritic Sulfur	%	<0.01	<0.01	<0.01	0.44	0.01	<0.01	0.22	0.29
Sulfate Sulfur	%	<0.01	<0.01	<0.01	0.13	<0.01	<0.01	0.02	0.15
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.04
NAG pH	s.u.	8.49	8.01	7.97	3.46	7.17	6.65	11.1	11.3

Appendix B
ABA Testing Results

Sample_ID	Units	AR2014-01	AR2015-01	AR2017-03	AR2017-07	AR2019-01	AR2020-01	AR2025-02	AR2025-04
Hole	-	AR2014	AR2015	AR2017	AR2017	AR2019	AR2020	AR2025	AR2025
From	ft	265	290	750	750	-	275	825	820
To	ft	300	340	800	800	50	320	865	870
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	40.9	41.6	<0.3	<0.3	15.9	6.3
AGP-Total Sulfur	$TCaCO_3$/ kT	1.3	<0.3125	50.0	41.6	0.6	3.4	22.5	13.1
ANP	$TCaCO_3$/ kT	31.1	73.3	73.2	74.6	11.8	13.9	71.9	31.1
ANP/AGP - Pyritic Sulfur	-	103.67	244.33	1.79	1.79	39.33	46.33	4.52	4.94
ANP/AGP - Total Sulfur	-	24.88	234.56	1.46	1.79	18.88	4.04	3.20	2.37
NNP	Pyritic S-Recalculated	30.80	73.00	32.30	33.00	11.50	13.60	56.00	24.80
Total Sulfur	%	0.04	<0.01	1.60	1.33	0.02	0.11	0.72	0.42
Pyritic Sulfur	%	<0.01	<0.01	1.31	1.33	<0.01	<0.01	0.51	0.2
Sulfate Sulfur	%	<0.01	<0.01	0.29	<0.01	0.02	0.11	0.21	0.12
Non-extractable Sulfur	%	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1
NAG pH	s.u.	10.3	8.46	7.89	7.68	9.04	8.5	8.18	8.56

Sample_ID	Units	AR2026-02	AR2030-02	AR2030-04	AR2032-02	AR2035-01	AR2036-01	AR2036-03	AR2037-02
Hole	-	AR2026	AR2030	AR2030	AR2032	AR2035	AR2036	AR2036	AR2037
From	ft	380	15	15	555	175	800	800	400
To	ft	430	65	75	565	225	850	850	430
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	<0.3	<0.3	0.3	7.2	5	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	3.4	1.6	11.3	7.5	<0.3125
ANP	$TCaCO_3$/ kT	108	97.2	63.5	36.5	44.8	103	75.2	48.9
ANP/AGP - Pyritic Sulfur	-	360.00	324.00	211.67	121.67	149.33	14.31	15.04	163.00
ANP/AGP - Total Sulfur	-	345.60	311.04	203.20	10.62	28.67	9.16	10.03	156.48
NNP	Pyritic S-Recalculated	107.70	96.90	63.20	36.20	44.50	95.80	70.20	48.60
Total Sulfur	%	<0.01	<0.01	<0.01	0.11	0.05	0.36	0.24	<0.01
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	0.01	0.23	0.16	<0.01
Sulfate Sulfur	%	<0.01	<0.01	<0.01	0.11	0.04	0.13	0.02	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01
NAG pH	s.u.	8.39	8.21	8.49	8.41	8.47	9.56	8.69	8.77

Appendix B
ABA Testing Results

Sample_ID	Units	AR2038-02	AR2038-05	AR2039-03	AR2039-06	AR2040-01	AR2041-01	AR2042-02	AR2042-04
Hole	-	AR2038	AR2038	AR2039	AR2039	AR2040	AR2041	AR2042	AR2042
From	ft	325	325	575	575	315	465	110	110
To	ft	375	375	625	625	330	500	155	160
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	20.3	23.1	0.3	13.1	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	25.0	32.5	1.6	15.0	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	100	16.6	24.8	19.7	7.7	44.3	134	111
ANP/AGP - Pyritic Sulfur	-	333.33	55.33	1.22	0.85	25.67	3.38	446.67	370.00
ANP/AGP - Total Sulfur	-	320.00	53.12	0.99	0.61	4.93	2.95	428.80	355.20
NNP	Pyritic S-Recalculated	99.70	16.30	4.50	<3.4	7.40	31.20	133.70	110.70
Total Sulfur	%	<0.01	<0.01	0.8	1.04	0.05	0.48	<0.01	<0.01
Pyritic Sulfur	%	<0.01	<0.01	0.65	0.74	0.01	0.42	<0.01	<0.01
Sulfate Sulfur	%	<0.01	<0.01	0.15	0.19	0.03	0.06	<0.01	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	0.11	0.01	<0.01	<0.01	<0.01
NAG pH	s.u.	8.54	7.8	9.2	7.96	8.6	8.06	8.8	7.97

Sample_ID	Units	AR2043-02	Arkose (AR2054)	UAGH-ARKOSE-01	VABH0609-01	2263614	2263713	1561-02	1561-04
Hole	-	AR2043	AR2054	JAGH-ARKOS	VABH0609	A-884	HB-2154	1561	1561
From	ft	715	-	-	-	50	675	653	774
To	ft	775	-	-	-	55	680	658	778
Formation	-	Arkose	Arkose	Arkose	Arkose	Bolsa	Bolsa	Bolsa	Bolsa
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	32.2	<0.3	0.6	<0.3	0.3125	<0.3125	6.03	0.54
AGP-Total Sulfur	$TCaCO_3$/ kT	47.2	<0.3125	1.6	0.3	1.6	0.3	10.9	0.9
ANP	$TCaCO_3$/ kT	175	8.3	5.7	4.3	3	13	1.5	4.2
ANP/AGP - Pyritic Sulfur	-	5.43	27.67	9.50	14.33	9.60	41.60	0.25	7.78
ANP/AGP - Total Sulfur	-	3.71	26.56	3.65	13.76	1.92	41.60	0.14	4.48
NNP	Pyritic S-Recalculated	142.80	8.00	5.10	4.00	2.69	12.69	<4.53	3.66
Total Sulfur	%	1.51	<0.01	0.05	0.01	0.05	0.01	0.35	0.03
Pyritic Sulfur	%	1.03	<0.01	0.02	<0.01	0.01	<0.01	0.19	0.02
Sulfate Sulfur	%	0.48	<0.01	<0.01	0.01	0.02	0.01	0.16	0.01
Non-extractable Sulfur	%	<0.01	<0.01	0.03	<0.01	-	-	<0.01	<0.01
NAG pH	s.u.	7.6	6.7	7.3	-	-	-	-	-

Sample_ID	**Units**	**A780-02**	**A780-02 Composite**	**A780-03**	**A780-03 Composite**	**AR2023-01**	**AR2033-01**	**AR2059-01**	**AR2060-01**
Hole	-	A780	A780	A780	A780	AR2023	AR2033	AR2059	AR2060
From	ft	447	447	496	496.1	945	1527	900	635
To	ft	452	456	500	499	1154.5	1553	905	640
Formation	-	Bolsa	Bolsa	Bolsa	Bolsa	Bolsa	Bolsa	Bolsa	Bolsa
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	9.69	9.06	39.7	9.78	21.5	0.55	2.74	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	14.1	13.1	45.3	14.1	25.0	0.6	5.3	0.3
ANP	$TCaCO_3$/ kT	3.5	3	<0.3	1	8.3	13.5	2.7	3.2
ANP/AGP - Pyritic Sulfur	-	0.36	0.33	0.01	0.10	0.39	24.55	0.99	10.67
ANP/AGP - Total Sulfur	-	0.25	0.23	0.01	0.07	0.33	21.60	0.51	10.24
NNP	Pyritic S-Recalculated	<6.19	<6.06	<39.4	<8.78	<13.2	12.95	<0.04	2.90
Total Sulfur	%	0.45	0.42	1.45	0.45	0.8	0.02	0.17	0.01
Pyritic Sulfur	%	0.31	0.29	1.27	0.31	0.69	0.02	0.09	<0.01
Sulfate Sulfur	%	0.14	0.13	0.18	0.13	0.11	<0.01	0.08	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
NAG pH	s.u.	-	-	-	-	-	-	-	-

Appendix B
ABA Testing Results

Sample_ID	Units	AR2066-01	AR2067-01	AR2072-01	AR2073-01	VABH0608-01	1528-02	1914-01	A815-01
Hole	-	AR2066	AR2067	AR2072	AR2073	VABH0608	1528	1914	A815
From	ft	740	655	765	560	-	727	491	845
To	ft	745	660	770	565	-	732	495	885
Formation	-	Bolsa	Bolsa	Bolsa	Bolsa	Bolsa	Colina	Colina	Colina
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	15.4	<0.3	5.47	<0.3	<0.3	11.9	18.1	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	21.6	<0.3125	7.8	<0.3125	0.3	181.6	21.3	<0.3125
ANP	$TCaCO_3$/ kT	38.1	7.3	10.4	9.9	2.6	337	403	453
ANP/AGP - Pyritic Sulfur	-	2.47	24.33	1.90	33.00	8.67	28.32	22.27	1510.00
ANP/AGP - Total Sulfur	-	1.77	23.36	1.33	31.68	8.32	1.86	18.96	1449.60
NNP	Pyritic S-Recalculated	22.70	7.00	4.93	9.60	2.30	325.10	384.90	452.70
Total Sulfur	%	0.69	<0.01	0.25	<0.01	0.01	5.81	0.68	<0.01
Pyritic Sulfur	%	0.49	<0.01	0.18	<0.01	<0.01	0.38	0.58	<0.01
Sulfate Sulfur	%	0.2	<0.01	0.07	<0.01	0.01	5.41	0.01	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
NAG pH	s.u.	-	-	-	-	-	-	-	8.06

Appendix B
ABA Testing Results

Sample_ID	Units	A840-01	A852-01	A860-01	A865-01	AR2002-02	AR2010-04	AR2011-04	AR2041-02
Hole	-	A840	A852	A860	A865	AR2002	AR2010	AR2011	AR2041
From	ft	1257	1147	1028	1108	1300	1643	1488	1030
To	ft	1262	1151	1087	1161	1470	1648	1518	1100
Formation	-	Colina	Colina	Colina	Colina	Colina	Colina	Colina	Colina
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	74.8	2.2	3.4	0.6	<0.3	1.6	1.6
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	99.4	9.7	85.3	33.1	<0.3125	17.5	1.9
ANP	$TCaCO_3$/ kT	492	203	354	129	617	930	299	221
ANP/AGP - Pyritic Sulfur	-	1640.00	2.71	160.91	37.94	1028.33	3100.00	186.88	138.13
ANP/AGP - Total Sulfur	-	1574.40	2.04	36.54	1.51	18.63	2976.00	17.09	117.87
NNP	Pyritic S-Recalculated	491.70	128.20	351.80	125.60	616.40	929.70	297.40	219.40
Total Sulfur	%	<0.01	3.18	0.31	2.73	1.06	<0.01	0.56	0.06
Pyritic Sulfur	%	<0.01	2.39	0.07	0.11	0.02	<0.01	0.05	0.05
Sulfate Sulfur	%	<0.01	0.74	0.24	2.61	1.02	<0.01	0.51	0.01
Non-extractable Sulfur	%	<0.01	0.05	<0.01	0.01	0.02	<0.01	<0.01	<0.01
NAG pH	s.u.	-	-	7.93	7.69	7.94	-	8.56	8.3

Appendix B
ABA Testing Results

Sample_ID	Units	A804-01	A808-02	AH4-02	AR2006-01	AR2042-01	AR2042-05	2263604	2263676
Hole	-	A804	A808	AH4	AR2006	AR2042	AR2042	1919	HB-2131
From	ft	238	437	298	400	300	300	432	102
To	ft	282	489	345	450	350	350	437	107
Formation	-	Concha	Concha	Concha	Concha	Concha	Concha	Earp	Earp
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.3125	<0.3125
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	0.6	<0.3125
ANP	$TCaCO_3$/ kT	889	740	530	740	432	570	215	249
ANP/AGP - Pyritic Sulfur	-	2963.33	2466.67	1766.67	2466.67	1440.00	1900.00	688.00	796.80
ANP/AGP - Total Sulfur	-	2844.80	2368.00	1696.00	2368.00	1382.40	1824.00	344.00	796.80
NNP	Pyritic S-Recalculated	888.70	739.70	529.70	739.70	431.70	569.70	214.69	248.69
Total Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Sulfate Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
NAG pH	s.u.	7.4	7.9	8.36	8.63	8.78	8.32	-	-

Appendix B
ABA Testing Results

Sample_ID	Units	2263687	1528-01	1920-02	A830-04	A834-02	A845-01	A849-01	AR2000-02
Hole	-	HB-2151	1528	1920	A830	A834	A845	A849	AR2000
From	ft	1124	794	593	1445	629	509	625	450
To	ft	1129	822	598	1449	644	551	631	500
Formation	-	Earp	Earp	Earp	Earp	Earp	Earp	Earp	Earp
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	0.9375	4.4	1.16	15.3	5.6	4.1	1.81	10.9
AGP-Total Sulfur	$TCaCO_3$/ kT	2.2	6.9	2.2	20.0	7.5	5.0	3.8	17.2
ANP	$TCaCO_3$/ kT	163	182	249	178	109	26.2	208	62.2
ANP/AGP - Pyritic Sulfur	-	173.87	41.36	214.66	11.63	19.46	6.39	114.92	5.71
ANP/AGP - Total Sulfur	-	74.51	26.47	113.83	8.90	14.53	5.24	55.47	3.62
NNP	Pyritic S-Recalculated	162.06	177.60	247.84	162.70	103.40	22.10	206.19	51.30
Total Sulfur	%	0.07	0.22	0.07	0.64	0.24	0.16	0.12	0.55
Pyritic Sulfur	%	0.03	0.14	0.04	0.49	0.18	0.13	0.06	0.35
Sulfate Sulfur	%	0.04	0.08	0.03	0.15	0.06	0.03	0.05	0.19
Non-extractable Sulfur	%	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
NAG pH	s.u.	-	8.27	-	-	8.36	8.02	-	7.76

Sample_ID	Units	AR2000-03	AR2014-05	AR2017-02	AR2019-03	AR2028B-02	AR2030-01	AR2035-02	2263606
Hole	-	AR2000	AR2014	AR2017	AR2019	AR2028B	AR2030	AR2035	A-803
From	ft	620	1621	1310	1115	1760	675	885	556
To	ft	680	1641	1350	1190	1765	725	955	561
Formation	-	Earp	Earp	Earp	Earp	Earp	Earp	Earp	Epitaph
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	8.1	10	<0.3	8.8	<0.3	4.4	1.9	<0.3125
AGP-Total Sulfur	$TCaCO_3$/ kT	11.6	11.6	<0.3125	10.9	<0.3125	5.3	4.1	<0.3125
ANP	$TCaCO_3$/ kT	112	104	47.4	23.1	58.4	85.2	171	951
ANP/AGP - Pyritic Sulfur	-	13.83	10.40	158.00	2.63	194.67	19.36	90.00	3043.20
ANP/AGP - Total Sulfur	-	9.69	8.99	151.68	2.11	186.88	16.04	42.09	3043.20
NNP	Pyritic S-Recalculated	103.90	94.00	47.10	14.30	58.10	80.80	169.10	950.69
Total Sulfur	%	0.37	0.37	<0.01	0.35	<0.01	0.17	0.13	<0.01
Pyritic Sulfur	%	0.26	0.32	<0.01	0.28	<0.01	0.14	0.06	<0.01
Sulfate Sulfur	%	0.11	<0.01	<0.01	0.07	<0.01	0.03	0.07	<0.01
Non-extractable Sulfur	%	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	-
NAG pH	s.u.	8.27	10.4	8.17	8.39	-	8.21	8.3	-

Sample_ID	Units	2263618	2263674	2263678	2263709	1538-01	A801-01	A825-01	A828-01
Hole	-	AR-2022	HB-2129A	HB-2133	HB-2093	1538	A801	A825	A828
From	ft	1010	626	101.5	460	1026	430	1698	784
To	ft	1015	631	106.5	465	1029	480	1703	788
Formation	-	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	0.625	1.25	<0.3125	<0.3125	<0.3	<0.3	<0.3	5.47
AGP-Total Sulfur	$TCaCO_3$/ kT	0.9	1.6	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	7.5
ANP	$TCaCO_3$/ kT	19	776	264	983	621	770	933	165
ANP/AGP - Pyritic Sulfur	-	30.40	620.80	844.80	3145.60	2070.00	2566.67	3110.00	30.16
ANP/AGP - Total Sulfur	-	20.27	496.64	844.80	3145.60	1987.20	2464.00	2985.60	22.00
NNP	Pyritic S-Recalculated	18.38	774.75	263.69	982.69	620.70	769.70	932.70	159.53
Total Sulfur	%	0.03	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.24
Pyritic Sulfur	%	0.02	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	0.18
Sulfate Sulfur	%	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07
Non-extractable Sulfur	%	-	-	-	-	<0.01	<0.01	<0.01	<0.01
NAG pH	s.u.	-	-	-	-	-	7.18	-	-

Appendix B
ABA Testing Results

Sample_ID	Units	A829-01	A830-01	A847-01	A850-01	A860-02	A860-03	AR2001-03	AR2002-03
Hole	-	A829	A830	A847	A850	A860	A860	AR2001	AR2002
From	ft	932	1290	897	797	1244	1351	800	835
To	ft	936	1340	947	843	1351	1361	850	840
Formation	-	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	<0.3	0.3	5	<0.3	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	3.8	4.7	107.5	64.1	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	680	638	774	176	252	405	99.1	522
ANP/AGP - Pyritic Sulfur	-	2266.67	2126.67	2580.00	586.67	50.40	1350.00	330.33	1740.00
ANP/AGP - Total Sulfur	-	2176.00	2041.60	206.40	37.55	2.34	6.32	317.12	1670.40
NNP	Pyritic S-Recalculated	679.70	637.70	773.70	175.70	247.00	404.70	98.80	521.70
Total Sulfur	%	<0.01	<0.01	0.12	0.15	3.44	2.05	<0.01	<0.01
Pyritic Sulfur	%	<0.01	<0.01	<0.01	0.01	0.16	<0.01	<0.01	<0.01
Sulfate Sulfur	%	<0.01	<0.01	0.12	0.13	3.27	2.05	<0.01	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01
NAG pH	s.u.	-	7.36	8.19	8.66	7	7	9.19	-

Sample_ID	Units	AR2009-04	AR2014-04	AR2034-02	AR2040-02	2263708	1461-01	1506-02	1507-01
Hole	-	AR2009	AR2014	AR2034	AR2040	1918	1461	1506	1507
From	ft	1000	950	755	905	491	-	608	1124
To	ft	1050	1002	760	910	496	48	641	1128
Formation	-	Epitaph	Epitaph	Epitaph	Epitaph	Escabrosa	Escabrosa	Escabrosa	Escabrosa
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	17.2	<0.3	<0.3	<0.3	<0.3125	<0.3	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	25.0	3.4	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	80.3	584	928	707	863	788	838	912
ANP/AGP - Pyritic Sulfur	-	4.67	1946.67	3093.33	2356.67	2761.60	2626.67	2793.33	3040.00
ANP/AGP - Total Sulfur	-	3.21	169.89	2969.60	2262.40	2761.60	2521.60	2681.60	2918.40
NNP	Pyritic S-Recalculated	63.10	583.70	927.70	706.70	862.69	787.70	837.70	911.70
Total Sulfur	%	0.8	0.11	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyritic Sulfur	%	0.55	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulfate Sulfur	%	0.24	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Non-extractable Sulfur	%	0.01	0.04	<0.01	<0.01	-	<0.01	<0.01	<0.01
NAG pH	s.u.	7.64	10.1	-	-	-	8.46	7.95	-

Appendix B
ABA Testing Results

Sample_ID	Units	1580-01	1926-03	A812-01	A814-02	A871-01	A872-01	AR2004-05	2263602
Hole	-	1580	1926	A812	A814	A871	A872	AR2004	1462
From	ft	712	656	1181	902	432	1075	1961	451
To	ft	716	661	1186	951	481	1110	1966	456
Formation	-	Escabrosa	Escabrosa	Escabrosa	Escabrosa	Escabrosa	Escabrosa	Escabrosa	Gila
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	<0.3	<0.3	0.6	<0.3	<0.3	0.625
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	<0.3125	1.3	<0.3125	<0.3125	2.5
ANP	$TCaCO_3$/ kT	34.8	862	112	874	570	203	880	7
ANP/AGP - Pyritic Sulfur	-	116.00	2873.33	373.33	2913.33	950.00	676.67	2933.33	11.20
ANP/AGP - Total Sulfur	-	111.36	2758.40	358.40	2796.80	456.00	649.60	2816.00	2.80
NNP	Pyritic S-Recalculated	34.50	861.70	111.70	873.70	569.40	202.70	879.70	6.38
Total Sulfur	%	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	0.08
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.02
Sulfate Sulfur	%	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.02
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-
NAG pH	s.u.	-	-	-	7.77	7.44	9.44	-	-

Appendix B
ABA Testing Results

Sample_ID	Units	2263603	2263617	2263637	2263638	2263639	2263641	2263647	2263648
Hole	-	1462	AR-2022	HB-2098	HB-2098	HB-2098	HB-2099	HB-2102	HB-2102
From	ft	545	200	115	640	808	177	630	750
To	ft	550	205	120	645	813	182	635	755
Formation	-	Gila	Gila	Gila	Gila	Gila	Gila	Gila	Gila
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	2.1875	<0.3125	<0.3125	<0.3125	0.3125	<0.3125	<0.3125	<0.3125
AGP-Total Sulfur	$TCaCO_3$/ kT	4.1	<0.3125	3.1	<0.3125	0.9	<0.3125	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	5	43	79	26	8	71	8	81
ANP/AGP - Pyritic Sulfur	-	2.29	137.60	252.80	83.20	25.60	227.20	25.60	259.20
ANP/AGP - Total Sulfur	-	1.23	137.60	25.28	83.20	8.53	227.20	25.60	259.20
NNP	Pyritic S-Recalculated	2.81	42.69	78.69	25.69	7.69	70.69	7.69	80.69
Total Sulfur	%	0.13	<0.01	0.1	<0.01	0.03	<0.01	<0.01	<0.01
Pyritic Sulfur	%	0.07	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Sulfate Sulfur	%	0.03	<0.01	0.04	<0.01	0.02	<0.01	<0.01	<0.01
Non-extractable Sulfur	%	-	-	-	-	-	-	-	-
NAG pH	s.u.	-	-	-	-	-	-	-	-

Sample_ID	Units	2263673	2263679	2263712	UAGH-GILA-01	2263624	2263651	2263656	2263667
Hole	-	HB-2129A	HB-2136	HB-2129A	UAGH-GILA	HB-2086A	HB-2104	HB-2108	HB-2120
From	ft	358	180.7	180	-	727	842	723	380
To	ft	363	185.7	185	-	732	847	728	385
Formation	-	Gila	Gila	Gila	Gila	Glance	Glance	Glance	Glance
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3125	0.625	0.3125	<0.3	<0.3125	<0.3125	<0.3125	<0.3125
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	2.5	1.9	3.8	<0.3125	<0.3125	<0.3125	4.7
ANP	$TCaCO_3$/ kT	8	22	15	95.7	736	476	666	658
ANP/AGP - Pyritic Sulfur	-	25.60	35.20	48.00	319.00	2355.20	1523.20	2131.20	2105.60
ANP/AGP - Total Sulfur	-	25.60	8.80	8.00	25.52	2355.20	1523.20	2131.20	140.37
NNP	Pyritic S-Recalculated	7.69	21.38	14.69	95.40	735.69	475.69	665.69	657.69
Total Sulfur	%	<0.01	0.08	0.06	0.12	<0.01	<0.01	<0.01	0.15
Pyritic Sulfur	%	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulfate Sulfur	%	<0.01	0.01	0.02	0.1	<0.01	<0.01	<0.01	0.15
Non-extractable Sulfur	%	-	-	-	0.02	-	-	-	-
NAG pH	s.u.	-	-	-	9.06	-	-	-	-

Sample_ID	Units	2263691	2263697	2263702	2263703	1596-02	A805-01	A834-01	AR2004-02
Hole	-	HB-2157	HB-2164	HB-2170A	HB-2172	1596	A805	A834	AR2004
From	ft	162	370	573	447	320	721	382	200
To	ft	167	375	578	452	376	741	392	250
Formation	-	Glance	Glance	Glance	Glance	Glance	Glance	Glance	Glance
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	<0.3125	<0.3	<0.3	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	956	493	946	768	784	473	519	722
ANP/AGP - Pyritic Sulfur	-	3059.20	1577.60	3027.20	2457.60	2613.33	1576.67	1730.00	2406.67
ANP/AGP - Total Sulfur	-	3059.20	1577.60	3027.20	2457.60	2508.80	1513.60	1660.80	2310.40
NNP	Pyritic S-Recalculated	955.69	492.69	945.69	767.69	783.70	472.70	518.70	721.70
Total Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulfate Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Non-extractable Sulfur	%	-	-	-	-	<0.01	<0.01	<0.01	<0.01
NAG pH	s.u.	-	-	-	-	7.74	8.17	8.21	8.31

Sample_ID	Units	UAGH-GLANCE-01	2263609	2263677	2263680	2263681	1502-01	1530-01	1596-03
Hole	-	JAGH-GLANC	A-862	HB-2132	HB-2137	HB-2140	1502	1530	1596
From	ft	-	50	403	533	427	846	1009	741
To	ft	-	55	408	538	432	851	1012	746
Formation	-	Glance	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3125	<0.3125	<0.3125	<0.3125	<0.3	32.2	6.25
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	<0.3125	64.1	30.6
ANP	$TCaCO_3$/ kT	450	284	960	820	918	887	202	212
ANP/AGP - Pyritic Sulfur	-	1500.00	908.80	3072.00	2624.00	2937.60	2956.67	6.27	33.92
ANP/AGP - Total Sulfur	-	1440.00	908.80	3072.00	2624.00	2937.60	2838.40	3.15	6.92
NNP	Pyritic S-Recalculated	449.70	283.69	959.69	819.69	917.69	886.70	169.80	205.75
Total Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2.05	0.98
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.03	0.2
Sulfate Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.02	0.78
Non-extractable Sulfur	%	<0.01	-	-	-	-	<0.01	<0.01	<0.01
NAG pH	s.u.	8.42	-	-	-	-	-	-	-

Sample_ID	Units	A806-01	A809-01	A842-01	A845-02	A866-02	A878-02	AR2000-04	AR2000-05
Hole	-	A806	A809	A842	A845	A866	A878	AR2000	AR2000
From	ft	1961	584	1146	782	576	714	1770	1950
To	ft	1966	619.5	1151	829	581	719	1820	1955
Formation	-	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	0.6	<0.3	<0.3	<0.3	2.19	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	2.8	<0.3125	<0.3125	<0.3125	<3.75	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	194	219	224	201	766	175	467	862
ANP/AGP - Pyritic Sulfur	-	646.67	365.00	746.67	670.00	2553.33	79.91	1556.67	2873.33
ANP/AGP - Total Sulfur	-	620.80	77.87	716.80	643.20	2451.20	46.67	1494.40	2758.40
NNP	Pyritic S-Recalculated	193.70	218.40	223.70	200.70	765.70	172.81	466.70	861.70
Total Sulfur	%	<0.01	0.09	<0.01	<0.01	<0.01	<0.12	<0.01	<0.01
Pyritic Sulfur	%	<0.01	0.02	<0.01	<0.01	<0.01	0.07	<0.01	<0.01
Sulfate Sulfur	%	<0.01	0.07	<0.01	<0.01	<0.01	0.05	<0.01	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
NAG pH	s.u.	-	8.02	-	8.04	-	-	7.94	-

Sample_ID	Units	AR2004-03	AR2004-04	AR2004-06	AR2006-02	AR2007-02	AR2015-02	AR2017-08	AR2030-07
Hole	-	AR2004	AR2004	AR2004	AR2006	AR2007	AR2015	AR2017	AR2030
From	ft	1231	1720	1761	1745	1242	2120	1920	1780
To	ft	1282	1771	1766	1750	1292	2145	1925	1785
Formation	-	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	<0.3	<0.3	0.9	<0.3	<0.3	0.75
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	<0.3125	3.4	<0.3125	<0.3125	11.3
ANP	$TCaCO_3$/ kT	270	459	590	167	97.8	874	251	413
ANP/AGP - Pyritic Sulfur	-	900.00	1530.00	1966.67	556.67	108.67	2913.33	836.67	550.67
ANP/AGP - Total Sulfur	-	864.00	1468.80	1888.00	534.40	28.45	2796.80	803.20	36.71
NNP	Pyritic S-Recalculated	269.70	458.70	589.70	166.70	96.90	873.70	250.70	412.25
Total Sulfur	%	<0.01	<0.01	<0.01	<0.01	0.11	<0.01	<0.01	0.36
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.02
Sulfate Sulfur	%	<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.01	0.23
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.11
NAG pH	s.u.	8.17	8.89	-	-	8.61	-	-	-

Appendix B
ABA Testing Results

Sample_ID	Units	AR2032-03	AR2035-03	AR2039-07	AR2042-03	AR2042-06	AR2043-03	AR2043-05	Leach-01
Hole	-	AR2032	AR2035	AR2039	AR2042	AR2042	AR2043	AR2043	Leach
From	ft	1715	1850	1835	1190	1190	2145	1990	-
To	ft	1720	1855	1840	1220	1240	2150	1995	-
Formation	-	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	Horquilla	de material (no
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	42.7	1.9
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	1.9	<0.3125	<0.3125	62.2	3.4
ANP	$TCaCO_3$/ kT	154	272	169	285	410	449	272	53.7
ANP/AGP - Pyritic Sulfur	-	513.33	906.67	563.33	950.00	1366.67	1496.67	6.37	28.26
ANP/AGP - Total Sulfur	-	492.80	870.40	540.80	152.00	1312.00	1436.80	4.37	15.62
NNP	Pyritic S-Recalculated	153.70	271.70	168.70	284.70	409.70	448.70	229.30	51.80
Total Sulfur	%	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	1.99	0.11
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.37	0.06
Sulfate Sulfur	%	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	0.61	0.05
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
NAG pH	s.u.	-	-	-	8.9	7.89	-	-	9.51

Sample_ID	Units	2263611	2263613	2263672	2263688	2263689	1461-02	1506-03	1511-01
Hole	-	A-864	A-878	HB-2128	HB-2154	HB-2154	1461	1506	1511
From	ft	587	1123	647	245	405	156	818	300
To	ft	592	1128	652	250	410	210	823	350
Formation	-	Martin	Martin	Martin	Martin	Martin	Martin	Martin	Martin
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	2.1875	4.0625	<0.3125	1.25	1.5625	<0.3	2	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	2.2	4.4	<0.3125	2.8	1.9	<0.3125	10.0	<0.3125
ANP	$TCaCO_3$/ kT	876	835	225	603	760	876	489	863
ANP/AGP - Pyritic Sulfur	-	400.46	205.54	720.00	482.40	486.40	2920.00	244.50	2876.67
ANP/AGP - Total Sulfur	-	400.46	190.86	720.00	214.40	405.33	2803.20	48.90	2761.60
NNP	Pyritic S-Recalculated	873.81	830.94	224.69	601.75	758.44	875.70	487.00	862.70
Total Sulfur	%	0.07	0.14	<0.01	0.09	0.06	<0.01	0.32	<0.01
Pyritic Sulfur	%	0.07	0.13	<0.01	0.04	0.05	<0.01	0.06	<0.01
Sulfate Sulfur	%	<0.01	0.01	<0.01	0.05	0.01	<0.01	0.26	<0.01
Non-extractable Sulfur	%	-	-	-	-	-	<0.01	<0.01	<0.01
NAG pH	s.u.	-	-	-	-	-	8.48	-	8.78

Sample_ID	Units	1916-01	A856-01	A866-01	A878-01	1462-01	1462-02	1485-01	A821-01
Hole	-	1916	A856	A866	A878	1462	1462	1485	A821
From	ft	1739	994	1261	1016	11	460	7	604
To	ft	1744	1048	1281	1056	50	510	42	638
Formation	-	Martin	Martin	Martin	Martin	Overburden	Overburden	Overburden	Overburden
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	<0.3	4.1	<0.3	0.9	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	<0.3125	5.0	1.3	2.2	8.8	0.3
ANP	$TCaCO_3$/ kT	738	707	599	576	115	11.7	25.7	47.3
ANP/AGP - Pyritic Sulfur	-	2460.00	2356.67	1996.67	140.49	383.33	13.00	85.67	157.67
ANP/AGP - Total Sulfur	-	2361.60	2262.40	1916.80	115.20	92.00	5.35	2.94	151.36
NNP	Pyritic S-Recalculated	737.70	706.70	598.70	571.90	114.70	10.80	25.40	47.00
Total Sulfur	%	<0.01	<0.01	<0.01	0.16	0.04	0.07	0.28	0.01
Pyritic Sulfur	%	<0.01	<0.01	<0.01	0.13	<0.01	0.03	<0.01	<0.01
Sulfate Sulfur	%	<0.01	<0.01	<0.01	0.03	0.02	0.04	0.28	0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
NAG pH	s.u.	-	7.83	7.49	8.41	8.23	8.04	8.14	8.79

Sample_ID	Units	A830-02	AR2039-01	AR2039-02	AR2039-04	AR2039-05	2263612	2263682	1503-01
Hole	-	A830	AR2039	AR2039	AR2039	AR2039	A-866	HB-2143	1503
From	ft	100	0	200	0	200	106	872	75
To	ft	150	50	250	50	250	111	877	82
Formation	-	Overburden	Overburden	Overburden	Overburden	Overburden	Qmp	Qmp	Qmp
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	1.3	1.9	1.6	<0.3	0.3	<0.3125	<0.3125	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	5.0	10.0	5.3	5.9	3.8	<0.3125	0.3	0.6
ANP	$TCaCO_3$/ kT	62.6	9.5	19	4.2	19.2	139	18	5.6
ANP/AGP - Pyritic Sulfur	-	48.15	5.00	11.88	14.00	64.00	444.80	57.60	18.67
ANP/AGP - Total Sulfur	-	12.52	0.95	3.58	0.71	5.12	444.80	57.60	8.96
NNP	Pyritic S-Recalculated	61.30	7.60	17.40	3.90	18.90	138.69	17.69	5.30
Total Sulfur	%	0.16	0.32	0.17	0.19	0.12	<0.01	0.01	0.02
Pyritic Sulfur	%	0.04	0.06	0.05	<0.01	0.01	<0.01	<0.01	<0.01
Sulfate Sulfur	%	0.06	0.21	0.1	0.09	0.06	<0.01	0.01	0.02
Non-extractable Sulfur	%	0.06	0.05	0.02	0.1	0.05	-	-	<0.01
NAG pH	s.u.	8.17	8.95	8.49	8.56	8.71	-	-	7.43

Sample_ID	Units	1506-01	1926-01	A815-02	A855-01	AR2034-01	AR2036-02	AR2036-04	AR2037-03
Hole	-	1506	1926	A815	A855	AR2034	AR2036	AR2036	AR2037
From	ft	41	224	931	907	0	965	965	705
To	ft	53	262	982	947	50	1015	1015	725
Formation	-	Qmp	Qmp	Qmp	Qmp	Qmp	Qmp	Qmp	Qmp
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	<0.3125	0.3	<0.3125	0.3	1.9	0.9	<0.3125
ANP	$TCaCO_3$/ kT	9.3	12.2	10.1	20.6	2.1	4.7	<0.3	36.7
ANP/AGP - Pyritic Sulfur	-	31.00	40.67	33.67	68.67	7.00	15.67	1.00	122.33
ANP/AGP - Total Sulfur	-	29.76	39.04	32.32	65.92	6.72	2.51	0.32	117.44
NNP	Pyritic S-Recalculated	9.00	11.90	9.80	20.30	1.80	4.40	0.00	36.40
Total Sulfur	%	<0.01	<0.01	0.01	<0.01	0.01	0.06	0.03	<0.01
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulfate Sulfur	%	<0.01	<0.01	0.01	<0.01	0.01	0.04	0.01	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	<0.01
NAG pH	s.u.	7.28	7	8.27	9.61	6.58	7.56	5.67	8.46

Sample_ID	Units	Qmp Column Leach	2263696	2263714	2263716	2012 13-21 Year Composite	2012 4-7 Year Composite	2012 8-12 Year Composite
Hole	-	Leach	HB-2163	HB-2158	HB-2158	Tailings	Tailings	Tailings
From	ft	-	460	351	408	-	-	-
To	ft	-	465	356	413	-	-	-
Formation	-	Qmp	Scherrer	Scherrer	Scherrer	Tailings	Tailings	Tailings
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3125	<0.3125	<0.3125	<0.3	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	1.9	<0.3125	<0.3125	<0.3125	15.6	2.5	0.9
ANP	$TCaCO_3$/ kT	1.6	595	601	5	3533	424	309
ANP/AGP - Pyritic Sulfur	-	5.33	1904.00	1923.20	16.00	11776.67	1413.33	1030.00
ANP/AGP - Total Sulfur	-	0.85	1904.00	1923.20	16.00	226.11	169.60	329.60
NNP	Pyritic S-Recalculated	1.30	594.69	600.69	4.69	3532.70	423.70	308.70
Total Sulfur	%	0.06	<0.01	<0.01	<0.01	0.5	0.08	0.03
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulfate Sulfur	%	0.06	<0.01	<0.01	<0.01	0.5	0.08	0.03
Non-extractable Sulfur	%	<0.01	-	-	-	<0.01	<0.01	<0.01
NAG pH	s.u.	4.44	-	-	-	8.51	8.13	8.35

Appendix B
ABA Testing Results

Sample_ID	Units	4-7 Year Composite	Colina	Earp	Epitaph	Escarbosa	Horquilla	June 2012 1-3 Year Composite
Hole	-	Tailings	Tailings	Tailings	Tailings	Tailings	Tailings	Tailings
From	ft	-	-	-	-	-	-	-
To	ft	-	-	-	-	-	-	-
Formation	-	Tailings	Tailings	Tailings	Tailings	Tailings	Tailings	Tailings
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	4.89	1.1	6.1	22.6	8.16	9	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	11.3	2.2	9.1	37.5	25.9	25.0	1.6
ANP	$TCaCO_3$/ kT	241	181	145	400	371	548	247
ANP/AGP - Pyritic Sulfur	-	49.28	164.55	23.77	17.70	45.47	60.89	823.33
ANP/AGP - Total Sulfur	-	21.42	82.74	16.00	10.67	14.30	21.92	158.08
NNP	Pyritic S-Recalculated	236.11	179.90	138.90	377.40	362.84	539.00	246.70
Total Sulfur	%	0.36	0.07	0.29	1.2	0.83	0.8	0.05
Pyritic Sulfur	%	0.16	0.03	0.19	0.72	0.26	0.29	<0.01
Sulfate Sulfur	%	0.18	0.04	0.09	0.46	0.55	0.49	0.05
Non-extractable Sulfur	%	0.02	<0.01	0.01	0.02	0.02	0.02	<0.01
NAG pH	s.u.	9.34	11.48	8.88	7.99	9.63	11.27	11.32

Sample_ID	Units	May 2012 1-3 Year Composite	Tailings-022807	Tailings-05 June2007	Tailings-May 2006	TTTP-07-02 (BU-01)	TTTP-07-02, BU-01	TTTP-07-03	TTTP-07-03 (BU-01)
Hole	-	Tailings	Tailings	Tailings	Tailings	TTTP-07-02	TTTP-07-02	TTTP-07-03	TTTP-07-03
From	ft	-	-	-	-	-	-	-	-
To	ft	-	-	-	-	-	-	-	-
Formation	-	Tailings	Tailings	Tailings	Tailings	Tailings	Tailings	Tailings	Tailings
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	<0.3	<0.3	1	<0.3	<0.3	<0.3	<0.3
AGP-Total Sulfur	$TCaCO_3$/ kT	2.2	<0.3125	1.3	1.6	<0.3125	<0.3125	<0.3125	<0.3125
ANP	$TCaCO_3$/ kT	260	332	248	426	3.1	5.3	825	866
ANP/AGP - Pyritic Sulfur	-	866.67	1106.67	826.67	426.00	10.33	17.67	2750.00	2886.67
ANP/AGP - Total Sulfur	-	118.86	1062.40	198.40	272.64	9.92	16.96	2640.00	2771.20
NNP	Pyritic S-Recalculated	259.70	331.70	247.70	425.00	2.80	5.00	824.70	865.70
Total Sulfur	%	0.07	<0.01	0.04	0.05	<0.01	<0.01	<0.01	<0.01
Pyritic Sulfur	%	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Sulfate Sulfur	%	0.07	<0.01	0.04	0.04	<0.01	<0.01	<0.01	<0.01
Non-extractable Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
NAG pH	s.u.	8.09	7.87	8.25	-	5.68	8.21	11.4	9.45

Appendix B
ABA Testing Results

Sample_ID	Units	Year 0-3 Tailings	Composite-1	LC-032707-01 3-12	LC-032707-01 36-60	S-01	S-02	S-03	S-04
Hole	-	Tailings	Composite	LC-032707	LC-032707	Surface	Surface	Surface	Surface
From	ft	-	-	-	-	-	-	-	-
To	ft	-	-	-	-	-	-	-	-
Formation	-	Tailings	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
AGP-Pyritic Sulfur	$TCaCO_3$/ kT	<0.3	16.3	<0.3	<0.3	6.3	<0.3	2.2	1.3
AGP-Total Sulfur	$TCaCO_3$/ kT	<0.3125	18.8	<0.3125	<0.3125	15.9	<0.3125	2.2	6.3
ANP	$TCaCO_3$/ kT	304	82.8	1.3	18.1	53.9	161	43.2	321
ANP/AGP - Pyritic Sulfur	-	1013.33	5.08	4.33	60.33	8.56	536.67	19.64	246.92
ANP/AGP - Total Sulfur	-	972.80	4.42	4.16	57.92	3.38	515.20	19.75	51.36
NNP	Pyritic S-Recalculated	303.70	66.50	1.00	17.80	47.60	160.70	41.00	319.70
Total Sulfur	%	<0.01	0.6	<0.01	<0.01	0.51	<0.01	0.07	0.2
Pyritic Sulfur	%	<0.01	0.52	<0.01	<0.01	0.2	<0.01	0.07	0.04
Sulfate Sulfur	%	<0.01	0.03	<0.01	<0.01	0.18	<0.01	<0.01	0.16
Non-extractable Sulfur	%	<0.01	0.05	<0.01	<0.01	0.13	<0.01	<0.01	<0.01
NAG pH	s.u.	-	9.38	-	-	8.45	7.37	7.33	7.91

APPENDIX C
MWMP testing results

Appendix C
MWMP Testing Results

Sample ID		Andesite Col. Leach	AR2011-03	AR2017-05	AR2025-03	AR2030-05
	Units					
Formation	-	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	3.34	8.02	7.95	7.41	7.51
Total Alkalinity	mg/L	0.0	0.0	63.5	24.5	20.8
Aluminum	mg/L	71.4	<0.03	<0.08	<0.08	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	0.0039	<0.025	0.0222	0.0095	0.0042
Barium	mg/L	0.0271	0.0281	0.0076	0.0049	0.0426
Beryllium	mg/L	0.0291	0	<0.002	<0.002	<0.002
Cadmium	mg/L	0.377	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	526	52.2	10.2	13.4	8.82
Chloride	mg/L	6.97	2.38	3.33	3.58	1.5
Chromium	mg/L	0.04	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	53.1	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	6.38	1.76	1.55	0.32	0.5
Iron	mg/L	1.09	<0.06	<0.06	<0.06	<0.06
Lead	mg/L	0.0342	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	187	13.5	2.79	1.8	1.59
Manganese	mg/L	31.1	0.033	<0.004	<0.004	<0.004
Molybdenum	mg/L	0.009	0	0	0	0
Nickel	mg/L	0.734	0	<0.01	<0.01	<0.01
Potassium	mg/L	9.81	48.8	5.57	3.5	3.51
Selenium	mg/L	0.13	0.1	0.32	0.14	0.04
Silver	mg/L	0.017	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	10.3	18.4	20.7	16.5	7.46
Sulfate	mg/L	2500	213	11.2	39.5	13
Thallium	mg/L	<0.015	0	<0.015	<0.015	<0.015
Total Dissolved Solids	mg/L	3890	350	119	103	57
Zinc	mg/L	21.5	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0.122	0.07	0	0	0
Total Metals	mg/L	366.3882	13.6975	3.0177	2.015	1.7997
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	75.745	0.030	0.040	0.040	0.040
Passing 200 Mesh	%	-	15.6	-	-	-
Weight	kg	5.31	5	5.06	5.02000	5.16
Moisture at Saturation	mL	-	706	-	-	-

Appendix C
MWMP Testing Results

Sample ID		AR2038-04	AR2038-06	AR2001-01	AR2017-07	AR2025-04
	Units					
Formation	-	Andesite	Andesite	Arkose	Arkose	Arkose
pH	s.u.	7.46	7.82	8.48	7.46	7.49
Total Alkalinity	mg/L	47.0	29.6	74.8	61.1	37.3
Aluminum	mg/L	<0.08	<0.08	0.034	<0.08	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	0.0311	0.0158	0.039	0.01	0.0079
Barium	mg/L	0.0073	0.0061	0.004	0.0064	0.0067
Beryllium	mg/L	<0.002	<0.002	0	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	20.3	9.75	14.5	32	8.17
Chloride	mg/L	5.33	2.91	2.02	6.48	2.34
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	<0.01	0.037	0.033
Fluoride	mg/L	0.84	0.48	2.09	1.13	0.31
Iron	mg/L	<0.06	<0.06	<0.06	<0.06	<0.06
Lead	mg/L	<0.0075	0.0874	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	3.9	1.83	1.96	6.75	1.05
Manganese	mg/L	0.015	<0.004	<0.004	0.0109	<0.004
Molybdenum	mg/L	0	0	0	0	0
Nickel	mg/L	<0.01	<0.01	0	<0.01	<0.01
Potassium	mg/L	4.12	2.66	9.64	9.62	2.71
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	21.8	10.8	6.45	15.8	7.74
Sulfate	mg/L	59.9	15.1	6.16	91.3	10.7
Thallium	mg/L	<0.015	<0.015	0	<0.015	<0.015
Total Dissolved Solids	mg/L	163	73	42.7723	202	59
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0	0	0.04	0	0
Total Metals	mg/L	4.1476	2.1312	2.1465	6.9955	1.2864
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.040	0.119	0.030	0.067	0.063
Passing 200 Mesh	%	-	-	23.2	-	-
Weight	kg	5.1	5.05	5	5.05	5.02
Moisture at Saturation	mL	-	-	722	-	-

Appendix C
MWMP Testing Results

Sample ID		AR2030-04	AR2036-03	AR2038-05	AR2039-06	AR2042-04
	Units					
Formation	-	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.82	7.28	7.87	7.79	8.26
Total Alkalinity	mg/L	73.5	32.6	48.1	69.6	35.7
Aluminum	mg/L	<0.08	<0.08	<0.08	<0.08	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	0.0232	0.0053	0.02	0.0111	<0.003
Barium	mg/L	0.0047	0.0028	0.003	0.0071	0.0035
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	10.2	8.23	8.32	19.3	7.78
Chloride	mg/L	7.39	2.8	2.59	5.18	1.2
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	0.017	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	0.73	0.35	0.56	0.9	0.35
Iron	mg/L	<0.06	<0.06	<0.06	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	1.58	1.37	1.03	3.93	1.36
Manganese	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Molybdenum	mg/L	0	0	0	0	0.000
Nickel	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Potassium	mg/L	6.24	1.38	1.99	6.55	0.75
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	22.6	5.71	15.7	32.6	5.05
Sulfate	mg/L	17.7	9.29	17.9	76.1	5.8
Thallium	mg/L	<0.015	<0.015	<0.015	<0.015	<0.015
Total Dissolved Solids	mg/L	110	51	70	194	38
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0	0	0	0	0
Total Metals	mg/L	1.8157	1.5808	1.2534	4.1466	1.5685
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.047	0.040	0.040	0.040	0.040
Passing 200 Mesh	%	-	-	-	-	-
Weight	kg	5.14	5.02	5.07	5.09	5.03
Moisture at Saturation	mL	-	-	-	-	-

Appendix C
MWMP Testing Results

Sample ID		UAGH-ARKOSE-01	AR2042-05	UAGH-GILA-01	UAGH-GLANCE-01	AR2000-04
	Units					
Formation	-	Arkose	Concha	Gila	Glance	Horquilla
pH	s.u.	7.98	7.42	8.05	8.01	9.54
Total Alkalinity	mg/L	149.1	36.6	98.1	72.0	65.3
Aluminum	mg/L	<0.08	<0.08	<0.08	<0.08	<0.03
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	0.0052	<0.003	0.0047	0.0033	<0.025
Barium	mg/L	0.0194	0.0029	0.063	<0.002	0.0151
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002	0
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	27.8	8.69	30.5	29.2	59.4
Chloride	mg/L	1.22	0.88	1.39	7.53	67.2
Chromium	mg/L	<0.006	<0.006	<0.06	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	0.93	0.17	0.58	0.65	1.62
Iron	mg/L	<0.06	<0.06	<0.06	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	0.112	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	7.84	0.88	2.08	1.62	<0.06
Manganese	mg/L	0.0118	<0.004	<0.004	0.009	<0.004
Molybdenum	mg/L	0.164	0	0.009	0.067	0
Nickel	mg/L	<0.01	<0.01	<0.01	<0.01	0
Potassium	mg/L	22.6	0.83	3.72	3.65	9.36
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	5.93	5.29	7.41	2.08	8.6
Sulfate	mg/L	18.7	6.34	22.1	17.2	29.1
Thallium	mg/L	<0.015	<0.015	<0.015	<0.015	0
Total Dissolved Solids	mg/L	180	35	133	143	175
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0.013	0	0.201	1.43	0.03
Total Metals	mg/L	8.0585	1.0885	2.2902	1.9383	0.2285
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.040	0.040	0.040	0.144	0.030
Passing 200 Mesh	%	8	-	12	19.6	12.4
Weight	kg	5	5	5	5	5
Moisture at Saturation	mL	540	-	924	947	627

Appendix C
MWMP Testing Results

Sample ID		AR2042-06	Leach-01	AR2039-04	AR2039-05	AR2036-04
	Units					
Formation	-	Horquilla	Leach grade material (not leached)	Overburden	Overburden	Qmp
pH	s.u.	8.03	8.23	7.63	8.05	7.41
Total Alkalinity	mg/L	59.7	57.6	75.2	83.4	15.4
Aluminum	mg/L	<0.08	<0.03	<0.08	<0.08	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	0.0267	<0.025	0.0638	0.0711	<0.003
Barium	mg/L	0.0047	0.0127	0.0082	0.0324	0.0034
Beryllium	mg/L	<0.002	0	<0.002	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	17.4	19.5	12.8	22.9	2.21
Chloride	mg/L	4.9	28.9	3.92	14.4	0.71
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	0.01	0.016	0.012	<0.01
Fluoride	mg/L	1.3	1.44	1.22	1.39	0.26
Iron	mg/L	<0.06	<0.06	<0.06	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	4.44	2.64	1.58	4.38	0.39
Manganese	mg/L	<0.004	0.013	<0.004	<0.004	<0.004
Molybdenum	mg/L	0	0	0.037	0.147	0
Nickel	mg/L	<0.01	0	<0.01	<0.01	<0.01
Potassium	mg/L	3.92	15	4.79	3.08	0.59
Selenium	mg/L	0.18	0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	18.8	16.9	26.5	46.5	4.37
Sulfate	mg/L	49.7	26.4	33.6	87.9	3.6
Thallium	mg/L	<0.015	0	<0.015	<0.015	<0.015
Total Dissolved Solids	mg/L	138	110.58	155	285	20
Zinc	mg/L	<0.01	<0.1	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0	<0.02	0	0	0
Total Metals	mg/L	4.6722	2.9075	1.8553	4.6586	0.5985
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.040	0.120	0.046	0.042	0.040
Passing 200 Mesh	%	-	2	-	-	-
Weight	kg	5.09	5	5.05	5.17	5.08
Moisture at Saturation	mL	-	777	-	-	-

Appendix C
MWMP Testing Results

Sample ID		Qmp Column Leach	2012 13-21 Year Composite	2012 4-7 Year Composite	2012 8-12 Year Composite	4-7 Year Composite
	Units					
Formation	-	Qmp	Tailings	Tailings	Tailings	Tailings
pH	s.u.	3.65	8.18	8.83	8.78	8.52
Total Alkalinity	mg/L	0.0	7.1	8.3	11.9	8.8
Aluminum	mg/L	14	<0.08	<0.08	<0.08	<0.08
Antimony	mg/L	<0.02	<0.003	<0.003	<0.003	<0.02
Arsenic	mg/L	<0.003	<0.025	<0.025	<0.025	<0.025
Barium	mg/L	0.0422	0.021	0.0331	0.0061	0.0191
Beryllium	mg/L	0.0075	<0.002	<0.002	<0.002	-
Cadmium	mg/L	0.0849	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	172	644	371	23.4	52.6
Chloride	mg/L	2.8	22.2	3.75	0.8	6.27
Chromium	mg/L	0.014	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	90.1	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	1.57	1.41	1.37	0.66	6.49
Iron	mg/L	0.46	<0.06	<0.06	<0.06	<0.06
Lead	mg/L	0.0445	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	0.00038	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	32	6.78	2.14	0.735	13.8
Manganese	mg/L	6.78	<0.004	<0.004	<0.004	0.0081
Molybdenum	mg/L	<0.008	0.193	0.359	0.034	0
Nickel	mg/L	0.141	<0.01	<0.01	<0.01	-
Potassium	mg/L	3.07	16.7	8.38	4.43	11.6
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	0.007	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	6.21	21.6	9.16	<4	33.9
Sulfate	mg/L	772	1380	826.0	55.8	264
Thallium	mg/L	<0.015	<0.001	<0.001	<0.001	-
Total Dissolved Solids	mg/L	1250	2360	1400	116	387.9215
Zinc	mg/L	4.95	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0.058	-	<0.1	-	<0.5
Total Metals	mg/L	148.5909	6.9935	2.3535	0.9485	14.0226
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	95.320	0.040	0.040	0.040	0.030
Passing 200 Mesh	%	-	-	-	-	-
Weight	kg	5.17	-	-	-	5
Moisture at Saturation	mL	-	-	-	-	-

Appendix C
MWMP Testing Results

Sample ID		Colina	Earp	Epitaph	Horquilla	June 2012 1-3 Year Composite
	Units					
Formation	-	Tailings	Tailings	Tailings	Tailings	Tailings
pH	s.u.	8.65	7.98	8.13	8.38	9.15
Total Alkalinity	mg/L	140.7	71.4	64.0	29.27	22.6
Aluminum	mg/L	<0.08	<0.08	<0.08	*<0.08*	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	*<0.02*	0.0104
Arsenic	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025
Barium	mg/L	0.0346	0.0297	0.0266	0.008	0.0278
Beryllium	mg/L	-	-	-	-	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	*<0.002*	<0.002
Calcium	mg/L	658	151	557	29.4	27.5
Chloride	mg/L	4.14	3.51	<1	3.56	3.56
Chromium	mg/L	<0.006	<0.006	<0.006	*<0.006*	<0.006
Copper	mg/L	0.011	0.01	0.016	*<0.01*	<0.01
Fluoride	mg/L	2.76	1.25	0.94	1.05	0.98
Iron	mg/L	<0.06	<0.06	<0.06	*<0.06*	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	*<0.0075*	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	*<0.0002*	<0.0002
Magnesium	mg/L	15.5	11.4	148	0.535	0.374
Manganese	mg/L	<0.004	0.0372	0.0988	<0.004	<0.004
Molybdenum	mg/L	-	-	-	-	0.342
Nickel	mg/L	-	-	-	-	<0.01
Potassium	mg/L	5.53	15	17.9	4.97	7.65
Selenium	mg/L	0.048	<0.04	<0.04	*<0.04*	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	*<0.005*	<0.005
Sodium	mg/L	15.4	33.9	32.6	19.3	17.7
Sulfate	mg/L	1560	435	1960	91.1	90.4
Thallium	mg/L	-	-	-	-	<0.001
Total Dissolved Solids	mg/L	2260.7039	650.3812	2714.8257	149.1533	203
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	<0.5	<0.5	<0.5	<0.5	0.052
Total Metals	mg/L	15.7195	11.6517	148.3193	0.7535	0.5949
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.031	0.030	0.036	0.030	0.040
Passing 200 Mesh	%	-	-	-	-	-
Weight	kg	-	-	-	-	-
Moisture at Saturation	mL	-	-	-	-	-

Sample ID		May 2012 1-3 Year Composite	Tailings-05 June2007	TTTP-07-02, BU-01	TTTP-07-03	Year 0-3 Tailings
	Units					
Formation	-	Tailings	Tailings	*Tailings*	Tailings	Tailings
pH	s.u.	9.25	7.43	*7.51*	7.86	8.51
Total Alkalinity	mg/L	19	31.0309966	*14.3759241*	67.99124163	12.91652182
Aluminum	mg/L	<0.08	<0.08	*<0.08*	<0.08	<0.08
Antimony	mg/L	0.0144	<0.02	*<0.02*	<0.02	<0.02
Arsenic	mg/L	<0.0025	<0.003	*<0.003*	0.0034	<0.003
Barium	mg/L	0.0268	0.0172	*0.0053*	0.004	0.0229
Beryllium	mg/L	<0.002	<0.002	*<0.002*	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	*<0.002*	<0.002	<0.002
Calcium	mg/L	28.5	103	*2.37*	17.9	150
Chloride	mg/L	5.27	5.69	*0.44*	0.37	5.18
Chromium	mg/L	<0.006	<0.006	*<0.006*	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	*<0.01*	0.036	<0.01
Fluoride	mg/L	0.76	1.02	*0.36*	0.17	1.11
Iron	mg/L	<0.06	<0.06	*<0.06*	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	*<0.0075*	<0.0075	<0.008
Mercury	mg/L	<0.0002	0.00033	*<0.0002*	<0.0002	<0.0002
Magnesium	mg/L	0.406	0.65	*0.81*	0.87	1.91
Manganese	mg/L	<0.004	0.0186	*0.0061*	<0.004	0.0172
Molybdenum	mg/L	0.208	0.46	*0*	<0.008	0.463
Nickel	mg/L	<0.01	<0.01	*<0.01*	<0.01	<0.01
Potassium	mg/L	7.77	8.33	*1.63*	4.61	11.3
Selenium	mg/L	<0.04	<0.04	*<0.04*	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	*<0.005*	<0.005	<0.005
Sodium	mg/L	17.5	27.6	*2.16*	2.96	37.1
Sulfate	mg/L	97.3	285	*3.26*	3.42	441
Thallium	mg/L	<0.001	<0.015	*<0.015*	<0.015	<0.015
Total Dissolved Solids	mg/L	212	505	*11.0547*	62	647.8319
Zinc	mg/L	<0.02	<0.01	*<0.01*	<0.01	<0.01
Nitrate (as N)	mg/L	0.148	0.021	*0.284*	0.944	0
Total Metals	mg/L	0.6184	0.8731	*1.0206*	1.1049	2.1322
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.050	0.040	*0.040*	0.066	0.040
Passing 200 Mesh	%	-	50.4	-	-	-
Weight	kg	-	5	*5.02*	5.01	5
Moisture at Saturation	mL	-	-	-	-	-

Sample ID		Composite-1	S-01	S-02
	Units			
Formation	-	Unknown	Unknown	Unknown
pH	s.u.	7.57	8.29	8.16
Total Alkalinity	mg/L	43.33908396	191.5985143	75.56285413
Aluminum	mg/L	<0.03	<0.03	<0.03
Antimony	mg/L	<0.02	<0.02	<0.02
Arsenic	mg/L	<0.025	<0.025	<0.025
Barium	mg/L	0.027	0.049	0.0123
Beryllium	mg/L	0	0	0
Cadmium	mg/L	<0.002	<0.002	<0.002
Calcium	mg/L	40.7	49.2	33.4
Chloride	mg/L	4.22	3.07	3.2
Chromium	mg/L	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	0.143	<0.023
Fluoride	mg/L	1.51	2.17	0.34
Iron	mg/L	<0.06	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	0.0003
Magnesium	mg/L	6.24	10.7	3.7
Manganese	mg/L	0.02	0.014	0.011
Molybdenum	mg/L	0	0	0
Nickel	mg/L	0	0	0
Potassium	mg/L	23.9	17.9	8.79
Selenium	mg/L	0.05	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005
Sodium	mg/L	15	6.04	3.6
Sulfate	mg/L	143	38.5	48.2
Thallium	mg/L	0	0	0
Total Dissolved Solids	mg/L	234.4713	129.2403	102.2331
Zinc	mg/L	<0.01	<0.01	<0.012
Nitrate (as N)	mg/L	<0.02	1.66	1.21
Total Metals	mg/L	6.4245	11.0115	3.8905
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.030	0.163	0.045
Passing 200 Mesh	%	18.4	6	3.6
Weight	kg	5	2.4	4
Moisture at Saturation	mL	871	461	740

APPENDIX D
SPLP testing results

Appendix D
SPLP Testing Results

Sample ID		1461-01	1461-02	1506-02	1530-01	1561-01	1561-02	1561-03	1596-03
	Units								
Formation	-	Escabrosa	Martin	Escabrosa	Horquilla	Abrigo	Bolsa	Abrigo	Horquilla
pH	s.u.	3.34	8.02	9.74	8.38	9.66	8.53	9.49	8.39
Aluminum	mg/L	<0.08	<0.08	<0.08	0.08	0.2	<0.08	0.2	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Barium	mg/L	0.003	0.003	0.002	0.11	<0.002	0.01	<0.002	0.02
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	0.006	<0.002	<0.002
Calcium	mg/L	5.8	4.5	6.7	130	5.6	2.6	6.4	198
Chloride	mg/L	0.98	0.86	0.61	6.95	1.36	0.42	0.38	0.63
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.3	<0.01	<0.01
Fluoride	mg/L	0.23	0.14	0.82	0.44	0.4	0.54	0.35	0.53
Iron	mg/L	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	2.9	3.2	0.1	8	0.4	0.4	0.4	8.7
Manganese	mg/L	<0.004	<0.004	<0.004	0.01	<0.004	0.61	<0.004	0.03
Molybdenum	mg/L	<0.008	<0.008	0.01	0.06	<0.008	<0.008	<0.008	0.008
Nickel	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Potassium	mg/L	0.69	4.1	<0.5	2.23	3.47	2.61	2.56	0.93
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	2.3	1.7	1.7	2.4	1.9	2.8	1.2	1.5
Sulfate	mg/L	1.4	1.6	3.9	342	6	15.3	1.9	514
Thallium	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Dissolved Solids	mg/L	0	0	0	0	0	0	0	0
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.12	<0.01	<0.01
Nitrate (as N)	mg/L	0	0	0	0	0	0	0	0
Uranium	mg/L	<0.004	<0.004	<0.004	<0.005	<0.004	<0.005	<0.005	<0.005
Total Metals	mg/L	3.1405	3.4405	0.3405	8.2475	0.7605	1.6515	0.7615	8.9675
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.040	0.040	0.040	0.040	0.040	0.444	0.040	0.040

Appendix D
SPLP Testing Results

Sample ID		1916-02	1926-01	1926-02	2012 13-21 Year Composite	2012 4-7 Year Composite	2012 8-12 Year Composite	4-7 Year Composite	A780-02
	Units								
Formation	-	Abrigo	Qmp	Abrigo	Tailings	Tailings	Tailings	Tailings	Bolsa
pH	s.u.	9.20	-	-	9.22	9.02	9.4	7.98	9.29
Aluminum	mg/L	0.4	0.67	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.003	<0.003	<0.003	<0.02	<0.02
Arsenic	mg/L	<0.02	0.0133	0.0052	<0.025	<0.025	<0.025	<0.02	<0.02
Barium	mg/L	<0.002	0.0334	0.0053	0.0074	0.019	<0.004	0.02	<0.002
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	6.3	4.7	5.07	141	31.5	9.25	10.5	1.5
Chloride	mg/L	<0.2	2.03	1.39	0.45	0.2	<0.2	0.425	0.49
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Fluoride	mg/L	0.15	0.2	0.3	0.45	0.44	0.4	1.12	<0.1
Iron	mg/L	<0.06	0.189	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	0.0006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	0.5	0.35	0.8	1.49	0.286	0.323	2.5	0.4
Manganese	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	0.006	<0.004	0.22
Molybdenum	mg/L	0.24	0	0	0.029	0.094	<0.008	-	<0.008
Nickel	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01
Potassium	mg/L	8.84	3.95	5.87	1.52	0.75	1.09	1.05	3.06
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	1.9	6	1.01	<4	<4	<4	3.2	3.2
Sulfate	mg/L	4.4	1.88	1.55	319	75.1	8.1	24	10.4
Thallium	mg/L	<0.02	<0.015	<0.015	<0.001	<0.001	<0.001	-	<0.02
Total Dissolved Solids	mg/L	0	24	13	643	136	32	-	0
Zinc	mg/L	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01
Nitrate (as N)	mg/L	0	0	0	<0.1	<0.1	<0.1	<0.5	0
Uranium	mg/L	<0.005	0	0	<0.001	<0.001	<0.001	-	<0.002
Total Metals	mg/L	1.0615	1.3388	1.0217	1.7255	0.5215	0.5605	2.7245	0.8545
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.040	0.080	0.040	0.050	0.050	0.050	0.030	0.040

Appendix D
SPLP Testing Results

Sample ID		A808-02	A814-02	A815-01	A815-02	A818-01	A821-01	A830-01	A842-01
	Units								
Formation	-	Concha	Escabrosa	Colina	Qmp	Abrigo	Overburden	Epitaph	Horquilla
pH	s.u.	-	9.75	5.65	-	9.38	-	-	9.32
Aluminum	mg/L	<0.08	<0.08	<0.08	0.25	0.1	0.24	<0.08	0.09
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	<0.003	<0.02	<0.02	0.0032	<0.02	0.013	<0.003	<0.02
Barium	mg/L	0.0182	0.002	0.03	0.0048	<0.002	0.0717	0.0393	0.002
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	5.01	4.3	6.9	5.24	5.7	4.7	534	7.5
Chloride	mg/L	0.88	0.63	0.78	0.84	0.66	1.94	1	2.09
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	<0.1	0.28	2.42	0.4	0.1	0.33	1.37	0.29
Iron	mg/L	<0.06	0	<0.06	<0.06	<0.06	0.092	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	0	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	2.61	2	1.3	0.673	0.6	0.555	15.2	0.5
Manganese	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Molybdenum	mg/L	0	<0.008	0.05	0	0.02	0	0	0.02
Nickel	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0	<0.01
Potassium	mg/L	2.14	2.29	3.04	3.22	2.08	2.03	11.9	2.49
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	0.8	2	2	6.35	2.2	10.3	1.73	2.6
Sulfate	mg/L	1.4	2.1	13.6	2.87	3.2	3.52	1450	1.9
Thallium	mg/L	<0.015	<0.02	<0.02	<0.015	<0.02	<0.015	0	<0.02
Total Dissolved Solids	mg/L	25	0	0	46	0	59	2200	0
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0	0	0	0	0	0	0.082	0
Uranium	mg/L	0	<0.004	<0.004	0	<0.005	0	<0.0003	<0.005
Total Metals	mg/L	2.8295	2.1805	1.5405	1.0637	0.8615	0.9765	15.4078	0.7515
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.040	0.040	0.040	0.041	0.040	0.040	0.030	0.040

Appendix D
SPLP Testing Results

Sample ID		A845-01	A847-01	A850-01	A856-01	A860-02	A865-01	A866-01	A866-02
	Units								
Formation	-	Earp	Epitaph	Epitaph	Martin	Epitaph	Colina	Martin	Horquilla
pH	s.u.	-	9.47	-	8.56	-	9.72	9.37	9.53
Aluminum	mg/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	<0.003	<0.02	0.004	<0.02	<0.003	<0.02	<0.02	<0.02
Barium	mg/L	0.0022	0.002	0.0053	0.002	0.0466	0.02	<0.002	<0.002
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	7.61	6.1	5.75	4.7	576	574	8.1	11.9
Chloride	mg/L	1.6	0.87	1.94	0.94	5.9	0.79	1.74	3.45
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	0.15	0.76	2.49	0.16	<1	0.3	0.47	1.21
Iron	mg/L	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	0.784	1.3	0.753	1.9	8.07	8.4	1.1	0.1
Manganese	mg/L	<0.004	<0.004	<0.004	<0.004	0.0067	0.009	<0.004	<0.004
Molybdenum	mg/L	0	0.03	0	0.03	0	0.04	0.01	0.04
Nickel	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Potassium	mg/L	3	1.59	2.76	3.12	2.32	4.21	1.55	<0.5
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	3.83	4	11.4	1.7	2.8	4	2.2	1.2
Sulfate	mg/L	9.88	10.2	3.6	2.3	1480	1540	9.3	8.5
Thallium	mg/L	<0.015	<0.02	<0.015	<0.02	<0.015	<0.02	<0.02	<0.02
Total Dissolved Solids	mg/L	50	0	43	0	2310	0	0	0
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0	0	0	0	0	0	0	0
Uranium	mg/L	0	<0.004	0	<0.004	0	<0.004	<0.004	<0.005
Total Metals	mg/L	1.0035	1.5405	0.9735	2.1405	8.2922	8.6455	1.3405	0.3415
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040

Appendix D
SPLP Testing Results

Sample ID		A872-01	A878-01	Andesite Col. Leach	AR2001-01	AR2002-03	AR2003-03	AR2004-04	AR2009-01
	Units								
Formation	-	Escabrosa	Martin	Andesite	Arkose	Epitaph	Arkose	Horquilla	Arkose
pH	s.u.	9.91	9.72	-	-	-	-	-	-
Aluminum	mg/L	<0.08	<0.08	3.56	0.37	<0.08	0.23	<0.03	0.28
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	<0.02	<0.02	<0.003	<0.025	<0.02	<0.025	<0.025	<0.025
Barium	mg/L	<0.002	0.004	0.0453	0.0041	0.03	0.004	0.003	0.0038
Beryllium	mg/L	<0.002	<0.002	0.0021	0	<0.002	0	0	0
Cadmium	mg/L	<0.002	<0.002	0.031	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	7	4.7	163	6.13	9.9	9.76	8.94	4.75
Chloride	mg/L	1.1	1.01	1.72	0.32	0.48	0.24	0.89	0.34
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	3.92	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	0.36	0.41	0.66	0.12	0.45	0.16	0.41	0.14
Iron	mg/L	<0.06	<0.06	<0.06	0.52	<0.06	<0.06	<0.06	0.08
Lead	mg/L	<0.0075	<0.0075	0.0114	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	0.1	1.3	14	0.68	1.1	0.95	0.16	0.85
Manganese	mg/L	<0.004	<0.004	2.86	0.0054	<0.004	<0.004	<0.004	<0.004
Molybdenum	mg/L	0.009	0.02	0.013	0	<0.008	0	0	0
Nickel	mg/L	<0.01	<0.01	0.046	0	<0.01	0	0	0
Potassium	mg/L	0.88	3.24	3.94	3.17	2.12	4.29	0.5	1.43
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	0.0281	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	1.9	6	2.63	2.89	2.8	1.97	1.21	6.45
Sulfate	mg/L	3.7	7.1	508	0.98	13.8	16.9	3.85	1.14
Thallium	mg/L	<0.02	<0.02	<0.015	0	<0.02	0	0	0
Total Dissolved Solids	mg/L	0	0	773	0	0	0	0	0
Zinc	mg/L	<0.01	<0.01	1.84	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0	0	0	0.03	0	0.02	0.04	0.03
Uranium	mg/L	<0.004	<0.004	0	<0.001	<0.005	<0.001	<0.001	<0.001
Total Metals	mg/L	0.3405	1.5405	26.3876	1.6619	1.3415	1.3305	0.3405	1.3005
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.040	0.040	5.848	0.030	0.040	0.030	0.030	0.030

Appendix D
SPLP Testing Results

Sample ID		AR2009-03	AR2011-01	AR2011-04	AR2013-01	AR2014-05	AR2016-01	AR2017-02	AR2019-03
	Units								
Formation	-	Andesite	Arkose	Colina	Andesite	Earp	Andesite	Earp	Earp
pH	s.u.	-	-	9.69	-	9.59	-	-	9.55
Aluminum	mg/L	0.11	0.45	<0.08	0.07	<0.08	0.28	0.18	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	<0.025	<0.025	<0.02	<0.025	<0.02	0.0236	0.0042	<0.02
Barium	mg/L	0.0028	0.004	0.007	0.0049	<0.002	0.0029	<0.002	0.01
Beryllium	mg/L	0	0	<0.002	0	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	10.5	4.39	7.6	19.2	6.8	5.11	6.03	9.4
Chloride	mg/L	0.29	0.5	1.06	0.53	0.57	1.01	0.37	0.6
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	0.3	0.23	1.12	0.4	0.49	0.22	0.21	0.56
Iron	mg/L	<0.06	0.66	<0.06	<0.06	<0.06	0.316	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	1.3	0.72	0.4	3.27	0.3	0.439	0.394	1.4
Manganese	mg/L	<0.004	<0.004	<0.004	0.0112	<0.004	<0.004	<0.004	<0.004
Molybdenum	mg/L	0	0.000	0.07	0	0.02	0.000	0	0.31
Nickel	mg/L	0	0	<0.01	0	<0.01	<0.01	<0.01	<0.01
Potassium	mg/L	5.19	3.34	0.99	10.5	2.07	2.76	1.7	2.44
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	3.4	3.36	1.6	1.82	5.4	7.11	3.35	5.9
Sulfate	mg/L	15.3	2.18	6.2	53.7	12.5	1.21	3.56	28.5
Thallium	mg/L	0	0	<0.02	0	<0.02	<0.015	<0.015	<0.02
Total Dissolved Solids	mg/L	0	0	0	0	0	46	33	0
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0.03	0.03	0	<0.02	0	0	0	0
Uranium	mg/L	<0.001	0	<0.004	<0.001	<0.004	0	0	<0.004
Total Metals	mg/L	1.5605	1.9195	0.6405	3.4977	0.5405	1.1351	0.7147	1.6405
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.030	0.030	0.040	0.030	0.040	0.040	0.040	0.040

Appendix D
SPLP Testing Results

Sample ID		AR2030-01	AR2032-01	AR2034-02	AR2035-02	AR2036-01	AR2039-01	AR2039-07	AR2040-01
	Units								
Formation	-	Earp	Andesite	Epitaph	Earp	Arkose	Overburden	Horquilla	Arkose
pH	s.u.	9.87	-	-	-	-	9.60	-	-
Aluminum	mg/L	0.08	0.12	<0.08	0.08	0.12	1	0.2	0.28
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	<0.02	0.0165	<0.02	<0.003	0.0121	0.0482	<0.02	0.06
Barium	mg/L	0.01	<0.002	0.004	0.0125	<0.002	0.0544	<0.002	0.004
Beryllium	mg/L	<0.002	0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	5.6	5.85	7.6	5.56	7.2	5.89	7.7	4.1
Chloride	mg/L	0.77	0.46	<0.2	1.5	0.55	0.42	2.32	0.95
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	0.76	0.286	0.75	0.37	0.39	0.31	0.33	0.24
Iron	mg/L	<0.06	0.15	<0.06	<0.06	<0.06	0.574	<0.06	0.099
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.031	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00192
Magnesium	mg/L	0.6	0.6	2.7	0.775	0.791	0.61	0.3	0.726
Manganese	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	0.0108	<0.004	0.0069
Molybdenum	mg/L	0.009	0	0.04	0	0	0	0.58	0
Nickel	mg/L	<0.01	0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Potassium	mg/L	1.6	2.94	1.02	3.05	3.33	3.4	<0.5	2.07
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	4.2	5.49	1.2	3.58	2.3	7.5	1.6	10.3
Sulfate	mg/L	4.4	1.14	12.4	2.63	6.33	3.56	2	1.83
Thallium	mg/L	<0.02	0	<0.02	<0.015	<0.015	<0.015	<0.02	<0.015
Total Dissolved Solids	mg/L	0	32	0	35	26	43	0	41
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.015	<0.01	<0.01
Nitrate (as N)	mg/L	0	0.075	0	0	0	0	0	0
Uranium	mg/L	<0.004	0	<0.005	0	0	0	<0.005	0
Total Metals	mg/L	0.8405	0.951	2.9415	0.9945	1.0596	2.344	0.6615	1.2444
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.040	0.030	0.040	0.040	0.040	0.068	0.040	0.040

Appendix D
SPLP Testing Results

Sample ID		AR2041-01	AR2041-02	AR2042-03	AR2043-03	AR2059-01	AR2066-01	AR2072-01	Colina
	Units								
Formation	-	Arkose	Colina	Horquilla	Horquilla	Bolsa	Bolsa	Bolsa	Tailings
pH	s.u.	9.28	9.66	-	9.59	9.09	9.69	9.41	8.01
Aluminum	mg/L	0.16	<0.08	<0.08	<0.08	<0.08	0.2	0.2	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	0.0093	<0.02	0.0048	<0.02	<0.02	<0.02	<0.02	<0.02
Barium	mg/L	0.0305	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.02
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	6.83	4.8	6.37	7.4	0.6	6.9	2.1	193
Chloride	mg/L	1.32	0.71	1.3	1.12	0.57	0.59	0.47	0.218
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	<0.01
Fluoride	mg/L	0.55	0.61	0.39	0.47	0.1	0.27	0.17	0.844
Iron	mg/L	0.061	<0.06	<0.06	<0.06	0.07	<0.06	0.2	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002
Magnesium	mg/L	0.509	1	1.07	0.1	0.1	0.9	0.4	3.7
Manganese	mg/L	<0.004	<0.004	<0.004	<0.004	0.007	<0.004	0.004	<0.004
Molybdenum	mg/L	0	0.12	0	<0.008	<0.008	<0.008	<0.008	-
Nickel	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-
Potassium	mg/L	3.41	3.35	1.2	0.6	0.58	<0.5	1.45	1.27
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	3.42	3.1	2.45	4.1	2.8	3.8	5.6	1.4
Sulfate	mg/L	4.51	3.7	4.41	2.9	0.9	1.8	2.5	432
Thallium	mg/L	<0.015	<0.02	<0.015	<0.02	<0.02	<0.02	<0.02	-
Total Dissolved Solids	mg/L	32	0	30	0	0	0	0	-
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0	0	0	0	0	0	0	<0.1
Uranium	mg/L	0	<0.004	0	<0.005	<0.002	<0.002	<0.002	-
Total Metals	mg/L	0.8158	1.2405	1.2913	0.3415	0.3515	1.2585	0.8985	3.9245
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.030

Appendix D
SPLP Testing Results

Sample ID		Composite-1	Earp	Epitaph	Escarbosa	Horquilla	June 2012 1-3 Year Composite	Leach-01	May 2012 1-3 Year Composite
	Units								
Formation	-	Unknown	Tailings	Tailings	Tailings	Tailings	Tailings	Leach grade material (not leached)	Tailings
pH	s.u.	-	8.51	8.47	7.54	8.76	9.07	-	9.84
Aluminum	mg/L	0.1	<0.08	<0.08	<0.08	<0.08	<0.08	0.15	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.003	<0.02	<0.003
Arsenic	mg/L	<0.025	<0.02	<0.02	<0.02	<0.02	<0.025	<0.025	<0.025
Barium	mg/L	0.0037	0.05	0.02	0.02	0.005	0.0403	0.0027	0.0088
Beryllium	mg/L	0	-	-	-	-	<0.002	0	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	7.55	18.4	107	27.1	9.8	11	7.2	9.53
Chloride	mg/L	0.46	0.628	0.34	0.352	<0.2	0.33	1.73	0.33
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	0.17	<0.01	0.029	0.12
Fluoride	mg/L	0.22	0.63	0.846	1	0.694	1.23	0.1	0.78
Iron	mg/L	<0.06	<0.06	<0.06	<0.06	1.2	0.073	0.13	0.1
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Magnesium	mg/L	0.94	1	8.5	1.3	1.9	0.279	0.77	0.321
Manganese	mg/L	0.0066	<0.004	0.01	0.007	0.1	0.0095	<0.004	0.0098
Molybdenum	mg/L	0	-	-	-	-	0.052	0	0.029
Nickel	mg/L	0	-	-	-	-	<0.01	0	<0.01
Potassium	mg/L	5.49	1.97	1.04	0.86	0.84	1.01	2.8	0.52
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	4.27	3.3	3.3	2.1	2.4	<4	4.42	5.21
Sulfate	mg/L	9.57	36.8	278	61.5	6.88	6	2.61	7.24
Thallium	mg/L	0	-	-	-	-	<0.001	0	<0.001
Total Dissolved Solids	mg/L	0	-	-	-	-	44	0	44
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	0.05	<0.02	<0.01	<0.02
Nitrate (as N)	mg/L	0.03	<0.1	0.11	<0.1	<0.1	<0.1	0.06	<0.1
Uranium	mg/L	0	-	-	-	-	<0.001	0	<0.001
Total Metals	mg/L	1.1921	1.2245	8.7305	1.5275	3.5605	0.533	1.1585	0.7123
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.030	0.030	0.030	0.030	0.230	0.050	0.049	0.160

Appendix D
SPLP Testing Results

Sample ID		Qmp Column Leach	S-01	S-02	S-03	S-04	Tailings-022807	Tailings-05 June2007	Tailings-May 2006
	Units								
Formation	-	Qmp	Unknown	Unknown	Unknown	Unknown	Tailings	Tailings	Tailings
pH	s.u.	-	-	-	-	-	-	-	-
Aluminum	mg/L	0.36	0.27	0.04	0.17	<0.03	<0.08	<0.08	0
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0
Arsenic	mg/L	<0.003	<0.025	<0.025	<0.025	<0.025	<0.003	<0.003	<1
Barium	mg/L	0.0639	0.0091	0.0041	0.0066	<0.002	<0.002	0.0032	<10
Beryllium	mg/L	<0.002	0	0	0	0	0	<0.002	0
Cadmium	mg/L	0.0078	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.5
Calcium	mg/L	25.5	9.68	11.9	4.72	9.59	8.78	13.1	0
Chloride	mg/L	0.35	0.45	0.33	0.54	0.34	0.36	0.43	0
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<1
Copper	mg/L	14.3	0.125	0.193	0.061	0.023	<0.01	<0.01	0
Fluoride	mg/L	0.48	0.64	<0.1	<0.1	0.11	1.25	1.29	0
Iron	mg/L	<0.06	0.47	<0.06	0.39	<0.06	<0.06	<0.06	0
Lead	mg/L	0.025	0.0125	<0.0075	0.0491	<0.0075	<0.0075	<0.0075	<1
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.01
Magnesium	mg/L	3.16	1.38	1	1.74	0.44	0.23	0.172	0
Manganese	mg/L	0.873	0.0061	<0.004	0.0193	<0.004	<0.004	<0.004	0
Molybdenum	mg/L	0.008	0	0	0	0	0	0.075	0
Nickel	mg/L	<0.01	0	0	0	0	0	<0.01	0
Potassium	mg/L	2.46	2.63	1.35	3.65	0.62	0.62	0.86	0
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.5
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0
Sodium	mg/L	1.18	4.09	3.21	2.76	0.82	2.57	2.22	0
Sulfate	mg/L	112	2	3	2.57	3.77	7	20	0
Thallium	mg/L	<0.015	0	0	0	0	0	<0.015	0
Total Dissolved Solids	mg/L	167	0	0	0	0	13	66	0
Zinc	mg/L	0.555	0.017	0.056	0.071	<0.01	<0.01	<0.01	0
Nitrate (as N)	mg/L	0	0.2	0.14	0.09	0.12	0.04	0	0
Uranium	mg/L	0	<0.001	<0.001	<0.001	<0.001	0	0	0
Total Metals	mg/L	19.3868	2.3396	1.4195	2.5594	0.6335	0.4375	0.3915	3.5
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	14.898	0.157	0.259	0.183	0.043	0.030	0.040	1.500

Appendix D
SPLP Testing Results

Sample ID		TTTP-07-02, BU-01	TTTP-07-03	UAGH-Arkose-01	UAGH-Gila-01	UAGH-Glance-01	VABH0608-01	VABH0609-01	Year 0-3 Tailings
	Units								
Formation	-	Tailings	Tailings	Arkose	Gila	Glance	Bolsa	Arkose	Tailings
pH	s.u.	-	-	-	-	-	-	-	-
Aluminum	mg/L	0.28	0.09	0.16	0.36	<0.08	0.2	0.23	<0.08
Antimony	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	mg/L	<0.003	<0.003	0.0041	0.0083	0.0032	0.005	0.0033	<0.02
Barium	mg/L	<0.002	<0.002	<0.002	0.0054	<0.002	<0.002	0.003	0.02
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	0.829	6.41	3.28	8.11	10.1	0.759	2.55	15.6
Chloride	mg/L	0.39	<0.2	0.34	0.46	0.37	0.93	2.6	0.55
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	0.021	0.021	<0.01	<0.01	<0.01	0.049	0.032	<0.01
Fluoride	mg/L	0.22	0.12	0.21	0.27	0.2	0.37	0.28	0.85
Iron	mg/L	0.191	<0.06	0.488	0.209	<0.06	0.345	0.2	<0.06
Lead	mg/L	<0.0075	<0.0075	0.0203	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0007
Magnesium	mg/L	0.333	0.185	0.921	0.545	0.553	0.194	0.762	0.2
Manganese	mg/L	0.0056	<0.004	0.0177	0.0053	0.0064	<0.004	<0.004	<0.004
Molybdenum	mg/L	0	<0.008	0.018	<0.008	0.011	0	0	0.06
Nickel	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Potassium	mg/L	1.05	0.77	1.67	0.72	<0.5	1.96	1.85	1.24
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	4.02	<0.5	6	7.16	3.8	9.13	8.22	4.1
Sulfate	mg/L	1	1.21	1	1.9	1.07	0.97	1.76	35
Thallium	mg/L	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.02
Total Dissolved Solids	mg/L	20	11	38	54	48	27	32	0
Zinc	mg/L	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0	0	0	0	0	0	0	0
Uranium	mg/L	0	0	0	0	0	0	0	<0.002
Total Metals	mg/L	0.8961	0.4255	1.6781	1.2001	0.7751	0.8595	1.2938	0.4385
Ficklin Metals (Cu, Co, Cd, Pb, Ni, Zn)	mg/L	0.051	0.051	0.054	0.0395	0.0395	0.0785	0.0615	0.0395

APPENDIX E
Tabulated HCT testing results

Sample ID		A780-02 Composite	A780-02 Composite	A780-02 Composite	A780-02 Composite
Week	Units	0	4	8	12
Rock Unit	-	Bolsa	Bolsa	Bolsa	Bolsa
pH	s.u.	4.06	4.59	4.21	4
Redox	mV	181	181	181	181
Conductivity	mS/cm	0.16	0.16	0.16	0.16
Total Alkalinity	mg/L	0	1	0	0
Aluminum	mg/L	2.55	0.266	0.312	0.487
Antimony	mg/L	<0.003	<0.003	<0.003	<0.003
Arsenic	mg/L	<0.003	<0.003	<0.003	<0.003
Barium	mg/L	0.0329	0.018	0.0092	0.021
Beryllium	mg/L	0.00346	<0.002	<0.002	<0.002
Cadmium	mg/L	0.0512	0.0056	0.0029	0.002
Calcium	mg/L	72.1	9.39	4.21	3.37
Chloride	mg/L	10	0.469	<0.2	<0.2
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	10	1.34	1.03	1.35
Fluoride	mg/L	1.8	0.522	0.36	0.544
Fe 2+	mg/L	-	-	-	-
Fe 3+	mg/L	-	-	-	-
Iron	mg/L	0.909	0.079	0.085	0.219
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075
Magnesium	mg/L	17	1.55	0.529	0.318
Manganese	mg/L	18	1.68	0.629	0.495
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	mg/L	0.531	0.052	0.03	0.027
Potassium	mg/L	41.6	9.08	3.95	2.96
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	9.67	0.51	<0.5	<0.5
Sulfate	mg/L	373	49.7	34.1	31.7
Thallium	mg/L	<0.001	<0.001	<0.001	<0.001
TDS	mg/L	315	87	50	47
Zinc	mg/L	5.31	0.623	0.339	0.259
Cum SO4	mg	273.782	419.7012	519.8188	612.89
Cum Fe	mg	0.667206	0.89915	1.14871	1.791694
Pyritic Sulfur	%	0.290	0.290	0.290	0.290
ANP/AGP<Pyritic Sulfur	-	0.331	0.331	0.331	0.331

Sample ID		A780-02 Composite	A780-02 Composite	A780-02 Composite	A780-02 Composite
Week	Units	16	20	24	25
Rock Unit	-	Bolsa	Bolsa	Bolsa	Bolsa
pH	s.u.	3.98	3.73	3.63	3.37
Redox	mV	181	181	181	181
Conductivity	mS/cm	0.16	0.16	0.16	0.16
Total Alkalinity	mg/L	0	0	0	0
Aluminum	mg/L	0.659	0.945	0.786	0.858
Antimony	mg/L	<0.003	<0.003	<0.003	<0.003
Arsenic	mg/L	<0.003	<0.003	<0.003	<0.003
Barium	mg/L	0.0311	0.0219	<0.002	<0.002
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	2.27	1.55	1.2	1.3
Chloride	mg/L	0.207	0.365	0.796	0.358
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	1.37	1.37	0.987	0.831
Fluoride	mg/L	0.733	0.957	0.455	<0.5
Fe 2+	mg/L	-	-	-	-
Fe 3+	mg/L	-	-	-	-
Iron	mg/L	0.409	0.993	1.41	2.01
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075
Magnesium	mg/L	0.199	0.152	0.091	0.087
Manganese	mg/L	0.35	0.325	0.231	0.213
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	mg/L	0.026	0.02	0.014	0.015
Potassium	mg/L	2.58	2.29	1.78	1.6
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	<0.5	<0.5	<0.5	<0.5
Sulfate	mg/L	20.2	22.2	18.8	18.6
Thallium	mg/L	<0.001	<0.001	<0.001	<0.001
TDS	mg/L	31	38	46	<10
Zinc	mg/L	0.229	0.184	0.102	0.0768
Cum SO4	mg	672.1972	737.3764	792.5732	806.2256
Cum Fe	mg	2.992518	5.907966	10.047726	11.523066
Pyritic Sulfur	%	0.290	0.290	0.290	0.290
ANP/AGP<Pyritic Sulfur	-	0.331	0.331	0.331	0.331

Sample ID		A780-03 Composite	A780-03 Composite	A780-03 Composite	A780-03 Composite
Week	Units	0	4	8	12
Rock Unit	-	Bolsa	Bolsa	Bolsa	Bolsa
pH	s.u.	5.13	6.95	6.82	6.58
Redox	mV	181	181	181	181
Conductivity	mS/cm	0.16	0.16	0.16	0.16
Total Alkalinity	mg/L	2	2	1	1
Aluminum	mg/L	0.124	<0.08	<0.08	<0.08
Antimony	mg/L	<0.003	<0.003	<0.003	<0.003
Arsenic	mg/L	<0.003	<0.003	<0.003	<0.003
Barium	mg/L	0.0454	0.0096	0.0073	0.0327
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	0.0184	<0.002	<0.002	<0.002
Calcium	mg/L	14.9	5.02	1.81	1.51
Chloride	mg/L	32.6	6.21	0.234	0.252
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	3.22	0.123	0.053	0.076
Fluoride	mg/L	0.572	0.294	<0.1	0.164
Fe 2+	mg/L	-	-	-	-
Fe 3+	mg/L	-	-	-	-
Iron	mg/L	1.17	<0.06	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075
Magnesium	mg/L	2.73	0.947	0.314	0.242
Manganese	mg/L	0.591	0.872	0.359	0.364
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	mg/L	0.039	<0.01	<0.01	<0.01
Potassium	mg/L	12.6	2.76	0.86	0.62
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	5.08	0.95	<0.5	<0.5
Sulfate	mg/L	42.9	13	8.85	5.72
Thallium	mg/L	<0.001	<0.001	<0.001	<0.001
TDS	mg/L	150	46	86	20
Zinc	mg/L	1.12	0.105	0.0486	0.063
Cum SO4	mg	31.4886	69.6566	95.6402	112.43412
Cum Fe	mg	0.85878	1.03494	1.2111	1.38726
Pyritic Sulfur	%	0.310	0.310	0.310	0.310
ANP/AGP<Pyritic Sulfur	-	0.102	0.102	0.102	0.102

Sample ID		A780-03 Composite	A780-03 Composite	A780-03 Composite	A780-03 Composite
Week	Units	16	20	24	25
Rock Unit	-	Bolsa	Bolsa	Bolsa	Bolsa
pH	s.u.	6.28	6.37	5.23	5.4
Redox	mV	181	181	181	181
Conductivity	mS/cm	0.16	0.16	0.16	0.16
Total Alkalinity	mg/L	2	1	2	2
Aluminum	mg/L	<0.08	<0.08	<0.08	<0.08
Antimony	mg/L	<0.003	<0.003	<0.003	<0.003
Arsenic	mg/L	<0.003	<0.003	<0.003	<0.003
Barium	mg/L	0.0125	0.0979	0.0791	0.0287
Beryllium	mg/L	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	1.26	1.11	0.88	0.808
Chloride	mg/L	0.311	0.311	0.36	<0.2
Chromium	mg/L	<0.006	<0.006	<0.006	<0.006
Copper	mg/L	0.164	0.258	0.368	0.283
Fluoride	mg/L	0.308	<0.1	<0.1	<0.1
Fe 2+	mg/L	-	-	-	-
Fe 3+	mg/L	-	-	-	-
Iron	mg/L	<0.06	<0.06	<0.06	<0.06
Lead	mg/L	<0.0075	<0.0075	<0.0075	<0.0075
Magnesium	mg/L	0.197	0.2	0.132	0.113
Manganese	mg/L	0.328	0.322	0.254	0.224
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	mg/L	<0.01	<0.01	<0.01	<0.01
Potassium	mg/L	<0.5	<0.5	<0.5	<0.5
Selenium	mg/L	<0.04	<0.04	<0.04	<0.04
Silver	mg/L	<0.005	<0.005	<0.005	<0.005
Sodium	mg/L	<0.5	<0.5	<0.5	<0.5
Sulfate	mg/L	5.52	9.75	10.8	5.48
Thallium	mg/L	<0.001	<0.001	<0.001	<0.001
TDS	mg/L	11	24	16	<10
Zinc	mg/L	0.09	0.118	0.101	0.0723
Cum SO4	mg	128.64084	157.26684	188.97564	192.99796
Cum Fe	mg	1.56342	1.73958	1.91574	1.95978
Pyritic Sulfur	%	0.310	0.310	0.310	0.310
ANP/AGP<Pyritic Sulfur	-	0.102	0.102	0.102	0.102

Sample ID		AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Earp	Earp	Earp	Earp	Earp	Earp	Earp	Earp
pH	s.u.	7.09	7.14	7.14	7.17	7.91	7.7	7.32	7.69
Redox	mV	88	74	165	170	146	149	163	167
Conductivity	mS/cm	0.46	0.24	0.26	0.17	0.18	0.19	0.18	0.18
Total Alkalinity	mg/L	42	36	30	28	36	40	42	40
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	<0.003	-	-	-	-	<0.006	-	-
Arsenic	mg/L	0.007	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0066	-	-	-	-	<0.002	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	72.2	-	-	-	-	16.3	-	-
Chloride	mg/L	6.24	-	-	-	-	0.33	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	<0.01	-	-	-	-	<0.01	-	-
Fluoride	mg/L	1.01	-	-	-	-	0.736	-	-
Fe 2+	mg/L	0.04	-	-	-	-	-	-	-
Fe 3+	mg/L	0.04	0.03	0.02	0.02	-	0.01	0.02	0.01
Iron	mg/L	0.08	0.03	0.02	0.02	-	0.01	0.02	0.01
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	5.52	-	-	-	-	1.71	-	-
Manganese	mg/L	0.017	-	-	-	-	0.006	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	6.22	-	-	-	-	2.3	-	-
Selenium	mg/L	<0.04	-	-	-	-	<0.04	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	15.7	-	-	-	-	8.81	-	-
Sulfate	mg/L	243	93	30	22.7	42.9	24.5	19.8	24.9
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	375	-	-	-	-	98	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	191.241	258.015	280.875	296.765	329.3261	346.6966	360.4972	377.6782
Cum Fe	mg	0.06296	0.0845	0.09974	0.11374	0.11374	0.12083	0.13477	0.14167
Pyritic Sulfur	%	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
ANP/AGP<Pyritic Sulfur	-	5.706	5.706	5.706	5.706	5.706	5.706	5.706	5.706

Appendix E
Tabulated HCT Testing Results

Sample ID		AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Earp	Earp	Earp	Earp	Earp	Earp	Earp	Earp
pH	s.u.	7.74	7.51	7.59	7.56	7.44	7.87	7.69	7.85
Redox	mV	134	136	147	131	132	105	194	93
Conductivity	mS/cm	0.18	0.18	0.18	0.18	0.19	0.18	0.18	0.18
Total Alkalinity	mg/L	42	40	42	40	42	40	42	38
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	<0.006	-	-	-	-	0.004
Arsenic	mg/L	-	-	<0.01	-	-	-	-	<0.003
Barium	mg/L	-	-	0.0024	-	-	-	-	0.0155
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	14.7	-	-	-	-	11.7
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	1.21	-	-	-	-	1.29
Fe 2+	mg/L	-	-	0.01	-	-	-	0.01	-
Fe 3+	mg/L	-	0.01	0.03	-	-	0.01	-	0.01
Iron	mg/L	-	0.01	0.04	-	-	0.01	0.01	0.01
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	1.81	-	-	-	-	1.7
Manganese	mg/L	-	-	0.007	-	-	-	-	<0.004
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	2.62	-	-	-	-	2.3
Selenium	mg/L	-	-	<0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	8.9	-	-	-	-	7.61
Sulfate	mg/L	25.5	25.4	20.2	18.6	18.2	14.6	11.7	10.2
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	98	-	-	-	-	72
Zinc	mg/L	-	-	<0.002	-	-	-	-	<0.01
Cum SO4	mg	394.8907	412.7469	427.9373	441.1619	454.0475	465.1727	473.6318	481.5164
Cum Fe	mg	0.14167	0.1487	0.17878	0.17878	0.17878	0.1864	0.19363	0.20136
Pyritic Sulfur	%	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
ANP/AGP<Pyritic Sulfur	-	5.706	5.706	5.706	5.706	5.706	5.706	5.706	5.706

Sample ID		AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Earp	Earp	Earp	Earp	Earp	Earp	Earp	Earp
pH	s.u.	7.29	7.39	7.68	7.49	7.27	7.65	7.96	7.99
Redox	mV	100	100	103	101	78	70	68	41
Conductivity	mS/cm	0.18	0.18	0.18	0.18	0.19	0.18	0.18	0.18
Total Alkalinity	mg/L	36	36	28	36	34	32	40	40
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.00403	-	-	-
Arsenic	mg/L	-	-	-	-	0.0045	-	-	-
Barium	mg/L	-	-	-	-	0.0221	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	13.9	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	1.09	-	-	-
Fe 2+	mg/L	-	-	-	-	0.01	-	0.04	-
Fe 3+	mg/L	0.05	0.01	-	0.01	0.02	0.01	0.03	0.01
Iron	mg/L	0.05	0.01	-	0.01	0.03	0.01	0.07	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	1.99	-	-	-
Manganese	mg/L	-	-	-	-	0.005	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	2.15	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	6.85	-	-	-
Sulfate	mg/L	10.6	19.4	11	17.5	13.2	8.3	10.4	8.1
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	81	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	489.3286	503.025	511.132	522.8745	532.6425	538.7015	546.1167	552.1107
Cum Fe	mg	0.23821	0.24527	0.24527	0.25198	0.27418	0.28148	0.33139	0.33879
Pyritic Sulfur	%	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
ANP/AGP<Pyritic Sulfur	-	5.706	5.706	5.706	5.706	5.706	5.706	5.706	5.706

Sample ID		AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02	AR2000-02
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Earp	Earp	Earp	Earp	Earp	Earp	Earp	Earp
pH	s.u.	7.49	7.65	7.44	7.76	7.51	7.28	7.56	7.71
Redox	mV	99	53	93	88	52	60	112	121
Conductivity	mS/cm	0.18	0.18	0.17	0.18	0.18	0.18	0.18	0.18
Total Alkalinity	mg/L	38	42	38	34	36	30	36	38
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.0034	-	-	-	-	0.0035	-
Arsenic	mg/L	-	0.0059	-	-	-	-	0.004	-
Barium	mg/L	-	0.0051	-	-	-	-	0.0068	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	9.35	-	-	-	-	12.9	-
Chloride	mg/L	-	1.16	-	-	-	-	0.64	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	1.61	-	-	-	-	1.33	-
Fe 2+	mg/L	-	-	0.01	-	-	-	-	-
Fe 3+	mg/L	0.01	0.04	-	-	0.03	0.01	-	0.01
Iron	mg/L	0.01	0.04	0.01	-	0.03	0.01	<0.06	0.01
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	1.28	-	-	-	-	1.67	-
Manganese	mg/L	-	<0.004	-	-	-	-	<0.004	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	1.69	-	-	-	-	1.99	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	6.34	-	-	-	-	7.7	-
Sulfate	mg/L	15.6	10.5	3.8	11.8	9	6.3	12.9	6.3
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	69	-	-	-	-	92	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	563.7015	571.4505	574.1979	582.6939	589.4619	593.8908	603.4755	608.0871
Cum Fe	mg	0.34622	0.37574	0.38297	0.38297	0.40553	0.41256	0.45714	0.46446
Pyritic Sulfur	%	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
ANP/AGP<Pyritic Sulfur	-	5.706	5.706	5.706	5.706	5.706	5.706	5.706	5.706

Sample ID		AR2000-02	AR2000-02	AR2000-02	AR2000-02				
Week	Units	32	33	34	35				
Rock Unit	-	Earp	Earp	Earp	Earp				
pH	s.u.	7.8	7.67	7.3	7.28				
Redox	mV	104	91	72	68				
Conductivity	mS/cm	0.18	0.18	0.18	0.18				
Total Alkalinity	mg/L	38	42	36	36				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00197				
Arsenic	mg/L	-	-	-	0.00403				
Barium	mg/L	-	-	-	<0.002				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	9.75				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	1.29				
Fe 2+	mg/L	-	-	-	-				
Fe 3+	mg/L	0.02	-	-	0.01				
Iron	mg/L	0.02	-	-	0.01				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	1.48				
Manganese	mg/L	-	-	-	<0.004				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	1.87				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	7.03				
Sulfate	mg/L	16.5	14.1	14.6	18.9				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	620.1321	630.693	641.2342	653.8405				
Cum Fe	mg	0.47906	0.47906	0.47906	0.48573				
Pyritic Sulfur	%	0.350	0.350	0.350	0.350				
ANP/AGP<Pyritic Sulfur	-	5.706	5.706	5.706	5.706				

Appendix E
Tabulated HCT Testing Results

Sample ID		AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.33	7.37	6.96	7.16	8.11	7.41	7.83	7.87
Redox	mV	91	81	172	167	150	160	148	163
Conductivity	mS/cm	0.36	0.38	0.36	0.2	0.19	0.17	0.17	0.17
Total Alkalinity	mg/L	22	26	26	26	30	26	28	54
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	<0.003	-	-	-	-	0.0116	-	-
Arsenic	mg/L	0.006	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0124	-	-	-	-	0.0046	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	52.3	-	-	-	-	26.3	-	-
Chloride	mg/L	1.68	-	-	-	-	0.76	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	<0.01	-	-	-	-	<0.01	-	-
Fluoride	mg/L	0.5	-	-	-	-	0.404	-	-
Fe 2+	mg/L	0.01	-	0.02	0.01	-	0.01	0.01	-
Fe 3+	mg/L	0.01	0.02	0.02	0.01	-	-	0.03	0.02
Iron	mg/L	0.02	0.02	0.04	0.02	-	0.01	0.04	0.02
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	6.7	-	-	-	-	4.1	-	-
Manganese	mg/L	0.294	-	-	-	-	0.058	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	10.6	-	-	-	-	6.13	-	-
Selenium	mg/L	0.08	-	-	-	-	<0.04	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	7.02	-	-	-	-	7.87	-	-
Sulfate	mg/L	199.2	180.4	80	34	54.1	20.2	18.9	9.5
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	293	-	-	-	-	153	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	143.0256	267.5016	326.3016	349.4556	390.4093	405.1149	418.0236	424.6926
Cum Fe	mg	0.01436	0.02816	0.05756	0.07118	0.07118	0.07846	0.10578	0.11982
Pyritic Sulfur	%	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660
ANP/AGP<Pyritic Sulfur	-	1.510	1.510	1.510	1.510	1.510	1.510	1.510	1.510

Sample ID		AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.73	7.61	7.25	7.41	7.61	7.78	7.61	7.68
Redox	mV	144	132	144	126	123	110	195	102
Conductivity	mS/cm	0.17	0.17	0.17	0.17	0.17	0.17	0.18	0.18
Total Alkalinity	mg/L	58	54	54	50	40	42	44	44
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.0263	-	-	-	-	0.0211
Arsenic	mg/L	-	-	<0.01	-	-	-	-	0.0091
Barium	mg/L	-	-	0.0036	-	-	-	-	0.0129
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	8.73	-	-	-	-	7.91
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.846	-	-	-	-	0.618
Fe 2+	mg/L	-	0.01	-	-	-	-	0.01	-
Fe 3+	mg/L	0.01	0.01	0.02	0.03	0.01	0.03	-	0.01
Iron	mg/L	0.01	0.02	0.02	0.03	0.01	0.03	0.01	0.01
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	1.78	-	-	-	-	1.93
Manganese	mg/L	-	-	0.013	-	-	-	-	0.007
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	7.48	-	-	-	-	6.64
Selenium	mg/L	-	-	<0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	8.82	-	-	-	-	6.63
Sulfate	mg/L	8.5	7.5	7	6.2	5.8	7.6	10.8	10.7
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	81	-	-	-	-	56
Zinc	mg/L	-	-	<0.002	-	-	-	-	<0.01
Cum SO4	mg	430.8211	436.3486	441.5006	445.8468	449.7908	455.4984	463.2852	471.2139
Cum Fe	mg	0.12703	0.14177	0.15649	0.17752	0.18432	0.20685	0.21406	0.22147
Pyritic Sulfur	%	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660
ANP/AGP<Pyritic Sulfur	-	1.510	1.510	1.510	1.510	1.510	1.510	1.510	1.510

Sample ID		AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.4	7.44	7.34	7.2	7.18	7.55	7.62	7.86
Redox	mV	93	101	104	109	105	97	90	61
Conductivity	mS/cm	0.18	0.18	0.17	0.17	0.18	0.17	0.17	0.17
Total Alkalinity	mg/L	44	40	38	38	40	38	34	34
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.0144	-	-	-
Arsenic	mg/L	-	-	-	-	0.0096	-	-	-
Barium	mg/L	-	-	-	-	0.0252	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	10.8	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.54	-	-	-
Fe 2+	mg/L	0.02	-	-	-	0.01	-	0.02	-
Fe 3+	mg/L	0.02	-	-	0.02	0.02	-	0.03	0.01
Iron	mg/L	0.04	-	-	0.02	0.03	-	0.05	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	2.29	-	-	-
Manganese	mg/L	-	-	-	-	0.006	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	6.3	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	6.34	-	-	-
Sulfate	mg/L	8.5	13.4	7.8	16	13	9.3	7.2	13.5
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	75	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	477.4614	486.8548	492.6658	503.3858	512.2908	519.21	524.1924	533.5749
Cum Fe	mg	0.25087	0.25087	0.25087	0.26427	0.28482	0.28482	0.31942	0.32637
Pyritic Sulfur	%	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660
ANP/AGP<Pyritic Sulfur	-	1.510	1.510	1.510	1.510	1.510	1.510	1.510	1.510

Sample ID		AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03	AR2003-03
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.47	7.46	7.73	7.71	7.28	7.58	7.54	7.41
Redox	mV	101	74	73	105	76	47	120	136
Conductivity	mS/cm	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Total Alkalinity	mg/L	30	30	36	28	30	28	30	32
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.00993	-	-	-	-	0.0108	-
Arsenic	mg/L	-	0.0086	-	-	-	-	0.0088	-
Barium	mg/L	-	0.0049	-	-	-	-	0.004	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	7.79	-	-	-	-	10.7	-
Chloride	mg/L	-	1.86	-	-	-	-	0.7	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.711	-	-	-	-	0.58	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	0.02	0.01	0.01	0.03	0.03	-	0.03
Iron	mg/L	-	0.02	0.01	0.01	0.03	0.03	<0.06	0.03
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	1.56	-	-	-	-	1.89	-
Manganese	mg/L	-	0.0052	-	-	-	-	0.007	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	3.81	-	-	-	-	4.12	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	5.03	-	-	-	-	6.87	-
Sulfate	mg/L	19.1	10.2	9.3	10.1	10.6	8	12.6	12.1
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	65	-	-	-	-	73	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	546.9067	554.0467	559.9708	567.3236	574.8814	580.4894	589.0952	597.4684
Cum Fe	mg	0.32637	0.34037	0.34674	0.35402	0.37541	0.39644	0.43742	0.45818
Pyritic Sulfur	%	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660
ANP/AGP<Pyritic Sulfur	-	1.510	1.510	1.510	1.510	1.510	1.510	1.510	1.510

Sample ID		AR2003-03	AR2003-03	AR2003-03	AR2003-03				
Week	Units	32	33	34	35				
Rock Unit	-	Arkose	Arkose	Arkose	Arkose				
pH	s.u.	7.75	7.62	7.56	7.69				
Redox	mV	107	99	58	44				
Conductivity	mS/cm	0.17	0.16	0.17	0.17				
Total Alkalinity	mg/L	32	24	24	34				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00829				
Arsenic	mg/L	-	-	-	0.00922				
Barium	mg/L	-	-	-	0.0029				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	7.85				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.468				
Fe 2+	mg/L	-	-	0.01	0.01				
Fe 3+	mg/L	0.01	0.02	0.04	0.02				
Iron	mg/L	0.01	0.02	0.05	0.03				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	1.54				
Manganese	mg/L	-	-	-	<0.004				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	3.34				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	6.11				
Sulfate	mg/L	19	14.8	12.9	16.2				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	611.0344	620.7728	629.2223	638.8937				
Cum Fe	mg	0.46532	0.47848	0.51123	0.52914				
Pyritic Sulfur	%	0.660	0.660	0.660	0.660				
ANP/AGP<Pyritic Sulfur	-	1.510	1.510	1.510	1.510				

Appendix E
Tabulated HCT Testing Results

Sample ID		AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.59	7.38	7.25	7.47	8	7.62	7.64	7.69
Redox	mV	98	82	156	166	153	165	167	168
Conductivity	mS/cm	1.22	0.2	0.2	0.18	0.18	0.19	0.19	0.19
Total Alkalinity	mg/L	48	70	58	64	76	60	52	52
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	0.0093	-	-	-	-	0.025	-	-
Arsenic	mg/L	0.019	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0204	-	-	-	-	0.003	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	244	-	-	-	-	9.36	-	-
Chloride	mg/L	8.77	-	-	-	-	0.23	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	<0.01	-	-	-	-	<0.01	-	-
Fluoride	mg/L	0.99	-	-	-	-	0.53	-	-
Fe 2+	mg/L	-	-	-	0.01	0.03	-	-	-
Fe 3+	mg/L	0.02	0.01	0.01	0.02	0.01	-	0.02	0.01
Iron	mg/L	0.02	0.01	0.01	0.03	0.04	<0.06	0.02	0.01
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	45.4	-	-	-	-	2.47	-	-
Manganese	mg/L	0.101	-	-	-	-	0.005	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	31	-	-	-	-	8.3	-	-
Selenium	mg/L	0.42	-	-	-	-	0.06	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	43.1	-	-	-	-	8.72	-	-
Sulfate	mg/L	781	41	13.5	15.4	25.2	25.9	28.9	30.7
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	1470	-	-	-	-	71	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	556.853	587.849	597.9605	609.6645	628.3881	647.4246	667.5101	690.0746
Cum Fe	mg	0.01426	0.02182	0.02931	0.05211	0.08183	0.12593	0.13983	0.14718
Pyritic Sulfur	%	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
ANP/AGP<Pyritic Sulfur	-	1.160	1.160	1.160	1.160	1.160	1.160	1.160	1.160

Sample ID		AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.66	7.66	7.24	7.45	7.71	7.84	7.5	7.61
Redox	mV	158	138	149	122	127	113	202	109
Conductivity	mS/cm	0.19	0.19	0.19	0.19	0.18	0.19	0.19	0.18
Total Alkalinity	mg/L	50	48	50	44	44	46	40	40
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.026	-	-	-	-	0.0188
Arsenic	mg/L	-	-	<0.01	-	-	-	-	0.0036
Barium	mg/L	-	-	0.0042	-	-	-	-	0.0126
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	13.7	-	-	-	-	12.6
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.462	-	-	-	-	0.466
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	-	-	0.01	0.02	0.01	-	0.01
Iron	mg/L	-	-	<0.06	0.01	0.02	0.01	-	0.01
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	3.13	-	-	-	-	2.86
Manganese	mg/L	-	-	0.008	-	-	-	-	0.006
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	8.38	-	-	-	-	5.94
Selenium	mg/L	-	-	0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	7.21	-	-	-	-	6.74
Sulfate	mg/L	23.7	25.6	24.8	17.9	21.9	18.4	23.5	21.6
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	104	-	-	-	-	77
Zinc	mg/L	-	-	<0.002	-	-	-	-	<0.01
Cum SO4	mg	708.0629	726.3157	744.8165	757.0243	772.7923	787.0523	804.6303	820.6143
Cum Fe	mg	0.14718	0.14718	0.19194	0.19876	0.21316	0.22091	0.22091	0.22831
Pyritic Sulfur	%	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
ANP/AGP<Pyritic Sulfur	-	1.160	1.160	1.160	1.160	1.160	1.160	1.160	1.160

Sample ID		AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.45	7.49	7.61	7.5	7.26	7.52	7.84	7.93
Redox	mV	98	103	103	115	110	108	90	59
Conductivity	mS/cm	0.18	0.18	0.18	0.17	0.18	0.18	0.18	0.18
Total Alkalinity	mg/L	42	40	40	40	40	40	38	42
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.0136	-	-	-
Arsenic	mg/L	-	-	-	-	0.0038	-	-	-
Barium	mg/L	-	-	-	-	0.02	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	13	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.428	-	-	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	0.05	0.04	0.03	-	-	-	0.02	0.01
Iron	mg/L	0.05	0.04	0.03	-	<0.06	-	0.02	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	2.53	-	-	-
Manganese	mg/L	-	-	-	-	0.004	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	4.34	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	6.33	-	-	-
Sulfate	mg/L	16	18.6	14.6	15.2	15.8	12.4	18	22.1
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	85	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	832.2303	845.5479	856.4103	867.5519	878.7857	887.2053	900.0213	916.309
Cum Fe	mg	0.26461	0.29325	0.31557	0.31557	0.35823	0.35823	0.37247	0.37984
Pyritic Sulfur	%	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
ANP/AGP<Pyritic Sulfur	-	1.160	1.160	1.160	1.160	1.160	1.160	1.160	1.160

Appendix E
Tabulated HCT Testing Results

Sample ID		AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02	AR2005-02
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.57	7.45	7.64	7.62	7.35	7.48	7.68	7.46
Redox	mV	105	84	103	122	86	66	118	126
Conductivity	mS/cm	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.18
Total Alkalinity	mg/L	34	36	34	34	30	32	34	30
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.0108	-	-	-	-	0.0096	-
Arsenic	mg/L	-	0.004	-	-	-	-	<0.003	-
Barium	mg/L	-	0.0049	-	-	-	-	0.0032	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	13.2	-	-	-	-	15.2	-
Chloride	mg/L	-	1.79	-	-	-	-	0.78	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.727	-	-	-	-	0.56	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	0.01	-	0.01	0.02	-	0.01	-	-
Iron	mg/L	0.01	<0.06	0.01	0.02	-	0.01	<0.06	-
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	2.35	-	-	-	-	2.29	-
Manganese	mg/L	-	<0.004	-	-	-	-	<0.004	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	3.64	-	-	-	-	3.23	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	6.49	-	-	-	-	7.2	-
Sulfate	mg/L	24.4	19	11.2	20	12.3	15	22.5	18.8
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	85	-	-	-	-	85	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	932.5594	945.2324	953.0612	967.4412	976.2972	986.9022	1003.3497	1016.6037
Cum Fe	mg	0.3865	0.42652	0.43351	0.44789	0.44789	0.45496	0.49882	0.49882
Pyritic Sulfur	%	0.940	0.940	0.940	0.940	0.940	0.940	0.940	0.940
ANP/AGP<Pyritic Sulfur	-	1.160	1.160	1.160	1.160	1.160	1.160	1.160	1.160

Sample ID		AR2005-02	AR2005-02	AR2005-02	AR2005-02				
Week	Units	32	33	34	35				
Rock Unit	-	Arkose	Arkose	Arkose	Arkose				
pH	s.u.	7.77	7.64	7.57	7.55				
Redox	mV	101	115	71	57				
Conductivity	mS/cm	0.18	0.18	0.18	0.18				
Total Alkalinity	mg/L	30	26	28	32				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00721				
Arsenic	mg/L	-	-	-	0.00655				
Barium	mg/L	-	-	-	0.0024				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	13.5				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.44				
Fe 2+	mg/L	-	-	-	-				
Fe 3+	mg/L	-	0.01	-	-				
Iron	mg/L	-	0.01	-	<0.06				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	1.92				
Manganese	mg/L	-	-	-	<0.004				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	2.51				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	6.11				
Sulfate	mg/L	34.8	27	33.6	29.5				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	1041.6249	1060.0659	1082.4771	1102.3896				
Cum Fe	mg	0.49882	0.50565	0.50565	0.54615				
Pyritic Sulfur	%	0.940	0.940	0.940	0.940				
ANP/AGP<Pyritic Sulfur	-	1.160	1.160	1.160	1.160				

Appendix E
Tabulated HCT Testing Results

Sample ID		AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.6	7.33	7.21	7.39	7.87	7.63	7.59	7.63
Redox	mV	123	97	222	193	160	166	173	174
Conductivity	mS/cm	0.94	0.32	0.3	0.24	0.22	0.2	0.22	0.22
Total Alkalinity	mg/L	114	64	64	62	60	54	54	54
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	0.0087	-	-	-	-	0.0239	-	-
Arsenic	mg/L	0.009	-	-	-	-	0.0119	-	-
Barium	mg/L	0.0357	-	-	-	-	0.0052	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	136	-	-	-	-	16.9	-	-
Chloride	mg/L	6.69	-	-	-	-	0.27	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	<0.01	-	-	-	-	<0.01	-	-
Fluoride	mg/L	3.34	-	-	-	-	1.19	-	-
Fe 2+	mg/L	0.04	-	-	-	-	-	-	-
Fe 3+	mg/L	0.03	-	-	-	-	-	0.01	0.01
Iron	mg/L	0.07	-	-	-	-	<0.06	0.01	0.01
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	25.3	-	-	-	-	4.78	-	-
Manganese	mg/L	0.025	-	-	-	-	0.005	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	26.3	-	-	-	-	11	-	-
Selenium	mg/L	<0.04	-	-	-	-	<0.04	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	50.4	-	-	-	-	14.7	-	-
Sulfate	mg/L	456	109	74.1	58.3	56.5	27.1	43.2	48.4
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	824	-	-	-	-	139	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	339.72	420.053	474.0719	517.0973	557.8903	578.405	609.5954	646.3794
Cum Fe	mg	0.05215	0.05215	0.05215	0.05215	0.05215	0.09757	0.10479	0.11239
Pyritic Sulfur	%	2.050	2.050	2.050	2.050	2.050	2.050	2.050	2.050
ANP/AGP<Pyritic Sulfur	-	1.546	1.546	1.546	1.546	1.546	1.546	1.546	1.546

Sample ID		AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.68	7.58	7.31	7.36	7.45	7.55	7.41	7.55
Redox	mV	150	148	150	128	134	111	207	118
Conductivity	mS/cm	0.21	0.23	0.21	0.22	0.2	0.21	0.22	0.21
Total Alkalinity	mg/L	46	50	50	56	54	54	52	52
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.0228	-	-	-	-	0.0208
Arsenic	mg/L	-	-	<0.01	-	-	-	-	0.0074
Barium	mg/L	-	-	0.0072	-	-	-	-	0.0255
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	18.9	-	-	-	-	17.7
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.657	-	-	-	-	0.677
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	0.01	0.01	-	-	0.01	-	0.01
Iron	mg/L	-	0.01	0.01	-	-	0.01	-	0.01
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	4.75	-	-	-	-	4.89
Manganese	mg/L	-	-	0.007	-	-	-	-	0.007
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	8.91	-	-	-	-	7.07
Selenium	mg/L	-	-	<0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	7.6	-	-	-	-	6.34
Sulfate	mg/L	45.1	49.4	40.3	44.6	33.4	37.8	36.2	32.4
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	138	-	-	-	-	99
Zinc	mg/L	-	-	<0.002	-	-	-	-	<0.01
Cum SO4	mg	679.7534	715.8154	745.2344	776.053	799.934	828.1706	854.5966	878.5078
Cum Fe	mg	0.11239	0.11969	0.12699	0.12699	0.12699	0.13446	0.13446	0.14184
Pyritic Sulfur	%	2.050	2.050	2.050	2.050	2.050	2.050	2.050	2.050
ANP/AGP<Pyritic Sulfur	-	1.546	1.546	1.546	1.546	1.546	1.546	1.546	1.546

Sample ID		AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.37	7.54	7.47	7.44	7.24	7.51	7.57	7.75
Redox	mV	103	109	109	113	116	115	106	74
Conductivity	mS/cm	0.21	0.19	0.2	0.19	0.2	0.2	0.2	0.2
Total Alkalinity	mg/L	50	50	52	48	54	46	48	50
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.0179	-	-	-
Arsenic	mg/L	-	-	-	-	0.0077	-	-	-
Barium	mg/L	-	-	-	-	0.0201	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	17.5	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.618	-	-	-
Fe 2+	mg/L	-	-	0.01	-	0.01	-	-	-
Fe 3+	mg/L	0.03	0.01	-	-	-	-	-	0.01
Iron	mg/L	0.03	0.01	0.01	-	0.01	-	-	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	4.54	-	-	-
Manganese	mg/L	-	-	-	-	<0.004	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	5.87	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	5.86	-	-	-
Sulfate	mg/L	22.9	32.7	20.7	24	23.4	23.2	25.4	15.1
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	113	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	895.2019	919.3672	934.147	951.307	968.038	985.3916	1003.2224	1014.5021
Cum Fe	mg	0.16371	0.1711	0.17824	0.17824	0.18539	0.18539	0.18539	0.19286
Pyritic Sulfur	%	2.050	2.050	2.050	2.050	2.050	2.050	2.050	2.050
ANP/AGP<Pyritic Sulfur	-	1.546	1.546	1.546	1.546	1.546	1.546	1.546	1.546

Sample ID		AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03	AR2009-03
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.38	7.43	7.48	7.77	7.53	7.47	7.41	7.51
Redox	mV	115	93	85	124	87	74	125	132
Conductivity	mS/cm	0.19	0.2	0.19	0.2	0.2	0.2	0.2	0.19
Total Alkalinity	mg/L	46	48	44	42	42	40	42	44
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.0116	-	-	-	-	0.0115	-
Arsenic	mg/L	-	0.0071	-	-	-	-	0.0058	-
Barium	mg/L	-	0.0102	-	-	-	-	0.0073	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	15.2	-	-	-	-	17.7	-
Chloride	mg/L	-	1.84	-	-	-	-	0.75	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.745	-	-	-	-	0.62	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	0.02	-	-	-	0.02	-	0.01
Iron	mg/L	-	0.02	-	-	-	0.02	<0.06	0.01
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	3.91	-	-	-	-	4.25	-
Manganese	mg/L	-	0.0044	-	-	-	-	<0.004	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	5.02	-	-	-	-	5.12	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	5.25	-	-	-	-	6.52	-
Sulfate	mg/L	28.3	27.5	11.7	16.6	21.3	20.9	23	21.3
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	91	-	-	-	-	112	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	1035.0762	1055.2062	1063.443	1075.1958	1090.5957	1105.7482	1122.1242	1137.7797
Cum Fe	mg	0.19286	0.2075	0.2075	0.2075	0.2075	0.222	0.26472	0.27207
Pyritic Sulfur	%	2.050	2.050	2.050	2.050	2.050	2.050	2.050	2.050
ANP/AGP<Pyritic Sulfur	-	1.546	1.546	1.546	1.546	1.546	1.546	1.546	1.546

Sample ID		AR2009-03	AR2009-03	AR2009-03	AR2009-03				
Week	Units	32	33	34	35				
Rock Unit	-	Andesite	Andesite	Andesite	Andesite				
pH	s.u.	7.73	7.54	7.41	7.29				
Redox	mV	109	135	90	75				
Conductivity	mS/cm	0.19	0.2	0.19	0.19				
Total Alkalinity	mg/L	40	40	38	42				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00898				
Arsenic	mg/L	-	-	-	0.00917				
Barium	mg/L	-	-	-	0.0058				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	15.1				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.538				
Fe 2+	mg/L	-	-	-	-				
Fe 3+	mg/L	-	0.01	-	-				
Iron	mg/L	-	0.01	-	<0.06				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	3.42				
Manganese	mg/L	-	-	-	0.004				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	4.01				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	5.84				
Sulfate	mg/L	39.5	33.3	31.2	30.3				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	1165.9827	1190.1252	1212.3084	1233.6396				
Cum Fe	mg	0.27207	0.27932	0.27932	0.32156				
Pyritic Sulfur	%	2.050	2.050	2.050	2.050				
ANP/AGP<Pyritic Sulfur	-	1.546	1.546	1.546	1.546				

Sample ID		AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph
pH	s.u.	7.7	7.44	7.37	7.55	8.15	7.96	7.68	7.77
Redox	mV	98	94	198	175	152	159	171	176
Conductivity	mS/cm	0.43	0.21	0.22	0.17	0.17	0.18	0.18	0.18
Total Alkalinity	mg/L	54	68	58	50	50	52	52	58
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	<0.003	-	-	-	-	<0.006	-	-
Arsenic	mg/L	0.008	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0101	-	-	-	-	<0.002	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	83.7	-	-	-	-	7.87	-	-
Chloride	mg/L	5.46	-	-	-	-	<0.2	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	0.011	-	-	-	-	<0.01	-	-
Fluoride	mg/L	2.68	-	-	-	-	1.17	-	-
Fe 2+	mg/L	-	0.01	-	0.01	-	-	-	-
Fe 3+	mg/L	0.03	0.02	0.02	0.01	-	0.01	0.01	0.01
Iron	mg/L	0.03	0.03	0.02	0.02	-	0.01	0.01	0.01
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	16.1	-	-	-	-	2.36	-	-
Manganese	mg/L	0.008	-	-	-	-	<0.004	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	17.1	-	-	-	-	8.48	-	-
Selenium	mg/L	<0.04	-	-	-	-	<0.04	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	27.8	-	-	-	-	9.27	-	-
Sulfate	mg/L	116	14	15.2	12.4	15.8	12.1	13.3	16
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	590	-	-	-	-	71	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	81.2	91.672	103.148	111.9272	123.793	132.9527	142.2228	154.3508
Cum Fe	mg	0.021	0.04344	0.05854	0.0727	0.0727	0.08027	0.08724	0.09482
Pyritic Sulfur	%	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.550
ANP/AGP<Pyritic Sulfur	-	4.669	4.669	4.669	4.669	4.669	4.669	4.669	4.669

Appendix E
Tabulated HCT Testing Results

Sample ID		AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph
pH	s.u.	7.62	7.79	7.4	7.29	7.62	7.67	7.58	7.62
Redox	mV	155	146	150	120	133	109	203	119
Conductivity	mS/cm	0.18	0.18	0.18	0.17	0.17	0.18	0.18	0.19
Total Alkalinity	mg/L	54	50	54	44	42	46	42	44
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.00672	-	-	-	-	0.0061
Arsenic	mg/L	-	-	<0.01	-	-	-	-	<0.003
Barium	mg/L	-	-	0.0035	-	-	-	-	0.0141
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	11.3	-	-	-	-	10.3
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.685	-	-	-	-	0.509
Fe 2+	mg/L	-	-	-	0.01	-	-	-	-
Fe 3+	mg/L	-	0.01	-	-	-	0.01	-	0.01
Iron	mg/L	-	0.01	<0.06	0.01	-	0.01	-	0.01
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	3.12	-	-	-	-	3.05
Manganese	mg/L	-	-	<0.004	-	-	-	-	<0.004
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	10.8	-	-	-	-	8.84
Selenium	mg/L	-	-	<0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	5.75	-	-	-	-	5.13
Sulfate	mg/L	14.9	15.3	15.3	13.3	16.3	16.1	14.1	20.1
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	97	-	-	-	-	69
Zinc	mg/L	-	-	<0.002	-	-	-	-	<0.01
Cum SO4	mg	165.0788	176.2631	187.1414	196.8105	208.8073	220.5442	230.3296	244.3393
Cum Fe	mg	0.09482	0.10213	0.14479	0.15206	0.15206	0.15935	0.15935	0.16632
Pyritic Sulfur	%	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.550
ANP/AGP<Pyritic Sulfur	-	4.669	4.669	4.669	4.669	4.669	4.669	4.669	4.669

Sample ID		AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph
pH	s.u.	7.49	7.54	7.5	7.59	7.32	7.59	7.82	7.87
Redox	mV	101	109	113	112	117	118	107	75
Conductivity	mS/cm	0.18	0.19	0.19	0.18	0.18	0.19	0.19	0.18
Total Alkalinity	mg/L	44	44	42	42	34	40	46	44
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.00667	-	-	-
Arsenic	mg/L	-	-	-	-	0.0048	-	-	-
Barium	mg/L	-	-	-	-	0.0085	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	11.6	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.418	-	-	-
Fe 2+	mg/L	-	-	-	-	0.01	-	-	-
Fe 3+	mg/L	0.02	0.05	0.04	-	0.02	-	-	0.01
Iron	mg/L	0.02	0.05	0.04	-	0.03	-	-	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	3.18	-	-	-
Manganese	mg/L	-	-	-	-	<0.004	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	8.21	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	4.76	-	-	-
Sulfate	mg/L	12.8	14.6	16.8	15	13.8	15.8	17.6	12.8
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	90	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	253.4913	264.2807	276.0911	287.3711	297.1139	308.2529	321.2241	330.7729
Cum Fe	mg	0.18062	0.21757	0.24569	0.24569	0.26687	0.26687	0.26687	0.27433
Pyritic Sulfur	%	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.550
ANP/AGP<Pyritic Sulfur	-	4.669	4.669	4.669	4.669	4.669	4.669	4.669	4.669

Sample ID		AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04	AR2009-04
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph	Epitaph
pH	s.u.	7.47	7.45	7.73	7.82	7.47	7.63	7.63	7.59
Redox	mV	114	100	87	127	96	68	116	118
Conductivity	mS/cm	0.17	0.18	0.17	0.17	0.18	0.17	0.17	0.18
Total Alkalinity	mg/L	38	38	34	36	36	32	34	36
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.00573	-	-	-	-	0.0041	-
Arsenic	mg/L	-	0.0041	-	-	-	-	0.0037	-
Barium	mg/L	-	0.0063	-	-	-	-	0.0033	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	10.6	-	-	-	-	10.3	-
Chloride	mg/L	-	2.03	-	-	-	-	0.75	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.631	-	-	-	-	0.51	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	0.01	0.01	-	0.02	0.01	0.01	0.01	-
Iron	mg/L	0.01	0.01	-	0.02	0.01	0.01	0.01	-
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	2.77	-	-	-	-	2.55	-
Manganese	mg/L	-	<0.004	-	-	-	-	<0.004	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	7.09	-	-	-	-	6.56	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	4.94	-	-	-	-	5.78	-
Sulfate	mg/L	17.6	13.3	3.2	5.7	9.6	7.4	13.3	9.4
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	80	-	-	-	-	76	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	343.1985	352.2425	354.5977	358.7416	365.164	370.7362	380.3122	386.9674
Cum Fe	mg	0.28139	0.28819	0.28819	0.30273	0.30942	0.31695	0.32415	0.32415
Pyritic Sulfur	%	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.550
ANP/AGP<Pyritic Sulfur	-	4.669	4.669	4.669	4.669	4.669	4.669	4.669	4.669

Sample ID		AR2009-04	AR2009-04	AR2009-04	AR2009-04				
Week	Units	32	33	34	35				
Rock Unit	-	Epitaph	Epitaph	Epitaph	Epitaph				
pH	s.u.	7.94	7.71	7.54	7.57				
Redox	mV	100	124	93	65				
Conductivity	mS/cm	0.17	0.17	0.17	0.17				
Total Alkalinity	mg/L	32	30	34	34				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00297				
Arsenic	mg/L	-	-	-	0.00879				
Barium	mg/L	-	-	-	0.0025				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	7.88				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.44				
Fe 2+	mg/L	-	-	-	-				
Fe 3+	mg/L	0.01	-	0.01	-				
Iron	mg/L	0.01	-	0.01	<0.06				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	1.98				
Manganese	mg/L	-	-	-	<0.004				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	5.38				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	5.01				
Sulfate	mg/L	11.6	18.1	12.3	9.2				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	395.157	407.4107	415.8485	422.2057				
Cum Fe	mg	0.33121	0.33121	0.33807	0.37953				
Pyritic Sulfur	%	0.550	0.550	0.550	0.550				
ANP/AGP<Pyritic Sulfur	-	4.669	4.669	4.669	4.669				

Sample ID		AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.74	7.48	7.38	7.4	8.09	7.7	7.67	7.71
Redox	mV	110	93	204	198	160	168	175	179
Conductivity	mS/cm	0.67	0.2	0.22	0.18	0.17	0.18	0.17	0.17
Total Alkalinity	mg/L	60	60	52	60	50	56	50	48
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	0.0061	-	-	-	-	0.0199	-	-
Arsenic	mg/L	0.009	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0132	-	-	-	-	0.0021	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	89.1	-	-	-	-	7.54	-	-
Chloride	mg/L	2.76	-	-	-	-	<0.2	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	0.021	-	-	-	-	<0.01	-	-
Fluoride	mg/L	1.3	-	-	-	-	0.949	-	-
Fe 2+	mg/L	0.01	-	-	-	0.01	-	-	-
Fe 3+	mg/L	-	0.03	0.03	0.01	0.01	-	0.03	0.02
Iron	mg/L	0.01	0.03	0.03	0.01	0.02	<0.06	0.03	0.02
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	15.2	-	-	-	-	2.3	-	-
Manganese	mg/L	0.022	-	-	-	-	<0.004	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	19.9	-	-	-	-	9.7	-	-
Selenium	mg/L	0.08	-	-	-	-	<0.04	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	24.4	-	-	-	-	8.61	-	-
Sulfate	mg/L	316	20	10.6	11.2	12	9.8	9.2	11.3
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	577	-	-	-	-	56	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	248.692	261.552	269.8942	277.7342	286.9142	293.9212	300.1956	308.5802
Cum Fe	mg	0.00787	0.02716	0.05077	0.05777	0.07307	0.11597	0.13643	0.15127
Pyritic Sulfur	%	0.440	0.440	0.440	0.440	0.440	0.440	0.440	0.440
ANP/AGP<Pyritic Sulfur	-	1.275	1.275	1.275	1.275	1.275	1.275	1.275	1.275

Sample ID		AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.73	7.87	7.42	7.37	7.67	7.73	7.47	7.54
Redox	mV	157	151	155	131	134	112	205	120
Conductivity	mS/cm	0.17	0.18	0.18	0.17	0.17	0.18	0.18	0.18
Total Alkalinity	mg/L	44	48	52	50	48	46	46	46
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.0218	-	-	-	-	0.0172
Arsenic	mg/L	-	-	<0.01	-	-	-	-	0.0096
Barium	mg/L	-	-	0.0028	-	-	-	-	0.0336
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	9.88	-	-	-	-	9.31
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.53	-	-	-	-	0.518
Fe 2+	mg/L	-	-	-	-	-	0.01	-	-
Fe 3+	mg/L	0.01	0.02	-	0.03	0.01	0.03	0.01	-
Iron	mg/L	0.01	0.02	<0.06	0.03	0.01	0.04	0.01	<0.06
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	2.47	-	-	-	-	2.63
Manganese	mg/L	-	-	<0.004	-	-	-	-	<0.004
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.0105
Potassium	mg/L	-	-	9.2	-	-	-	-	7.55
Selenium	mg/L	-	-	<0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	6.55	-	-	-	-	6.3
Sulfate	mg/L	12.4	15.1	11.9	13.1	9.9	9.9	14.3	13
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	89	-	-	-	-	70
Zinc	mg/L	-	-	<0.002	-	-	-	-	0.0105
Cum SO4	mg	317.5454	329.0063	337.5029	347.0266	354.4219	361.5796	372.419	381.584
Cum Fe	mg	0.1585	0.17368	0.21652	0.23833	0.2458	0.27472	0.2823	0.3246
Pyritic Sulfur	%	0.440	0.440	0.440	0.440	0.440	0.440	0.440	0.440
ANP/AGP<Pyritic Sulfur	-	1.275	1.275	1.275	1.275	1.275	1.275	1.275	1.275

Sample ID		AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.4	7.42	7.6	7.44	7.48	7.43	7.88	8.05
Redox	mV	104	114	112	104	116	123	105	71
Conductivity	mS/cm	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17
Total Alkalinity	mg/L	44	46	38	42	40	44	38	40
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.0144	-	-	-
Arsenic	mg/L	-	-	-	-	0.0081	-	-	-
Barium	mg/L	-	-	-	-	0.0173	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	9.25	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.429	-	-	-
Fe 2+	mg/L	-	0.01	-	-	-	-	-	-
Fe 3+	mg/L	0.03	-	0.01	0.01	0.03	0.02	-	0.01
Iron	mg/L	0.03	0.01	0.01	0.01	0.03	0.02	-	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	2.4	-	-	-
Manganese	mg/L	-	-	-	-	<0.004	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	6.18	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	5.9	-	-	-
Sulfate	mg/L	4.9	9.1	6.5	3.9	7.3	6.7	9.1	6.5
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	74	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	385.0973	391.9769	396.4619	399.1724	404.7861	409.4225	416.0291	420.8326
Cum Fe	mg	0.34611	0.35367	0.36057	0.36752	0.39059	0.40443	0.40443	0.41182
Pyritic Sulfur	%	0.440	0.440	0.440	0.440	0.440	0.440	0.440	0.440
ANP/AGP<Pyritic Sulfur	-	1.275	1.275	1.275	1.275	1.275	1.275	1.275	1.275

Appendix E
Tabulated HCT Testing Results

Sample ID		AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02	AR2010-02
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose	Arkose
pH	s.u.	7.46	7.49	7.67	7.98	7.49	7.71	7.72	7.66
Redox	mV	116	100	103	123	105	70	109	129
Conductivity	mS/cm	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Total Alkalinity	mg/L	38	38	34	34	32	34	34	36
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.0112	-	-	-	-	0.01	-
Arsenic	mg/L	-	0.0081	-	-	-	-	0.0075	-
Barium	mg/L	-	0.0089	-	-	-	-	0.0023	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	7.92	-	-	-	-	8.76	-
Chloride	mg/L	-	1.71	-	-	-	-	0.71	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.657	-	-	-	-	0.6	-
Fe 2+	mg/L	-	-	-	-	0.01	-	-	-
Fe 3+	mg/L	-	0.02	-	-	0.01	-	-	0.02
Iron	mg/L	-	0.02	-	-	0.02	-	<0.06	0.02
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	1.9	-	-	-	-	1.93	-
Manganese	mg/L	-	<0.004	-	-	-	-	<0.004	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	5.01	-	-	-	-	4.87	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	5.95	-	-	-	-	7.35	-
Sulfate	mg/L	9.8	8.3	4.9	7.4	4.3	6.6	11.7	5.5
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	64	-	-	-	-	69	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	427.8788	433.7967	437.1042	442.743	445.8648	450.6696	459.2223	463.1823
Cum Fe	mg	0.41182	0.42608	0.42608	0.42608	0.4406	0.4406	0.48446	0.49886
Pyritic Sulfur	%	0.440	0.440	0.440	0.440	0.440	0.440	0.440	0.440
ANP/AGP<Pyritic Sulfur	-	1.275	1.275	1.275	1.275	1.275	1.275	1.275	1.275

Sample ID		AR2010-02	AR2010-02	AR2010-02	AR2010-02				
Week	Units	32	33	34	35				
Rock Unit	-	Arkose	Arkose	Arkose	Arkose				
pH	s.u.	7.99	7.56	7.45	7.48				
Redox	mV	100	135	95	74				
Conductivity	mS/cm	0.17	0.17	0.17	0.17				
Total Alkalinity	mg/L	34	32	34	38				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00913				
Arsenic	mg/L	-	-	-	0.0107				
Barium	mg/L	-	-	-	0.0023				
Beryllium	mg/L	-	-	-	<0.0002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	7.67				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.473				
Fe 2+	mg/L	-	0.01	-	-				
Fe 3+	mg/L	0.01	-	-	-				
Iron	mg/L	0.01	0.01	-	<0.06				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	1.6				
Manganese	mg/L	-	-	-	<0.004				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	3.78				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	6.02				
Sulfate	mg/L	11.6	12.4	12.1	9.2				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	471.9867	480.6295	488.8696	495.4384				
Cum Fe	mg	0.50645	0.51342	0.51342	0.55626				
Pyritic Sulfur	%	0.440	0.440	0.440	0.440				
ANP/AGP<Pyritic Sulfur	-	1.275	1.275	1.275	1.275				

Sample ID		AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.88	7.58	7.31	7.75	8.1	7.73	8.17	8.02
Redox	mV	104	95	210	192	167	170	163	173
Conductivity	mS/cm	0.3	0.22	0.22	0.19	0.18	0.18	0.17	0.17
Total Alkalinity	mg/L	54	32	32	28	32	32	28	28
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	<0.003	-	-	-	-	<0.006	-	-
Arsenic	mg/L	0.007	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0051	-	-	-	-	0.0033	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	31.7	-	-	-	-	15.4	-	-
Chloride	mg/L	3.71	-	-	-	-	0.43	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	<0.01	-	-	-	-	<0.01	-	-
Fluoride	mg/L	2.08	-	-	-	-	0.683	-	-
Fe 2+	mg/L	0.01	-	-	-	-	-	-	-
Fe 3+	mg/L	0.02	-	-	0.01	0.01	0.01	0.02	-
Iron	mg/L	0.03	-	-	0.01	0.01	0.01	0.02	-
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	4.55	-	-	-	-	3.05	-	-
Manganese	mg/L	0.034	-	-	-	-	0.015	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	7.51	-	-	-	-	3.56	-	-
Selenium	mg/L	<0.04	-	-	-	-	<0.04	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	14.9	-	-	-	-	9.21	-	-
Sulfate	mg/L	79	61	62	30	44.4	30.5	25.7	31
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	223	-	-	-	-	95	-	-
Zinc	mg/L	0.757	-	-	-	-	<0.002	-	-
Cum SO4	mg	52.219	94.248	139.942	160.312	193.2124	215.5994	232.0988	253.3028
Cum Fe	mg	0.01983	0.01983	0.01983	0.02662	0.03403	0.04137	0.05421	0.05421
Pyritic Sulfur	%	1.670	1.670	1.670	1.670	1.670	1.670	1.670	1.670
ANP/AGP<Pyritic Sulfur	-	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510

Sample ID		AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.79	7.91	7.77	7.74	7.97	7.67	7.74	7.82
Redox	mV	162	149	143	118	128	113	200	118
Conductivity	mS/cm	0.18	0.18	0.17	0.16	0.17	0.18	0.17	0.19
Total Alkalinity	mg/L	30	28	26	26	26	34	28	52
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	<0.006	-	-	-	-	<0.003
Arsenic	mg/L	-	-	<0.01	-	-	-	-	0.0051
Barium	mg/L	-	-	0.0033	-	-	-	-	0.0274
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	11.4	-	-	-	-	11
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.554	-	-	-	-	0.72
Fe 2+	mg/L	-	-	-	-	-	-	-	0.01
Fe 3+	mg/L	-	-	0.02	0.01	0.01	-	-	0.01
Iron	mg/L	-	-	0.02	0.01	0.01	-	-	0.02
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	2.33	-	-	-	-	2.52
Manganese	mg/L	-	-	0.01	-	-	-	-	0.007
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	2.98	-	-	-	-	2.92
Selenium	mg/L	-	-	<0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	7.25	-	-	-	-	6.9
Sulfate	mg/L	27.7	30.6	17.8	20.5	21.7	19.3	14.9	26.5
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	78	-	-	-	-	69
Zinc	mg/L	-	-	<0.002	-	-	-	-	<0.01
Cum SO4	mg	273.5238	295.9536	308.3246	322.6131	337.1087	351.0819	361.5566	380.2656
Cum Fe	mg	0.05421	0.05421	0.06811	0.07508	0.08176	0.08176	0.08176	0.09588
Pyritic Sulfur	%	1.670	1.670	1.670	1.670	1.670	1.670	1.670	1.670
ANP/AGP<Pyritic Sulfur	-	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510

Sample ID		AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.52	7.58	7.53	7.6	7.49	7.58	7.74	7.79
Redox	mV	105	112	108	117	118	122	113	83
Conductivity	mS/cm	0.18	0.17	0.17	0.16	0.17	0.17	0.17	0.18
Total Alkalinity	mg/L	42	42	44	30	34	34	32	40
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	<0.003	-	-	-
Arsenic	mg/L	-	-	-	-	0.006	-	-	-
Barium	mg/L	-	-	-	-	0.0235	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	9.37	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.603	-	-	-
Fe 2+	mg/L	-	-	-	-	0.01	-	-	-
Fe 3+	mg/L	0.02	0.09	-	-	0.01	0.02	0.01	0.01
Iron	mg/L	0.02	0.09	-	-	0.02	0.02	0.01	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	2.2	-	-	-
Manganese	mg/L	-	-	-	-	0.004	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	2.87	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	5.95	-	-	-
Sulfate	mg/L	10	10.1	6.2	4.5	8.4	12.1	11.9	11.1
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	65	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	387.4956	394.707	399.2454	402.4089	408.0705	417.0487	425.3549	433.1582
Cum Fe	mg	0.11034	0.1746	0.1746	0.1746	0.18808	0.20292	0.2099	0.21693
Pyritic Sulfur	%	1.670	1.670	1.670	1.670	1.670	1.670	1.670	1.670
ANP/AGP<Pyritic Sulfur	-	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510

Sample ID		AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03	AR2010-03
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.42	7.46	7.68	7.95	7.47	7.54	7.56	7.46
Redox	mV	118	103	96	127	110	90	114	125
Conductivity	mS/cm	0.18	0.17	0.18	0.18	0.17	0.17	0.17	0.18
Total Alkalinity	mg/L	40	26	44	34	38	34	36	40
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	<0.003	-	-	-	-	<0.003	-
Arsenic	mg/L	-	0.0075	-	-	-	-	0.008	-
Barium	mg/L	-	0.0098	-	-	-	-	0.0039	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	9.84	-	-	-	-	11.1	-
Chloride	mg/L	-	1.85	-	-	-	-	0.75	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.872	-	-	-	-	0.73	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	0.01	0.29	-	-	0.01	0.03	0.01	0.01
Iron	mg/L	0.01	0.29	-	-	0.01	0.03	0.01	0.01
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	2.41	-	-	-	-	2.79	-
Manganese	mg/L	-	0.0055	-	-	-	-	0.0054	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	2.83	-	-	-	-	3.15	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	5.74	-	-	-	-	6.8	-
Sulfate	mg/L	14.6	13.3	7.9	10.7	6.9	7.4	9.9	9.3
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	68	-	-	-	-	76	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	444.3856	453.6025	459.1088	467.2943	472.4417	477.6217	484.918	491.521
Cum Fe	mg	0.22462	0.42559	0.42559	0.42559	0.43305	0.45405	0.46142	0.46852
Pyritic Sulfur	%	1.670	1.670	1.670	1.670	1.670	1.670	1.670	1.670
ANP/AGP<Pyritic Sulfur	-	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510

Sample ID		AR2010-03	AR2010-03	AR2010-03	AR2010-03				
Week	Units	32	33	34	35				
Rock Unit	-	Andesite	Andesite	Andesite	Andesite				
pH	s.u.	7.79	7.6	7.4	7.5				
Redox	mV	115	135	102	77				
Conductivity	mS/cm	0.17	0.17	0.17	0.17				
Total Alkalinity	mg/L	34	30	34	38				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	<0.0008				
Arsenic	mg/L	-	-	-	0.00887				
Barium	mg/L	-	-	-	0.0043				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	7.98				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.522				
Fe 2+	mg/L	-	-	-	-				
Fe 3+	mg/L	-	-	-	-				
Iron	mg/L	-	-	-	<0.06				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	1.99				
Manganese	mg/L	-	-	-	0.0047				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	2.21				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	5.21				
Sulfate	mg/L	11.4	12.3	8.9	9.3				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	499.8544	508.6243	515.0234	521.2823				
Cum Fe	mg	0.46852	0.46852	0.46852	0.5089				
Pyritic Sulfur	%	1.670	1.670	1.670	1.670				
ANP/AGP<Pyritic Sulfur	-	0.510	0.510	0.510	0.510				

Sample ID		AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.84	7.55	7.35	7.59	8	7.71	7.9	7.84
Redox	mV	109	99	215	190	173	172	173	179
Conductivity	mS/cm	0.9	0.32	0.32	0.24	0.23	0.23	0.21	0.21
Total Alkalinity	mg/L	96	76	62	60	50	54	46	50
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	0.0079	-	-	-	-	0.0279	-	-
Arsenic	mg/L	0.007	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0241	-	-	-	-	0.0057	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	95	-	-	-	-	15.1	-	-
Chloride	mg/L	3.93	-	-	-	-	0.23	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	<0.01	-	-	-	-	<0.01	-	-
Fluoride	mg/L	2.38	-	-	-	-	0.805	-	-
Fe 2+	mg/L	0.02	-	-	0.01	-	-	-	-
Fe 3+	mg/L	0.01	0.01	0.01	-	-	-	0.01	-
Iron	mg/L	0.03	0.01	0.01	0.01	-	<0.06	0.01	-
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	30.7	-	-	-	-	6.37	-	-
Manganese	mg/L	0.024	-	-	-	-	0.008	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	41	-	-	-	-	16.1	-	-
Selenium	mg/L	0.05	-	-	-	-	<0.04	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	26.6	-	-	-	-	8.26	-	-
Sulfate	mg/L	418	107	13	65.4	68.5	56.1	46.1	50.1
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	777	-	-	-	-	141	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	323.532	399.288	408.869	458.246	509.21	550.1069	581.501	618.8756
Cum Fe	mg	0.02322	0.0303	0.03767	0.04522	0.04522	0.08896	0.09577	0.09577
Pyritic Sulfur	%	2.200	2.200	2.200	2.200	2.200	2.200	2.200	2.200
ANP/AGP<Pyritic Sulfur	-	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788

Sample ID		AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.7	7.93	7.62	7.59	7.68	7.65	7.6	7.71
Redox	mV	169	152	149	127	135	114	205	124
Conductivity	mS/cm	0.22	0.2	0.2	0.19	0.19	0.19	0.2	0.2
Total Alkalinity	mg/L	46	42	46	42	40	40	42	44
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.0207	-	-	-	-	0.0169
Arsenic	mg/L	-	-	<0.01	-	-	-	-	0.0035
Barium	mg/L	-	-	0.0072	-	-	-	-	0.016
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	14.7	-	-	-	-	13.4
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.493	-	-	-	-	0.453
Fe 2+	mg/L	-	-	-	-	-	-	0.01	-
Fe 3+	mg/L	-	-	0.02	0.08	-	0.01	-	-
Iron	mg/L	-	-	0.02	0.08	-	0.01	0.01	<0.06
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	5.29	-	-	-	-	4.69
Manganese	mg/L	-	-	0.012	-	-	-	-	0.011
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	11.8	-	-	-	-	8.58
Selenium	mg/L	-	-	<0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	5.37	-	-	-	-	4.84
Sulfate	mg/L	44.6	36.3	38.5	32.9	30.7	27.7	28.1	31
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	124	-	-	-	-	99
Zinc	mg/L	-	-	0.0034	-	-	-	-	<0.01
Cum SO4	mg	651.4336	678.5497	706.2697	730.7473	753.3732	773.5111	793.8274	816.8294
Cum Fe	mg	0.09577	0.09577	0.11017	0.16969	0.16969	0.17696	0.18419	0.22871
Pyritic Sulfur	%	2.200	2.200	2.200	2.200	2.200	2.200	2.200	2.200
ANP/AGP<Pyritic Sulfur	-	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788

Sample ID		AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.51	7.58	7.56	7.51	7.41	7.57	7.75	7.8
Redox	mV	112	121	121	125	122	127	115	93
Conductivity	mS/cm	0.19	0.19	0.18	0.18	0.18	0.19	0.18	0.19
Total Alkalinity	mg/L	38	42	42	38	34	36	36	44
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.0128	-	-	-
Arsenic	mg/L	-	-	-	-	0.00552	-	-	-
Barium	mg/L	-	-	-	-	0.0197	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	12.6	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.383	-	-	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	0.03	0.02	0.04	-	0.03	0.01	-	0.01
Iron	mg/L	0.03	0.02	0.04	-	0.03	0.01	-	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	3.73	-	-	-
Manganese	mg/L	-	-	-	-	0.011	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	6.32	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	4.18	-	-	-
Sulfate	mg/L	15.9	25.6	18.1	13.7	21	25.1	27	23.6
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	92	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	828.2615	846.7191	859.6968	869.643	885.015	902.2838	921.5348	938.9516
Cum Fe	mg	0.25028	0.2647	0.29338	0.29338	0.31534	0.32222	0.32222	0.3296
Pyritic Sulfur	%	2.200	2.200	2.200	2.200	2.200	2.200	2.200	2.200
ANP/AGP<Pyritic Sulfur	-	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788

Sample ID		AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03	AR2011-03
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.52	7.49	7.63	7.76	7.41	7.61	7.44	7.55
Redox	mV	119	105	100	136	116	100	124	137
Conductivity	mS/cm	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.18
Total Alkalinity	mg/L	34	34	36	30	32	32	36	32
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.0112	-	-	-	-	0.0097	-
Arsenic	mg/L	-	0.0047	-	-	-	-	0.0045	-
Barium	mg/L	-	0.0077	-	-	-	-	0.0049	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	12.5	-	-	-	-	13.2	-
Chloride	mg/L	-	1.7	-	-	-	-	0.71	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.606	-	-	-	-	0.48	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	0.01	0.01	-	-	0.01	0.01	0.01	-
Iron	mg/L	0.01	0.01	-	-	0.01	0.01	0.01	-
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	3.46	-	-	-	-	3.59	-
Manganese	mg/L	-	0.0086	-	-	-	-	0.0073	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	5.88	-	-	-	-	5.93	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	4.24	-	-	-	-	5.41	-
Sulfate	mg/L	21.2	23.7	8.7	16.7	20.6	15.8	22.1	15.4
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	83	-	-	-	-	90	-
Zinc	mg/L	-	<0.01	-	-	-	-	0.0365	-
Cum SO4	mg	953.7492	970.8843	977.0526	989.0432	1003.8134	1015.3158	1031.4267	1042.1913
Cum Fe	mg	0.33658	0.34381	0.34381	0.34381	0.35098	0.35826	0.36555	0.36555
Pyritic Sulfur	%	2.200	2.200	2.200	2.200	2.200	2.200	2.200	2.200
ANP/AGP<Pyritic Sulfur	-	0.788	0.788	0.788	0.788	0.788	0.788	0.788	0.788

Sample ID		AR2011-03	AR2011-03	AR2011-03	AR2011-03				
Week	Units	32	33	34	35				
Rock Unit	-	Andesite	Andesite	Andesite	Andesite				
pH	s.u.	7.98	7.73	7.51	7.63				
Redox	mV	112	134	99	74				
Conductivity	mS/cm	0.17	0.17	0.17	0.18				
Total Alkalinity	mg/L	28	26	26	34				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00577				
Arsenic	mg/L	-	-	-	0.00619				
Barium	mg/L	-	-	-	0.0034				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	10.4				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.344				
Fe 2+	mg/L	0.01	-	-	-				
Fe 3+	mg/L	0.01	0.01	-	-				
Iron	mg/L	0.02	0.01	-	<0.06				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	2.6				
Manganese	mg/L	-	-	-	0.0066				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	4.4				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	4.19				
Sulfate	mg/L	20	25.4	24.8	28.3				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	1055.7913	1072.5045	1089.3437	1107.8519				
Cum Fe	mg	0.37915	0.38573	0.38573	0.42497				
Pyritic Sulfur	%	2.200	2.200	2.200	2.200				
ANP/AGP<Pyritic Sulfur	-	0.788	0.788	0.788	0.788				

Appendix E
Tabulated HCT Testing Results

Sample ID		AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.68	7.33	7.41	7.55	8.1	7.69	7.7	7.71
Redox	mV	162	163	180	189	171	176	181	186
Conductivity	mS/cm	3.18	0.49	0.27	0.2	0.18	0.22	0.25	0.27
Total Alkalinity	mg/L	66	94	66	74	56	52	48	52
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	0.0119	-	-	-	-	0.0183	-	-
Arsenic	mg/L	0.009	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0398	-	-	-	-	0.0072	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	432	-	-	-	-	21.5	-	-
Chloride	mg/L	14.8	-	-	-	-	0.4	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	0.014	-	-	-	-	<0.01	-	-
Fluoride	mg/L	2.85	-	-	-	-	1.41	-	-
Fe 2+	mg/L	0.02	0.02	-	-	-	-	-	-
Fe 3+	mg/L	0.02	-	0.01	1	0.01	-	-	-
Iron	mg/L	0.04	0.02	0.01	0.01	0.01	<0.06	-	-
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	193	-	-	-	-	6.13	-	-
Manganese	mg/L	0.411	-	-	-	-	0.012	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	187	-	-	-	-	24.6	-	-
Selenium	mg/L	<0.04	-	-	-	-	<0.04	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	60.4	-	-	-	-	7.35	-	-
Sulfate	mg/L	1880	180	38	23.3	26.1	39.5	64.9	86.6
Thallium	mg/L	<0.002	-	-	-	-	0.0029	-	-
TDS	mg/L	3560	-	-	-	-	177	-	-
Zinc	mg/L	<0.01	-	-	-	-	0.0025	-	-
Cum SO4	mg	1383.68	1515.44	1538.772	1555.2684	1574.9217	1604.2702	1653.1399	1716.9641
Cum Fe	mg	0.02944	0.04408	0.05022	0.0573	0.06483	0.10941	0.10941	0.10941
Pyritic Sulfur	%	1.550	1.550	1.550	1.550	1.550	1.550	1.550	1.550
ANP/AGP<Pyritic Sulfur	-	1.233	1.233	1.233	1.233	1.233	1.233	1.233	1.233

Sample ID		AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.63	7.79	7.54	7.6	7.81	7.73	7.64	7.67
Redox	mV	206	157	154	130	136	114	206	128
Conductivity	mS/cm	0.24	0.23	0.21	0.2	0.18	0.19	0.2	0.21
Total Alkalinity	mg/L	44	50	48	44	36	34	38	38
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.0144	-	-	-	-	0.01
Arsenic	mg/L	-	-	<0.01	-	-	-	-	0.0044
Barium	mg/L	-	-	0.0075	-	-	-	-	0.0238
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	22.6	-	-	-	-	17.7
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.653	-	-	-	-	0.485
Fe 2+	mg/L	-	-	-	-	-	-	-	0.01
Fe 3+	mg/L	-	-	-	0.01	0.02	-	-	-
Iron	mg/L	-	-	<0.06	0.01	0.02	-	-	0.01
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	4.93	-	-	-	-	3.45
Manganese	mg/L	-	-	0.019	-	-	-	-	0.018
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	15.2	-	-	-	-	9.24
Selenium	mg/L	-	-	<0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	4.62	-	-	-	-	3.42
Sulfate	mg/L	67.6	57.5	47.6	38.8	30.1	28.2	38.5	43.6
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	156	-	-	-	-	100
Zinc	mg/L	-	-	0.0021	-	-	-	-	0.0107
Cum SO4	mg	1765.0277	1807.7502	1843.5454	1872.2186	1894.0712	1914.4598	1942.8343	1975.2727
Cum Fe	mg	0.10941	0.10941	0.15453	0.16192	0.17644	0.17644	0.17644	0.18388
Pyritic Sulfur	%	1.550	1.550	1.550	1.550	1.550	1.550	1.550	1.550
ANP/AGP<Pyritic Sulfur	-	1.233	1.233	1.233	1.233	1.233	1.233	1.233	1.233

Sample ID		AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.53	7.61	7.46	7.45	7.26	7.63	7.68	7.7
Redox	mV	115	123	127	130	129	132	120	97
Conductivity	mS/cm	0.21	0.2	0.22	0.21	0.22	0.21	0.2	0.2
Total Alkalinity	mg/L	38	36	42	46	44	48	46	46
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.0147	-	-	-
Arsenic	mg/L	-	-	-	-	0.0039	-	-	-
Barium	mg/L	-	-	-	-	0.0308	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	19.9	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.571	-	-	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	0.01	0.05	0.07	-	0.02	0.01	0.01	0.01
Iron	mg/L	0.01	0.05	0.07	-	0.02	0.01	0.01	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	3.53	-	-	-
Manganese	mg/L	-	-	-	-	0.015	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	9.67	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	4.11	-	-	-
Sulfate	mg/L	32.2	28.8	35.8	36.6	32.8	26.9	27.3	23.2
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	125	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	1998.7787	2019.6299	2045.8355	2072.9561	2096.7033	2116.8245	2136.8081	2152.6769
Cum Fe	mg	0.19118	0.22738	0.27862	0.27862	0.2931	0.30058	0.3079	0.31474
Pyritic Sulfur	%	1.550	1.550	1.550	1.550	1.550	1.550	1.550	1.550
ANP/AGP<Pyritic Sulfur	-	1.233	1.233	1.233	1.233	1.233	1.233	1.233	1.233

Sample ID		AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01	AR2013-01
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.39	7.29	7.26	7.5	7.51	7.36	7.25	7.26
Redox	mV	125	116	103	152	118	121	139	151
Conductivity	mS/cm	0.21	0.2	0.21	0.19	0.2	0.22	0.22	0.23
Total Alkalinity	mg/L	50	48	70	42	44	42	44	50
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.014	-	-	-	-	0.0119	-
Arsenic	mg/L	-	0.0051	-	-	-	-	0.005	-
Barium	mg/L	-	0.0127	-	-	-	-	0.0067	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	17.1	-	-	-	-	21.2	-
Chloride	mg/L	-	1.82	-	-	-	-	0.73	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	1.03	-	-	-	-	0.76	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	-	-	0.01	-	-	0.01	-
Iron	mg/L	-	<0.06	-	0.01	-	-	0.01	-
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	3.04	-	-	-	-	3.4	-
Manganese	mg/L	-	0.0137	-	-	-	-	0.0324	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	9.88	-	-	-	-	10.3	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	4.15	-	-	-	-	4.63	-
Sulfate	mg/L	35.8	25.5	12.9	19.6	19.7	25.5	34.7	21
Thallium	mg/L	-	<0.002	-	-	-	-	0.00108	-
TDS	mg/L	-	109	-	-	-	-	115	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	2175.8753	2194.3883	2203.4183	2217.9223	2232.5594	2250.9704	2276.7178	2291.9638
Cum Fe	mg	0.31474	0.3583	0.3583	0.3657	0.3657	0.3657	0.37312	0.37312
Pyritic Sulfur	%	1.550	1.550	1.550	1.550	1.550	1.550	1.550	1.550
ANP/AGP<Pyritic Sulfur	-	1.233	1.233	1.233	1.233	1.233	1.233	1.233	1.233

Sample ID		AR2013-01	AR2013-01	AR2013-01	AR2013-01				
Week	Units	32	33	34	35				
Rock Unit	-	Andesite	Andesite	Andesite	Andesite				
pH	s.u.	7.62	7.44	7.3	7.24				
Redox	mV	137	159	117	114				
Conductivity	mS/cm	0.2	0.22	0.21	0.2				
Total Alkalinity	mg/L	42	46	46	46				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.0105				
Arsenic	mg/L	-	-	-	0.00776				
Barium	mg/L	-	-	-	0.0057				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	17.8				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.748				
Fe 2+	mg/L	0.01	-	-	-				
Fe 3+	mg/L	-	-	0.01	-				
Iron	mg/L	0.01	-	0.01	<0.06				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	2.97				
Manganese	mg/L	-	-	-	0.0153				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	9.36				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	4.5				
Sulfate	mg/L	29.8	43.2	35.2	30.8				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	2313.6582	2344.5462	2370.207	2392.7526				
Cum Fe	mg	0.3804	0.3804	0.38769	0.43161				
Pyritic Sulfur	%	1.550	1.550	1.550	1.550				
ANP/AGP<Pyritic Sulfur	-	1.233	1.233	1.233	1.233				

Sample ID		AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.79	7.71	7.75	7.86	8.11	8.11	7.85	8.11
Redox	mV	121	103	183	177	170	161	176	170
Conductivity	mS/cm	1.26	0.59	0.56	0.27	0.29	0.23	0.28	0.27
Total Alkalinity	mg/L	54	144	58	74	68	58	66	66
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	0.0032	-	-	-	-	0.0198	-	-
Arsenic	mg/L	0.023	-	-	-	-	0.0223	-	-
Barium	mg/L	0.136	-	-	-	-	0.018	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	112	-	-	-	-	14.7	-	-
Chloride	mg/L	7.12	-	-	-	-	0.45	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	0.02	-	-	-	-	<0.01	-	-
Fluoride	mg/L	1.73	-	-	-	-	0.979	-	-
Fe 2+	mg/L	0.04	0.01	0.02	0.02	0.01	-	-	-
Fe 3+	mg/L	0.03	0.01	0.01	0.01	0.01	-	-	-
Iron	mg/L	0.07	0.02	0.03	0.03	0.02	<0.06	-	-
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	30.8	-	-	-	-	5.58	-	-
Manganese	mg/L	0.071	-	-	-	-	<0.004	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	99.2	-	-	-	-	51.3	-	-
Selenium	mg/L	0.49	-	-	-	-	0.07	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	75.4	-	-	-	-	17.9	-	-
Sulfate	mg/L	573	319	35	36	82.3	35.2	68.3	58.1
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	1090	-	-	-	-	238	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	471.006	672.614	699.074	725.822	785.2426	810.6922	859.7316	904.2943
Cum Fe	mg	0.05754	0.07018	0.09286	0.11515	0.12959	0.17297	0.17297	0.17297
Pyritic Sulfur	%	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060
ANP/AGP<Pyritic Sulfur	-	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121

Sample ID		AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.9	8.1	8	8.02	7.96	8.16	7.86	7.91
Redox	mV	208	143	142	115	132	105	198	124
Conductivity	mS/cm	0.28	0.24	0.22	0.2	0.21	0.22	0.21	0.23
Total Alkalinity	mg/L	62	64	52	42	50	50	38	50
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.0188	-	-	-	-	0.0125
Arsenic	mg/L	-	-	0.0213	-	-	-	-	0.0092
Barium	mg/L	-	-	0.0164	-	-	-	-	0.0453
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	9.71	-	-	-	-	10.4
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.667	-	-	-	-	0.526
Fe 2+	mg/L	-	-	-	-	-	-	0.01	-
Fe 3+	mg/L	-	-	0.01	0.02	-	-	-	0.01
Iron	mg/L	-	-	0.01	0.02	-	-	0.01	0.01
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	3.91	-	-	-	-	3.52
Manganese	mg/L	-	-	0.005	-	-	-	-	0.004
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	36.3	-	-	-	-	25.2
Selenium	mg/L	-	-	0.06	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	9.73	-	-	-	-	7.7
Sulfate	mg/L	63.1	38.1	28	32	48.9	31.1	26.9	45.4
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	157	-	-	-	-	120
Zinc	mg/L	-	-	<0.002	-	-	-	-	0.0141
Cum SO4	mg	949.537	978.8359	999.1639	1023.0359	1059.4175	1082.276	1102.182	1136.0958
Cum Fe	mg	0.17297	0.17297	0.18023	0.19515	0.19515	0.19515	0.20255	0.21002
Pyritic Sulfur	%	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060
ANP/AGP<Pyritic Sulfur	-	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121

Sample ID		AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.9	7.82	7.73	7.82	7.72	7.76	7.75	7.69
Redox	mV	106	121	110	119	120	149	118	101
Conductivity	mS/cm	0.22	0.25	0.25	0.22	0.23	0.25	0.29	0.35
Total Alkalinity	mg/L	44	48	50	52	52	20	62	70
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.0141	-	-	-
Arsenic	mg/L	-	-	-	-	0.0162	-	-	-
Barium	mg/L	-	-	-	-	0.0233	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	11.5	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.547	-	-	-
Fe 2+	mg/L	0.01	0.01	-	-	-	-	-	-
Fe 3+	mg/L	0.03	0.02	0.03	-	-	0.02	0.01	0.01
Iron	mg/L	0.04	0.03	0.03	-	<0.06	0.02	0.01	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	3.7	-	-	-
Manganese	mg/L	-	-	-	-	<0.004	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	24.8	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	7.75	-	-	-
Sulfate	mg/L	33.6	47.9	41.4	33.3	33.5	58.8	71.8	165.6
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	133	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	1160.7918	1194.1302	1224.435	1248.6441	1273.9366	1315.5082	1362.25	1468.8964
Cum Fe	mg	0.23942	0.2603	0.28226	0.28226	0.32756	0.3417	0.34821	0.35465
Pyritic Sulfur	%	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060
ANP/AGP<Pyritic Sulfur	-	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121

Sample ID		AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02	AR2013-02
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.4	7.42	7.51	7.62	7.43	7.35	7.48	7.36
Redox	mV	124	114	90	153	126	125	136	146
Conductivity	mS/cm	0.3	0.26	0.26	0.25	0.27	0.27	0.25	0.25
Total Alkalinity	mg/L	66	64	60	60	60	58	56	54
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.0169	-	-	-	-	0.0139	-
Arsenic	mg/L	-	0.0196	-	-	-	-	0.0194	-
Barium	mg/L	-	0.0244	-	-	-	-	0.0181	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	13.1	-	-	-	-	14.5	-
Chloride	mg/L	-	1.66	-	-	-	-	0.76	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.962	-	-	-	-	0.76	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	-	-	-	-	0.02	-	-
Iron	mg/L	-	<0.06	-	-	-	0.02	<0.06	-
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	4.09	-	-	-	-	4.65	-
Manganese	mg/L	-	0.0042	-	-	-	-	<0.004	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	29.2	-	-	-	-	32.2	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	7.78	-	-	-	-	8.83	-
Sulfate	mg/L	46.4	41.1	27.9	35.3	32	33.2	39.4	27.1
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	145	-	-	-	-	157	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	1503.0468	1533.4197	1553.3961	1578.8827	1602.7867	1626.7903	1656.2615	1676.1529
Cum Fe	mg	0.35465	0.39899	0.39899	0.39899	0.39899	0.41345	0.45833	0.45833
Pyritic Sulfur	%	1.060	1.060	1.060	1.060	1.060	1.060	1.060	1.060
ANP/AGP<Pyritic Sulfur	-	2.121	2.121	2.121	2.121	2.121	2.121	2.121	2.121

Sample ID		AR2013-02	AR2013-02	AR2013-02	AR2013-02				
Week	Units	32	33	34	35				
Rock Unit	-	Andesite	Andesite	Andesite	Andesite				
pH	s.u.	7.74	7.5	7.36	7.31				
Redox	mV	139	157	125	214				
Conductivity	mS/cm	0.24	0.24	0.23	0.24				
Total Alkalinity	mg/L	54	54	44	58				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.0121				
Arsenic	mg/L	-	-	-	0.0211				
Barium	mg/L	-	-	-	0.0178				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	12.1				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.635				
Fe 2+	mg/L	-	-	-	-				
Fe 3+	mg/L	-	0.01	-	-				
Iron	mg/L	-	0.01	-	<0.06				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	3.67				
Manganese	mg/L	-	-	-	<0.004				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	25.8				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	7.57				
Sulfate	mg/L	44.3	42.5	46.1	38				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	1709.0678	1739.2853	1772.5234	1800.4914				
Cum Fe	mg	0.45833	0.46544	0.46544	0.5096				
Pyritic Sulfur	%	1.060	1.060	1.060	1.060				
ANP/AGP<Pyritic Sulfur	-	2.121	2.121	2.121	2.121				

Sample ID		AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.96	7.62	7.4	7.61	8.03	7.79	7.81	7.87
Redox	mV	69	104	200	190	173	171	176	178
Conductivity	mS/cm	0.85	0.26	0.24	0.19	0.2	0.2	0.19	0.19
Total Alkalinity	mg/L	104	86	90	86	66	66	72	58
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	0.0091	-	-	-	-	0.0234	-	-
Arsenic	mg/L	0.047	-	-	-	-	0.0244	-	-
Barium	mg/L	0.0241	-	-	-	-	0.0044	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	111	-	-	-	-	11.7	-	-
Chloride	mg/L	5.49	-	-	-	-	0.22	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	<0.01	-	-	-	-	<0.01	-	-
Fluoride	mg/L	3.35	-	-	-	-	1.04	-	-
Fe 2+	mg/L	0.02	-	-	-	-	-	-	-
Fe 3+	mg/L	0.04	-	-	0.01	0.01	-	-	-
Iron	mg/L	0.06	-	-	0.01	0.01	<0.06	-	-
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	28.8	-	-	-	-	4.41	-	-
Manganese	mg/L	0.028	-	-	-	-	0.008	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	29.7	-	-	-	-	12.3	-	-
Selenium	mg/L	1.03	-	-	-	-	0.24	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	28.1	-	-	-	-	8.64	-	-
Sulfate	mg/L	421	40	34.5	23.2	33.4	23.3	22.5	24.5
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	742	-	-	-	-	106	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	306.488	335.288	361.439	379.1406	403.2554	420.0547	436.4797	454.9772
Cum Fe	mg	0.04368	0.04368	0.04368	0.05131	0.05853	0.10179	0.10179	0.10179
Pyritic Sulfur	%	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
ANP/AGP<Pyritic Sulfur	-	2.476	2.476	2.476	2.476	2.476	2.476	2.476	2.476

Sample ID		AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.79	7.88	7.67	7.67	7.66	7.7	7.58	7.63
Redox	mV	167	150	154	126	138	114	202	129
Conductivity	mS/cm	0.19	0.19	0.19	0.19	0.18	0.19	0.2	0.2
Total Alkalinity	mg/L	56	56	50	52	52	48	48	48
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.0217	-	-	-	-	0.0187
Arsenic	mg/L	-	-	0.0207	-	-	-	-	0.0175
Barium	mg/L	-	-	0.0042	-	-	-	-	0.0323
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	10.8	-	-	-	-	12.5
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.537	-	-	-	-	0.531
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	0.01	-	0.01	-	0.02	-	0.01
Iron	mg/L	-	0.01	<0.06	0.01	-	0.02	-	0.01
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	4.01	-	-	-	-	4.14
Manganese	mg/L	-	-	0.01	-	-	-	-	0.009
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	10.5	-	-	-	-	7.71
Selenium	mg/L	-	-	0.28	-	-	-	-	0.27
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	6.22	-	-	-	-	5.88
Sulfate	mg/L	22.2	24.8	23.7	22.8	19.1	18.4	23.3	18.4
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	105	-	-	-	-	97
Zinc	mg/L	-	-	<0.002	-	-	-	-	<0.01
Cum SO4	mg	471.4718	489.4022	506.7743	523.4867	537.9072	551.3944	568.7296	582.6032
Cum Fe	mg	0.10179	0.10902	0.153	0.16033	0.16033	0.17499	0.17499	0.18253
Pyritic Sulfur	%	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
ANP/AGP<Pyritic Sulfur	-	2.476	2.476	2.476	2.476	2.476	2.476	2.476	2.476

Sample ID		AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.48	7.51	7.62	7.52	7.44	7.65	7.83	7.93
Redox	mV	113	125	112	115	125	127	115	92
Conductivity	mS/cm	0.19	0.19	0.19	0.18	0.19	0.19	0.18	0.18
Total Alkalinity	mg/L	40	42	40	44	44	38	40	44
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.0145	-	-	-
Arsenic	mg/L	-	-	-	-	0.0177	-	-	-
Barium	mg/L	-	-	-	-	0.0187	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	13.8	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.0442	-	-	-
Fe 2+	mg/L	-	-	-	-	0.01	-	-	-
Fe 3+	mg/L	0.01	0.07	0.02	0.01	-	-	-	0.01
Iron	mg/L	0.01	0.07	0.02	0.01	0.01	-	-	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	3.39	-	-	-
Manganese	mg/L	-	-	-	-	0.013	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	5.11	-	-	-
Selenium	mg/L	-	-	-	-	0.19	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	4.84	-	-	-
Sulfate	mg/L	11.9	24.5	17.1	17.5	15.4	16.1	18.5	22.6
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	88	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	591.433	609.4895	622.0922	634.9897	645.9237	657.6928	670.9758	687.632
Cum Fe	mg	0.18995	0.24154	0.25628	0.26365	0.27075	0.27075	0.27075	0.27812
Pyritic Sulfur	%	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
ANP/AGP<Pyritic Sulfur	-	2.476	2.476	2.476	2.476	2.476	2.476	2.476	2.476

Sample ID		AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03	AR2013-03
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.47	7.59	7.71	7.86	7.65	7.58	7.62	7.66
Redox	mV	120	108	86	144	159	112	125	129
Conductivity	mS/cm	0.18	0.18	0.17	0.18	0.17	0.19	0.18	0.19
Total Alkalinity	mg/L	36	32	36	38	30	36	36	40
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.0141	-	-	-	-	0.0116	-
Arsenic	mg/L	-	0.0175	-	-	-	-	0.0148	-
Barium	mg/L	-	0.0072	-	-	-	-	0.0041	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	11.7	-	-	-	-	11.7	-
Chloride	mg/L	-	1.76	-	-	-	-	0.7	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.733	-	-	-	-	0.59	-
Fe 2+	mg/L	-	-	-	-	-	-	0.01	-
Fe 3+	mg/L	-	0.01	-	0.01	0.02	0.01	-	-
Iron	mg/L	-	0.01	-	0.01	0.02	0.01	0.01	-
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	3.1	-	-	-	-	2.95	-
Manganese	mg/L	-	0.008	-	-	-	-	0.0084	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	5.07	-	-	-	-	4.67	-
Selenium	mg/L	-	0.21	-	-	-	-	0.13	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	5.93	-	-	-	-	6.68	-
Sulfate	mg/L	21.5	16.4	7.6	16.8	7.3	16.5	21.7	15.7
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	85	-	-	-	-	87	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	703.1335	714.9087	720.1907	732.4043	737.7187	749.3182	765.2677	776.5403
Cum Fe	mg	0.27812	0.2853	0.2853	0.29257	0.30713	0.31416	0.32151	0.32151
Pyritic Sulfur	%	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
ANP/AGP<Pyritic Sulfur	-	2.476	2.476	2.476	2.476	2.476	2.476	2.476	2.476

Sample ID		AR2013-03	AR2013-03	AR2013-03	AR2013-03				
Week	Units	32	33	34	35				
Rock Unit	-	Andesite	Andesite	Andesite	Andesite				
pH	s.u.	7.92	7.65	7.54	7.58				
Redox	mV	137	143	109	103				
Conductivity	mS/cm	0.17	0.18	0.17	0.16				
Total Alkalinity	mg/L	36	36	30	32				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00866				
Arsenic	mg/L	-	-	-	0.0129				
Barium	mg/L	-	-	-	0.033				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	9.55				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.484				
Fe 2+	mg/L	-	-	-	-				
Fe 3+	mg/L	-	0.01	-	-				
Iron	mg/L	-	0.01	-	<0.06				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	2.33				
Manganese	mg/L	-	-	-	0.0074				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	3.8				
Selenium	mg/L	-	-	-	0.118				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	5.89				
Sulfate	mg/L	19	23.3	15.2	15.4				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	790.1633	806.6131	817.4051	828.2929				
Cum Fe	mg	0.32151	0.32857	0.32857	0.37099				
Pyritic Sulfur	%	1.020	1.020	1.020	1.020				
ANP/AGP<Pyritic Sulfur	-	2.476	2.476	2.476	2.476				

Sample ID		AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.67	7.94	7.61	7.86	7.99	7.75	8.02	7.86
Redox	mV	166	87	186	187	169	178	177	186
Conductivity	mS/cm	0.72	0.16	0.14	0.23	0.27	0.27	0.24	0.34
Total Alkalinity	mg/L	68	32	32	28	24	26	28	32
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	0.0075	-	-	-	-	0.00908	-	-
Arsenic	mg/L	0.006	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0292	-	-	-	-	0.0076	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	70.6	-	-	-	-	19.3	-	-
Chloride	mg/L	7.87	-	-	-	-	0.36	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	0.011	-	-	-	-	<0.01	-	-
Fluoride	mg/L	2.35	-	-	-	-	0.738	-	-
Fe 2+	mg/L	0.02	-	-	0.01	-	-	-	-
Fe 3+	mg/L	0.02	0.03	-	-	-	-	-	-
Iron	mg/L	0.04	0.03	-	0.01	-	<0.06	-	-
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	27.7	-	-	-	-	6.98	-	-
Manganese	mg/L	0.033	-	-	-	-	0.026	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	26.6	-	-	-	-	7.44	-	-
Selenium	mg/L	<0.04	-	-	-	-	<0.04	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	26.8	-	-	-	-	7.49	-	-
Sulfate	mg/L	317	12.3	83.9	87	120.6	78.8	95.5	153.6
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	584	-	-	-	-	140	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	252.649	259.9921	320.484	380.079	468.72	525.6136	584.4416	687.0464
Cum Fe	mg	0.03188	0.04979	0.04979	0.05664	0.05664	0.09996	0.09996	0.09996
Pyritic Sulfur	%	3.920	3.920	3.920	3.920	3.920	3.920	3.920	3.920
ANP/AGP<Pyritic Sulfur	-	0.854	0.854	0.854	0.854	0.854	0.854	0.854	0.854

Sample ID		AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.84	7.92	7.83	7.73	7.72	7.67	7.64	7.71
Redox	mV	170	155	155	124	143	119	200	133
Conductivity	mS/cm	0.3	0.24	0.22	0.22	0.24	0.23	0.22	0.23
Total Alkalinity	mg/L	32	28	26	28	30	30	28	26
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.00983	-	-	-	-	0.012
Arsenic	mg/L	-	-	<0.01	-	-	-	-	<0.003
Barium	mg/L	-	-	0.0106	-	-	-	-	0.0474
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	22.7	-	-	-	-	22.3
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.837	-	-	-	-	0.795
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	-	-	-	0.01	-	-	-
Iron	mg/L	-	-	<0.06	-	0.01	-	-	<0.06
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	8.14	-	-	-	-	7.53
Manganese	mg/L	-	-	0.028	-	-	-	-	0.024
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	7.9	-	-	-	-	5.56
Selenium	mg/L	-	-	<0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	7.6	-	-	-	-	5.43
Sulfate	mg/L	80	68.2	43.7	63.1	92.2	59.8	54.9	53.2
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	168	-	-	-	-	138
Zinc	mg/L	-	-	<0.002	-	-	-	-	0.0166
Cum SO4	mg	746.0864	796.3498	826.4591	870.8184	933.6988	977.4724	1015.3534	1052.1146
Cum Fe	mg	0.09996	0.09996	0.1413	0.1413	0.14812	0.14812	0.14812	0.18958
Pyritic Sulfur	%	3.920	3.920	3.920	3.920	3.920	3.920	3.920	3.920
ANP/AGP<Pyritic Sulfur	-	0.854	0.854	0.854	0.854	0.854	0.854	0.854	0.854

Sample ID		AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.57	7.54	7.8	7.83	7.48	7.79	7.87	7.75
Redox	mV	117	125	108	111	129	127	117	102
Conductivity	mS/cm	0.22	0.21	0.17	0.17	0.18	0.21	0.2	0.2
Total Alkalinity	mg/L	28	30	32	22	28	26	26	30
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.00903	-	-	-
Arsenic	mg/L	-	-	-	-	<0.003	-	-	-
Barium	mg/L	-	-	-	-	0.0274	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	17.1	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.531	-	-	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	0.01	0.03	0.01	0.01	0.01	0.01	-
Iron	mg/L	-	0.01	0.03	0.01	0.01	0.01	0.01	-
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	5.68	-	-	-
Manganese	mg/L	-	-	-	-	0.023	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	3.63	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	4.41	-	-	-
Sulfate	mg/L	41	48.5	23.2	32.7	61	64.8	45.2	46.5
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	99	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	1080.8556	1114.7086	1130.6238	1152.4347	1194.3417	1237.3689	1269.1897	1303.6462
Cum Fe	mg	0.18958	0.19656	0.21714	0.22381	0.23068	0.23732	0.24436	0.24436
Pyritic Sulfur	%	3.920	3.920	3.920	3.920	3.920	3.920	3.920	3.920
ANP/AGP<Pyritic Sulfur	-	0.854	0.854	0.854	0.854	0.854	0.854	0.854	0.854

Sample ID		AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02	AR2014-02
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.73	7.7	8.06	7.77	7.72	7.68	7.71	7.77
Redox	mV	117	109	104	146	153	110	117	122
Conductivity	mS/cm	0.2	0.2	0.17	0.19	0.19	0.21	0.18	0.21
Total Alkalinity	mg/L	32	36	34	34	26	22	24	28
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.00936	-	-	-	-	0.0079	-
Arsenic	mg/L	-	<0.003	-	-	-	-	0.0034	-
Barium	mg/L	-	0.0128	-	-	-	-	0.0071	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	17.9	-	-	-	-	18	-
Chloride	mg/L	-	1.86	-	-	-	-	0.72	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.779	-	-	-	-	0.57	-
Fe 2+	mg/L	0.01	-	-	-	-	-	0.01	-
Fe 3+	mg/L	-	0.01	-	0.02	0.02	0.02	0.01	0.02
Iron	mg/L	0.01	0.01	-	0.02	0.02	0.02	0.02	0.02
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	5.64	-	-	-	-	5.08	-
Manganese	mg/L	-	0.0202	-	-	-	-	0.0314	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	3.31	-	-	-	-	2.82	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	4.46	-	-	-	-	4.46	-
Sulfate	mg/L	47.5	46.2	9.8	47.2	30.2	39.7	29	43.9
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	108	-	-	-	-	110	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	1333.0962	1363.9578	1370.122	1401.6516	1422.9426	1450.7723	1471.0723	1499.9585
Cum Fe	mg	0.25056	0.25724	0.25724	0.2706	0.2847	0.29872	0.31272	0.32588
Pyritic Sulfur	%	3.920	3.920	3.920	3.920	3.920	3.920	3.920	3.920
ANP/AGP<Pyritic Sulfur	-	0.854	0.854	0.854	0.854	0.854	0.854	0.854	0.854

Sample ID		AR2014-02	AR2014-02	AR2014-02	AR2014-02				
Week	Units	32	33	34	35				
Rock Unit	-	Andesite	Andesite	Andesite	Andesite				
pH	s.u.	7.96	8.04	7.67	7.69				
Redox	mV	144	131	116	105				
Conductivity	mS/cm	0.21	0.19	0.23	0.21				
Total Alkalinity	mg/L	26	30	30	48				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00746				
Arsenic	mg/L	-	-	-	0.00679				
Barium	mg/L	-	-	-	0.0063				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	17.9				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.546				
Fe 2+	mg/L	-	-	-	-				
Fe 3+	mg/L	-	0.02	0.01	0.01				
Iron	mg/L	-	0.02	0.01	0.01				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	5.18				
Manganese	mg/L	-	-	-	0.0175				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	2.76				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	5.14				
Sulfate	mg/L	56.6	40.9	61.7	49.2				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	1538.2767	1563.4711	1600.6145	1631.3645				
Cum Fe	mg	0.32588	0.3382	0.34422	0.35047				
Pyritic Sulfur	%	3.920	3.920	3.920	3.920				
ANP/AGP<Pyritic Sulfur	-	0.854	0.854	0.854	0.854				

Sample ID		AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.99	7.73	7.54	7.74	8.06	7.8	7.8	7.88
Redox	mV	91	97	196	181	165	174	182	184
Conductivity	mS/cm	1.22	0.23	0.24	0.2	0.19	0.19	0.19	0.2
Total Alkalinity	mg/L	112	74	62	74	58	58	44	64
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	0.0113	-	-	-	-	0.0298	-	-
Arsenic	mg/L	0.022	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0341	-	-	-	-	0.0066	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	122	-	-	-	-	6.54	-	-
Chloride	mg/L	6.57	-	-	-	-	<0.2	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	0.025	-	-	-	-	<0.01	-	-
Fluoride	mg/L	2.55	-	-	-	-	0.764	-	-
Fe 2+	mg/L	0.01	0.02	-	-	-	-	-	-
Fe 3+	mg/L	0.02	-	0.02	0.05	0.01	-	-	-
Iron	mg/L	0.03	0.02	0.02	0.05	0.01	<0.06	-	-
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	42.3	-	-	-	-	3.76	-	-
Manganese	mg/L	0.021	-	-	-	-	<0.004	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	55.5	-	-	-	-	15.4	-	-
Selenium	mg/L	0.49	-	-	-	-	0.05	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	67	-	-	-	-	9.68	-	-
Sulfate	mg/L	528	25	21.2	18.3	23.9	19.1	21.4	20.5
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	1070	-	-	-	-	94	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	381.744	400.669	417.0778	430.6564	447.5537	461.7068	477.286	492.6815
Cum Fe	mg	0.02169	0.03683	0.05231	0.08941	0.09648	0.14094	0.14094	0.14094
Pyritic Sulfur	%	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
ANP/AGP<Pyritic Sulfur	-	2.414	2.414	2.414	2.414	2.414	2.414	2.414	2.414

Sample ID		AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.8	7.95	7.74	7.75	7.7	7.89	7.66	7.91
Redox	mV	169	154	157	123	139	115	198	126
Conductivity	mS/cm	0.2	0.19	0.18	0.18	0.19	0.19	0.19	0.19
Total Alkalinity	mg/L	60	58	56	52	54	54	46	50
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	0.0306	-	-	-	-	0.0121
Arsenic	mg/L	-	-	<0.01	-	-	-	-	<0.003
Barium	mg/L	-	-	0.0096	-	-	-	-	0.0415
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	9.57	-	-	-	-	10.5
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.586	-	-	-	-	0.503
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	-	-	0.02	0.01	0.01	-	-
Iron	mg/L	-	-	<0.06	0.02	0.01	0.01	-	<0.06
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	4.43	-	-	-	-	4.14
Manganese	mg/L	-	-	0.006	-	-	-	-	0.005
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	13.3	-	-	-	-	9.14
Selenium	mg/L	-	-	0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	6.78	-	-	-	-	5.83
Sulfate	mg/L	21	19.3	15.7	14.5	19.1	12.7	15.6	18.5
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	107	-	-	-	-	92
Zinc	mg/L	-	-	<0.002	-	-	-	-	0.0161
Cum SO4	mg	508.0745	522.1249	534.1982	544.7252	559.0311	568.7593	580.1629	594.2229
Cum Fe	mg	0.14094	0.14094	0.18708	0.2016	0.20909	0.21675	0.21675	0.26235
Pyritic Sulfur	%	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
ANP/AGP<Pyritic Sulfur	-	2.414	2.414	2.414	2.414	2.414	2.414	2.414	2.414

Sample ID		AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.67	7.69	7.73	7.73	7.54	7.72	7.89	7.99
Redox	mV	112	124	120	130	128	130	116	94
Conductivity	mS/cm	0.18	0.18	0.18	0.17	0.17	0.19	0.18	0.19
Total Alkalinity	mg/L	42	40	38	42	42	46	48	46
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	0.0138	-	-	-
Arsenic	mg/L	-	-	-	-	0.0046	-	-	-
Barium	mg/L	-	-	-	-	0.0226	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	10	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.411	-	-	-
Fe 2+	mg/L	-	-	-	-	0.01	-	-	-
Fe 3+	mg/L	0.02	0.03	-	-	0.01	0.01	-	0.01
Iron	mg/L	0.02	0.03	-	-	0.02	0.01	-	0.01
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	3.38	-	-	-
Manganese	mg/L	-	-	-	-	<0.004	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	6.62	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	5.55	-	-	-
Sulfate	mg/L	8.5	16.5	13.3	11.7	10.9	17.8	13.2	15.1
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	80	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	600.5384	612.8309	622.4734	631.2718	639.3051	652.2101	661.8329	673.173
Cum Fe	mg	0.27721	0.29956	0.29956	0.29956	0.3143	0.32155	0.32155	0.32906
Pyritic Sulfur	%	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
ANP/AGP<Pyritic Sulfur	-	2.414	2.414	2.414	2.414	2.414	2.414	2.414	2.414

Sample ID		AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03	AR2014-03
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite	Andesite
pH	s.u.	7.65	7.61	7.68	8.01	7.56	7.72	7.59	7.51
Redox	mV	119	119	119	142	161	114	126	141
Conductivity	mS/cm	0.18	0.18	0.19	0.18	0.19	0.19	0.19	0.18
Total Alkalinity	mg/L	44	42	48	40	48	42	40	40
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	<0.003	-	-	-	-	0.0134	-
Arsenic	mg/L	-	<0.003	-	-	-	-	0.0055	-
Barium	mg/L	-	0.0061	-	-	-	-	0.0106	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	8.05	-	-	-	-	12	-
Chloride	mg/L	-	1.82	-	-	-	-	0.74	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	0.744	-	-	-	-	0.64	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	-	-	0.02	0.01	0.01	0.01	0.01
Iron	mg/L	-	<0.06	-	0.02	0.01	0.01	0.01	0.01
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	1.06	-	-	-	-	3.41	-
Manganese	mg/L	-	<0.004	-	-	-	-	0.0042	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	3.19	-	-	-	-	6.59	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	5.32	-	-	-	-	6.31	-
Sulfate	mg/L	14.3	12.5	5	11.2	9.2	7.6	15.7	10.6
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	78	-	-	-	-	96	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	683.8694	693.1069	696.6869	704.9749	711.7829	717.5057	728.8097	736.7279
Cum Fe	mg	0.32906	0.3734	0.3734	0.3882	0.3956	0.40313	0.41033	0.4178
Pyritic Sulfur	%	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
ANP/AGP<Pyritic Sulfur	-	2.414	2.414	2.414	2.414	2.414	2.414	2.414	2.414

Sample ID		AR2014-03	AR2014-03	AR2014-03	AR2014-03				
Week	Units	32	33	34	35				
Rock Unit	-	Andesite	Andesite	Andesite	Andesite				
pH	s.u.	7.72	7.61	7.45	7.51				
Redox	mV	152	150	120	112				
Conductivity	mS/cm	0.18	0.17	0.17	0.18				
Total Alkalinity	mg/L	40	40	42	52				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00938				
Arsenic	mg/L	-	-	-	0.00851				
Barium	mg/L	-	-	-	0.0085				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	9.76				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.52				
Fe 2+	mg/L	-	-	-	-				
Fe 3+	mg/L	-	-	-	-				
Iron	mg/L	-	-	-	<0.06				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	2.88				
Manganese	mg/L	-	-	-	0.0054				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	5.52				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	6.01				
Sulfate	mg/L	17.5	21.5	17.2	20.4				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	749.9579	765.4809	777.5897	792.0125				
Cum Fe	mg	0.4178	0.4178	0.4178	0.46022				
Pyritic Sulfur	%	0.950	0.950	0.950	0.950				
ANP/AGP<Pyritic Sulfur	-	2.414	2.414	2.414	2.414				

Sample ID		AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05
Week	Units	0	1	2	3	4	5	6	7
Rock Unit	-	Earp	Earp	Earp	Earp	Earp	Earp	Earp	Earp
pH	s.u.	7.91	7.61	7.42	7.61	8.01	7.72	7.82	7.82
Redox	mV	120	107	194	189	167	176	180	185
Conductivity	mS/cm	0.46	0.26	0.26	0.16	0.16	0.16	0.16	0.16
Total Alkalinity	mg/L	40	36	44	46	44	42	40	44
Aluminum	mg/L	<0.08	-	-	-	-	<0.08	-	-
Antimony	mg/L	<0.003	-	-	-	-	<0.006	-	-
Arsenic	mg/L	0.007	-	-	-	-	<0.01	-	-
Barium	mg/L	0.0068	-	-	-	-	0.0027	-	-
Beryllium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Cadmium	mg/L	<0.002	-	-	-	-	<0.002	-	-
Calcium	mg/L	63.4	-	-	-	-	10.5	-	-
Chloride	mg/L	2.54	-	-	-	-	<0.2	-	-
Chromium	mg/L	<0.006	-	-	-	-	<0.006	-	-
Copper	mg/L	0.018	-	-	-	-	<0.01	-	-
Fluoride	mg/L	1.51	-	-	-	-	1.06	-	-
Fe 2+	mg/L	0.02	-	-	-	-	-	-	-
Fe 3+	mg/L	0.02	0.04	-	0.01	-	-	-	-
Iron	mg/L	0.04	0.04	-	0.01	-	<0.06	-	-
Lead	mg/L	<0.0075	-	-	-	-	<0.0075	-	-
Magnesium	mg/L	2.45	-	-	-	-	0.78	-	-
Manganese	mg/L	0.011	-	-	-	-	<0.004	-	-
Mercury	mg/L	<0.0002	-	-	-	-	<0.0002	-	-
Nickel	mg/L	<0.01	-	-	-	-	<0.01	-	-
Potassium	mg/L	9.41	-	-	-	-	4.48	-	-
Selenium	mg/L	0.04	-	-	-	-	<0.04	-	-
Silver	mg/L	<0.005	-	-	-	-	<0.005	-	-
Sodium	mg/L	27.1	-	-	-	-	12.2	-	-
Sulfate	mg/L	159	81	4	5.3	6.1	4.1	4.3	4.7
Thallium	mg/L	<0.002	-	-	-	-	<0.002	-	-
TDS	mg/L	394	-	-	-	-	77	-	-
Zinc	mg/L	<0.01	-	-	-	-	<0.002	-	-
Cum SO4	mg	111.618	166.536	169.484	173.2629	177.8196	180.8208	183.7061	187.0384
Cum Fe	mg	0.02808	0.0552	0.0552	0.06233	0.06233	0.10625	0.10625	0.10625
Pyritic Sulfur	%	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
ANP/AGP<Pyritic Sulfur	-	10.400	10.400	10.400	10.400	10.400	10.400	10.400	10.400

Sample ID		AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05
Week	Units	8	9	10	11	12	13	14	15
Rock Unit	-	Earp	Earp	Earp	Earp	Earp	Earp	Earp	Earp
pH	s.u.	7.7	7.84	7.87	7.64	7.69	7.74	7.53	7.71
Redox	mV	177	160	162	129	140	118	199	129
Conductivity	mS/cm	0.17	0.16	0.17	0.16	0.16	0.17	0.17	0.17
Total Alkalinity	mg/L	42	40	44	36	38	40	42	44
Aluminum	mg/L	-	-	<0.08	-	-	-	-	<0.08
Antimony	mg/L	-	-	<0.006	-	-	-	-	0.0036
Arsenic	mg/L	-	-	<0.01	-	-	-	-	0.0038
Barium	mg/L	-	-	0.0026	-	-	-	-	0.0319
Beryllium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Cadmium	mg/L	-	-	<0.002	-	-	-	-	<0.002
Calcium	mg/L	-	-	7.73	-	-	-	-	8.68
Chloride	mg/L	-	-	<0.2	-	-	-	-	<0.2
Chromium	mg/L	-	-	<0.006	-	-	-	-	<0.006
Copper	mg/L	-	-	<0.01	-	-	-	-	<0.01
Fluoride	mg/L	-	-	0.918	-	-	-	-	0.994
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	0.02	0.01	-	0.01	-	0.03	0.01	-
Iron	mg/L	0.02	0.01	<0.06	0.01	-	0.03	0.01	<0.06
Lead	mg/L	-	-	<0.0075	-	-	-	-	<0.0075
Magnesium	mg/L	-	-	0.8	-	-	-	-	1.07
Manganese	mg/L	-	-	<0.004	-	-	-	-	<0.004
Mercury	mg/L	-	-	<0.0002	-	-	-	-	<0.0002
Nickel	mg/L	-	-	<0.01	-	-	-	-	<0.01
Potassium	mg/L	-	-	4.44	-	-	-	-	4
Selenium	mg/L	-	-	<0.04	-	-	-	-	<0.04
Silver	mg/L	-	-	<0.005	-	-	-	-	<0.005
Sodium	mg/L	-	-	7.95	-	-	-	-	6.1
Sulfate	mg/L	4.7	3.8	5.3	5.1	5.7	4.7	6.8	7.5
Thallium	mg/L	-	-	<0.002	-	-	-	-	<0.002
TDS	mg/L	-	-	66	-	-	-	-	53
Zinc	mg/L	-	-	<0.002	-	-	-	-	0.0109
Cum SO4	mg	190.4459	193.2617	197.0406	200.7483	204.6414	208.0583	212.8931	218.1506
Cum Fe	mg	0.12075	0.12816	0.17094	0.17821	0.17821	0.20002	0.20713	0.24919
Pyritic Sulfur	%	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
ANP/AGP<Pyritic Sulfur	-	10.400	10.400	10.400	10.400	10.400	10.400	10.400	10.400

Sample ID		AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05
Week	Units	16	17	18	19	20	21	22	23
Rock Unit	-	Earp	Earp	Earp	Earp	Earp	Earp	Earp	Earp
pH	s.u.	7.46	7.49	7.54	7.47	7.4	7.75	7.81	8.2
Redox	mV	117	127	122	125	132	134	118	85
Conductivity	mS/cm	0.17	0.17	0.17	0.15	0.16	0.17	0.17	0.16
Total Alkalinity	mg/L	40	40	40	38	36	44	36	36
Aluminum	mg/L	-	-	-	-	<0.08	-	-	-
Antimony	mg/L	-	-	-	-	<0.003	-	-	-
Arsenic	mg/L	-	-	-	-	0.0039	-	-	-
Barium	mg/L	-	-	-	-	0.034	-	-	-
Beryllium	mg/L	-	-	-	-	<0.002	-	-	-
Cadmium	mg/L	-	-	-	-	<0.002	-	-	-
Calcium	mg/L	-	-	-	-	10.4	-	-	-
Chloride	mg/L	-	-	-	-	<0.2	-	-	-
Chromium	mg/L	-	-	-	-	<0.006	-	-	-
Copper	mg/L	-	-	-	-	<0.01	-	-	-
Fluoride	mg/L	-	-	-	-	0.848	-	-	-
Fe 2+	mg/L	-	-	-	-	-	0.02	-	-
Fe 3+	mg/L	0.01	-	-	-	0.01	-	0.01	0.02
Iron	mg/L	0.01	-	-	-	0.01	0.02	0.01	0.02
Lead	mg/L	-	-	-	-	<0.0075	-	-	-
Magnesium	mg/L	-	-	-	-	1.23	-	-	-
Manganese	mg/L	-	-	-	-	<0.004	-	-	-
Mercury	mg/L	-	-	-	-	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-	<0.01	-	-	-
Potassium	mg/L	-	-	-	-	3.71	-	-	-
Selenium	mg/L	-	-	-	-	<0.04	-	-	-
Silver	mg/L	-	-	-	-	<0.005	-	-	-
Sodium	mg/L	-	-	-	-	5.48	-	-	-
Sulfate	mg/L	9.5	6.9	5.6	5.2	5.3	5.8	4.5	4.3
Thallium	mg/L	-	-	-	-	<0.002	-	-	-
TDS	mg/L	-	-	-	-	64	-	-	-
Zinc	mg/L	-	-	-	-	<0.01	-	-	-
Cum SO4	mg	224.9906	229.9655	233.9583	237.5255	241.3839	245.6527	248.8432	251.9951
Cum Fe	mg	0.25639	0.25639	0.25639	0.25639	0.26367	0.27839	0.28548	0.30014
Pyritic Sulfur	%	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
ANP/AGP<Pyritic Sulfur	-	10.400	10.400	10.400	10.400	10.400	10.400	10.400	10.400

Sample ID		AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05	AR2014-05
Week	Units	24	25	26	27	28	29	30	31
Rock Unit	-	Earp	Earp	Earp	Earp	Earp	Earp	Earp	Earp
pH	s.u.	7.71	7.6	7.57	7.71	7.42	7.63	7.48	7.59
Redox	mV	124	137	136	150	163	107	123	137
Conductivity	mS/cm	0.16	0.17	0.17	0.17	0.18	0.17	0.17	0.17
Total Alkalinity	mg/L	34	36	36	40	42	32	36	38
Aluminum	mg/L	-	<0.08	-	-	-	-	<0.08	-
Antimony	mg/L	-	0.0141	-	-	-	-	<0.003	-
Arsenic	mg/L	-	0.0056	-	-	-	-	0.0037	-
Barium	mg/L	-	0.0111	-	-	-	-	0.0034	-
Beryllium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Cadmium	mg/L	-	<0.002	-	-	-	-	<0.002	-
Calcium	mg/L	-	10.4	-	-	-	-	11.2	-
Chloride	mg/L	-	1.91	-	-	-	-	0.7	-
Chromium	mg/L	-	<0.006	-	-	-	-	<0.006	-
Copper	mg/L	-	<0.01	-	-	-	-	<0.01	-
Fluoride	mg/L	-	1.08	-	-	-	-	1	-
Fe 2+	mg/L	-	-	-	-	-	-	-	-
Fe 3+	mg/L	-	0.03	-	-	0.02	0.02	-	0.01
Iron	mg/L	-	0.03	-	-	0.02	0.02	<0.06	0.01
Lead	mg/L	-	<0.0075	-	-	-	-	<0.0075	-
Magnesium	mg/L	-	3.42	-	-	-	-	1.25	-
Manganese	mg/L	-	0.0059	-	-	-	-	<0.004	-
Mercury	mg/L	-	<0.0002	-	-	-	-	<0.0002	-
Nickel	mg/L	-	<0.01	-	-	-	-	<0.01	-
Potassium	mg/L	-	6.68	-	-	-	-	3.46	-
Selenium	mg/L	-	<0.04	-	-	-	-	<0.04	-
Silver	mg/L	-	<0.005	-	-	-	-	<0.005	-
Sodium	mg/L	-	5.52	-	-	-	-	5.73	-
Sulfate	mg/L	8.6	8	3.6	5.6	4.8	2.7	8.2	6
Thallium	mg/L	-	<0.002	-	-	-	-	<0.001	-
TDS	mg/L	-	55	-	-	-	-	75	-
Zinc	mg/L	-	<0.01	-	-	-	-	<0.01	-
Cum SO4	mg	257.4303	262.6623	264.9483	268.8123	272.3163	274.209	280.1376	284.1696
Cum Fe	mg	0.30014	0.31976	0.31976	0.31976	0.33436	0.34838	0.39176	0.39848
Pyritic Sulfur	%	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320
ANP/AGP<Pyritic Sulfur	-	10.400	10.400	10.400	10.400	10.400	10.400	10.400	10.400

Sample ID		AR2014-05	AR2014-05	AR2014-05	AR2014-05				
Week	Units	32	33	34	35				
Rock Unit	-	Earp	Earp	Earp	Earp				
pH	s.u.	7.82	7.67	7.5	7.62				
Redox	mV	147	144	117	108				
Conductivity	mS/cm	0.17	0.17	0.17	0.17				
Total Alkalinity	mg/L	36	34	38	34				
Aluminum	mg/L	-	-	-	<0.08				
Antimony	mg/L	-	-	-	0.00213				
Arsenic	mg/L	-	-	-	0.00722				
Barium	mg/L	-	-	-	0.0023				
Beryllium	mg/L	-	-	-	<0.002				
Cadmium	mg/L	-	-	-	<0.002				
Calcium	mg/L	-	-	-	8.5				
Chloride	mg/L	-	-	-	<0.2				
Chromium	mg/L	-	-	-	<0.006				
Copper	mg/L	-	-	-	<0.01				
Fluoride	mg/L	-	-	-	0.837				
Fe 2+	mg/L	-	-	-	-				
Fe 3+	mg/L	-	-	0.01	0.01				
Iron	mg/L	-	-	0.01	0.01				
Lead	mg/L	-	-	-	<0.0075				
Magnesium	mg/L	-	-	-	1.13				
Manganese	mg/L	-	-	-	<0.004				
Mercury	mg/L	-	-	-	<0.0002				
Nickel	mg/L	-	-	-	<0.01				
Potassium	mg/L	-	-	-	3.16				
Selenium	mg/L	-	-	-	<0.04				
Silver	mg/L	-	-	-	<0.005				
Sodium	mg/L	-	-	-	5.34				
Sulfate	mg/L	6.7	8.9	9	7.8				
Thallium	mg/L	-	-	-	<0.0008				
TDS	mg/L	-	-	-	-				
Zinc	mg/L	-	-	-	<0.004				
Cum SO4	mg	288.7323	294.4194	300.0174	304.8222				
Cum Fe	mg	0.39848	0.39848	0.4047	0.41086				
Pyritic Sulfur	%	0.320	0.320	0.320	0.320				
ANP/AGP<Pyritic Sulfur	-	10.400	10.400	10.400	10.400				

Sample ID		Tailings-022807	Tailings-022807	Tailings-022807	Tailings-022807	Tailings-022807
Week	Units	0	1	2	3	4
Rock Unit	-	Tailings	Tailings	Tailings	Tailings	Tailings
pH	s.u.	8.15	7.73	7.77	7.71	7.55
Redox	mV	213	229	87	212	222
Conductivity	mS/cm	0.23	0.3	0.26	0.19	0.18
Total Alkalinity	mg/L	56	34	40	38	44
Aluminum	mg/L	<0.08	-	-	-	-
Antimony	mg/L	<0.006	-	-	-	-
Arsenic	mg/L	<0.01	-	-	-	-
Barium	mg/L	0.0409	-	-	-	-
Beryllium	mg/L	<0.002	-	-	-	-
Cadmium	mg/L	<0.002	-	-	-	-
Calcium	mg/L	26.9	-	-	-	-
Chloride	mg/L	4.07	-	-	-	-
Chromium	mg/L	<0.006	-	-	-	-
Copper	mg/L	<0.01	-	-	-	-
Fluoride	mg/L	0.81	-	-	-	-
Fe 2+	mg/L	0.01	-	-	0.02	-
Fe 3+	mg/L	0.01	0.08	0.04	0.04	0.04
Iron	mg/L	0.02	0.08	0.04	0.06	0.04
Lead	mg/L	<0.0075	-	-	-	-
Magnesium	mg/L	1.45	-	-	-	-
Manganese	mg/L	0.005	-	-	-	-
Mercury	mg/L	<0.0002	-	-	-	-
Nickel	mg/L	<0.01	-	-	-	-
Potassium	mg/L	3.99	-	-	-	-
Selenium	mg/L	<0.04	-	-	-	-
Silver	mg/L	<0.005	-	-	-	-
Sodium	mg/L	15.6	-	-	-	-
Sulfate	mg/L	59.4	84.1	50.4	26.8	15.3
Thallium	mg/L	<0.002	-	-	-	-
TDS	mg/L	162	-	-	-	-
Zinc	mg/L	0.0162	-	-	-	-
Cum SO4	mg	46.8666	99.9337	132.2905	149.4961	159.3646
Cum Fe	mg	0.01578	0.06626	0.09194	0.13046	0.15626
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01
ANP/AGP<Pyritic Sulfur	-	1106.667	1106.667	1106.667	1106.667	1106.667

Appendix E
Tabulated HCT Testing Results

Sample ID		Tailings-022807	Tailings-022807	Tailings-022807	Tailings-022807	Tailings-022807
Week	Units	5	6	7	8	9
Rock Unit	-	Tailings	Tailings	Tailings	Tailings	Tailings
pH	s.u.	7.62	7.52	8.06	8.02	7.96
Redox	mV	103	118	58	85	178
Conductivity	mS/cm	0.17	0.17	0.16	0.16	0.16
Total Alkalinity	mg/L	52	36	28	32	32
Aluminum	mg/L	<0.08	-	-	-	-
Antimony	mg/L	0.00351	-	-	-	-
Arsenic	mg/L	0.0071	-	-	-	-
Barium	mg/L	0.0176	-	-	-	-
Beryllium	mg/L	<0.002	-	-	-	-
Cadmium	mg/L	0.002	-	-	-	-
Calcium	mg/L	22.8	-	-	-	-
Chloride	mg/L	1.5	-	-	-	-
Chromium	mg/L	<0.006	-	-	-	-
Copper	mg/L	<0.01	-	-	-	-
Fluoride	mg/L	1.09	-	-	-	-
Fe 2+	mg/L	-	-	-	-	-
Fe 3+	mg/L	0.03	0.03	0.02	0.03	0.04
Iron	mg/L	0.03	0.03	0.02	0.03	0.04
Lead	mg/L	<0.0075	-	-	-	-
Magnesium	mg/L	1.49	-	-	-	-
Manganese	mg/L	0.017	-	-	-	-
Mercury	mg/L	<0.0002	-	-	-	-
Nickel	mg/L	<0.01	-	-	-	-
Potassium	mg/L	3.24	-	-	-	-
Selenium	mg/L	<0.04	-	-	-	-
Silver	mg/L	<0.005	-	-	-	-
Sodium	mg/L	10.3	-	-	-	-
Sulfate	mg/L	6.8	8.5	5	6.2	5.3
Thallium	mg/L	<0.002	-	-	-	-
TDS	mg/L	137	-	-	-	-
Zinc	mg/L	<0.01	-	-	-	-
Cum SO4	mg	164.1246	170.4231	174.0931	178.6377	182.5067
Cum Fe	mg	0.17726	0.19949	0.21417	0.23616	0.26536
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01
ANP/AGP<Pyritic Sulfur	-	1106.667	1106.667	1106.667	1106.667	1106.667

Appendix E
Tabulated HCT Testing Results

Sample ID		Tailings-022807	Tailings-022807	Tailings-022807	Tailings-022807	Tailings-022807
Week	Units	10	11	12	13	14
Rock Unit	-	Tailings	Tailings	Tailings	Tailings	Tailings
pH	s.u.	7.65	7.78	8.15	8.51	8.22
Redox	mV	81	55	85	55	124
Conductivity	mS/cm	0.17	0.16	0.18	0.17	0.17
Total Alkalinity	mg/L	34	32	34	32	36
Aluminum	mg/L	<0.08	-	-	-	-
Antimony	mg/L	0.00571	-	-	-	-
Arsenic	mg/L	0.0095	-	-	-	-
Barium	mg/L	0.0113	-	-	-	-
Beryllium	mg/L	<0.002	-	-	-	-
Cadmium	mg/L	<0.002	-	-	-	-
Calcium	mg/L	14.4	-	-	-	-
Chloride	mg/L	1.43	-	-	-	-
Chromium	mg/L	<0.006	-	-	-	-
Copper	mg/L	<0.01	-	-	-	-
Fluoride	mg/L	1.17	-	-	-	-
Fe 2+	mg/L	-	-	-	-	-
Fe 3+	mg/L	0.01	0.15	0.06	0.01	0.07
Iron	mg/L	0.01	0.15	0.06	0.01	0.07
Lead	mg/L	<0.0075	-	-	-	-
Magnesium	mg/L	0.75	-	-	-	-
Manganese	mg/L	0.0046	-	-	-	-
Mercury	mg/L	<0.0002	-	-	-	-
Nickel	mg/L	<0.01	-	-	-	-
Potassium	mg/L	1.57	-	-	-	-
Selenium	mg/L	<0.04	-	-	-	-
Silver	mg/L	<0.005	-	-	-	-
Sodium	mg/L	2.7	-	-	-	-
Sulfate	mg/L	5.9	6.1	7	4.1	7
Thallium	mg/L	<0.002	-	-	-	-
TDS	mg/L	83	-	-	-	-
Zinc	mg/L	<0.01	-	-	-	-
Cum SO4	mg	186.442	190.8767	196.0567	198.98	204.384
Cum Fe	mg	0.27203	0.38108	0.42548	0.43261	0.48665
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01
ANP/AGP<Pyritic Sulfur	-	1106.667	1106.667	1106.667	1106.667	1106.667

Appendix E
Tabulated HCT Testing Results

Sample ID		Tailings-022807	Tailings-022807	Tailings-022807	Tailings-022807	Tailings-022807
Week	Units	15	16	17	18	19
Rock Unit	-	Tailings	Tailings	Tailings	Tailings	Tailings
pH	s.u.	8.33	8.1	8.45	7.95	7.76
Redox	mV	55	31	66	157	106
Conductivity	mS/cm	0.17	0.18	0.17	0.17	0.17
Total Alkalinity	mg/L	38	40	42	40	38
Aluminum	mg/L	<0.08	-	-	-	-
Antimony	mg/L	0.0058	-	-	-	-
Arsenic	mg/L	0.0087	-	-	-	-
Barium	mg/L	0.0067	-	-	-	-
Beryllium	mg/L	<0.002	-	-	-	-
Cadmium	mg/L	<0.002	-	-	-	-
Calcium	mg/L	10.7	-	-	-	-
Chloride	mg/L	0.2	-	-	-	-
Chromium	mg/L	<0.006	-	-	-	-
Copper	mg/L	<0.01	-	-	-	-
Fluoride	mg/L	1.34	-	-	-	-
Fe 2+	mg/L	0.01	-	-	-	-
Fe 3+	mg/L	-	0.01	0.04	0.01	-
Iron	mg/L	0.01	0.01	0.04	0.01	-
Lead	mg/L	<0.0075	-	-	-	-
Magnesium	mg/L	0.6	-	-	-	-
Manganese	mg/L	<0.004	-	-	-	-
Mercury	mg/L	<0.0002	-	-	-	-
Nickel	mg/L	<0.01	-	-	-	-
Potassium	mg/L	1.08	-	-	-	-
Selenium	mg/L	<0.04	-	-	-	-
Silver	mg/L	<0.005	-	-	-	-
Sodium	mg/L	6.32	-	-	-	-
Sulfate	mg/L	8.3	6.7	7.1	7.8	8.2
Thallium	mg/L	<0.001	-	-	-	-
TDS	mg/L	99	-	-	-	-
Zinc	mg/L	<0.01	-	-	-	-
Cum SO4	mg	210.6256	215.1883	220.8257	226.4573	232.4761
Cum Fe	mg	0.49417	0.50098	0.53274	0.53996	0.53996
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01	<0.01
ANP/AGP<Pyritic Sulfur	-	1106.667	1106.667	1106.667	1106.667	1106.667

Sample ID		Tailings-022807						
Week	Units	20						
Rock Unit	-	Tailings						
pH	s.u.	7.79						
Redox	mV	126						
Conductivity	mS/cm	0.17						
Total Alkalinity	mg/L	42						
Aluminum	mg/L	0.08						
Antimony	mg/L	0.0056						
Arsenic	mg/L	0.0153						
Barium	mg/L	0.0094						
Beryllium	mg/L	<0.002						
Cadmium	mg/L	<0.002						
Calcium	mg/L	11.8						
Chloride	mg/L	<0.2						
Chromium	mg/L	<0.006						
Copper	mg/L	<0.01						
Fluoride	mg/L	1.65						
Fe 2+	mg/L	-						
Fe 3+	mg/L	0.03						
Iron	mg/L	0.03						
Lead	mg/L	<0.0075						
Magnesium	mg/L	0.75						
Manganese	mg/L	<0.004						
Mercury	mg/L	<0.0002						
Nickel	mg/L	<0.01						
Potassium	mg/L	1.03						
Selenium	mg/L	<0.04						
Silver	mg/L	<0.005						
Sodium	mg/L	7.58						
Sulfate	mg/L	8.4						
Thallium	mg/L	<0.001						
TDS	mg/L	112						
Zinc	mg/L	<0.01						
Cum SO4	mg	238.3225						
Cum Fe	mg	0.56084						
Pyritic Sulfur	%	<0.01						
ANP/AGP<Pyritic Sulfur	-	1106.667						

Sample ID		Year 0-3 Tailings	Year 0-3 Tailings	Year 0-3 Tailings	Year 0-3 Tailings
Week	Units	0	1	2	3
Rock Unit	-	Tailings	Tailings	Tailings	Tailings
pH	s.u.	8.33	8.57	8.69	8.69
Redox	mV	186	183	162	160
Conductivity	mS/cm	2.28	0.88	0.22	0.21
Total Alkalinity	mg/L	96	110	100	94
Aluminum	mg/L	<0.08	-	-	-
Antimony	mg/L	0.00918	-	-	-
Arsenic	mg/L	0.0167	-	-	-
Barium	mg/L	0.0167	-	-	-
Beryllium	mg/L	<0.002	-	-	-
Cadmium	mg/L	<0.002	-	-	-
Calcium	mg/L	335	-	-	-
Chloride	mg/L	15.2	-	-	-
Chromium	mg/L	<0.006	-	-	-
Copper	mg/L	0.012	-	-	-
Fluoride	mg/L	1.68	-	-	-
Fe 2+	mg/L	0.04	0.06	-	-
Fe 3+	mg/L	0.11	0.03	0.01	0.03
Iron	mg/L	0.15	0.09	0.01	0.03
Lead	mg/L	<0.0075	-	-	-
Magnesium	mg/L	6.92	-	-	-
Manganese	mg/L	0.0452	-	-	-
Mercury	mg/L	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-
Potassium	mg/L	25.4	-	-	-
Selenium	mg/L	0.151	-	-	-
Silver	mg/L	<0.005	-	-	-
Sodium	mg/L	106	-	-	-
Sulfate	mg/L	758	22.5	42	25.5
Thallium	mg/L	<0.001	-	-	-
TDS	mg/L	1700	-	-	-
Zinc	mg/L	<0.01	-	-	-
Cum SO4	mg	587.45	604.9775	635.2595	653.3135
Cum Fe	mg	0.11625	0.18636	0.19357	0.21481
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01
ANP/AGP<Pyritic Sulfur	-	1013.333	1013.333	1013.333	1013.333

Sample ID		Year 0-3 Tailings	Year 0-3 Tailings	Year 0-3 Tailings	Year 0-3 Tailings
Week	Units	4	5	6	7
Rock Unit	-	Tailings	Tailings	Tailings	Tailings
pH	s.u.	8.75	8.79	8.73	8.52
Redox	mV	169	172	175	204
Conductivity	mS/cm	0.2	0.18	0.17	0.18
Total Alkalinity	mg/L	50	58	40	48
Aluminum	mg/L	<0.08	-	-	-
Antimony	mg/L	0.00573	-	-	-
Arsenic	mg/L	0.00619	-	-	-
Barium	mg/L	0.0182	-	-	-
Beryllium	mg/L	<0.002	-	-	-
Cadmium	mg/L	<0.002	-	-	-
Calcium	mg/L	46.1	-	-	-
Chloride	mg/L	0.255	-	-	-
Chromium	mg/L	<0.006	-	-	-
Copper	mg/L	<0.01	-	-	-
Fluoride	mg/L	2.44	-	-	-
Fe 2+	mg/L	-	-	-	-
Fe 3+	mg/L	0.03	0.4	0.04	0.03
Iron	mg/L	0.03	0.4	0.04	0.03
Lead	mg/L	<0.0075	-	-	-
Magnesium	mg/L	1.09	-	-	-
Manganese	mg/L	0.0089	-	-	-
Mercury	mg/L	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-
Potassium	mg/L	6.6	-	-	-
Selenium	mg/L	<0.04	-	-	-
Silver	mg/L	<0.005	-	-	-
Sodium	mg/L	5.2	-	-	-
Sulfate	mg/L	16.2	6.3	6.3	6.3
Thallium	mg/L	<0.001	-	-	-
TDS	mg/L	230	-	-	-
Zinc	mg/L	<0.01	-	-	-
Cum SO4	mg	665.3663	670.3181	674.5706	678.7286
Cum Fe	mg	0.23713	0.55153	0.57853	0.59833
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01
ANP/AGP<Pyritic Sulfur	-	1013.333	1013.333	1013.333	1013.333

Sample ID		Year 0-3 Tailings	Year 0-3 Tailings	Year 0-3 Tailings	Year 0-3 Tailings
Week	Units	8	9	10	11
Rock Unit	-	Tailings	Tailings	Tailings	Tailings
pH	s.u.	8.4	8.48	8.48	8.5
Redox	mV	212	212	210	210
Conductivity	mS/cm	0.18	0.19	0.18	0.18
Total Alkalinity	mg/L	52	112	80	58
Aluminum	mg/L	<0.08	-	-	-
Antimony	mg/L	0.00654	-	-	-
Arsenic	mg/L	0.00871	-	-	-
Barium	mg/L	0.0447	-	-	-
Beryllium	mg/L	<0.002	-	-	-
Cadmium	mg/L	<0.002	-	-	-
Calcium	mg/L	13.5	-	-	-
Chloride	mg/L	0.275	-	-	-
Chromium	mg/L	<0.006	-	-	-
Copper	mg/L	<0.01	-	-	-
Fluoride	mg/L	2.22	-	-	-
Fe 2+	mg/L	0.18	-	-	-
Fe 3+	mg/L	0.5	0.04	0.03	0.05
Iron	mg/L	0.68	0.04	0.03	0.05
Lead	mg/L	<0.0075	-	-	-
Magnesium	mg/L	0.475	-	-	-
Manganese	mg/L	<0.004	-	-	-
Mercury	mg/L	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-
Potassium	mg/L	3.08	-	-	-
Selenium	mg/L	<0.04	-	-	-
Silver	mg/L	<0.005	-	-	-
Sodium	mg/L	0.58	-	-	-
Sulfate	mg/L	6.6	8.1	11.11	9.1
Thallium	mg/L	<0.001	-	-	-
TDS	mg/L	56	-	-	-
Zinc	mg/L	<0.01	-	-	-
Cum SO4	mg	683.078	688.586	696.86295	703.60605
Cum Fe	mg	1.04645	1.07365	1.096	1.13305
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01
ANP/AGP<Pyritic Sulfur	-	1013.333	1013.333	1013.333	1013.333

Sample ID		Year 0-3 Tailings	Year 0-3 Tailings	Year 0-3 Tailings	Year 0-3 Tailings
Week	Units	12	13	14	15
Rock Unit	-	Tailings	Tailings	Tailings	Tailings
pH	s.u.	8.46	8.55	8.6	8.61
Redox	mV	240	229	210	215
Conductivity	mS/cm	0.18	0.17	0.17	0.17
Total Alkalinity	mg/L	60	50	48	52
Aluminum	mg/L	<0.08	-	-	-
Antimony	mg/L	0.00469	-	-	-
Arsenic	mg/L	0.0102	-	-	-
Barium	mg/L	0.0758	-	-	-
Beryllium	mg/L	<0.002	-	-	-
Cadmium	mg/L	<0.002	-	-	-
Calcium	mg/L	16.8	-	-	-
Chloride	mg/L	0.25	-	-	-
Chromium	mg/L	<0.006	-	-	-
Copper	mg/L	<0.01	-	-	-
Fluoride	mg/L	1.81	-	-	-
Fe 2+	mg/L	-	-	-	0.01
Fe 3+	mg/L	0.03	-	0.03	0.03
Iron	mg/L	0.03	-	0.03	0.04
Lead	mg/L	<0.0075	-	-	-
Magnesium	mg/L	0.744	-	-	-
Manganese	mg/L	0.0074	-	-	-
Mercury	mg/L	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-
Potassium	mg/L	2.26	-	-	-
Selenium	mg/L	<0.04	-	-	-
Silver	mg/L	<0.005	-	-	-
Sodium	mg/L	<0.5	-	-	-
Sulfate	mg/L	6.7	3.5	3.7	5.1
Thallium	mg/L	<0.001	-	-	-
TDS	mg/L	110	-	-	-
Zinc	mg/L	<0.01	-	-	-
Cum SO4	mg	708.65115	711.05215	713.79385	717.56275
Cum Fe	mg	1.15564	1.15564	1.17787	1.20743
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01
ANP/AGP<Pyritic Sulfur	-	1013.333	1013.333	1013.333	1013.333

Sample ID		Year 0-3 Tailings	Year 0-3 Tailings	Year 0-3 Tailings	Year 0-3 Tailings
Week	Units	16	17	18	19
Rock Unit	-	Tailings	Tailings	Tailings	Tailings
pH	s.u.	8.74	8.63	8.79	8.81
Redox	mV	220	210	197	190
Conductivity	mS/cm	0.16	0.16	0.16	0.17
Total Alkalinity	mg/L	38	38	28	48
Aluminum	mg/L	<0.08	-	-	-
Antimony	mg/L	0.00328	-	-	-
Arsenic	mg/L	0.011	-	-	-
Barium	mg/L	0.0509	-	-	-
Beryllium	mg/L	<0.002	-	-	-
Cadmium	mg/L	<0.002	-	-	-
Calcium	mg/L	13.5	-	-	-
Chloride	mg/L	<0.2	-	-	-
Chromium	mg/L	<0.006	-	-	-
Copper	mg/L	<0.01	-	-	-
Fluoride	mg/L	2.19	-	-	-
Fe 2+	mg/L	-	-	-	-
Fe 3+	mg/L	-	-	0.03	0.01
Iron	mg/L	<0.06	-	0.03	0.01
Lead	mg/L	<0.0075	-	-	-
Magnesium	mg/L	0.558	-	-	-
Manganese	mg/L	0.0057	-	-	-
Mercury	mg/L	<0.0002	-	-	-
Nickel	mg/L	-	-	-	-
Potassium	mg/L	1.34	-	-	-
Selenium	mg/L	<0.04	-	-	-
Silver	mg/L	<0.005	-	-	-
Sodium	mg/L	<0.5	-	-	-
Sulfate	mg/L	3.4	2.6	3.9	4.5
Thallium	mg/L	<0.001	-	-	-
TDS	mg/L	96	-	-	-
Zinc	mg/L	<0.01	-	-	-
Cum SO4	mg	720.18075	721.96435	724.34335	727.59235
Cum Fe	mg	1.25363	1.25363	1.27193	1.27915
Pyritic Sulfur	%	<0.01	<0.01	<0.01	<0.01
ANP/AGP<Pyritic Sulfur	-	1013.333	1013.333	1013.333	1013.333

Sample ID		Year 0-3 Tailings
Week	Units	20
Rock Unit	-	Tailings
pH	s.u.	8.76
Redox	mV	181
Conductivity	mS/cm	0.16
Total Alkalinity	mg/L	50
Aluminum	mg/L	<0.08
Antimony	mg/L	0.00354
Arsenic	mg/L	0.00937
Barium	mg/L	0.051
Beryllium	mg/L	<0.002
Cadmium	mg/L	<0.002
Calcium	mg/L	13.5
Chloride	mg/L	<0.2
Chromium	mg/L	<0.006
Copper	mg/L	<0.01
Fluoride	mg/L	2.05
Fe 2+	mg/L	-
Fe 3+	mg/L	0.01
Iron	mg/L	0.01
Lead	mg/L	<0.0075
Magnesium	mg/L	0.546
Manganese	mg/L	0.0069
Mercury	mg/L	<0.0002
Nickel	mg/L	-
Potassium	mg/L	1.18
Selenium	mg/L	<0.04
Silver	mg/L	<0.005
Sodium	mg/L	<0.5
Sulfate	mg/L	5
Thallium	mg/L	<0.001
TDS	mg/L	121
Zinc	mg/L	<0.01
Cum SO4	mg	731.26235
Cum Fe	mg	1.28649
Pyritic Sulfur	%	<0.01
ANP/AGP<Pyritic Sulfur	-	1013.333

APPENDIX F
Composited geochemical unit CRFs

Sample ID		Abrigo:<1.2	Abrigo:<1.2	Abrigo:<1.2	Abrigo:<1.2	Abrigo:<1.2	Abrigo:<1.2	Abrigo:<1.2
Week	Units	0	4	8	12	16	20	24
pH	-	3.34	3.34	3.34	3.34	3.34	3.34	3.34
Alkalinity Total	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aluminum	mg/L	71.40	71.40	71.40	71.40	71.40	71.40	71.40
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Barium	mg/L	0.027	0.027	0.027	0.027	0.027	0.027	0.027
Beryllium	mg/L	0.029	0.029	0.029	0.029	0.029	0.029	0.029
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.377	0.377	0.377	0.377	0.377	0.377	0.377
Calcium	mg/L	526	526	526	526	526	526	526
Chloride	mg/L	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Chromium	mg/L	0.040	0.040	0.040	0.040	0.040	0.040	0.040
Copper	mg/L	53.10	53.10	53.10	53.10	53.10	53.10	53.10
Fluoride	mg/L	6.38	6.38	6.38	6.38	6.38	6.38	6.38
Iron	mg/L	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Lead	mg/L	0.034	0.034	0.034	0.034	0.034	0.034	0.034
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	187.0	187.0	187.0	187.0	187.0	187.0	187.0
Manganese	mg/L	31.10	31.10	31.10	31.10	31.10	31.10	31.10
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Nickel	mg/L	0.734	0.734	0.734	0.734	0.734	0.734	0.734
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	9.81	9.81	9.81	9.81	9.81	9.81	9.81
Selenium	mg/L	0.130	0.130	0.130	0.130	0.130	0.130	0.130
Silver	mg/L	0.017	0.017	0.017	0.017	0.017	0.017	0.017
Sodium	mg/L	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	2500	2500	2500	2500	2500	2500	2500
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	3890	3890	3890	3890	3890	3890	3890
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	21.50	21.50	21.50	21.50	21.50	21.50	21.50

Sample ID		Abrigo:<1.2	Abrigo:<1.2	Abrigo:>3.0	Abrigo:>3.0	Abrigo:>3.0	Abrigo:>3.0	Abrigo:>3.0
Week	Units	28	32	0	4	8	12	16
pH	-	3.34	3.34	9.43	9.43	9.43	9.43	9.43
Alkalinity Total	mg/L	0.1	0.1	111.9	111.9	111.9	111.9	111.9
Aluminum	mg/L	71.40	71.40	0.47	0.47	0.47	0.47	0.47
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.004	0.004	0.003	0.003	0.003	0.003	0.003
Barium	mg/L	0.027	0.027	0.002	0.002	0.002	0.002	0.002
Beryllium	mg/L	0.029	0.029	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.377	0.377	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	526	526	25	25	25	25	25
Chloride	mg/L	7.0	7.0	2.4	2.4	2.4	2.4	2.4
Chromium	mg/L	0.040	0.040	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	53.10	53.10	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	6.38	6.38	0.99	0.99	0.99	0.99	0.99
Iron	mg/L	1.09	1.09	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.034	0.034	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	187.0	187.0	2.3	2.3	2.3	2.3	2.3
Manganese	mg/L	31.10	31.10	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00019	0.00019	0.00019	0.00019	0.00019
Molybdenum	mg/L	0.01	0.01	0.02	0.02	0.02	0.02	0.02
Nickel	mg/L	0.734	0.734	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	9.81	9.81	17.09	17.09	17.09	17.09	17.09
Selenium	mg/L	0.130	0.130	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.017	0.017	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	10.3	10.3	6.8	6.8	6.8	6.8	6.8
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	2500	2500	13	13	13	13	13
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	3890	3890	2	2	2	2	2
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	21.50	21.50	0.00	0.00	0.00	0.00	0.00

Sample ID		Abrigo:>3.0	Abrigo:>3.0	Abrigo:>3.0	Abrigo:>3.0	Abrigo:1.2-3.0	Abrigo:1.2-3.0
Week	Units	20	24	28	32	0	4
pH	-	9.43	9.43	9.43	9.43	7.70	7.96
Alkalinity Total	mg/L	111.9	111.9	111.9	111.9	5.2	5.1
Aluminum	mg/L	0.47	0.47	0.47	0.47	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.003	0.003	0.003	0.003	0.003	0.000
Barium	mg/L	0.002	0.002	0.002	0.002	0.045	0.014
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	25	25	25	25	457	140
Chloride	mg/L	2.4	2.4	2.4	2.4	11.8	3.6
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.01	0.00
Fluoride	mg/L	0.99	0.99	0.99	0.99	0.37	0.24
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.02
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.3	2.3	2.3	2.3	23.7	9.1
Manganese	mg/L	0.00	0.00	0.00	0.00	0.02	0.01
Mercury	mg/L	0.00019	0.00019	0.00019	0.00019	0.00001	0.00001
Molybdenum	mg/L	0.02	0.02	0.02	0.02	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	17.09	17.09	17.09	17.09	13.11	9.23
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	6.8	6.8	6.8	6.8	18.4	10.6
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	13	13	13	13	862	278
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	2	2	2	2	2429	843
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Abrigo:1.2-3.0	Abrigo:1.2-3.0	Abrigo:1.2-3.0	Abrigo:1.2-3.0	Abrigo:1.2-3.0	Abrigo:1.2-3.0
Week	Units	8	12	16	20	24	28
pH	-	7.40	7.62	7.32	7.45	7.63	7.57
Alkalinity Total	mg/L	5.2	4.7	4.1	4.4	4.1	4.1
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.003	0.003	0.003	0.003	0.002	0.002
Arsenic	mg/L	0.000	0.000	0.003	0.002	0.002	0.004
Barium	mg/L	0.027	0.053	0.041	0.036	0.026	0.022
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	168	160	170	163	160	140
Chloride	mg/L	3.6	3.6	3.6	7.2	4.4	3.6
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.19	0.16	0.14	0.18	0.16	0.15
Iron	mg/L	0.00	0.02	0.00	0.02	0.02	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	10.4	10.3	10.5	9.8	9.4	8.3
Manganese	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	10.42	9.42	9.08	8.44	8.12	7.35
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	8.3	7.9	7.6	7.7	8.4	7.8
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	313	359	297	292	292	243
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	985	831	949	895	872	10002
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Abrigo:1.2-3.0	Andesite:<1.2	Andesite:<1.2	Andesite:<1.2	Andesite:<1.2	Andesite:<1.2
Week	Units	32	0	4	8	12	16
pH	-	7.57	6.68	6.63	6.64	6.65	6.43
Alkalinity Total	mg/L	4.1	20.5	12.2	11.2	13.1	11.3
Aluminum	mg/L	0.00	0.26	0.26	0.26	0.26	0.26
Antimony	mg/L	0.002	0.003	0.005	0.005	0.005	0.004
Arsenic	mg/L	0.004	0.006	0.002	0.002	0.003	0.004
Barium	mg/L	0.022	0.018	0.008	0.009	0.027	0.024
Beryllium	mg/L	0.000	0.002	0.002	0.002	0.002	0.002
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.004	0.004	0.004	0.004	0.004
Calcium	mg/L	140	103	39	38	36	32
Chloride	mg/L	3.6	5.3	0.7	1.0	1.0	1.0
Chromium	mg/L	0.000	0.006	0.006	0.006	0.006	0.006
Copper	mg/L	0.00	0.06	0.05	0.05	0.05	0.05
Fluoride	mg/L	0.15	2.94	1.27	1.10	1.13	0.94
Iron	mg/L	0.00	0.08	0.06	0.06	0.07	0.05
Lead	mg/L	0.000	0.007	0.007	0.007	0.007	0.007
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	8.3	29.2	12.6	11.7	11.4	9.7
Manganese	mg/L	0.01	0.17	0.10	0.10	0.09	0.07
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.017	0.017	0.017	0.017	0.017
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	7.35	16.84	8.04	7.23	6.08	5.04
Selenium	mg/L	0.000	0.014	0.007	0.007	0.007	0.007
Silver	mg/L	0.000	0.004	0.004	0.004	0.004	0.004
Sodium	mg/L	7.8	18.2	8.8	7.4	6.6	5.8
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	243	402	135	93	102	72
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	10002	792	292	282	246	219
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.14	0.04	0.04	0.05	0.04

Sample ID		Andesite:<1.2	Andesite:<1.2	Andesite:<1.2	Andesite:<1.2	Andesite:>3.0	Andesite:>3.0
Week	Units	20	24	28	32	0	4
pH	-	6.50	6.51	6.54	6.54	7.63	7.63
Alkalinity Total	mg/L	11.2	11.2	13.3	13.3	53.7	53.7
Aluminum	mg/L	0.26	0.26	0.26	0.26	0.00	0.00
Antimony	mg/L	0.004	0.004	0.003	0.003	0.000	0.000
Arsenic	mg/L	0.004	0.005	0.006	0.006	0.013	0.013
Barium	mg/L	0.013	0.008	0.007	0.007	0.009	0.009
Beryllium	mg/L	0.002	0.002	0.002	0.002	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.004	0.004	0.004	0.004	0.000	0.000
Calcium	mg/L	33	34	30	30	12	12
Chloride	mg/L	2.5	1.3	1.0	1.0	3.1	3.1
Chromium	mg/L	0.006	0.006	0.006	0.006	0.000	0.000
Copper	mg/L	0.05	0.05	0.05	0.05	0.00	0.00
Fluoride	mg/L	1.27	1.06	0.89	0.89	0.63	0.63
Iron	mg/L	0.07	0.04	0.06	0.06	0.00	0.00
Lead	mg/L	0.007	0.007	0.007	0.007	0.007	0.007
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	9.7	9.9	8.4	8.4	2.2	2.2
Manganese	mg/L	0.07	0.08	0.06	0.06	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00011	0.00011
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.017	0.017	0.017	0.017	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	4.82	4.77	4.03	4.03	3.76	3.76
Selenium	mg/L	0.007	0.007	0.007	0.007	0.026	0.026
Silver	mg/L	0.004	0.004	0.004	0.004	0.000	0.000
Sodium	mg/L	5.8	6.4	5.8	5.8	14.3	14.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	78	63	75	75	22	22
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	221	233	3890	3890	96	96
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.04	0.07	0.04	0.04	0.00	0.00

Sample ID		Andesite:>3.0	Andesite:>3.0	Andesite:>3.0	Andesite:>3.0	Andesite:>3.0	Andesite:>3.0
Week	Units	8	12	16	20	24	28
pH	-	7.63	7.63	7.63	7.63	7.63	7.63
Alkalinity Total	mg/L	53.7	53.7	53.7	53.7	53.7	53.7
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.013	0.013	0.013	0.013	0.013	0.013
Barium	mg/L	0.009	0.009	0.009	0.009	0.009	0.009
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	12	12	12	12	12	12
Chloride	mg/L	3.1	3.1	3.1	3.1	3.1	3.1
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.63	0.63	0.63	0.63	0.63	0.63
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.007	0.007	0.007	0.007	0.007	0.007
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.2	2.2	2.2	2.2	2.2	2.2
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	3.76	3.76	3.76	3.76	3.76	3.76
Selenium	mg/L	0.026	0.026	0.026	0.026	0.026	0.026
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	14.3	14.3	14.3	14.3	14.3	14.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	22	22	22	22	22	22
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	96	96	96	96	96	96
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Andesite:>3.0	Andesite:1.2-3.0	Andesite:1.2-3.0	Andesite:1.2-3.0	Andesite:1.2-3.0
Week	Units	32	0	4	8	12
pH	-	7.63	7.80	7.80	7.65	7.73
Alkalinity Total	mg/L	53.7	86.1	57.4	51.1	47.3
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.008	0.023	0.021	0.014
Arsenic	mg/L	0.013	0.018	0.007	0.004	0.006
Barium	mg/L	0.009	0.044	0.007	0.008	0.033
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	12	155	13	13	13
Chloride	mg/L	3.1	7.6	0.4	0.1	0.1
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.01	0.00	0.00	0.00
Fluoride	mg/L	0.63	2.69	1.05	0.62	0.54
Iron	mg/L	0.00	0.05	0.00	0.02	0.01
Lead	mg/L	0.007	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.2	44.9	4.9	4.4	4.0
Manganese	mg/L	0.00	0.05	0.00	0.01	0.01
Mercury	mg/L	0.00011	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	3.76	60.40	19.23	14.70	10.30
Selenium	mg/L	0.026	0.069	0.022	0.021	0.006
Silver	mg/L	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	14.3	53.3	11.0	6.8	5.6
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	22	642	28	29	29
Thallium	mg/L	0.000	0.000	0.001	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	96	1205	142	131	101
TSS	mg/L	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.01

Sample ID		Andesite:1.2-3.0	Andesite:1.2-3.0	Andesite:1.2-3.0	Andesite:1.2-3.0	Andesite:1.2-3.0
Week	Units	16	20	24	28	32
pH	-	7.50	7.43	7.44	7.41	7.41
Alkalinity Total	mg/L	46.6	46.7	45.3	46.3	45.1
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.015	0.010	0.014	0.010	0.010
Arsenic	mg/L	0.008	0.007	0.009	0.010	0.010
Barium	mg/L	0.024	0.012	0.010	0.012	0.012
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	14	13	15	12	13
Chloride	mg/L	0.1	1.4	0.7	0.6	0.5
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.33	0.80	0.67	0.62	0.59
Iron	mg/L	0.02	0.02	0.01	0.03	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	3.7	2.8	3.7	3.1	3.2
Manganese	mg/L	0.01	0.00	0.01	0.01	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	8.95	7.72	9.03	7.60	7.63
Selenium	mg/L	0.006	0.006	0.006	0.005	0.005
Silver	mg/L	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	5.6	5.7	6.3	5.8	6.0
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	23	22	26	25	24
Thallium	mg/L	0.000	0.000	0.001	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	103	103	111	91	112
TSS	mg/L	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00

Sample ID		Arkose:<1.2	Arkose:<1.2	Arkose:<1.2	Arkose:<1.2	Arkose:<1.2	Arkose:<1.2	Arkose:<1.2
Week	Units	0	4	8	12	16	20	24
pH	-	7.69	7.71	7.52	7.70	7.53	7.62	7.74
Alkalinity Total	mg/L	57.8	64.6	59.0	52.8	52.8	50.0	48.6
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.004	0.006	0.006	0.005	0.005	0.004	0.004
Arsenic	mg/L	0.015	0.004	0.004	0.006	0.006	0.007	0.004
Barium	mg/L	0.012	0.005	0.005	0.009	0.012	0.006	0.005
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	69	13	16	16	16	16	17
Chloride	mg/L	6.7	1.1	1.6	1.6	1.6	3.0	2.0
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.92	0.67	0.63	0.63	0.60	0.79	0.69
Iron	mg/L	0.02	0.00	0.00	0.02	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	13.4	3.1	3.5	3.4	3.2	3.0	3.0
Manganese	mg/L	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	14.25	7.37	7.41	6.24	5.33	4.88	4.60
Selenium	mg/L	0.032	0.012	0.010	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	37.5	16.9	15.3	14.8	14.4	14.5	15.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	244	44	43	41	35	38	41
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	534	117	142	122	128	128	128
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Arkose:<1.2	Arkose:<1.2	Arkose:>3.0	Arkose:>3.0	Arkose:>3.0	Arkose:>3.0	Arkose:>3.0
Week	Units	28	32	0	4	8	12	16
pH	-	7.67	7.67	7.87	7.87	7.87	7.87	7.87
Alkalinity Total	mg/L	47.2	47.2	47.5	47.5	47.5	47.5	47.5
Aluminum	mg/L	0.00	0.00	0.04	0.04	0.04	0.04	0.04
Antimony	mg/L	0.003	0.003	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.009	0.009	0.010	0.010	0.010	0.010	0.010
Barium	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	16	16	9	9	9	9	9
Chloride	mg/L	1.6	1.6	2.6	2.6	2.6	2.6	2.6
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Fluoride	mg/L	0.61	0.61	0.56	0.56	0.56	0.56	0.56
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.7	2.7	1.4	1.4	1.4	1.4	1.4
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	4.05	4.05	2.64	2.64	2.64	2.64	2.64
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	14.1	14.1	8.9	8.9	8.9	8.9	8.9
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	47	47	10	10	10	10	10
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	194	194	31	31	31	31	31
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Arkose:>3.0	Arkose:>3.0	Arkose:>3.0	Arkose:>3.0	Arkose:1.2-3.0	Arkose:1.2-3.0
Week	Units	20	24	28	32	0	4
pH	-	7.87	7.87	7.87	7.87	7.51	7.52
Alkalinity Total	mg/L	47.5	47.5	47.5	47.5	43.2	44.6
Aluminum	mg/L	0.04	0.04	0.04	0.04	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.002	0.007
Arsenic	mg/L	0.010	0.010	0.010	0.010	0.007	0.002
Barium	mg/L	0.004	0.004	0.004	0.004	0.010	0.004
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	9	9	9	9	53	19
Chloride	mg/L	2.6	2.6	2.6	2.6	3.1	1.4
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.01	0.01	0.01	0.01	0.02	0.01
Fluoride	mg/L	0.56	0.56	0.56	0.56	0.90	0.76
Iron	mg/L	0.00	0.00	0.00	0.00	0.02	0.02
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	1.4	1.4	1.4	1.4	8.8	4.0
Manganese	mg/L	0.00	0.00	0.00	0.00	0.04	0.01
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	2.64	2.64	2.64	2.64	12.66	8.30
Selenium	mg/L	0.000	0.000	0.000	0.000	0.025	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	8.9	8.9	8.9	8.9	13.9	10.2
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	10	10	10	10	179	26
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	31	31	31	31	324	120
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Arkose:1.2-3.0	Arkose:1.2-3.0	Arkose:1.2-3.0	Arkose:1.2-3.0	Arkose:1.2-3.0	Arkose:1.2-3.0
Week	Units	8	12	16	20	24	28
pH	-	7.38	7.56	7.39	7.47	7.49	7.55
Alkalinity Total	mg/L	55.6	49.8	48.3	41.8	41.8	42.9
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.010	0.008	0.007	0.006	0.006	0.005
Arsenic	mg/L	0.002	0.008	0.008	0.008	0.008	0.008
Barium	mg/L	0.004	0.014	0.018	0.008	0.008	0.005
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	14	13	15	13	15	13
Chloride	mg/L	1.2	1.2	1.2	1.8	1.3	1.8
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
Fluoride	mg/L	0.80	0.71	0.68	0.70	0.66	0.70
Iron	mg/L	0.03	0.02	0.00	0.03	0.00	0.03
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	3.1	3.2	3.4	2.9	3.1	2.7
Manganese	mg/L	0.01	0.01	0.01	0.00	0.01	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	8.72	7.84	7.71	6.10	6.26	5.44
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	9.7	8.7	8.6	7.8	8.6	8.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	20	23	25	19	20	23
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	113	93	102	99	103	114
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.01	0.01	0.00	0.00	0.00

Sample ID		Arkose:1.2-3.0	Bolsa:<1.2	Bolsa:<1.2	Bolsa:<1.2	Bolsa:<1.2	Bolsa:<1.2	Bolsa:<1.2	Bolsa:<1.2
Week	Units	32	0	4	8	12	16	20	24
pH	-	7.62	4.60	5.77	5.52	5.29	5.13	5.05	4.43
Alkalinity Total	mg/L	41.3	1.0	1.4	0.7	0.7	1.0	0.7	1.0
Aluminum	mg/L	0.00	0.56	0.10	0.11	0.14	0.16	0.19	0.18
Antimony	mg/L	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Barium	mg/L	0.003	0.039	0.013	0.008	0.026	0.020	0.046	0.009
Beryllium	mg/L	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.031	0.002	0.002	0.001	0.000	0.000	0.000
Calcium	mg/L	13	33	7	3	2	2	1	1
Chloride	mg/L	1.3	18.1	1.7	0.3	0.4	0.3	0.3	0.5
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.01	5.67	0.41	0.23	0.32	0.47	0.59	0.60
Fluoride	mg/L	0.68	1.01	0.39	0.13	0.30	0.48	0.22	0.15
Iron	mg/L	0.00	1.03	0.05	0.05	0.08	0.11	0.17	0.21
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.7	6.8	1.2	0.4	0.3	0.2	0.2	0.1
Manganese	mg/L	0.00	3.26	1.21	0.48	0.42	0.34	0.32	0.24
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.144	0.016	0.012	0.012	0.011	0.010	0.008
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	5.39	22.89	5.01	1.84	1.35	0.80	0.76	0.67
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	8.9	7.0	0.7	0.1	0.1	0.1	0.1	0.1
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	26	126	25	17	13	11	15	14
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	118	217	63	66	31	18	30	27
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.002	0.000	0.000	0.000	0.001	0.002	0.002
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	2.44	0.26	0.13	0.13	0.14	0.15	0.10

Sample ID		Bolsa:<1.2	Bolsa:<1.2	Bolsa:>3.0	Bolsa:>3.0	Bolsa:>3.0	Bolsa:>3.0	Bolsa:>3.0	Bolsa:>3.0
Week	Units	28	32	0	4	8	12	16	20
pH	-	4.39	4.39	8.00	8.00	8.00	8.00	8.00	8.00
Alkalinity Total	mg/L	1.0	1.0	120.1	120.1	120.1	120.1	120.1	120.1
Aluminum	mg/L	0.19	0.19	0.87	0.87	0.87	0.87	0.87	0.87
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.022	0.022	0.022	0.022	0.022	0.022
Barium	mg/L	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	1	1	3	3	3	3	3	3
Chloride	mg/L	0.4	0.4	4.0	4.0	4.0	4.0	4.0	4.0
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.48	0.48	0.21	0.21	0.21	0.21	0.21	0.21
Fluoride	mg/L	0.01	0.01	1.60	1.60	1.60	1.60	1.60	1.60
Iron	mg/L	0.25	0.25	1.49	1.49	1.49	1.49	1.49	1.49
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	0.1	0.1	0.8	0.8	0.8	0.8	0.8	0.8
Manganese	mg/L	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.009	0.009	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	0.63	0.63	8.49	8.49	8.49	8.49	8.49	8.49
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	0.1	0.1	39.5	39.5	39.5	39.5	39.5	39.5
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	10	10	4	4	4	4	4	4
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	0	0	117	117	117	117	117	117
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Bolsa:>3.0	Bolsa:>3.0	Bolsa:>3.0	Bolsa:1.2-3.0	Bolsa:1.2-3.0	Bolsa:1.2-3.0	Bolsa:1.2-3.0
Week	Units	24	28	32	0	4	8	12
pH	-	8.00	8.00	8.00	9.55	9.55	9.55	9.55
Alkalinity Total	mg/L	120.1	120.1	120.1	112.8	112.8	112.8	112.8
Aluminum	mg/L	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.022	0.022	0.022	0.000	0.000	0.000	0.000
Barium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	3	3	3	16	16	16	16
Chloride	mg/L	4.0	4.0	4.0	2.3	2.3	2.3	2.3
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.21	0.21	0.21	0.04	0.04	0.04	0.04
Fluoride	mg/L	1.60	1.60	1.60	0.93	0.93	0.93	0.93
Iron	mg/L	1.49	1.49	1.49	0.16	0.16	0.16	0.16
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	0.8	0.8	0.8	2.6	2.6	2.6	2.6
Manganese	mg/L	0.00	0.00	0.00	0.01	0.01	0.01	0.01
Mercury	mg/L	0.00001	0.00001	0.00001	0.00029	0.00029	0.00029	0.00029
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	8.49	8.49	8.49	1.25	1.25	1.25	1.25
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	39.5	39.5	39.5	20.0	20.0	20.0	20.0
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	4	4	4	9	9	9	9
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	117	117	117	0	0	0	0
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Bolsa:1.2-3.0	Bolsa:1.2-3.0	Bolsa:1.2-3.0	Bolsa:1.2-3.0	Bolsa:1.2-3.0	Concha:>3.0
Week	Units	16	20	24	28	32	0
pH	-	9.55	9.55	9.55	9.55	9.55	7.42
Alkalinity Total	mg/L	112.8	112.8	112.8	112.8	112.8	69.6
Aluminum	mg/L	0.87	0.87	0.87	0.87	0.87	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Barium	mg/L	0.000	0.000	0.000	0.000	0.000	0.015
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	16	16	16	16	16	14
Chloride	mg/L	2.3	2.3	2.3	2.3	2.3	1.8
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.04	0.04	0.04	0.04	0.04	0.00
Fluoride	mg/L	0.93	0.93	0.93	0.93	0.93	0.09
Iron	mg/L	0.16	0.16	0.16	0.16	0.16	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.6	2.6	2.6	2.6	2.6	3.2
Manganese	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Mercury	mg/L	0.00029	0.00029	0.00029	0.00029	0.00029	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	1.25	1.25	1.25	1.25	1.25	2.77
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	20.0	20.0	20.0	20.0	20.0	4.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	9	9	9	9	9	6
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	0	0	0	0	0	62
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Concha:>3.0	Concha:>3.0	Concha:>3.0	Concha:>3.0	Concha:>3.0	Concha:>3.0
Week	Units	4	8	12	16	20	24
pH	-	7.42	7.42	7.42	7.42	7.42	7.42
Alkalinity Total	mg/L	69.6	69.6	69.6	69.6	69.6	69.6
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Barium	mg/L	0.015	0.015	0.015	0.015	0.015	0.015
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	14	14	14	14	14	14
Chloride	mg/L	1.8	1.8	1.8	1.8	1.8	1.8
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.09	0.09	0.09	0.09	0.09	0.09
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	3.2	3.2	3.2	3.2	3.2	3.2
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	2.77	2.77	2.77	2.77	2.77	2.77
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	4.3	4.3	4.3	4.3	4.3	4.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	6	6	6	6	6	6
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	62	62	62	62	62	62
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Concha:>3.0	Concha:>3.0	Earp:>3.0	Earp:>3.0	Earp:>3.0	Earp:>3.0	Earp:>3.0	Earp:>3.0
Week	Units	28	32	0	4	8	12	16	20
pH	-	7.42	7.42	8.29	8.43	8.44	8.48	8.18	8.37
Alkalinity Total	mg/L	69.6	69.6	83.1	83.1	84.4	83.0	78.8	81.6
Aluminum	mg/L	0.00	0.00	0.13	0.13	0.13	0.13	0.13	0.13
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.002
Arsenic	mg/L	0.000	0.000	0.004	0.002	0.002	0.003	0.003	0.004
Barium	mg/L	0.015	0.015	0.010	0.006	0.007	0.015	0.016	0.010
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	14	14	36	21	20	19	20	19
Chloride	mg/L	1.8	1.8	4.0	1.8	2.0	2.0	2.0	2.8
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.09	0.09	1.30	1.16	1.23	1.26	1.19	1.33
Iron	mg/L	0.00	0.00	0.04	0.02	0.03	0.02	0.02	0.03
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	3.2	3.2	3.0	2.0	2.0	2.1	2.2	2.5
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	2.77	2.77	8.94	6.70	6.83	6.57	6.42	6.80
Selenium	mg/L	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	4.3	4.3	17.5	13.9	13.0	12.1	11.7	11.5
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	6	6	42	16	16	15	15	15
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	62	62	94	57	56	51	54	51
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00

Sample ID		Earp:>3.0	Earp:>3.0	Earp:>3.0	Earp:1.2-3.0	Earp:1.2-3.0	Earp:1.2-3.0	Earp:1.2-3.0
Week	Units	24	28	32	0	4	8	12
pH	-	8.30	8.26	8.26	9.55	9.55	9.55	9.55
Alkalinity Total	mg/L	79.5	78.8	78.8	77.2	77.2	77.2	77.2
Aluminum	mg/L	0.13	0.13	0.13	0.00	0.00	0.00	0.00
Antimony	mg/L	0.002	0.002	0.002	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.003	0.003	0.003	0.000	0.000	0.000	0.000
Barium	mg/L	0.009	0.006	0.006	0.043	0.043	0.043	0.043
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	20	19	19	41	41	41	41
Chloride	mg/L	2.2	2.0	2.0	2.7	2.7	2.7	2.7
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	1.27	1.22	1.22	2.42	2.42	2.42	2.42
Iron	mg/L	0.00	0.02	0.02	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.2	2.1	2.1	6.1	6.1	6.1	6.1
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.01	0.01	0.01	1.34	1.34	1.34	1.34
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	6.26	6.10	6.10	10.57	10.57	10.57	10.57
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	12.0	11.7	11.7	25.5	25.5	25.5	25.5
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	16	17	17	123	123	123	123
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	56	47	47	0	0	0	0
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Earp:1.2-3.0	Earp:1.2-3.0	Earp:1.2-3.0	Earp:1.2-3.0	Earp:1.2-3.0	Epitaph:<1.2	Epitaph:<1.2
Week	Units	16	20	24	28	32	0	4
pH	-	9.55	9.55	9.55	9.55	9.55	3.34	3.34
Alkalinity Total	mg/L	77.2	77.2	77.2	77.2	77.2	0.1	0.1
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	71.40	71.40
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.000	0.000	0.000	0.004	0.004
Barium	mg/L	0.043	0.043	0.043	0.043	0.043	0.027	0.027
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.029	0.029
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.377	0.377
Calcium	mg/L	41	41	41	41	41	526	526
Chloride	mg/L	2.7	2.7	2.7	2.7	2.7	7.0	7.0
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.040	0.040
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	53.10	53.10
Fluoride	mg/L	2.42	2.42	2.42	2.42	2.42	6.38	6.38
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	1.09	1.09
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.034	0.034
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	6.1	6.1	6.1	6.1	6.1	187.0	187.0
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	31.10	31.10
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	1.34	1.34	1.34	1.34	1.34	0.01	0.01
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.734	0.734
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	10.57	10.57	10.57	10.57	10.57	9.81	9.81
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.130	0.130
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.017	0.017
Sodium	mg/L	25.5	25.5	25.5	25.5	25.5	10.3	10.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	123	123	123	123	123	2500	2500
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	0	0	0	0	0	3890	3890
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	21.50	21.50

Sample ID		Epitaph:<1.2	Epitaph:<1.2	Epitaph:<1.2	Epitaph:<1.2	Epitaph:<1.2	Epitaph:<1.2	Epitaph:<1.2
Week	Units	8	12	16	20	24	28	32
pH	-	3.34	3.34	3.34	3.34	3.34	3.34	3.34
Alkalinity Total	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aluminum	mg/L	71.40	71.40	71.40	71.40	71.40	71.40	71.40
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Barium	mg/L	0.027	0.027	0.027	0.027	0.027	0.027	0.027
Beryllium	mg/L	0.029	0.029	0.029	0.029	0.029	0.029	0.029
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.377	0.377	0.377	0.377	0.377	0.377	0.377
Calcium	mg/L	526	526	526	526	526	526	526
Chloride	mg/L	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Chromium	mg/L	0.040	0.040	0.040	0.040	0.040	0.040	0.040
Copper	mg/L	53.10	53.10	53.10	53.10	53.10	53.10	53.10
Fluoride	mg/L	6.38	6.38	6.38	6.38	6.38	6.38	6.38
Iron	mg/L	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Lead	mg/L	0.034	0.034	0.034	0.034	0.034	0.034	0.034
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	187.0	187.0	187.0	187.0	187.0	187.0	187.0
Manganese	mg/L	31.10	31.10	31.10	31.10	31.10	31.10	31.10
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Nickel	mg/L	0.734	0.734	0.734	0.734	0.734	0.734	0.734
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	9.81	9.81	9.81	9.81	9.81	9.81	9.81
Selenium	mg/L	0.130	0.130	0.130	0.130	0.130	0.130	0.130
Silver	mg/L	0.017	0.017	0.017	0.017	0.017	0.017	0.017
Sodium	mg/L	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	2500	2500	2500	2500	2500	2500	2500
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	3890	3890	3890	3890	3890	3890	3890
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	21.50	21.50	21.50	21.50	21.50	21.50	21.50

Sample ID		Epitaph:>3.0	Epitaph:>3.0	Epitaph:>3.0	Epitaph:>3.0	Epitaph:>3.0	Epitaph:>3.0
Week	Units	0	4	8	12	16	20
pH	-	9.47	9.47	9.47	9.47	9.47	9.47
Alkalinity Total	mg/L	42.9	42.9	42.9	42.9	42.9	42.9
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.002	0.002	0.002	0.002	0.002	0.002
Barium	mg/L	0.038	0.038	0.038	0.038	0.038	0.038
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	73	73	73	73	73	73
Chloride	mg/L	2.7	2.7	2.7	2.7	2.7	2.7
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	4.22	4.22	4.22	4.22	4.22	4.22
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	9.2	9.2	9.2	9.2	9.2	9.2
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.02	0.02	0.02	0.02	0.02	0.02
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	11.14	11.14	11.14	11.14	11.14	11.14
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	13.2	13.2	13.2	13.2	13.2	13.2
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	107	107	107	107	107	107
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	18	18	18	18	18	18
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Epitaph:>3.0	Epitaph:>3.0	Epitaph:>3.0	Epitaph:1.2-3.0	Epitaph:1.2-3.0	Epitaph:1.2-3.0
Week	Units	24	28	32	0	4	8
pH	-	9.47	9.47	9.47	7.70	7.96	7.40
Alkalinity Total	mg/L	42.9	42.9	42.9	5.2	5.1	5.2
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.003
Arsenic	mg/L	0.002	0.002	0.002	0.003	0.000	0.000
Barium	mg/L	0.038	0.038	0.038	0.045	0.014	0.027
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	73	73	73	457	140	168
Chloride	mg/L	2.7	2.7	2.7	11.8	3.6	3.6
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.01	0.00	0.00
Fluoride	mg/L	4.22	4.22	4.22	0.37	0.24	0.19
Iron	mg/L	0.00	0.00	0.00	0.00	0.02	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	9.2	9.2	9.2	23.7	9.1	10.4
Manganese	mg/L	0.00	0.00	0.00	0.02	0.01	0.01
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.02	0.02	0.02	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	11.14	11.14	11.14	13.11	9.23	10.42
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	13.2	13.2	13.2	18.4	10.6	8.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	107	107	107	862	278	313
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	18	18	18	2429	843	985
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Appendix F
Tabulated Chemical Release Functions

Sample ID		Epitaph:1.2-3.0	Epitaph:1.2-3.0	Epitaph:1.2-3.0	Epitaph:1.2-3.0	Epitaph:1.2-3.0
Week	Units	12	16	20	24	28
pH	-	7.62	7.32	7.45	7.63	7.57
Alkalinity Total	mg/L	4.7	4.1	4.4	4.1	4.1
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.003	0.003	0.003	0.002	0.002
Arsenic	mg/L	0.000	0.003	0.002	0.002	0.004
Barium	mg/L	0.053	0.041	0.036	0.026	0.022
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	160	170	163	160	140
Chloride	mg/L	3.6	3.6	7.2	4.4	3.6
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.16	0.14	0.18	0.16	0.15
Iron	mg/L	0.02	0.00	0.02	0.02	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	10.3	10.5	9.8	9.4	8.3
Manganese	mg/L	0.01	0.01	0.01	0.01	0.01
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	9.42	9.08	8.44	8.12	7.35
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	7.9	7.6	7.7	8.4	7.8
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	359	297	292	292	243
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	831	949	895	872	10002
TSS	mg/L	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00

Sample ID		Epitaph:1.2-3.0	Escabrosa:>3.0	Escabrosa:>3.0	Escabrosa:>3.0	Escabrosa:>3.0
Week	Units	32	0	4	8	12
pH	-	7.57	8.19	8.19	8.19	8.19
Alkalinity Total	mg/L	4.1	109.5	109.5	109.5	109.5
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.002	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.004	0.000	0.000	0.000	0.000
Barium	mg/L	0.022	0.006	0.006	0.006	0.006
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	140	25	25	25	25
Chloride	mg/L	3.6	3.5	3.5	3.5	3.5
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.15	1.61	1.61	1.61	1.61
Iron	mg/L	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	8.3	2.1	2.1	2.1	2.1
Manganese	mg/L	0.01	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.01	0.01	0.01	0.01
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	7.35	2.30	2.30	2.30	2.30
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	7.8	8.5	8.5	8.5	8.5
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	243	11	11	11	11
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	10002	0	0	0	0
TSS	mg/L	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00

Sample ID		Escabrosa:>3.0	Escabrosa:>3.0	Escabrosa:>3.0	Escabrosa:>3.0	Escabrosa:>3.0	Gila:>3.0
Week	Units	16	20	24	28	32	0
pH	-	8.19	8.19	8.19	8.19	8.19	8.05
Alkalinity Total	mg/L	109.5	109.5	109.5	109.5	109.5	98.1
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.000	0.000	0.000	0.005
Barium	mg/L	0.006	0.006	0.006	0.006	0.006	0.063
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	25	25	25	25	25	31
Chloride	mg/L	3.5	3.5	3.5	3.5	3.5	1.4
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	1.61	1.61	1.61	1.61	1.61	0.58
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.1	2.1	2.1	2.1	2.1	2.1
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	2.30	2.30	2.30	2.30	2.30	3.72
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	8.5	8.5	8.5	8.5	8.5	7.4
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	11	11	11	11	11	22
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	0	0	0	0	0	133
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Gila:>3.0	Gila:>3.0	Gila:>3.0	Gila:>3.0	Gila:>3.0	Gila:>3.0	Gila:>3.0	Gila:>3.0	Glance:<1.2
Week	Units	4	8	12	16	20	24	28	32	0
pH	-	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	3.34
Alkalinity Total	mg/L	98.1	98.1	98.1	98.1	98.1	98.1	98.1	98.1	0.1
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.40
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004
Barium	mg/L	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.027
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.377
Calcium	mg/L	31	31	31	31	31	31	31	31	526
Chloride	mg/L	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	7.0
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53.10
Fluoride	mg/L	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	6.38
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	187.0
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.10
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.734
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	3.72	3.72	3.72	3.72	3.72	3.72	3.72	3.72	9.81
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.130
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017
Sodium	mg/L	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	10.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	22	22	22	22	22	22	22	22	2500
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	133	133	133	133	133	133	133	133	3890
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.50

Sample ID		Glance:<1.2	Glance:<1.2	Glance:<1.2	Glance:<1.2	Glance:<1.2	Glance:<1.2	Glance:<1.2
Week	Units	4	8	12	16	20	24	28
pH	-	3.34	3.34	3.34	3.34	3.34	3.34	3.34
Alkalinity Total	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aluminum	mg/L	71.40	71.40	71.40	71.40	71.40	71.40	71.40
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Barium	mg/L	0.027	0.027	0.027	0.027	0.027	0.027	0.027
Beryllium	mg/L	0.029	0.029	0.029	0.029	0.029	0.029	0.029
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.377	0.377	0.377	0.377	0.377	0.377	0.377
Calcium	mg/L	526	526	526	526	526	526	526
Chloride	mg/L	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Chromium	mg/L	0.040	0.040	0.040	0.040	0.040	0.040	0.040
Copper	mg/L	53.10	53.10	53.10	53.10	53.10	53.10	53.10
Fluoride	mg/L	6.38	6.38	6.38	6.38	6.38	6.38	6.38
Iron	mg/L	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Lead	mg/L	0.034	0.034	0.034	0.034	0.034	0.034	0.034
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	187.0	187.0	187.0	187.0	187.0	187.0	187.0
Manganese	mg/L	31.10	31.10	31.10	31.10	31.10	31.10	31.10
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Nickel	mg/L	0.734	0.734	0.734	0.734	0.734	0.734	0.734
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	9.81	9.81	9.81	9.81	9.81	9.81	9.81
Selenium	mg/L	0.130	0.130	0.130	0.130	0.130	0.130	0.130
Silver	mg/L	0.017	0.017	0.017	0.017	0.017	0.017	0.017
Sodium	mg/L	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	2500	2500	2500	2500	2500	2500	2500
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	3890	3890	3890	3890	3890	3890	3890
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	21.50	21.50	21.50	21.50	21.50	21.50	21.50

Sample ID		Glance:<1.2	Glance:>3.0	Glance:>3.0	Glance:>3.0	Glance:>3.0	Glance:>3.0	Glance:>3.0
Week	Units	32	0	4	8	12	16	20
pH	-	3.34	8.01	8.01	8.01	8.01	8.01	8.01
Alkalinity Total	mg/L	0.1	112.8	112.8	112.8	112.8	112.8	112.8
Aluminum	mg/L	71.40	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.004	0.007	0.007	0.007	0.007	0.007	0.007
Barium	mg/L	0.027	0.000	0.000	0.000	0.000	0.000	0.000
Beryllium	mg/L	0.029	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.377	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	526	36	36	36	36	36	36
Chloride	mg/L	7.0	3.5	3.5	3.5	3.5	3.5	3.5
Chromium	mg/L	0.040	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	53.10	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	6.38	0.75	0.75	0.75	0.75	0.75	0.75
Iron	mg/L	1.09	0.00	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.034	0.021	0.021	0.021	0.021	0.021	0.021
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	187.0	2.0	2.0	2.0	2.0	2.0	2.0
Manganese	mg/L	31.10	0.02	0.02	0.02	0.02	0.02	0.02
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.01	0.06	0.06	0.06	0.06	0.06	0.06
Nickel	mg/L	0.734	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	9.81	0.96	0.96	0.96	0.96	0.96	0.96
Selenium	mg/L	0.130	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.017	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	10.3	5.9	5.9	5.9	5.9	5.9	5.9
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	2500	9	9	9	9	9	9
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	3890	172	172	172	172	172	172
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	21.50	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Glance:>3.0	Glance:>3.0	Glance:>3.0	Glance:1.2-3.0	Glance:1.2-3.0	Glance:1.2-3.0
Week	Units	24	28	32	0	4	8
pH	-	8.01	8.01	8.01	7.70	7.96	7.40
Alkalinity Total	mg/L	112.8	112.8	112.8	5.2	5.1	5.2
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.003
Arsenic	mg/L	0.007	0.007	0.007	0.003	0.000	0.000
Barium	mg/L	0.000	0.000	0.000	0.045	0.014	0.027
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	36	36	36	457	140	168
Chloride	mg/L	3.5	3.5	3.5	11.8	3.6	3.6
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.01	0.00	0.00
Fluoride	mg/L	0.75	0.75	0.75	0.37	0.24	0.19
Iron	mg/L	0.00	0.00	0.00	0.00	0.02	0.00
Lead	mg/L	0.021	0.021	0.021	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.0	2.0	2.0	23.7	9.1	10.4
Manganese	mg/L	0.02	0.02	0.02	0.02	0.01	0.01
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.06	0.06	0.06	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	0.96	0.96	0.96	13.11	9.23	10.42
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	5.9	5.9	5.9	18.4	10.6	8.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	9	9	9	862	278	313
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	172	172	172	2429	843	985
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Glance:1.2-3.0	Glance:1.2-3.0	Glance:1.2-3.0	Glance:1.2-3.0	Glance:1.2-3.0
Week	Units	12	16	20	24	28
pH	-	7.62	7.32	7.45	7.63	7.57
Alkalinity Total	mg/L	4.7	4.1	4.4	4.1	4.1
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.003	0.003	0.003	0.002	0.002
Arsenic	mg/L	0.000	0.003	0.002	0.002	0.004
Barium	mg/L	0.053	0.041	0.036	0.026	0.022
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	160	170	163	160	140
Chloride	mg/L	3.6	3.6	7.2	4.4	3.6
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.16	0.14	0.18	0.16	0.15
Iron	mg/L	0.02	0.00	0.02	0.02	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	10.3	10.5	9.8	9.4	8.3
Manganese	mg/L	0.01	0.01	0.01	0.01	0.01
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	9.42	9.08	8.44	8.12	7.35
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	7.9	7.6	7.7	8.4	7.8
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	359	297	292	292	243
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	831	949	895	872	10002
TSS	mg/L	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00

Sample ID		Glance:1.2-3.0	Granodiorite:<1.2	Granodiorite:<1.2	Granodiorite:<1.2	Granodiorite:<1.2
Week	Units	32	0	4	8	12
pH	-	7.57	5.53	5.53	5.53	5.53
Alkalinity Total	mg/L	4.1	2.8	2.8	2.8	2.8
Aluminum	mg/L	0.00	0.75	0.75	0.75	0.75
Antimony	mg/L	0.002	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.004	0.000	0.000	0.000	0.000
Barium	mg/L	0.022	0.012	0.012	0.012	0.012
Beryllium	mg/L	0.000	0.003	0.003	0.003	0.003
Boron	mg/L	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.009	0.009	0.009	0.009
Calcium	mg/L	140	19	19	19	19
Chloride	mg/L	3.6	1.4	1.4	1.4	1.4
Chromium	mg/L	0.000	0.006	0.006	0.006	0.006
Copper	mg/L	0.00	0.67	0.67	0.67	0.67
Fluoride	mg/L	0.15	0.64	0.64	0.64	0.64
Iron	mg/L	0.00	0.12	0.12	0.12	0.12
Lead	mg/L	0.000	0.013	0.013	0.013	0.013
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	8.3	3.5	3.5	3.5	3.5
Manganese	mg/L	0.01	0.12	0.12	0.12	0.12
Mercury	mg/L	0.00001	0.00019	0.00019	0.00019	0.00019
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.027	0.027	0.027	0.027
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	7.35	1.35	1.35	1.35	1.35
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.004	0.004	0.004	0.004
Sodium	mg/L	7.8	5.2	5.2	5.2	5.2
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	243	53	53	53	53
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	10002	158	158	158	158
TSS	mg/L	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.16	0.16	0.16	0.16

Sample ID		Granodiorite:<1.2	Granodiorite:<1.2	Granodiorite:<1.2	Granodiorite:<1.2	Granodiorite:<1.2
Week	Units	16	20	24	28	32
pH	-	5.53	5.53	5.53	5.53	5.53
Alkalinity Total	mg/L	2.8	2.8	2.8	2.8	2.8
Aluminum	mg/L	0.75	0.75	0.75	0.75	0.75
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.000	0.000	0.000
Barium	mg/L	0.012	0.012	0.012	0.012	0.012
Beryllium	mg/L	0.003	0.003	0.003	0.003	0.003
Boron	mg/L	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.009	0.009	0.009	0.009	0.009
Calcium	mg/L	19	19	19	19	19
Chloride	mg/L	1.4	1.4	1.4	1.4	1.4
Chromium	mg/L	0.006	0.006	0.006	0.006	0.006
Copper	mg/L	0.67	0.67	0.67	0.67	0.67
Fluoride	mg/L	0.64	0.64	0.64	0.64	0.64
Iron	mg/L	0.12	0.12	0.12	0.12	0.12
Lead	mg/L	0.013	0.013	0.013	0.013	0.013
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	3.5	3.5	3.5	3.5	3.5
Manganese	mg/L	0.12	0.12	0.12	0.12	0.12
Mercury	mg/L	0.00019	0.00019	0.00019	0.00019	0.00019
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.027	0.027	0.027	0.027	0.027
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	1.35	1.35	1.35	1.35	1.35
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.004	0.004	0.004	0.004	0.004
Sodium	mg/L	5.2	5.2	5.2	5.2	5.2
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	53	53	53	53	53
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	158	158	158	158	158
TSS	mg/L	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.16	0.16	0.16	0.16	0.16

Sample ID		Granodiorite:>3.0	Granodiorite:>3.0	Granodiorite:>3.0	Granodiorite:>3.0	Granodiorite:>3.0
Week	Units	0	4	8	12	16
pH	-	8.00	8.00	8.00	8.00	8.00
Alkalinity Total	mg/L	147.8	147.8	147.8	147.8	147.8
Aluminum	mg/L	1.77	1.77	1.77	1.77	1.77
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.028	0.028	0.028	0.028	0.028
Barium	mg/L	0.055	0.055	0.055	0.055	0.055
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	21	21	21	21	21
Chloride	mg/L	5.7	5.7	5.7	5.7	5.7
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.10	0.10	0.10	0.10	0.10
Fluoride	mg/L	1.22	1.22	1.22	1.22	1.22
Iron	mg/L	0.16	0.16	0.16	0.16	0.16
Lead	mg/L	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.1	2.1	2.1	2.1	2.1
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	15.44	15.44	15.44	15.44	15.44
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	26.7	26.7	26.7	26.7	26.7
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	10	10	10	10	10
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	144	144	144	144	144
TSS	mg/L	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00

Sample ID		Granodiorite:>3.0	Granodiorite:>3.0	Granodiorite:>3.0	Granodiorite:>3.0	Granodiorite:1.2-3.0
Week	Units	20	24	28	32	0
pH	-	8.00	8.00	8.00	8.00	7.41
Alkalinity Total	mg/L	147.8	147.8	147.8	147.8	15.4
Aluminum	mg/L	1.77	1.77	1.77	1.77	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.028	0.028	0.028	0.028	0.000
Barium	mg/L	0.055	0.055	0.055	0.055	0.003
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	21	21	21	21	2
Chloride	mg/L	5.7	5.7	5.7	5.7	0.7
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.10	0.10	0.10	0.10	0.00
Fluoride	mg/L	1.22	1.22	1.22	1.22	0.26
Iron	mg/L	0.16	0.16	0.16	0.16	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.1	2.1	2.1	2.1	0.4
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	15.44	15.44	15.44	15.44	0.59
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	26.7	26.7	26.7	26.7	4.4
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	10	10	10	10	4
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	144	144	144	144	20
TSS	mg/L	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00

Sample ID		Granodiorite:1.2-3.0	Granodiorite:1.2-3.0	Granodiorite:1.2-3.0	Granodiorite:1.2-3.0
Week	Units	4	8	12	16
pH	-	7.41	7.41	7.41	7.41
Alkalinity Total	mg/L	15.4	15.4	15.4	15.4
Aluminum	mg/L	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.000	0.000
Barium	mg/L	0.003	0.003	0.003	0.003
Beryllium	mg/L	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000
Calcium	mg/L	2	2	2	2
Chloride	mg/L	0.7	0.7	0.7	0.7
Chromium	mg/L	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.26	0.26	0.26	0.26
Iron	mg/L	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00
Magnesium	mg/L	0.4	0.4	0.4	0.4
Manganese	mg/L	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00
Potassium	mg/L	0.59	0.59	0.59	0.59
Selenium	mg/L	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000
Sodium	mg/L	4.4	4.4	4.4	4.4
Strontium	mg/L	0.00	0.00	0.00	0.00
Sulfate	mg/L	4	4	4	4
Thallium	mg/L	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00
TDS	mg/L	20	20	20	20
TSS	mg/L	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00

Sample ID		Granodiorite:1.2-3.0	Granodiorite:1.2-3.0	Granodiorite:1.2-3.0	Granodiorite:1.2-3.0
Week	Units	20	24	28	32
pH	-	7.41	7.41	7.41	7.41
Alkalinity Total	mg/L	15.4	15.4	15.4	15.4
Aluminum	mg/L	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.000	0.000
Barium	mg/L	0.003	0.003	0.003	0.003
Beryllium	mg/L	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000
Calcium	mg/L	2	2	2	2
Chloride	mg/L	0.7	0.7	0.7	0.7
Chromium	mg/L	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.26	0.26	0.26	0.26
Iron	mg/L	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00
Magnesium	mg/L	0.4	0.4	0.4	0.4
Manganese	mg/L	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00
Potassium	mg/L	0.59	0.59	0.59	0.59
Selenium	mg/L	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000
Sodium	mg/L	4.4	4.4	4.4	4.4
Strontium	mg/L	0.00	0.00	0.00	0.00
Sulfate	mg/L	4	4	4	4
Thallium	mg/L	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00
TDS	mg/L	20	20	20	20
TSS	mg/L	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00

Sample ID		Horquilla:>3.0	Horquilla:>3.0	Horquilla:>3.0	Horquilla:>3.0	Horquilla:>3.0	Horquilla:>3.0
Week	Units	0	4	8	12	16	20
pH	-	9.25	9.25	9.25	9.25	9.25	9.25
Alkalinity Total	mg/L	97.5	97.5	97.5	97.5	97.5	97.5
Aluminum	mg/L	0.10	0.10	0.10	0.10	0.10	0.10
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.003	0.003	0.003	0.003	0.003	0.003
Barium	mg/L	0.003	0.003	0.003	0.003	0.003	0.003
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	34	34	34	34	34	34
Chloride	mg/L	7.5	7.5	7.5	7.5	7.5	7.5
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	1.78	1.78	1.78	1.78	1.78	1.78
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	1.2	1.2	1.2	1.2	1.2	1.2
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.02	0.02	0.02	0.02	0.02	0.02
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	2.71	2.71	2.71	2.71	2.71	2.71
Selenium	mg/L	0.004	0.004	0.004	0.004	0.004	0.004
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	8.9	8.9	8.9	8.9	8.9	8.9
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	17	17	17	17	17	17
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	3	3	3	3	3	3
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Horquilla:>3.0	Horquilla:>3.0	Horquilla:>3.0	Martin:>3.0	Martin:>3.0	Martin:>3.0	Martin:>3.0
Week	Units	24	28	32	0	4	8	12
pH	-	9.25	9.25	9.25	8.92	8.92	8.92	8.92
Alkalinity Total	mg/L	97.5	97.5	97.5	128.8	128.8	128.8	128.8
Aluminum	mg/L	0.10	0.10	0.10	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.003	0.003	0.003	0.000	0.000	0.000	0.000
Barium	mg/L	0.003	0.003	0.003	0.007	0.007	0.007	0.007
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	34	34	34	23	23	23	23
Chloride	mg/L	7.5	7.5	7.5	4.7	4.7	4.7	4.7
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	1.78	1.78	1.78	1.11	1.11	1.11	1.11
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	1.2	1.2	1.2	7.4	7.4	7.4	7.4
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.02	0.02	0.02	0.04	0.04	0.04	0.04
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	2.71	2.71	2.71	12.26	12.26	12.26	12.26
Selenium	mg/L	0.004	0.004	0.004	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	8.9	8.9	8.9	10.8	10.8	10.8	10.8
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	17	17	17	17	17	17	17
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	3	3	3	0	0	0	0
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Martin:>3.0	Martin:>3.0	Martin:>3.0	Martin:>3.0	Martin:>3.0	Qmp:<1.2	Qmp:<1.2	Qmp:<1.2
Week	Units	16	20	24	28	32	0	4	8
pH	-	8.92	8.92	8.92	8.92	8.92	5.53	5.53	5.53
Alkalinity Total	mg/L	128.8	128.8	128.8	128.8	128.8	2.8	2.8	2.8
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.75	0.75	0.75
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Barium	mg/L	0.007	0.007	0.007	0.007	0.007	0.012	0.012	0.012
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.003
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.009	0.009	0.009
Calcium	mg/L	23	23	23	23	23	19	19	19
Chloride	mg/L	4.7	4.7	4.7	4.7	4.7	1.4	1.4	1.4
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.006	0.006	0.006
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.67	0.67	0.67
Fluoride	mg/L	1.11	1.11	1.11	1.11	1.11	0.64	0.64	0.64
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.12
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.013	0.013	0.013
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	7.4	7.4	7.4	7.4	7.4	3.5	3.5	3.5
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.12
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00019	0.00019	0.00019
Molybdenum	mg/L	0.04	0.04	0.04	0.04	0.04	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.027	0.027	0.027
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	12.26	12.26	12.26	12.26	12.26	1.35	1.35	1.35
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.004	0.004	0.004
Sodium	mg/L	10.8	10.8	10.8	10.8	10.8	5.2	5.2	5.2
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	17	17	17	17	17	53	53	53
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	0	0	0	0	0	158	158	158
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.16	0.16	0.16

Sample ID		Qmp:<1.2	Qmp:<1.2	Qmp:<1.2	Qmp:<1.2	Qmp:<1.2	Qmp:<1.2	Qmp:>3.0	Qmp:>3.0
Week	Units	12	16	20	24	28	32	0	4
pH	-	5.53	5.53	5.53	5.53	5.53	5.53	8.00	8.00
Alkalinity Total	mg/L	2.8	2.8	2.8	2.8	2.8	2.8	147.8	147.8
Aluminum	mg/L	0.75	0.75	0.75	0.75	0.75	0.75	1.77	1.77
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.028
Barium	mg/L	0.012	0.012	0.012	0.012	0.012	0.012	0.055	0.055
Beryllium	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.009	0.009	0.009	0.009	0.009	0.009	0.000	0.000
Calcium	mg/L	19	19	19	19	19	19	21	21
Chloride	mg/L	1.4	1.4	1.4	1.4	1.4	1.4	5.7	5.7
Chromium	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.000	0.000
Copper	mg/L	0.67	0.67	0.67	0.67	0.67	0.67	0.10	0.10
Fluoride	mg/L	0.64	0.64	0.64	0.64	0.64	0.64	1.22	1.22
Iron	mg/L	0.12	0.12	0.12	0.12	0.12	0.12	0.16	0.16
Lead	mg/L	0.013	0.013	0.013	0.013	0.013	0.013	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	3.5	3.5	3.5	3.5	3.5	3.5	2.1	2.1
Manganese	mg/L	0.12	0.12	0.12	0.12	0.12	0.12	0.00	0.00
Mercury	mg/L	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.027	0.027	0.027	0.027	0.027	0.027	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	1.35	1.35	1.35	1.35	1.35	1.35	15.44	15.44
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.000	0.000
Sodium	mg/L	5.2	5.2	5.2	5.2	5.2	5.2	26.7	26.7
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	53	53	53	53	53	53	10	10
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	158	158	158	158	158	158	144	144
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.16	0.16	0.16	0.16	0.16	0.16	0.00	0.00

Sample ID		Qmp:>3.0	Qmp:>3.0	Qmp:>3.0	Qmp:>3.0	Qmp:>3.0	Qmp:>3.0	Qmp:>3.0	Qmp:1.2-3.0
Week	Units	8	12	16	20	24	28	32	0
pH	-	8.00	8.00	8.00	8.00	8.00	8.00	8.00	7.41
Alkalinity Total	mg/L	147.8	147.8	147.8	147.8	147.8	147.8	147.8	15.4
Aluminum	mg/L	1.77	1.77	1.77	1.77	1.77	1.77	1.77	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.000
Barium	mg/L	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.003
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	21	21	21	21	21	21	21	2
Chloride	mg/L	5.7	5.7	5.7	5.7	5.7	5.7	5.7	0.7
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.00
Fluoride	mg/L	1.22	1.22	1.22	1.22	1.22	1.22	1.22	0.26
Iron	mg/L	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	2.1	2.1	2.1	2.1	2.1	2.1	2.1	0.4
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	15.44	15.44	15.44	15.44	15.44	15.44	15.44	0.59
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	26.7	26.7	26.7	26.7	26.7	26.7	26.7	4.4
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	10	10	10	10	10	10	10	4
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	144	144	144	144	144	144	144	20
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Qmp:1.2-3.0	Qmp:1.2-3.0	Qmp:1.2-3.0	Qmp:1.2-3.0	Qmp:1.2-3.0	Qmp:1.2-3.0	Qmp:1.2-3.0
Week	Units	4	8	12	16	20	24	28
pH	-	7.41	7.41	7.41	7.41	7.41	7.41	7.41
Alkalinity Total	mg/L	15.4	15.4	15.4	15.4	15.4	15.4	15.4
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Barium	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	2	2	2	2	2	2	2
Chloride	mg/L	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	0.59	0.59	0.59	0.59	0.59	0.59	0.59
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	4	4	4	4	4	4	4
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	20	20	20	20	20	20	20
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Qmp:1.2-3.0	Sherrer:>3.0	Sherrer:>3.0	Sherrer:>3.0	Sherrer:>3.0	Sherrer:>3.0	Sherrer:>3.0
Week	Units	32	0	4	8	12	16	20
pH	-	7.41	9.47	9.47	9.47	9.47	9.47	9.47
Alkalinity Total	mg/L	15.4	42.9	42.9	42.9	42.9	42.9	42.9
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arsenic	mg/L	0.000	0.002	0.002	0.002	0.002	0.002	0.002
Barium	mg/L	0.003	0.038	0.038	0.038	0.038	0.038	0.038
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	2	73	73	73	73	73	73
Chloride	mg/L	0.7	2.7	2.7	2.7	2.7	2.7	2.7
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.26	4.22	4.22	4.22	4.22	4.22	4.22
Iron	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	0.4	9.2	9.2	9.2	9.2	9.2	9.2
Manganese	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.02	0.02	0.02	0.02	0.02	0.02
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	0.59	11.14	11.14	11.14	11.14	11.14	11.14
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	4.4	13.2	13.2	13.2	13.2	13.2	13.2
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	4	107	107	107	107	107	107
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	20	18	18	18	18	18	18
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Sherrer:>3.0	Sherrer:>3.0	Sherrer:>3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0
Week	Units	24	28	32	0	4	8
pH	-	9.47	9.47	9.47	7.70	7.96	7.40
Alkalinity Total	mg/L	42.9	42.9	42.9	5.2	5.1	5.2
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.000	0.000	0.000	0.000	0.000	0.003
Arsenic	mg/L	0.002	0.002	0.002	0.003	0.000	0.000
Barium	mg/L	0.038	0.038	0.038	0.045	0.014	0.027
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	73	73	73	457	140	168
Chloride	mg/L	2.7	2.7	2.7	11.8	3.6	3.6
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.01	0.00	0.00
Fluoride	mg/L	4.22	4.22	4.22	0.37	0.24	0.19
Iron	mg/L	0.00	0.00	0.00	0.00	0.02	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	9.2	9.2	9.2	23.7	9.1	10.4
Manganese	mg/L	0.00	0.00	0.00	0.02	0.01	0.01
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.02	0.02	0.02	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	11.14	11.14	11.14	13.11	9.23	10.42
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	13.2	13.2	13.2	18.4	10.6	8.3
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	107	107	107	862	278	313
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	18	18	18	2429	843	985
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Sherrer:1.2-3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0
Week	Units	12	16	20	24	28
pH	-	7.62	7.32	7.45	7.63	7.57
Alkalinity Total	mg/L	4.7	4.1	4.4	4.1	4.1
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.003	0.003	0.003	0.002	0.002
Arsenic	mg/L	0.000	0.003	0.002	0.002	0.004
Barium	mg/L	0.053	0.041	0.036	0.026	0.022
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	160	170	163	160	140
Chloride	mg/L	3.6	3.6	7.2	4.4	3.6
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.16	0.14	0.18	0.16	0.15
Iron	mg/L	0.02	0.00	0.02	0.02	0.00
Lead	mg/L	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	10.3	10.5	9.8	9.4	8.3
Manganese	mg/L	0.01	0.01	0.01	0.01	0.01
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	9.42	9.08	8.44	8.12	7.35
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	7.9	7.6	7.7	8.4	7.8
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	359	297	292	292	243
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	831	949	895	872	10002
TSS	mg/L	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00

Sample ID		Sherrer:1.2-3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0
Week	Units	32	0	4	8	12	16	20
pH	-	7.57	7.35	7.48	7.20	7.31	7.16	7.23
Alkalinity Total	mg/L	4.1	5.2	5.1	5.2	4.7	4.1	4.4
Aluminum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	mg/L	0.002	0.000	0.000	0.003	0.003	0.003	0.003
Arsenic	mg/L	0.004	0.003	0.000	0.000	0.000	0.003	0.002
Barium	mg/L	0.022	0.045	0.014	0.027	0.053	0.041	0.036
Beryllium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	mg/L	140	457	140	168	160	170	163
Chloride	mg/L	3.6	11.8	3.6	3.6	3.6	3.6	7.2
Chromium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	mg/L	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/L	0.15	0.37	0.24	0.19	0.16	0.14	0.18
Iron	mg/L	0.00	0.00	0.02	0.00	0.02	0.00	0.02
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	mg/L	8.3	23.7	9.1	10.4	10.3	10.5	9.8
Manganese	mg/L	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	mg/L	7.35	13.11	9.23	10.42	9.42	9.08	8.44
Selenium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sodium	mg/L	7.8	18.4	10.6	8.3	7.9	7.6	7.7
Strontium	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	mg/L	243	862	278	313	359	297	292
Thallium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TDS	mg/L	10002	2429	843	985	831	949	895
TSS	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sample ID		Sherrer:1.2-3.0	Sherrer:1.2-3.0	Sherrer:1.2-3.0
Week	Units	24	28	32
pH	-	7.32	7.29	7.29
Alkalinity Total	mg/L	4.1	4.1	4.1
Aluminum	mg/L	0.00	0.00	0.00
Antimony	mg/L	0.002	0.002	0.002
Arsenic	mg/L	0.002	0.004	0.004
Barium	mg/L	0.026	0.022	0.022
Beryllium	mg/L	0.000	0.000	0.000
Boron	mg/L	0.000	0.000	0.000
Cadmium	mg/L	0.000	0.000	0.000
Calcium	mg/L	160	140	140
Chloride	mg/L	4.4	3.6	3.6
Chromium	mg/L	0.000	0.000	0.000
Copper	mg/L	0.00	0.00	0.00
Fluoride	mg/L	0.16	0.15	0.15
Iron	mg/L	0.02	0.00	0.00
Lead	mg/L	0.000	0.000	0.000
Lithium	mg/L	0.00	0.00	0.00
Magnesium	mg/L	9.4	8.3	8.3
Manganese	mg/L	0.01	0.01	0.01
Mercury	mg/L	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.00	0.00	0.00
Nickel	mg/L	0.001	0.001	0.001
Total Nitrogen	mg/L	0.1	0.1	0.1
Phosphorus	mg/L	0.00	0.00	0.00
Potassium	mg/L	8.12	7.35	7.35
Selenium	mg/L	0.000	0.000	0.000
Silver	mg/L	0.000	0.000	0.000
Sodium	mg/L	8.4	7.8	7.8
Strontium	mg/L	0.00	0.00	0.00
Sulfate	mg/L	292	243	243
Thallium	mg/L	0.000	0.000	0.000
Tin	mg/L	0.00	0.00	0.00
TDS	mg/L	872	10002	10002
TSS	mg/L	0.0	0.0	0.0
Uranium	mg/L	0.000	0.000	0.000
Vanadium	mg/L	0.000	0.000	0.000
Zinc	mg/L	0.00	0.00	0.00

APPENDIX G
Mass loading rates

Sample ID		Abrigo:<1.2	Abrigo:1.2-3.0	Abrigo:>3.0	Andesite:<1.2	Andesite:1.2-3.0	Andesite:>3.0	Arkose:<1.2	Arkose:1.2-3.0
Week	Units	0	0	0	0	0	0	0	0
H+	mg/kg	4.57E-04	2.00E-08	1.60E-09	2.08E-07	1.57E-08	2.34E-08	2.04E-08	3.09E-08
Alkalinity Total	mg/kg	9.40E+00	9.16E+00	1.12E+02	1.60E+01	6.18E+01	5.37E+01	4.90E+01	3.46E+01
Aluminum	mg/kg	3.52E+00	7.05E-02	6.28E-01	2.03E-01	2.87E-02	4.00E-02	3.39E-02	3.21E-02
Antimony	mg/kg	3.12E-03	2.64E-03	6.50E-03	2.65E-03	5.79E-03	1.50E-03	3.16E-03	1.92E-03
Arsenic	mg/kg	7.35E-03	6.11E-03	8.33E-03	4.54E-03	1.30E-02	1.34E-02	1.23E-02	5.54E-03
Barium	mg/kg	1.08E-02	3.82E-02	6.04E-03	1.38E-02	3.13E-02	9.33E-03	1.02E-02	8.14E-03
Beryllium	mg/kg	1.12E-02	1.76E-03	4.33E-03	1.81E-03	7.18E-04	1.00E-03	8.47E-04	8.02E-04
Boron	mg/kg	2.08E-03	1.76E-03	4.33E-03	7.80E-04	7.18E-04	1.00E-03	8.47E-04	8.02E-04
Cadmium	mg/kg	4.04E-02	1.76E-03	4.33E-03	3.44E-03	7.18E-04	1.00E-03	8.47E-04	8.02E-04
Calcium	mg/kg	1.52E+02	3.87E+02	2.51E+01	8.02E+01	1.11E+02	1.19E+01	5.81E+01	4.25E+01
Chloride	mg/kg	3.34E+00	1.00E+01	3.25E+00	4.15E+00	5.46E+00	3.08E+00	5.71E+00	2.49E+00
Chromium	mg/kg	2.28E-02	5.29E-03	1.30E-02	4.47E-03	2.15E-03	3.00E-03	2.54E-03	2.41E-03
Copper	mg/kg	1.07E+00	1.31E-02	2.17E-02	4.82E-02	8.03E-03	5.00E-03	4.24E-03	1.26E-02
Fluoride	mg/kg	2.35E+00	6.45E-01	9.92E-01	2.29E+00	1.93E+00	6.31E-01	7.77E-01	7.23E-01
Iron	mg/kg	3.76E-01	5.29E-02	1.30E-01	6.17E-02	3.68E-02	3.00E-02	2.08E-02	1.46E-02
Lead	mg/kg	2.43E-02	7.05E-03	1.73E-02	5.33E-03	2.87E-03	7.41E-03	3.39E-03	3.21E-03
Lithium	mg/kg	2.08E-06	1.76E-06	4.33E-06	7.80E-07	7.18E-07	1.00E-06	8.47E-07	8.02E-07
Magnesium	mg/kg	2.12E+01	2.01E+01	2.26E+00	2.27E+01	3.23E+01	2.24E+00	1.13E+01	7.08E+00
Manganese	mg/kg	9.28E-01	1.29E-02	8.66E-03	1.33E-01	3.82E-02	2.99E-03	1.20E-02	3.31E-02
Mercury	mg/kg	2.08E-04	1.76E-04	6.20E-04	7.80E-05	7.18E-05	1.15E-04	8.47E-05	8.02E-05
Molybdenum	mg/kg	2.07E-02	-	-	3.82E-03	2.87E-03	-	-	-
Nickel	mg/kg	1.26E-01	8.82E-03	2.17E-02	1.36E-02	3.59E-03	5.00E-03	4.24E-03	4.01E-03
Total Nitrogen	mg/kg	1.04E+00	8.82E-01	2.17E+00	3.90E-01	3.59E-01	5.00E-01	4.24E-01	4.01E-01
Phosphorus	mg/kg	2.08E-06	1.76E-06	4.33E-06	7.80E-07	7.18E-07	1.00E-06	8.47E-07	8.02E-07
Potassium	mg/kg	3.26E+00	1.11E+01	1.71E+01	1.31E+01	4.34E+01	3.76E+00	1.21E+01	1.02E+01
Selenium	mg/kg	3.75E-02	4.41E-03	1.08E-02	1.11E-02	4.94E-02	2.57E-02	2.75E-02	2.02E-02
Silver	mg/kg	1.36E-02	4.41E-03	1.08E-02	3.15E-03	1.79E-03	2.50E-03	2.12E-03	2.00E-03
Sodium	mg/kg	1.30E+01	1.56E+01	6.81E+00	1.42E+01	3.83E+01	1.43E+01	3.18E+01	1.12E+01
Strontium	mg/kg	2.08E-06	1.76E-06	4.33E-06	7.80E-07	7.18E-07	1.00E-06	8.47E-07	8.02E-07
Sulfate	mg/kg	1.08E+02	7.31E+02	1.31E+01	3.14E+02	4.61E+02	2.20E+01	2.07E+02	1.44E+02
Thallium	mg/kg	1.04E-03	8.82E-04	2.17E-03	3.90E-04	3.59E-04	5.00E-04	4.24E-04	4.01E-04
Tin	mg/kg	2.08E-06	1.76E-06	4.33E-06	7.80E-07	7.18E-07	1.00E-06	8.47E-07	8.02E-07
TDS	mg/kg	8.99E+02	2.06E+03	-	6.18E+02	8.65E+02	9.64E+01	4.52E+02	2.60E+02
TSS	mg/kg	2.08E-01	1.76E-01	4.33E-01	7.80E-02	7.18E-02	1.00E-01	8.47E-02	8.02E-02
Uranium	mg/kg	-	-	-	1.56E-03	1.44E-03	2.00E-03	1.69E-03	1.60E-03
Vanadium	mg/kg	2.08E-06	1.76E-06	4.33E-06	7.80E-07	7.18E-07	1.00E-06	8.47E-07	8.02E-07
Zinc	mg/kg	6.82E-01	8.82E-03	2.17E-02	1.11E-01	3.59E-03	5.00E-03	4.24E-03	4.01E-03

Appendix G
Submerged Rock Mass Loading Rates

Sample ID		Arkose:>3.0	Bolsa:<1.2	Bolsa:1.2-3.0	Bolsa:>3.0	Concha:>3.0	Earp:1.2-3.0	Earp:>3.0	Epitaph:<1.2
Week	Units	0	0	0	0	0	0	0	0
H+	mg/kg	1.36E-08	2.54E-05	1.22E-09	1.00E-07	3.80E-08	1.22E-09	8.36E-09	4.57E-04
Alkalinity Total	mg/kg	4.50E+01	7.18E-01	1.13E+02	1.77E+02	6.96E+01	7.72E+01	7.44E+01	5.00E-01
Aluminum	mg/kg	3.69E-02	4.04E-01	8.66E-01	1.73E-01	8.32E-02	1.73E-01	1.54E-01	7.14E+01
Antimony	mg/kg	1.42E-03	1.08E-03	6.50E-03	6.50E-03	3.12E-03	6.50E-03	3.57E-03	1.50E-03
Arsenic	mg/kg	9.50E-03	1.08E-03	6.50E-03	1.39E-02	3.12E-03	6.50E-03	7.08E-03	3.90E-03
Barium	mg/kg	3.73E-03	2.77E-02	4.33E-03	4.33E-03	1.51E-02	4.33E-02	1.14E-02	2.71E-02
Beryllium	mg/kg	-	1.34E-03	4.33E-03	4.33E-03	2.08E-03	4.33E-03	2.38E-03	2.91E-02
Boron	mg/kg	9.47E-04	7.18E-04	4.33E-03	4.33E-03	2.08E-03	4.33E-03	2.38E-03	1.00E-03
Cadmium	mg/kg	9.47E-04	2.20E-02	4.33E-03	4.33E-03	2.08E-03	4.33E-03	2.38E-03	3.77E-01
Calcium	mg/kg	8.80E+00	2.35E+01	1.65E+01	4.37E+01	1.37E+01	4.07E+01	3.25E+01	5.26E+02
Chloride	mg/kg	2.44E+00	1.30E+01	2.28E+00	1.60E+00	1.83E+00	2.68E+00	3.54E+00	6.97E+00
Chromium	mg/kg	2.84E-03	2.15E-03	1.30E-02	1.30E-02	6.24E-03	1.30E-02	7.14E-03	4.00E-02
Copper	mg/kg	7.95E-03	4.07E+00	4.33E-02	2.17E-02	1.04E-02	2.17E-02	1.47E-02	5.31E+01
Fluoride	mg/kg	5.35E-01	7.28E-01	9.28E-01	8.66E-01	1.92E-01	2.42E+00	1.16E+00	6.38E+00
Iron	mg/kg	2.84E-02	7.40E-01	3.35E-01	1.30E-01	6.24E-02	1.30E-01	8.82E-02	1.09E+00
Lead	mg/kg	3.79E-03	2.87E-03	1.73E-02	1.73E-02	8.32E-03	1.73E-02	9.51E-03	3.42E-02
Lithium	mg/kg	9.47E-07	7.18E-07	4.33E-06	4.33E-06	2.08E-06	4.33E-06	2.38E-06	1.00E-06
Magnesium	mg/kg	1.29E+00	4.89E+00	2.60E+00	2.39E+00	3.15E+00	6.06E+00	2.66E+00	1.87E+02
Manganese	mg/kg	1.89E-03	2.34E+00	1.22E-02	2.77E-02	4.16E-03	8.66E-03	9.03E-03	3.11E+01
Mercury	mg/kg	9.47E-05	7.18E-05	6.12E-04	4.33E-04	2.08E-04	4.33E-04	2.38E-04	1.00E-04
Molybdenum	mg/kg	-	4.49E-03	1.73E-02	4.76E-02	-	1.34E+00	-	9.00E-03
Nickel	mg/kg	-	1.03E-01	2.17E-02	2.17E-02	1.04E-02	2.17E-02	1.19E-02	7.34E-01
Total Nitrogen	mg/kg	4.74E-01	3.59E-01	2.17E+00	2.17E+00	1.04E+00	2.17E+00	1.19E+00	5.00E-01
Phosphorus	mg/kg	9.47E-07	7.18E-07	4.33E-06	4.33E-06	2.08E-06	4.33E-06	2.38E-06	1.00E-06
Potassium	mg/kg	2.50E+00	1.64E+01	2.61E+00	1.08E+00	2.77E+00	1.06E+01	8.01E+00	9.81E+00
Selenium	mg/kg	2.37E-03	1.79E-03	1.08E-02	1.08E-02	5.20E-03	1.08E-02	9.44E-03	1.30E-01
Silver	mg/kg	2.37E-03	1.79E-03	1.08E-02	1.08E-02	5.20E-03	1.08E-02	5.95E-03	1.70E-02
Sodium	mg/kg	8.47E+00	5.03E+00	2.00E+01	1.65E+01	4.28E+00	2.55E+01	1.57E+01	1.03E+01
Strontium	mg/kg	9.47E-07	7.18E-07	4.33E-06	4.33E-06	2.08E-06	4.33E-06	2.38E-06	1.00E-06
Sulfate	mg/kg	9.66E+00	9.08E+01	9.19E+00	4.63E+00	6.20E+00	1.23E+02	3.77E+01	2.50E+03
Thallium	mg/kg	-	3.59E-04	2.17E-03	2.17E-03	1.04E-03	2.17E-03	1.19E-03	5.00E-04
Tin	mg/kg	9.47E-07	7.18E-07	4.33E-06	4.33E-06	2.08E-06	4.33E-06	2.38E-06	1.00E-06
TDS	mg/kg	2.93E+01	1.56E+02	-	2.08E+02	6.16E+01	-	-	3.89E+03
TSS	mg/kg	9.47E-02	7.18E-02	4.33E-01	4.33E-01	2.08E-01	4.33E-01	2.38E-01	1.00E-01
Uranium	mg/kg	1.89E-03	1.76E-03	8.66E-03	-	-	8.66E-03	-	2.00E-03
Vanadium	mg/kg	9.47E-07	7.18E-07	4.33E-06	4.33E-06	2.08E-06	4.33E-06	2.38E-06	1.00E-06
Zinc	mg/kg	4.74E-03	1.75E+00	2.17E-02	2.17E-02	1.04E-02	2.17E-02	1.19E-02	2.15E+01

Appendix G
Submerged Rock Mass Loading Rates

Sample ID		Epitaph:1.2-3.0	Epitaph:>3.0	Escabrosa:>3.0	Gila:>3.0	Glance:<1.2	Glance:1.2-3.0	Glance:>3.0
Week	Units	0	0	0	0	0	0	0
H+	mg/kg	2.00E-08	1.47E-09	2.83E-08	8.91E-09	4.57E-04	2.00E-08	9.77E-09
Alkalinity Total	mg/kg	9.16E+00	5.76E+01	1.10E+02	9.06E+01	5.00E-01	9.16E+00	6.82E+01
Aluminum	mg/kg	7.05E-02	1.73E-01	1.73E-01	3.70E-02	7.14E+01	7.05E-02	3.79E-02
Antimony	mg/kg	2.64E-03	6.50E-03	6.50E-03	1.39E-03	1.50E-03	2.64E-03	1.42E-03
Arsenic	mg/kg	6.11E-03	7.90E-03	6.50E-03	4.34E-03	3.90E-03	6.11E-03	3.13E-03
Barium	mg/kg	3.82E-02	3.77E-02	8.06E-03	5.82E-02	2.71E-02	3.82E-02	9.47E-04
Beryllium	mg/kg	1.76E-03	-	4.33E-03	9.24E-04	2.91E-02	1.76E-03	9.47E-04
Boron	mg/kg	1.76E-03	4.33E-03	4.33E-03	9.24E-04	1.00E-03	1.76E-03	9.47E-04
Cadmium	mg/kg	1.76E-03	4.33E-03	4.33E-03	9.24E-04	3.77E-01	1.76E-03	9.47E-04
Calcium	mg/kg	3.87E+02	7.35E+01	2.53E+01	2.82E+01	5.26E+02	3.87E+02	2.77E+01
Chloride	mg/kg	1.00E+01	3.61E+00	3.47E+00	1.28E+00	6.97E+00	1.00E+01	7.13E+00
Chromium	mg/kg	5.29E-03	1.30E-02	1.30E-02	2.77E-03	4.00E-02	5.29E-03	2.84E-03
Copper	mg/kg	1.31E-02	2.17E-02	2.17E-02	4.62E-03	5.31E+01	1.31E-02	4.74E-03
Fluoride	mg/kg	6.45E-01	4.22E+00	1.61E+00	5.36E-01	6.38E+00	6.45E-01	6.16E-01
Iron	mg/kg	5.29E-02	1.30E-01	-	2.77E-02	1.09E+00	5.29E-02	2.84E-02
Lead	mg/kg	7.05E-03	1.73E-02	1.73E-02	3.70E-03	3.42E-02	7.05E-03	1.06E-01
Lithium	mg/kg	1.76E-06	4.33E-06	4.33E-06	9.24E-07	1.00E-06	1.76E-06	9.47E-07
Magnesium	mg/kg	2.01E+01	9.24E+00	2.12E+00	1.92E+00	1.87E+02	2.01E+01	1.53E+00
Manganese	mg/kg	1.29E-02	8.66E-03	8.66E-03	1.85E-03	3.11E+01	1.29E-02	8.52E-03
Mercury	mg/kg	1.76E-04	4.33E-04	-	9.24E-05	1.00E-04	1.76E-04	9.47E-05
Molybdenum	mg/kg	-	-	2.67E-02	8.32E-03	9.00E-03	-	6.34E-02
Nickel	mg/kg	8.82E-03	-	2.17E-02	4.62E-03	7.34E-01	8.82E-03	4.74E-03
Total Nitrogen	mg/kg	8.82E-01	2.17E+00	2.17E+00	4.62E-01	5.00E-01	8.82E-01	4.74E-01
Phosphorus	mg/kg	1.76E-06	4.33E-06	4.33E-06	9.24E-07	1.00E-06	1.76E-06	9.47E-07
Potassium	mg/kg	1.11E+01	1.11E+01	3.32E+00	3.44E+00	9.81E+00	1.11E+01	3.46E+00
Selenium	mg/kg	4.41E-03	1.08E-02	1.08E-02	2.31E-03	1.30E-01	4.41E-03	2.37E-03
Silver	mg/kg	4.41E-03	1.08E-02	1.08E-02	2.31E-03	1.70E-02	4.41E-03	2.37E-03
Sodium	mg/kg	1.56E+01	1.32E+01	8.50E+00	6.85E+00	1.03E+01	1.56E+01	1.97E+00
Strontium	mg/kg	1.76E-06	4.33E-06	4.33E-06	9.24E-07	1.00E-06	1.76E-06	9.47E-07
Sulfate	mg/kg	7.31E+02	1.07E+02	1.11E+01	2.04E+01	2.50E+03	7.31E+02	1.63E+01
Thallium	mg/kg	8.82E-04	-	2.17E-03	4.62E-04	5.00E-04	8.82E-04	4.74E-04
Tin	mg/kg	1.76E-06	4.33E-06	4.33E-06	9.24E-07	1.00E-06	1.76E-06	9.47E-07
TDS	mg/kg	2.06E+03	-	-	1.23E+02	3.89E+03	2.06E+03	1.35E+02
TSS	mg/kg	1.76E-01	4.33E-01	4.33E-01	9.24E-02	1.00E-01	1.76E-01	9.47E-02
Uranium	mg/kg	-	-	8.66E-03	1.85E-03	2.00E-03	-	1.89E-03
Vanadium	mg/kg	1.76E-06	4.33E-06	4.33E-06	9.24E-07	1.00E-06	1.76E-06	9.47E-07
Zinc	mg/kg	8.82E-03	2.17E-02	2.17E-02	4.62E-03	2.15E+01	8.82E-03	4.74E-03

Sample ID		Granodiorite:<1.2	Granodiorite:1.2-3.0	Granodiorite:>3.0	Horquilla:>3.0	Martin:>3.0	Qmp:<1.2	Qmp:1.2-3.0
Week	Units	0	0	0	0	0	0	0
H+	mg/kg	2.95E-06	3.89E-08	1.00E-07	1.49E-09	5.24E-09	2.95E-06	3.89E-08
Alkalinity Total	mg/kg	2.78E+00	1.54E+01	1.48E+02	9.25E+01	1.29E+02	2.78E+00	1.54E+01
Aluminum	mg/kg	7.48E-01	4.00E-02	1.77E+00	1.86E-01	1.73E-01	7.48E-01	4.00E-02
Antimony	mg/kg	1.50E-03	1.50E-03	6.50E-03	4.45E-03	6.50E-03	1.50E-03	1.50E-03
Arsenic	mg/kg	1.50E-03	1.50E-03	2.82E-02	6.98E-03	6.50E-03	1.50E-03	1.50E-03
Barium	mg/kg	1.20E-02	3.40E-03	5.48E-02	5.82E-03	9.58E-03	1.20E-02	3.40E-03
Beryllium	mg/kg	2.74E-03	1.00E-03	4.33E-03	-	4.33E-03	2.74E-03	1.00E-03
Boron	mg/kg	1.00E-03	1.00E-03	4.33E-03	2.97E-03	4.33E-03	1.00E-03	1.00E-03
Cadmium	mg/kg	9.21E-03	1.00E-03	4.33E-03	2.97E-03	4.33E-03	9.21E-03	1.00E-03
Calcium	mg/kg	1.95E+01	2.21E+00	2.15E+01	3.19E+01	2.31E+01	1.95E+01	2.21E+00
Chloride	mg/kg	1.41E+00	7.10E-01	5.65E+00	7.14E+00	4.73E+00	1.41E+00	7.10E-01
Chromium	mg/kg	6.48E-03	3.00E-03	1.30E-02	8.91E-03	1.30E-02	6.48E-03	3.00E-03
Copper	mg/kg	6.71E-01	5.00E-03	1.02E-01	1.48E-02	2.17E-02	6.71E-01	5.00E-03
Fluoride	mg/kg	6.39E-01	2.60E-01	1.22E+00	1.69E+00	1.11E+00	6.39E-01	2.60E-01
Iron	mg/kg	1.17E-01	3.00E-02	3.26E-01	8.91E-02	1.30E-01	1.17E-01	3.00E-02
Lead	mg/kg	1.33E-02	4.00E-03	1.73E-02	1.19E-02	1.73E-02	1.33E-02	4.00E-03
Lithium	mg/kg	1.00E-06	1.00E-06	4.33E-06	2.97E-06	4.33E-06	1.00E-06	1.00E-06
Magnesium	mg/kg	3.53E+00	3.90E-01	2.10E+00	1.17E+00	7.44E+00	3.53E+00	3.90E-01
Manganese	mg/kg	1.16E-01	2.00E-03	8.66E-03	5.94E-03	8.66E-03	1.16E-01	2.00E-03
Mercury	mg/kg	1.95E-04	1.00E-04	4.33E-04	2.97E-04	4.33E-04	1.95E-04	1.00E-04
Molybdenum	mg/kg	-	-	-	-	5.39E-02	-	-
Nickel	mg/kg	2.66E-02	5.00E-03	2.17E-02	-	2.17E-02	2.66E-02	5.00E-03
Total Nitrogen	mg/kg	5.00E-01	5.00E-01	2.17E+00	1.48E+00	2.17E+00	5.00E-01	5.00E-01
Phosphorus	mg/kg	1.00E-06	1.00E-06	4.33E-06	2.97E-06	4.33E-06	1.00E-06	1.00E-06
Potassium	mg/kg	1.35E+00	5.90E-01	1.54E+01	3.57E+00	1.23E+01	1.35E+00	5.90E-01
Selenium	mg/kg	2.50E-03	2.50E-03	1.08E-02	1.19E-02	1.08E-02	2.50E-03	2.50E-03
Silver	mg/kg	4.18E-03	2.50E-03	1.08E-02	7.42E-03	1.08E-02	4.18E-03	2.50E-03
Sodium	mg/kg	5.21E+00	4.37E+00	2.67E+01	8.41E+00	1.08E+01	5.21E+00	4.37E+00
Strontium	mg/kg	1.00E-06	1.00E-06	4.33E-06	2.97E-06	4.33E-06	1.00E-06	1.00E-06
Sulfate	mg/kg	5.27E+01	3.60E+00	1.01E+01	1.62E+01	1.71E+01	5.27E+01	3.60E+00
Thallium	mg/kg	5.00E-04	5.00E-04	2.17E-03	-	2.17E-03	5.00E-04	5.00E-04
Tin	mg/kg	1.00E-06	1.00E-06	4.33E-06	2.97E-06	4.33E-06	1.00E-06	1.00E-06
TDS	mg/kg	1.58E+02	2.00E+01	1.44E+02	-	"-"	1.58E+02	2.00E+01
TSS	mg/kg	1.00E-01	1.00E-01	4.33E-01	2.97E-01	4.33E-01	1.00E-01	1.00E-01
Uranium	mg/kg	2.00E-03	2.00E-03	-	-	8.66E-03	2.00E-03	2.00E-03
Vanadium	mg/kg	1.00E-06	1.00E-06	4.33E-06	2.97E-06	4.33E-06	1.00E-06	1.00E-06
Zinc	mg/kg	1.57E-01	5.00E-03	2.17E-02	1.48E-02	2.17E-02	1.57E-01	5.00E-03

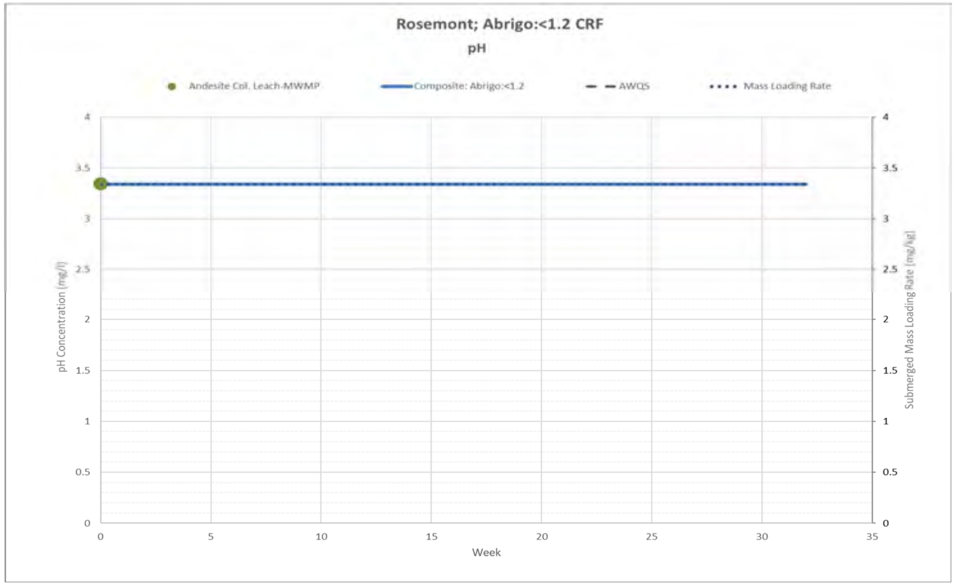
"-"

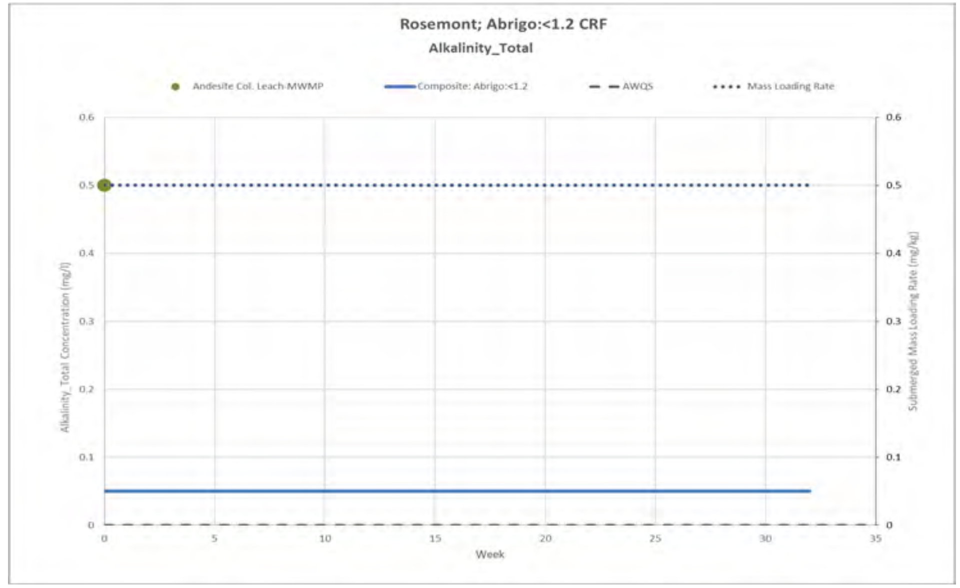
Sample ID		Qmp:>3.0	Sherrer:1.2-3.0	Sherrer:>3.0
Week	Units	0	0	0
H+	mg/kg	1.00E-07	2.00E-08	1.47E-09
Alkalinity Total	mg/kg	1.48E+02	9.16E+00	5.76E+01
Aluminum	mg/kg	1.77E+00	7.05E-02	1.73E-01
Antimony	mg/kg	6.50E-03	2.64E-03	6.50E-03
Arsenic	mg/kg	2.82E-02	6.11E-03	7.90E-03
Barium	mg/kg	5.48E-02	3.82E-02	3.77E-02
Beryllium	mg/kg	4.33E-03	1.76E-03	-
Boron	mg/kg	4.33E-03	1.76E-03	4.33E-03
Cadmium	mg/kg	4.33E-03	1.76E-03	4.33E-03
Calcium	mg/kg	2.15E+01	3.87E+02	7.35E+01
Chloride	mg/kg	5.65E+00	1.00E+01	3.61E+00
Chromium	mg/kg	1.30E-02	5.29E-03	1.30E-02
Copper	mg/kg	1.02E-01	1.31E-02	2.17E-02
Fluoride	mg/kg	1.22E+00	6.45E-01	4.22E+00
Iron	mg/kg	3.26E-01	5.29E-02	1.30E-01
Lead	mg/kg	1.73E-02	7.05E-03	1.73E-02
Lithium	mg/kg	4.33E-06	1.76E-06	4.33E-06
Magnesium	mg/kg	2.10E+00	2.01E+01	9.24E+00
Manganese	mg/kg	8.66E-03	1.29E-02	8.66E-03
Mercury	mg/kg	4.33E-04	1.76E-04	4.33E-04
Molybdenum	mg/kg	-	-	-
Nickel	mg/kg	2.17E-02	8.82E-03	-
Total Nitrogen	mg/kg	2.17E+00	8.82E-01	2.17E+00
Phosphorus	mg/kg	4.33E-06	1.76E-06	4.33E-06
Potassium	mg/kg	1.54E+01	1.11E+01	1.11E+01
Selenium	mg/kg	1.08E-02	4.41E-03	1.08E-02
Silver	mg/kg	1.08E-02	4.41E-03	1.08E-02
Sodium	mg/kg	2.67E+01	1.56E+01	1.32E+01
Strontium	mg/kg	4.33E-06	1.76E-06	4.33E-06
Sulfate	mg/kg	1.01E+01	7.31E+02	1.07E+02
Thallium	mg/kg	2.17E-03	8.82E-04	-
Tin	mg/kg	4.33E-06	1.76E-06	4.33E-06
TDS	mg/kg	1.44E+02	2.06E+03	-
TSS	mg/kg	4.33E-01	1.76E-01	4.33E-01
Uranium	mg/kg	-	-	-
Vanadium	mg/kg	4.33E-06	1.76E-06	4.33E-06
Zinc	mg/kg	2.17E-02	8.82E-03	2.17E-02

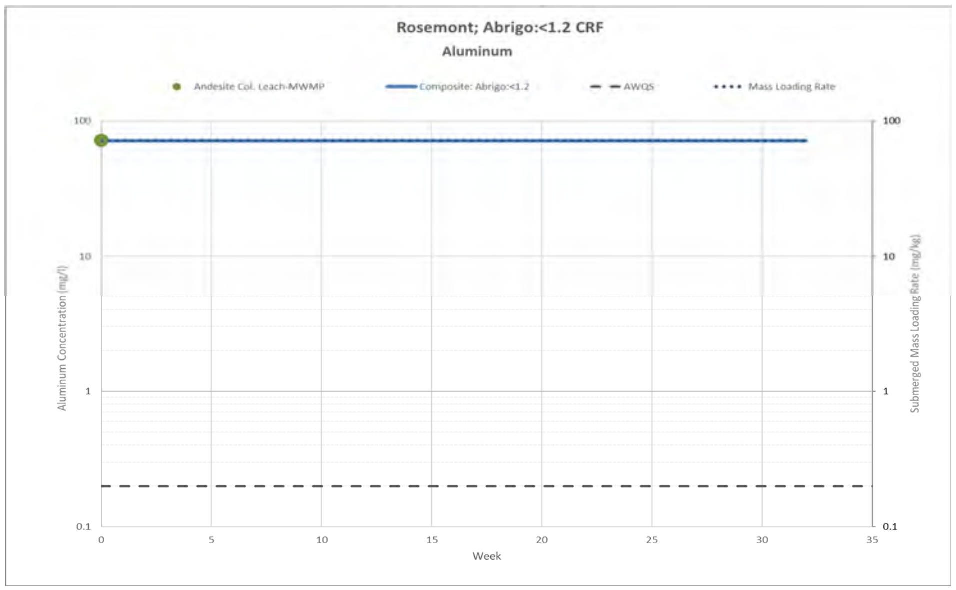
APPENDIX H
Graphical leachate testing concentrations and CRFs

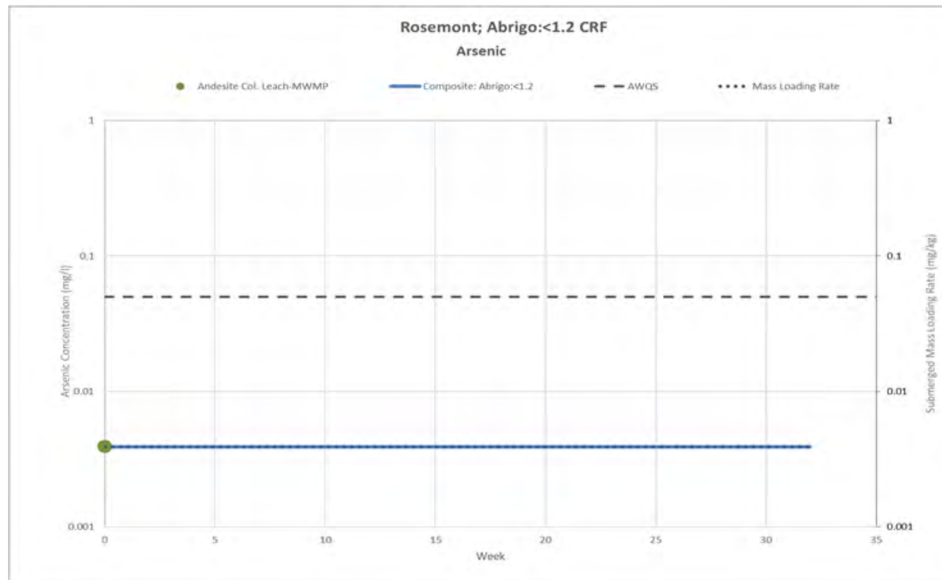
Rosemont Copper Company
Rosemont Copper World Project

Appendix - H
Composite CRF Charts

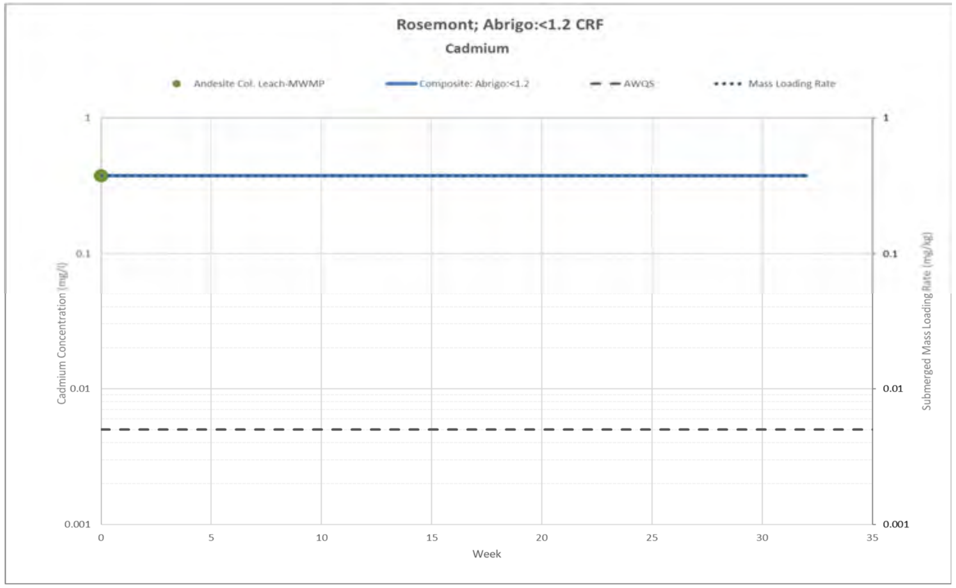


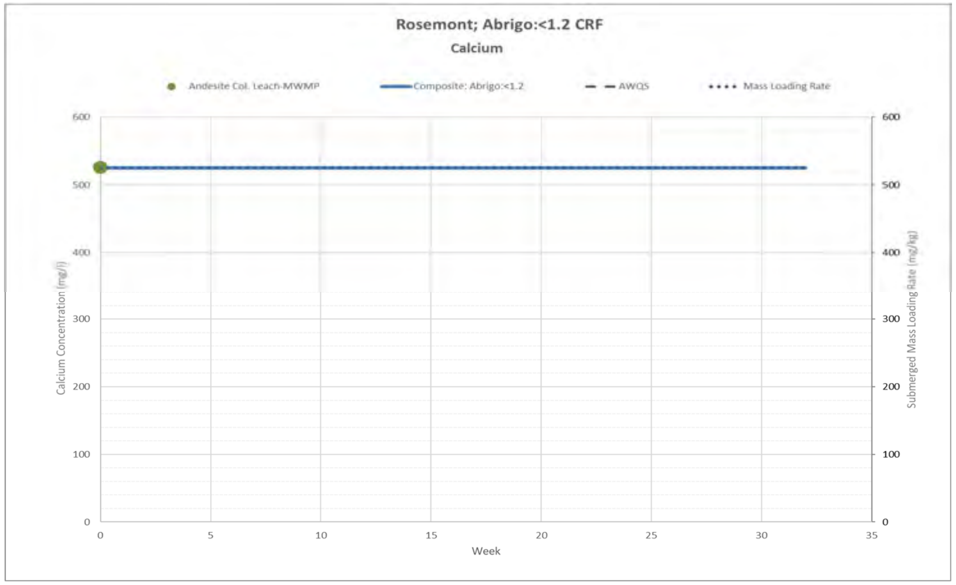


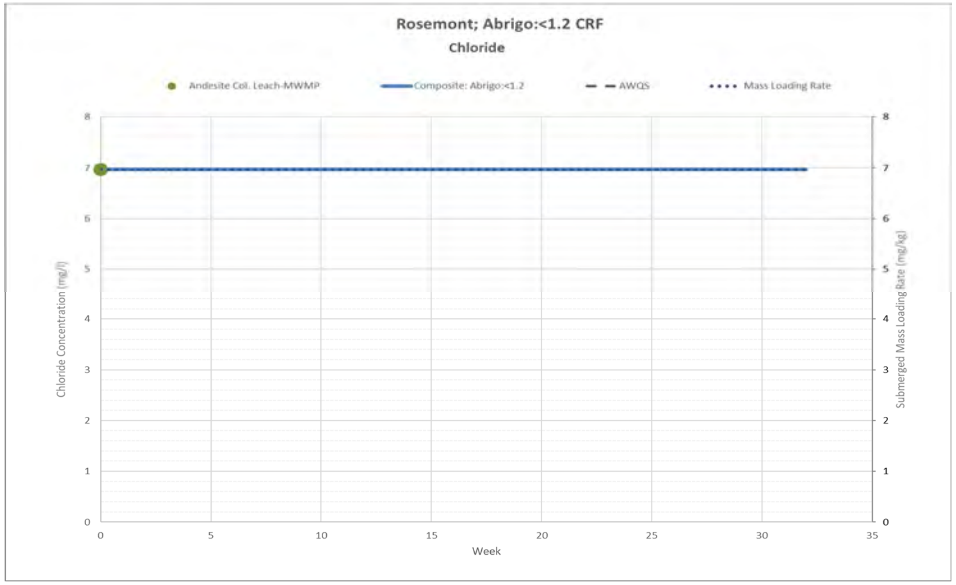


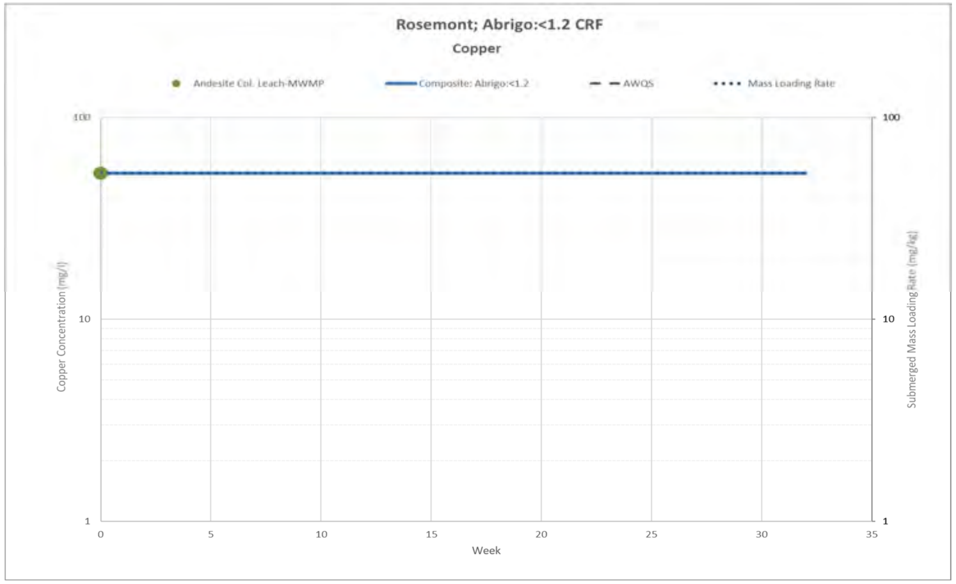


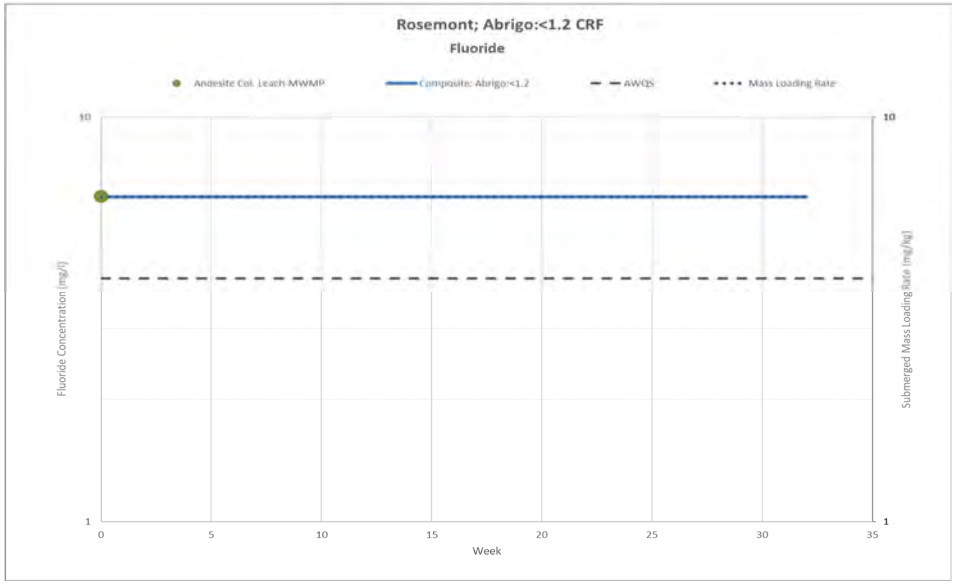
Appendix - H
Composite CRF Charts

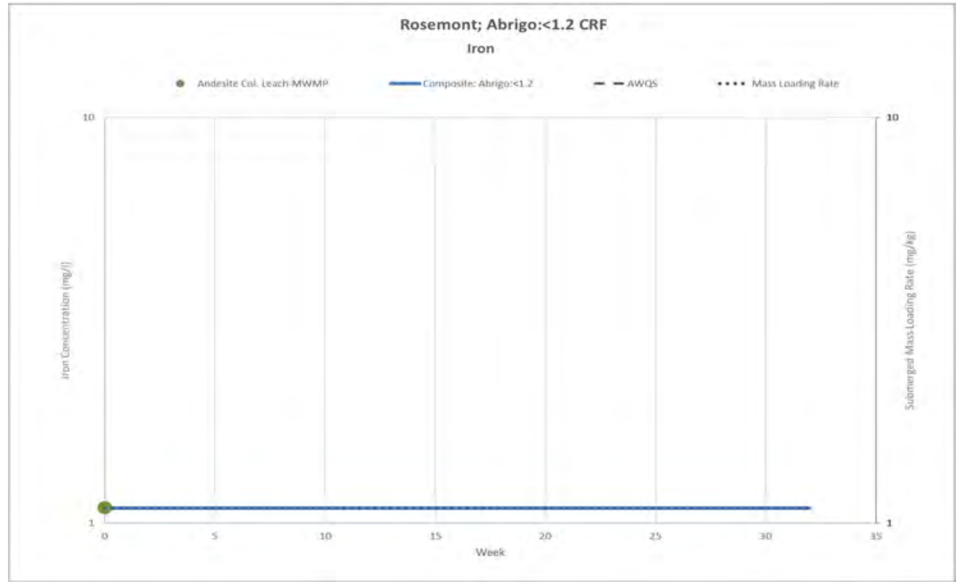


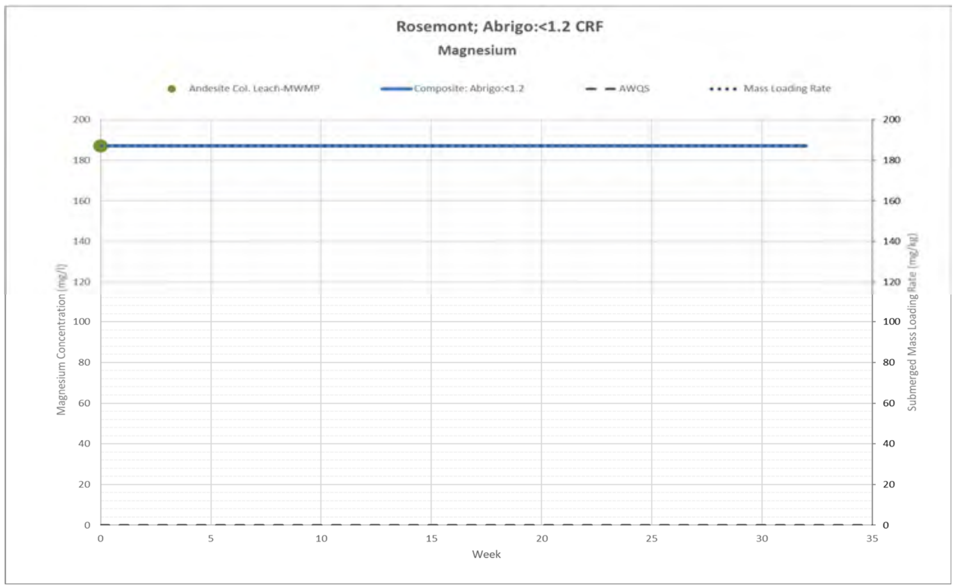


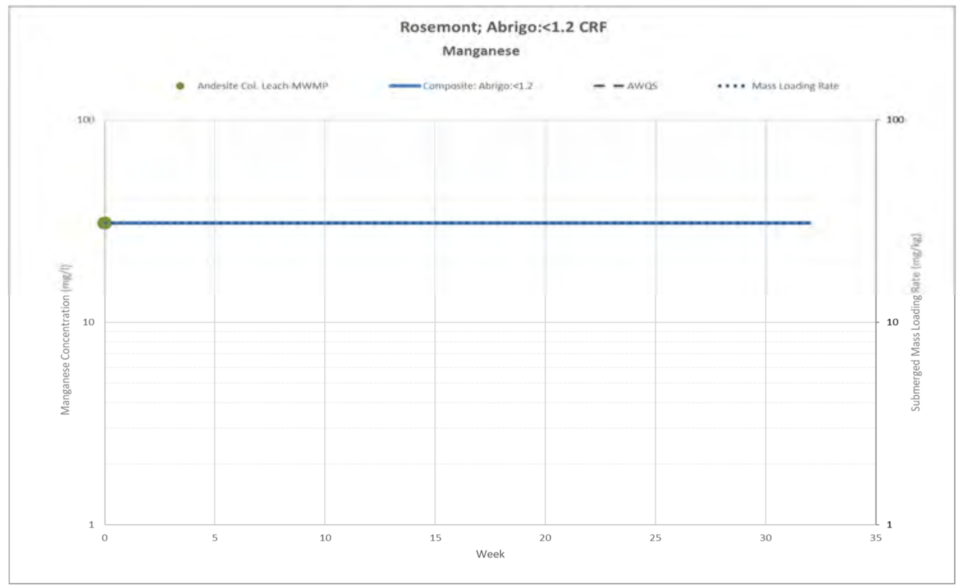


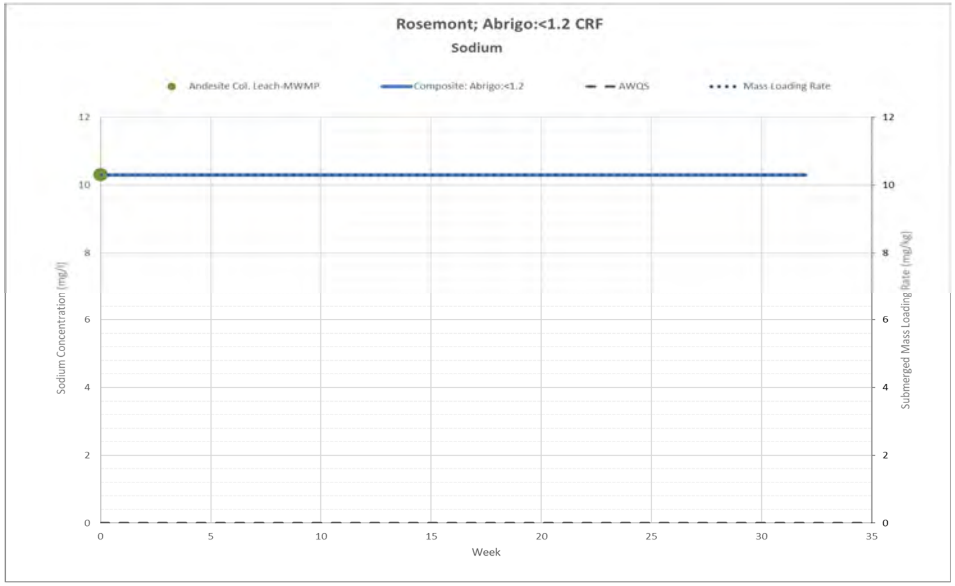


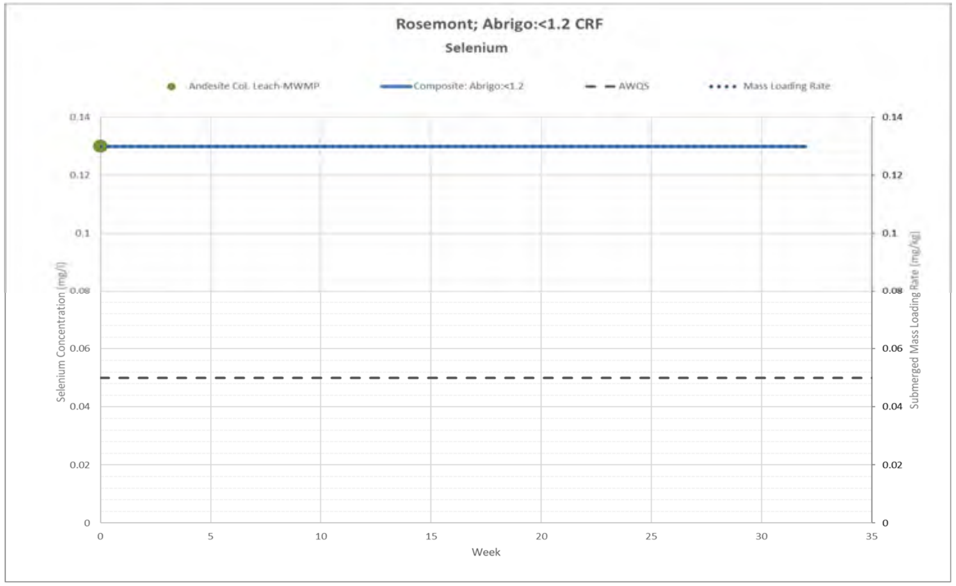

Rosemont; Abrigo:<1.2 CRF
Fluoride
Andesite Col. Leach-MWMP
Composite: Abrigo:<1.2
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

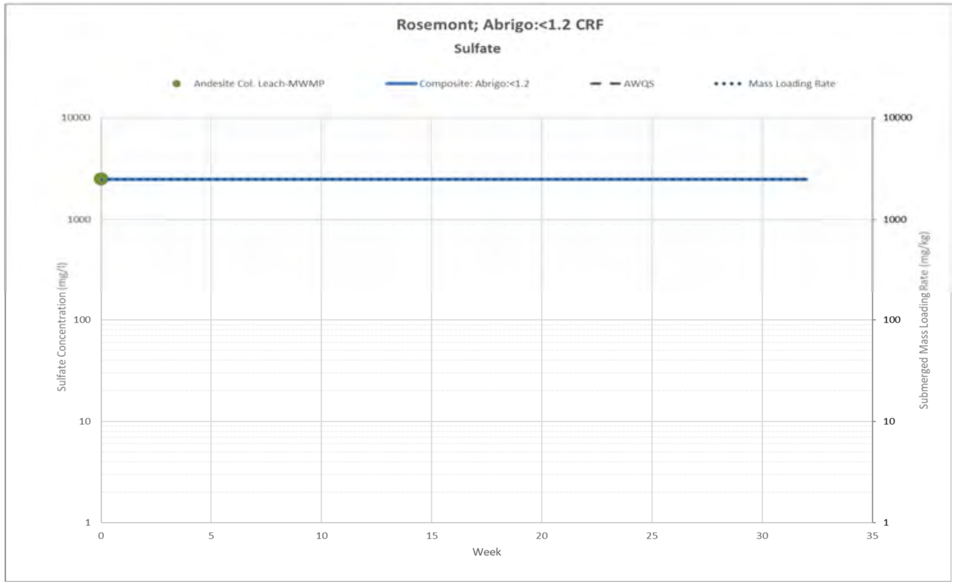

Rosemont; Abrigo:<1.2 CRF
Iron
Andesite Col. Leach-MWMP
Composite: Abrigo:<1.2
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

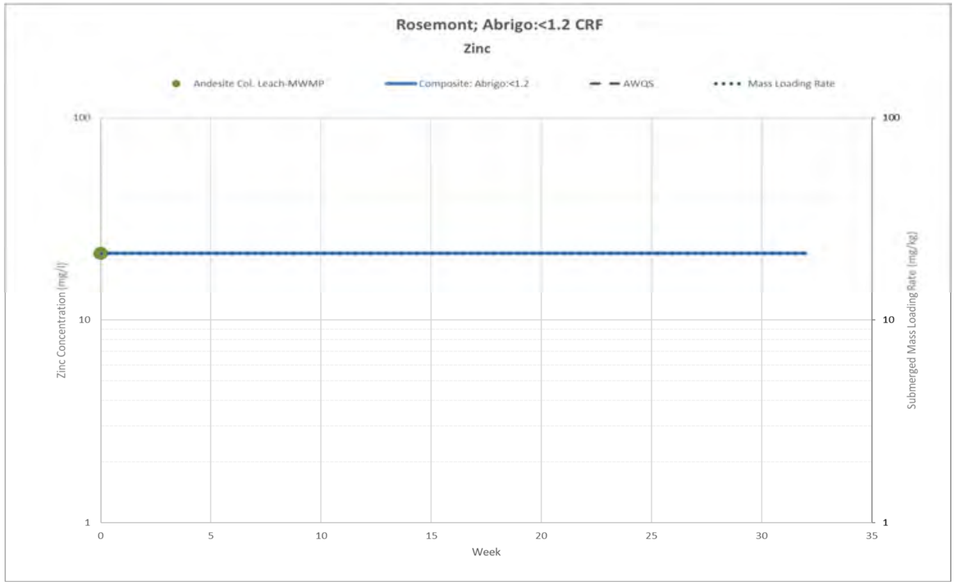

Rosemont; Abrigo:<1.2 CRF
Magnesium
Andesite Col. Leach-MWMP
Composite: Abrigo:<1.2
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Abrigo:<1.2 CRF
Manganese
Andesite Col. Leach-MWMP
Composite: Abrigo:<1.2
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

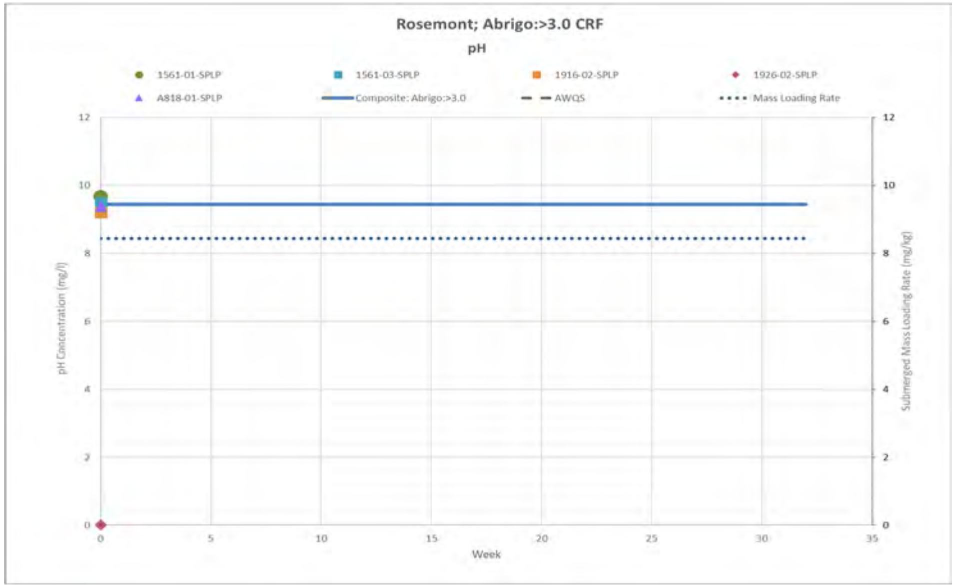

Rosemont; Abrigo:<1.2 CRF
Sodium
Andesite Col. Leach-MWMP
Composite: Abrigo:<1.2
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

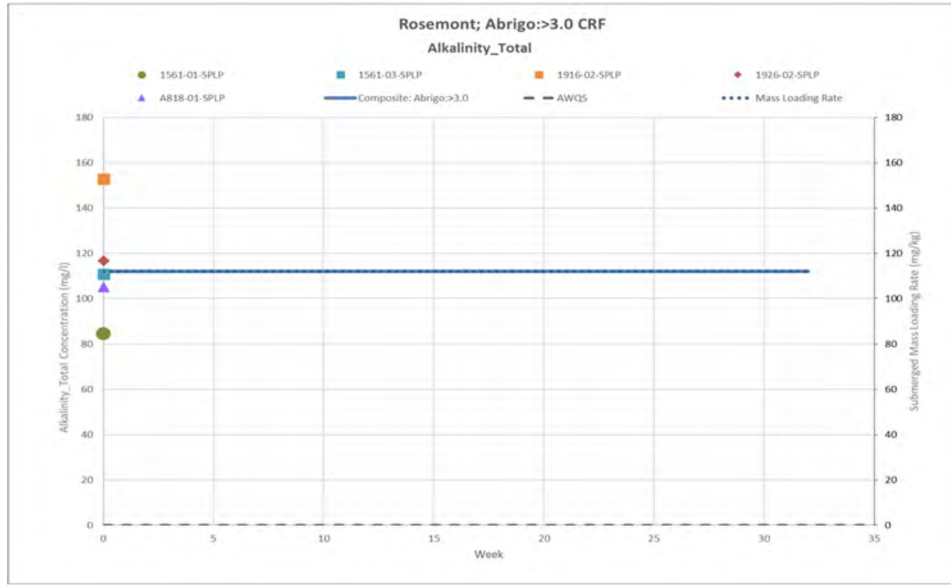

Rosemont; Abrigo:<1.2 CRF
Selenium
Andesite Col. Leach-MWMP
Composite: Abrigo:<1.2
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

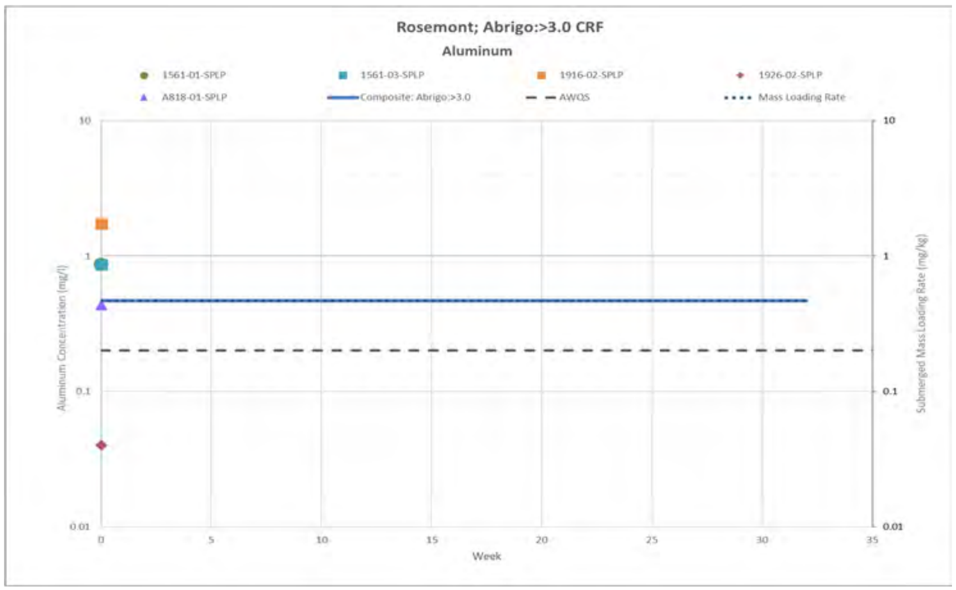

Rosemont; Abrigo:<1.2 CRF
Sulfate
Andesite Col. Leach-MWMP
Composite: Abrigo:<1.2
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

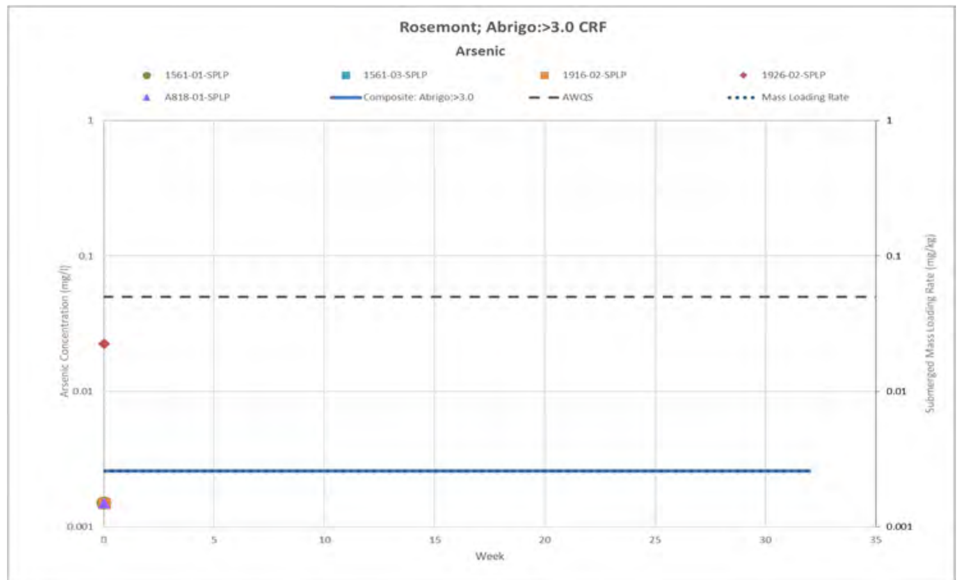

Rosemont; Abrigo:<1.2 CRF
Zinc
Andesite Col. Leach-MWMP
Composite: Abrigo:<1.2
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

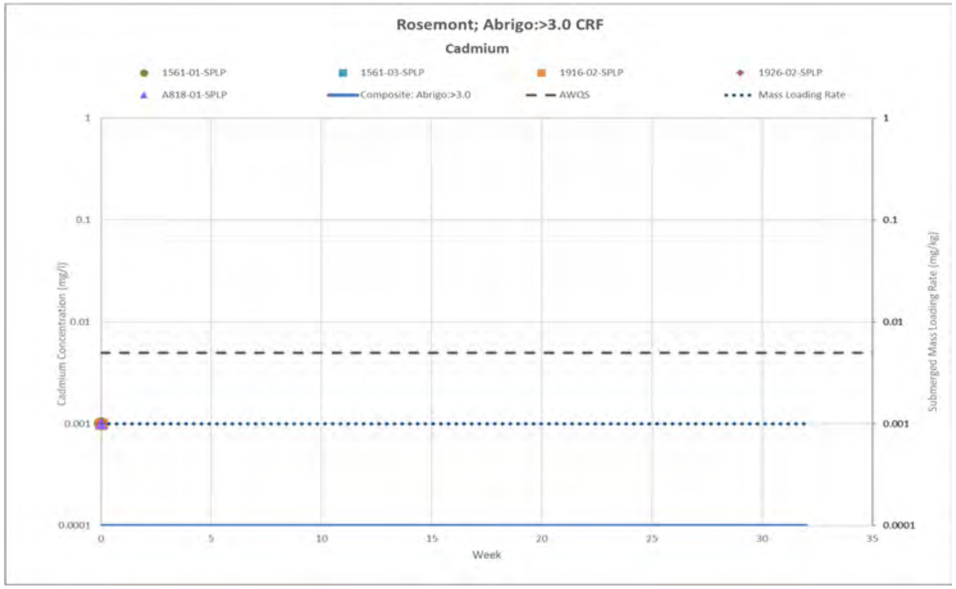
Appendix - H
Composite CRF Charts

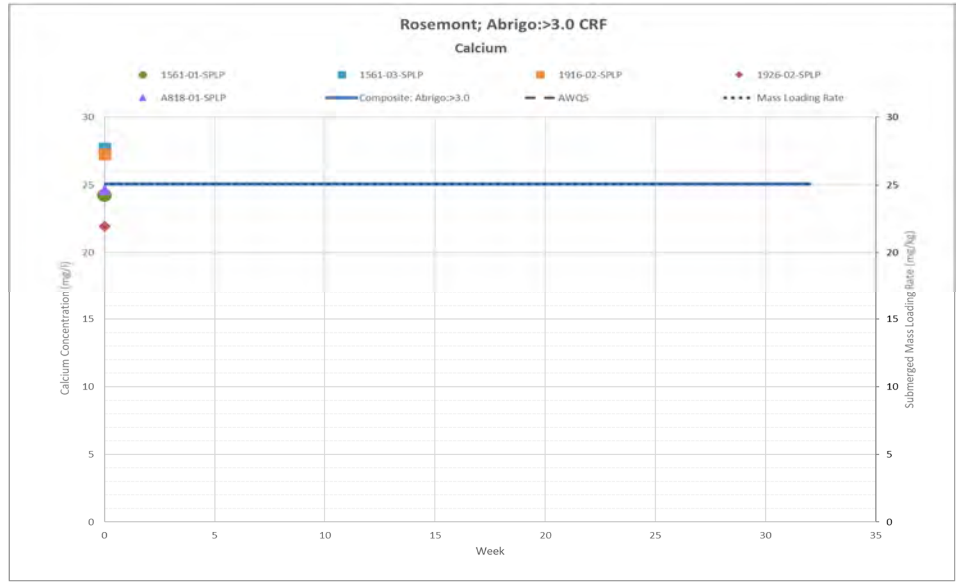


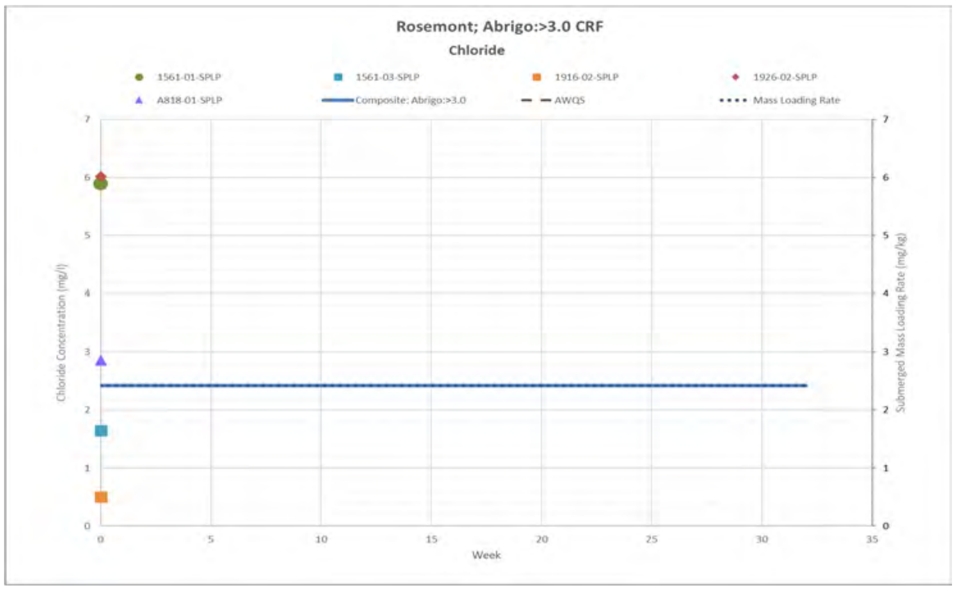


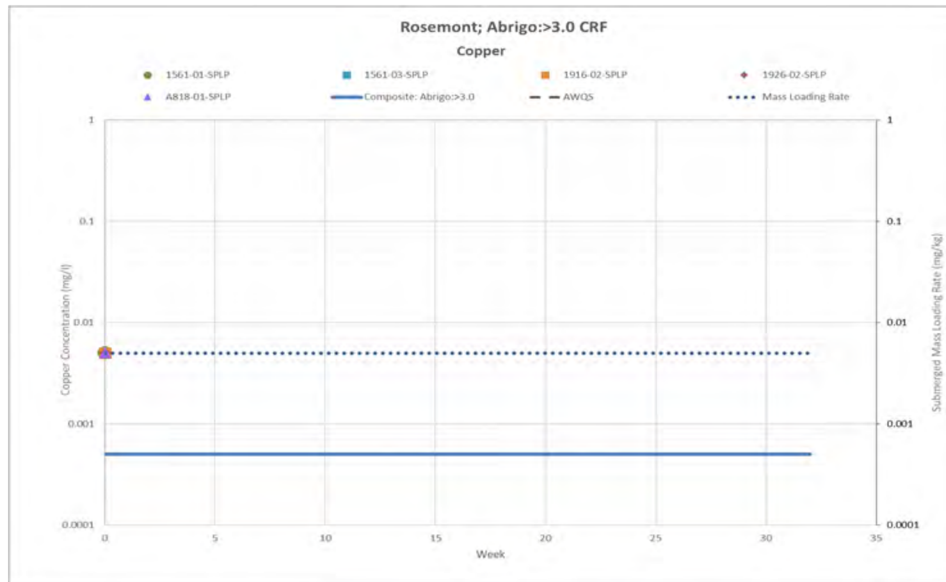




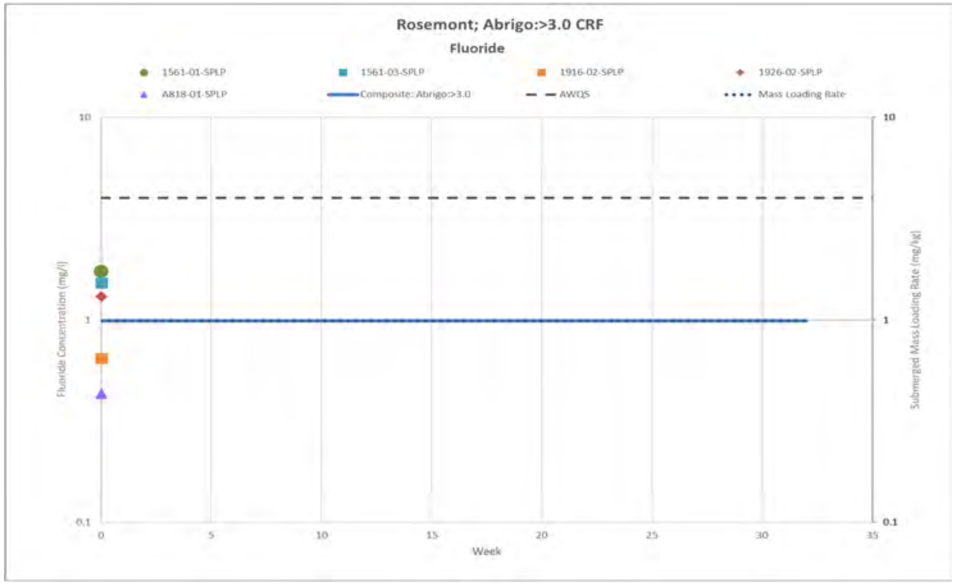

Rosemont; Abrigo:>3.0 CRF
Cadmium
1561-01-SPLP
1561-03-SPLP
1916-02-SPLP
1926-02-SPLP
A818-01-SPLP
Composite: Abrigo:>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

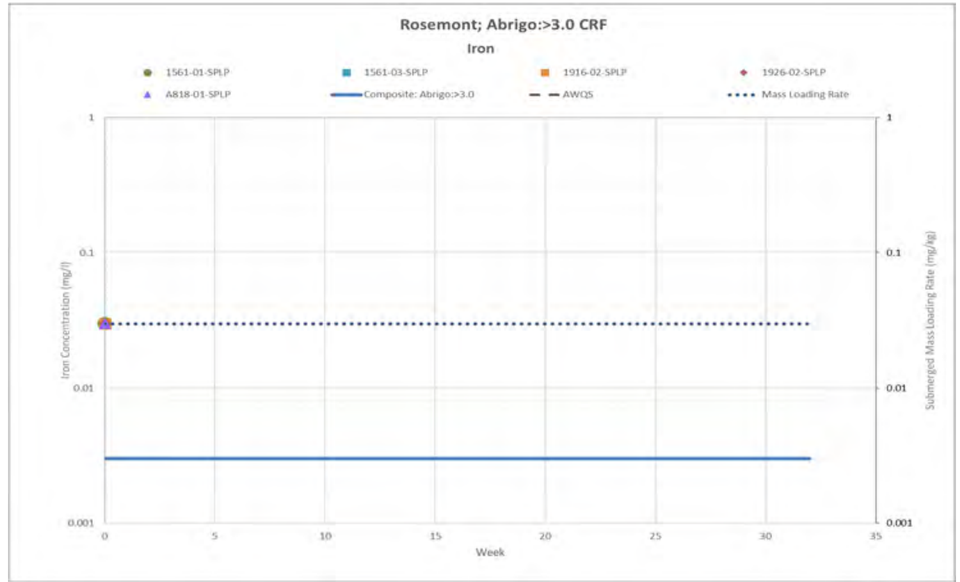

Rosemont; Abrigo:>3.0 CRF
Calcium
1561-01-SPLP
1561-03-SPLP
1916-02-SPLP
1926-02-SPLP
A818-01-SPLP
Composite: Abrigo:>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

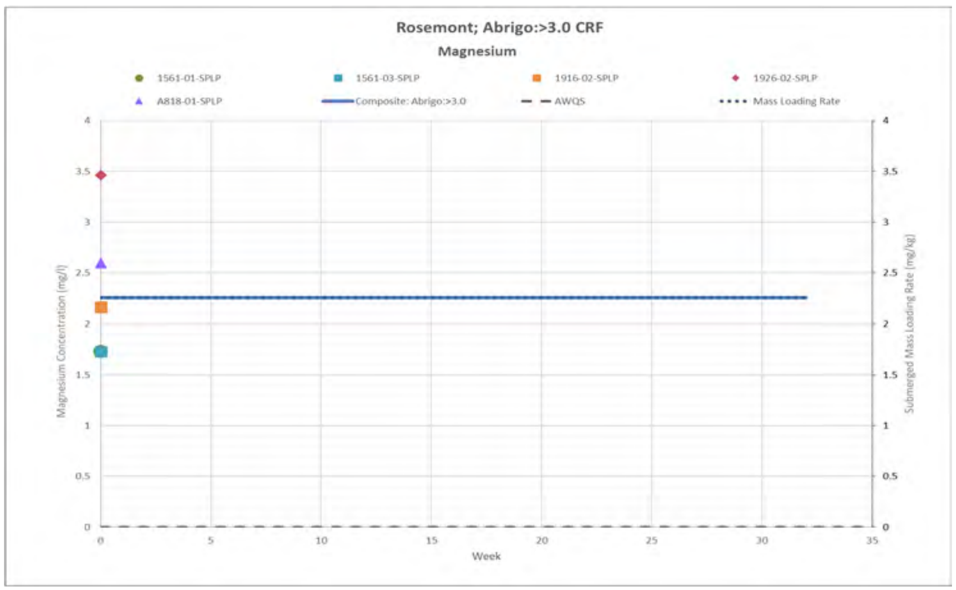

Rosemont; Abrigo:>3.0 CRF
Chloride
1561-01-SPLP
1561-03-SPLP
1916-02-SPLP
1926-02-SPLP
A818-01-SPLP
Composite: Abrigo:>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

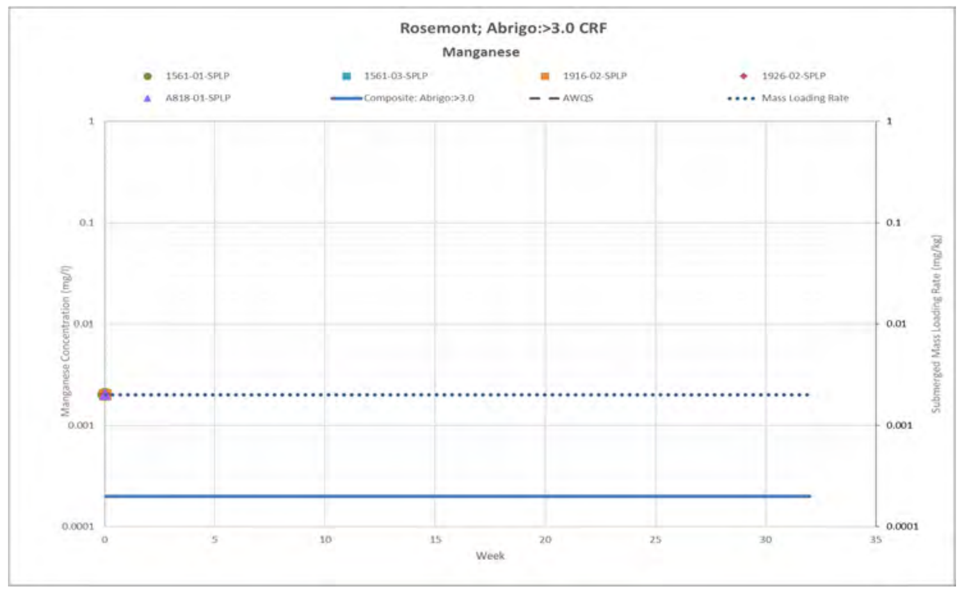

Rosemont; Abrigo:>3.0 CRF
Copper
1561-01-SPLP
1561-03-SPLP
1916-02-SPLP
1926-02-SPLP
A818-01-SPLP
Composite: Abrigo:>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

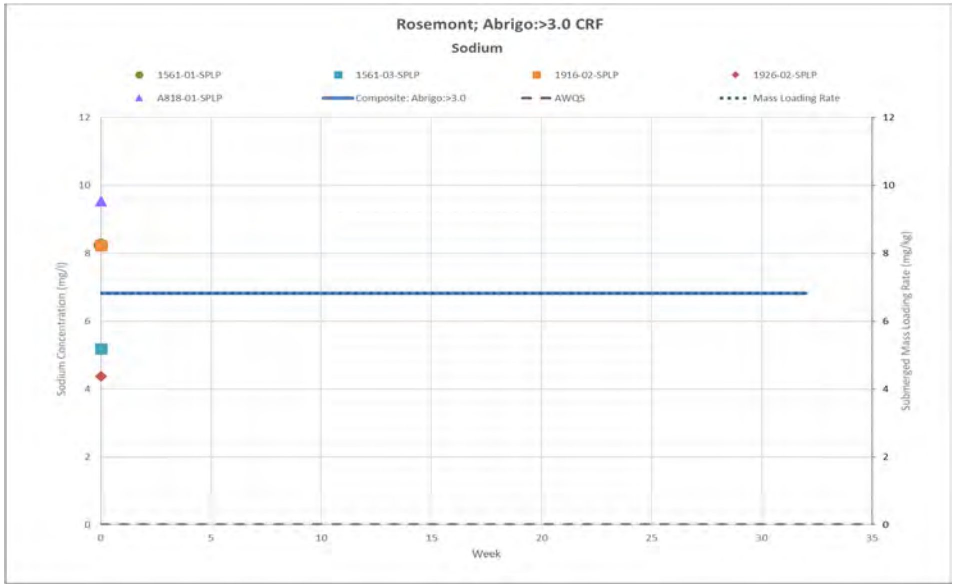
Appendix - H
Composite CRF Charts

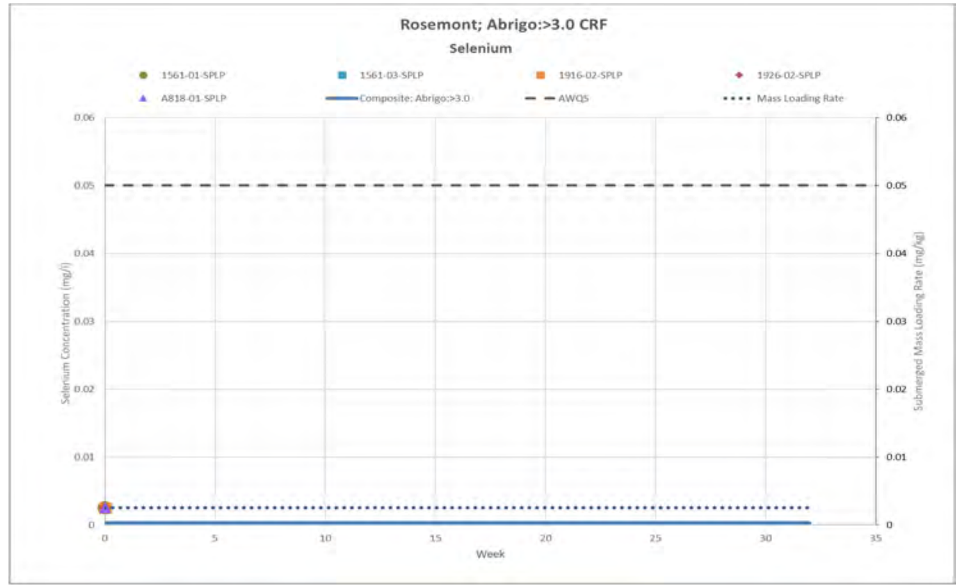


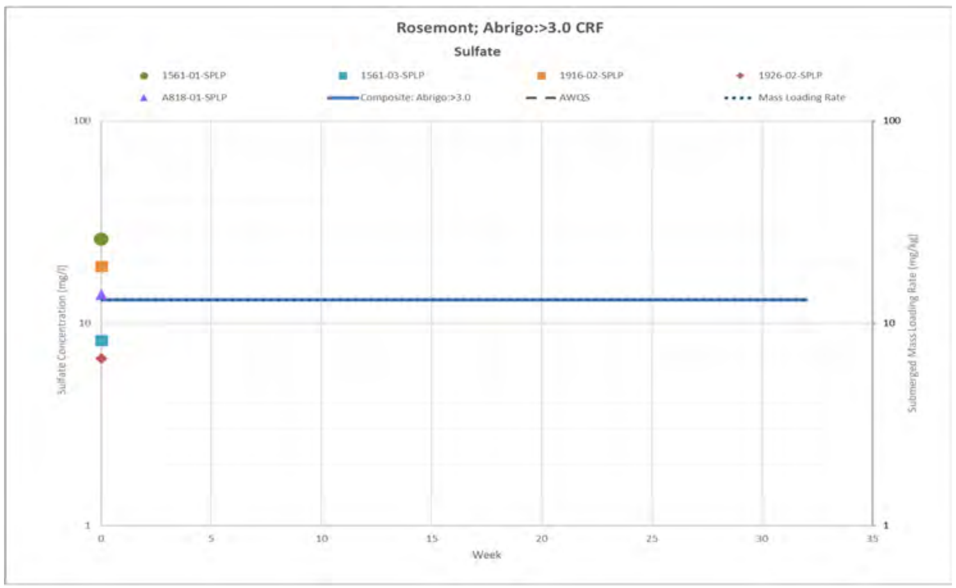


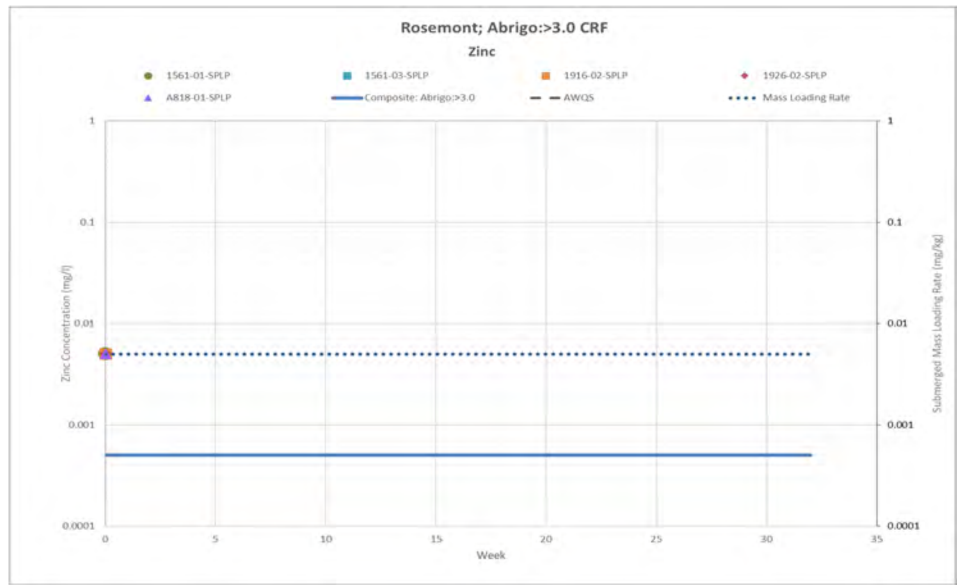


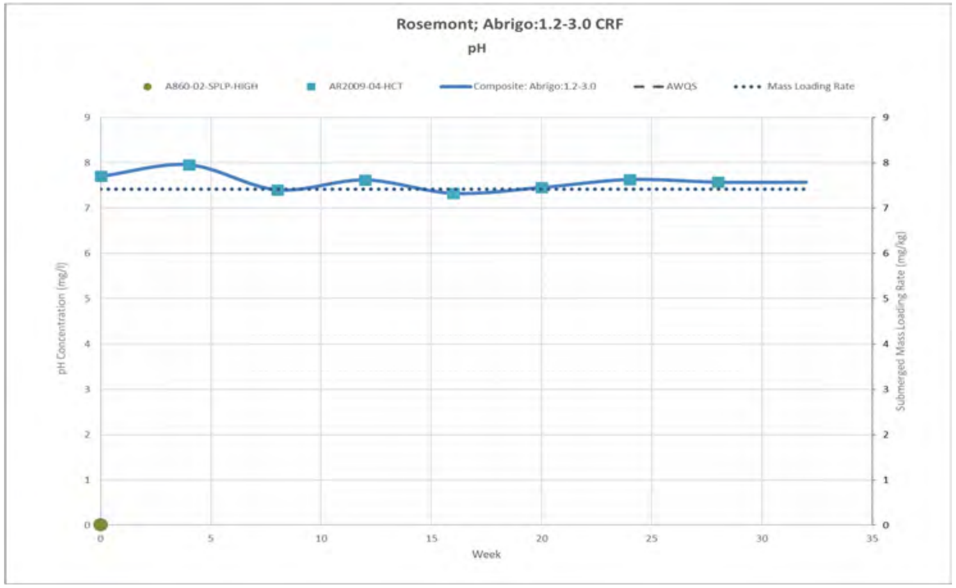


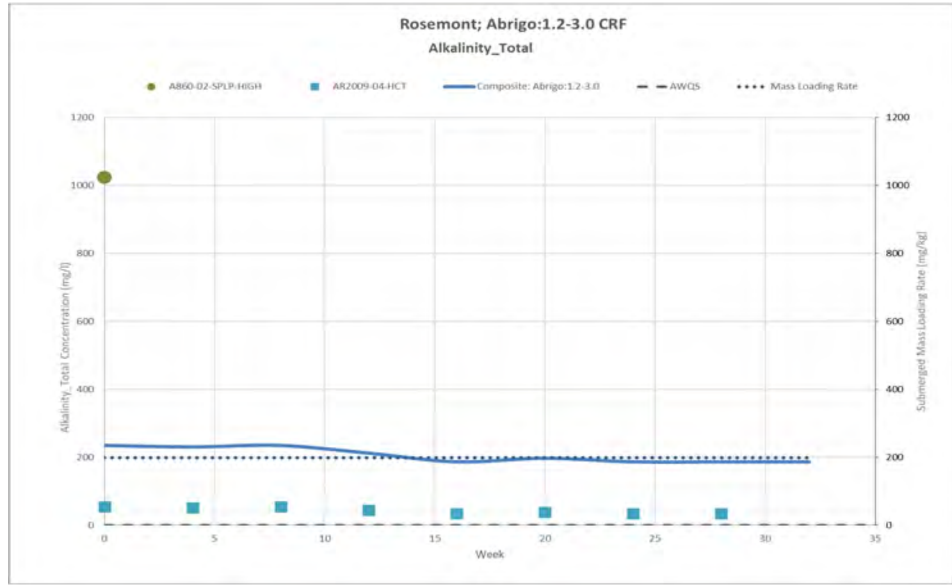

Rosemont; Abrigo:>3.0 CRF
Sodium
1561-01-SPLP
1561-03-SPLP
1916-02-SPLP
1926-02-SPLP
A818-01-SPLP
Composite: Abrigo:>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

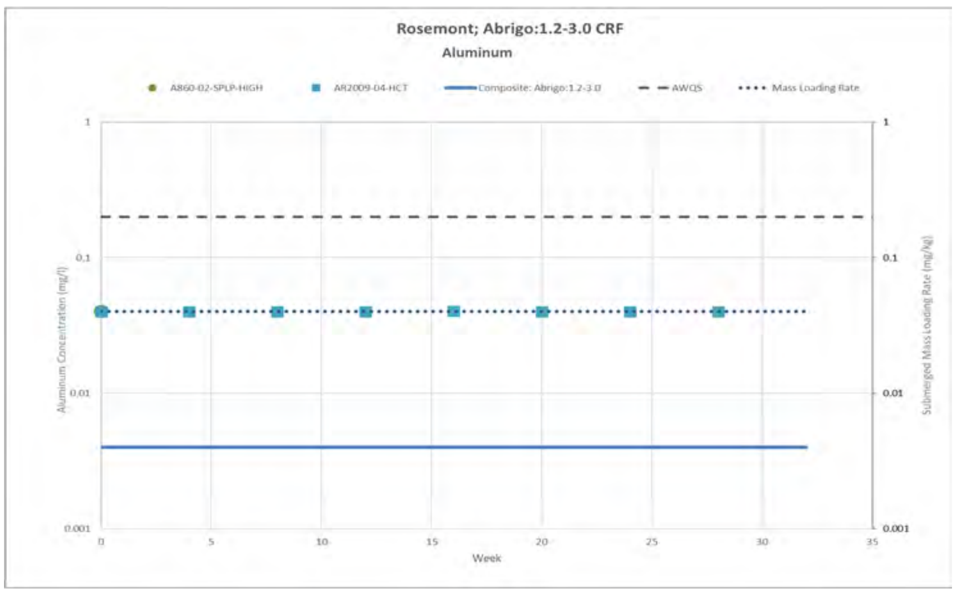

Rosemont; Abrigo:>3.0 CRF
Selenium
1561-01-SPLP
1561-03-SPLP
1916-02-SPLP
1926-02-SPLP
A818-01-SPLP
Composite: Abrigo:>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

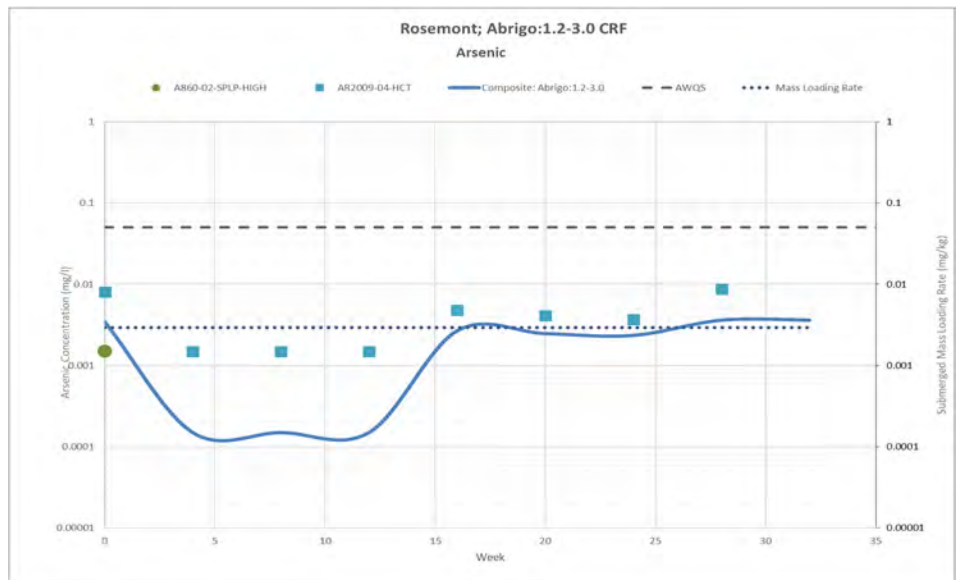

Rosemont; Abrigo:>3.0 CRF
Sulfate
1561-01-SPLP
1561-03-SPLP
1916-02-SPLP
1926-02-SPLP
A818-01-SPLP
Composite: Abrigo:>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

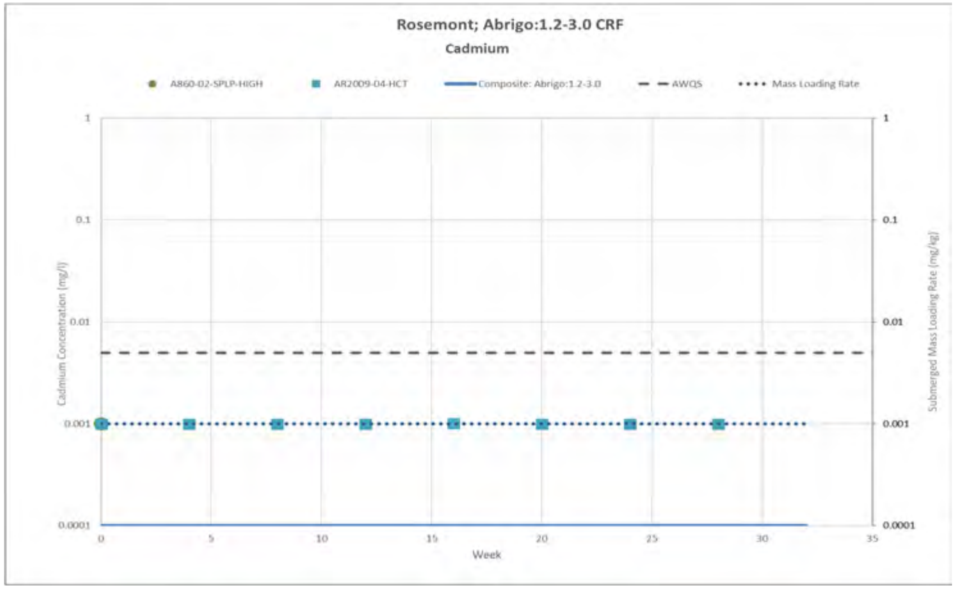

Rosemont; Abrigo:>3.0 CRF
Zinc
1561-01-SPLP
1561-03-SPLP
1916-02-SPLP
1926-02-SPLP
A818-01-SPLP
Composite: Abrigo:>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

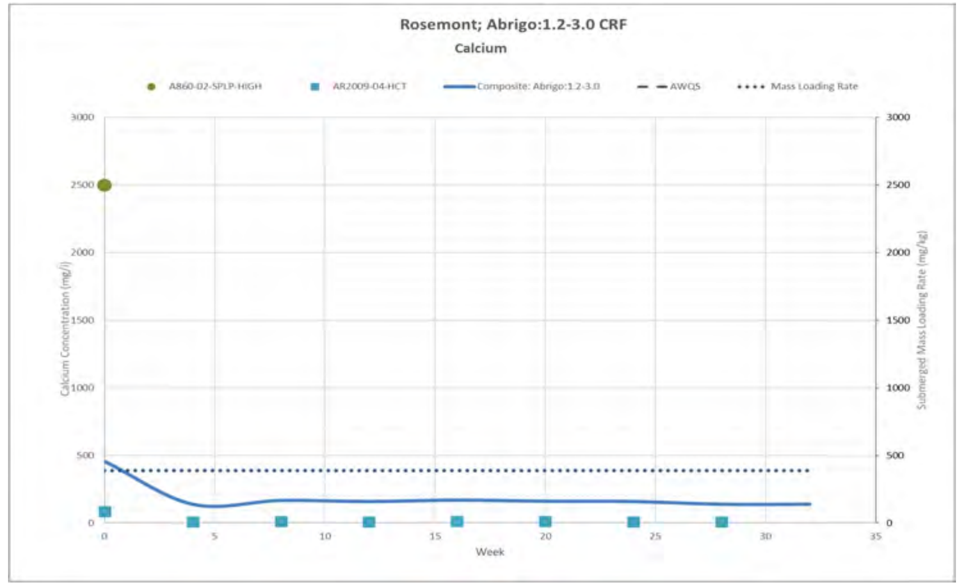

Rosemont; Abrigo:1.2-3.0 CRF
pH
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

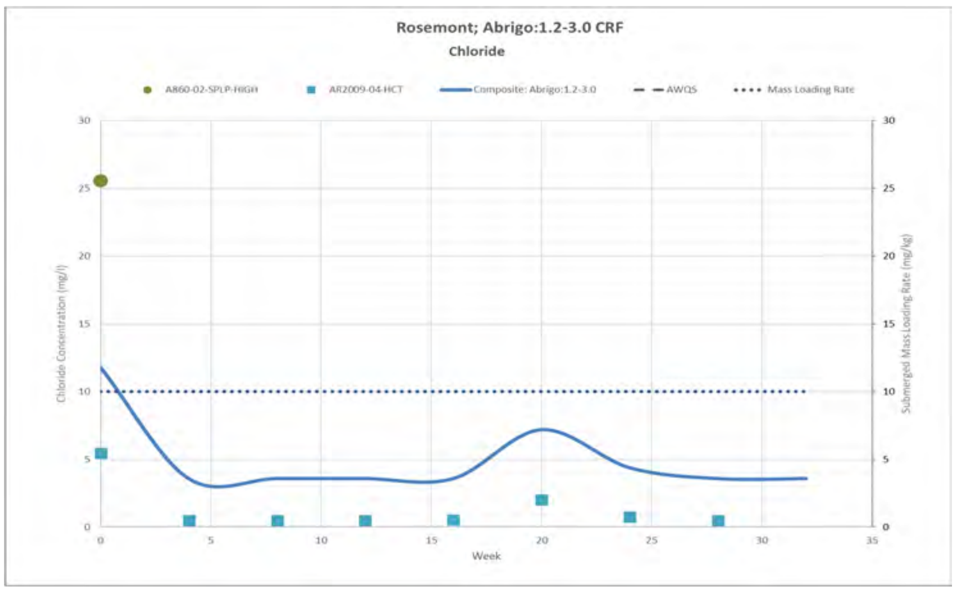

Rosemont; Abrigo:1.2-3.0 CRF
Alkalinity_Total
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

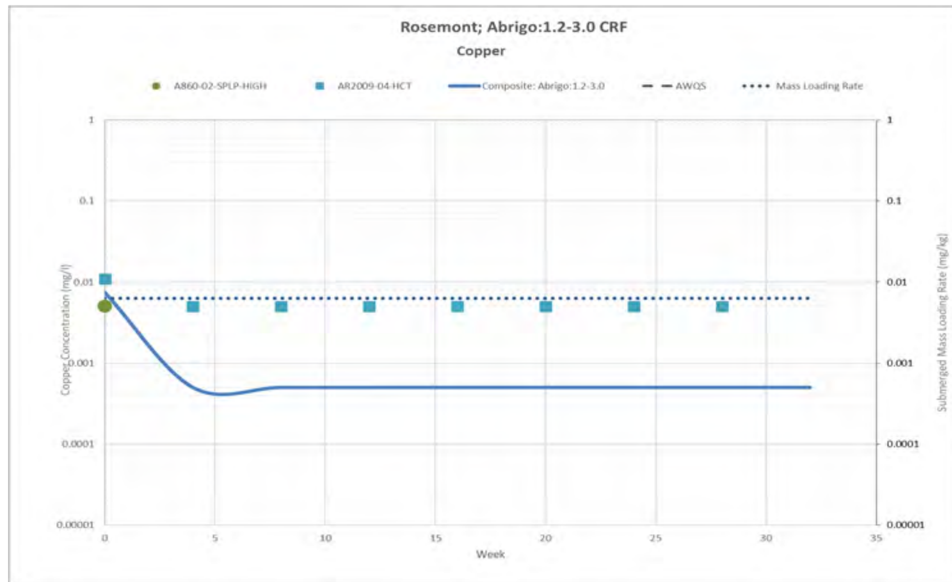

Rosemont; Abrigo:1.2-3.0 CRF
Aluminum
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Abrigo:1.2-3.0 CRF
Arsenic
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

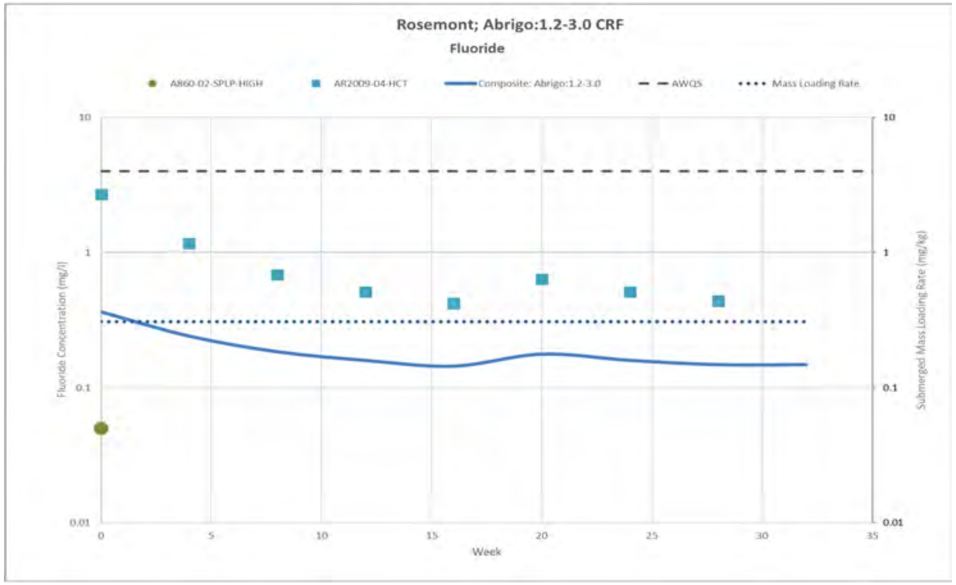

Rosemont; Abrigo:1.2-3.0 CRF
Cadmium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

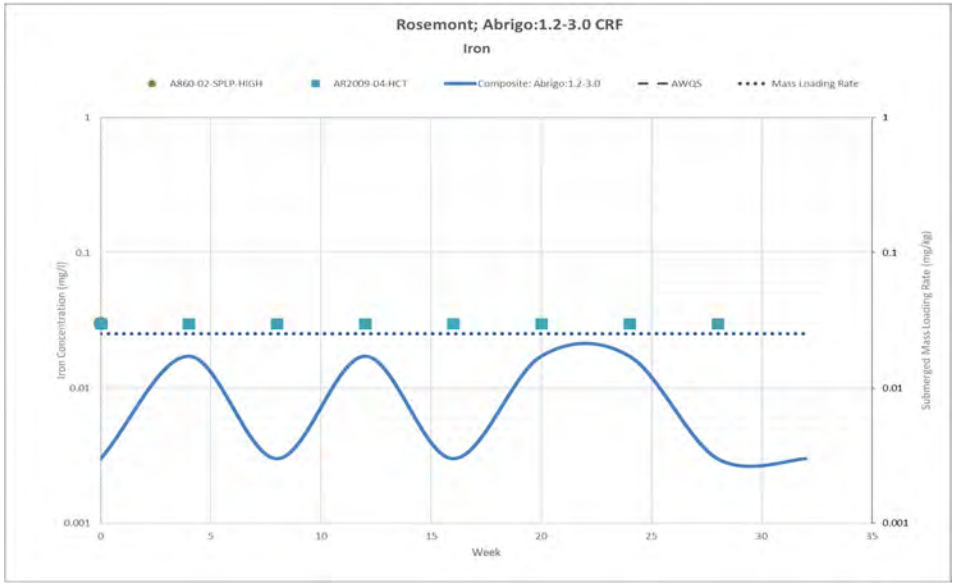

Rosemont; Abrigo:1.2-3.0 CRF
Calcium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

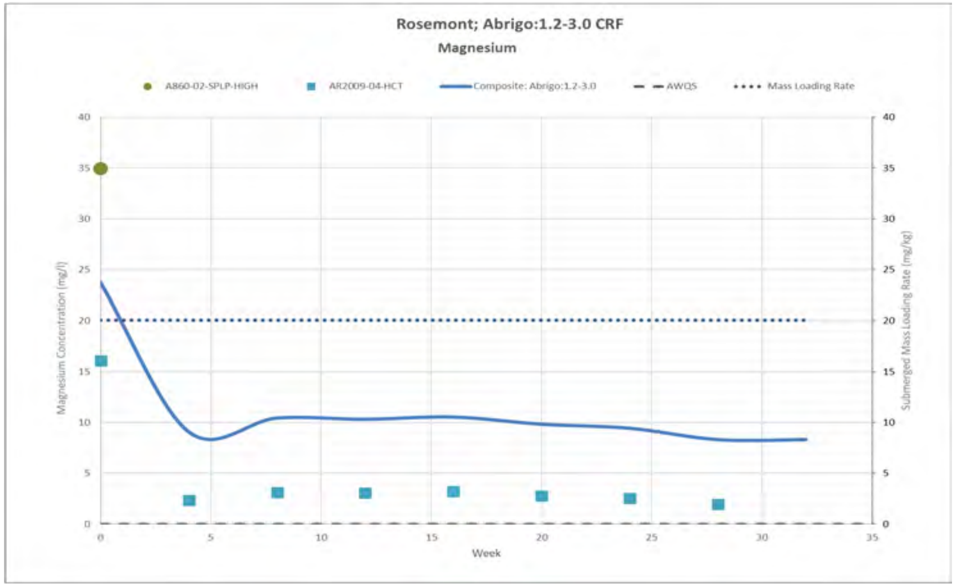

Rosemont; Abrigo:1.2-3.0 CRF
Chloride
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

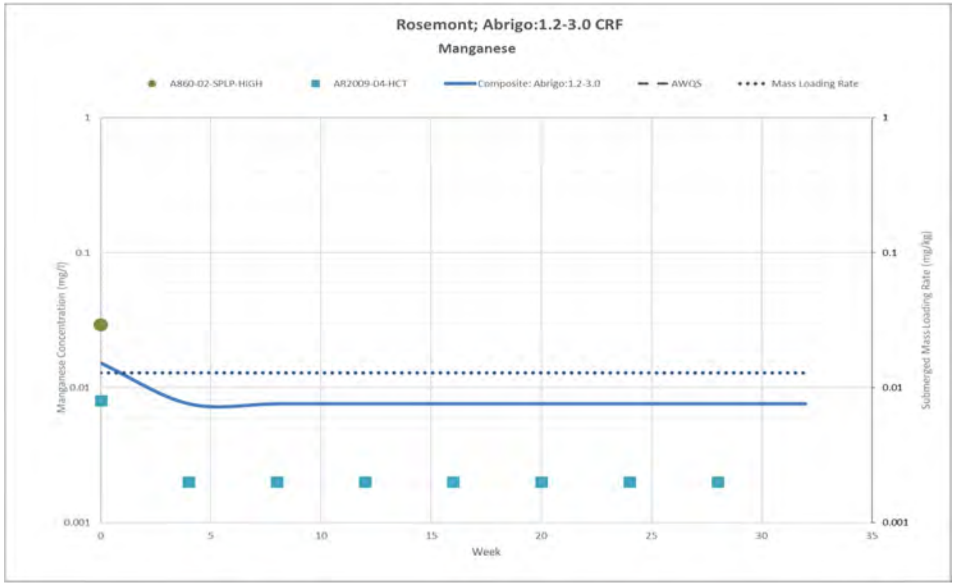

Rosemont; Abrigo:1.2-3.0 CRF
Copper
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

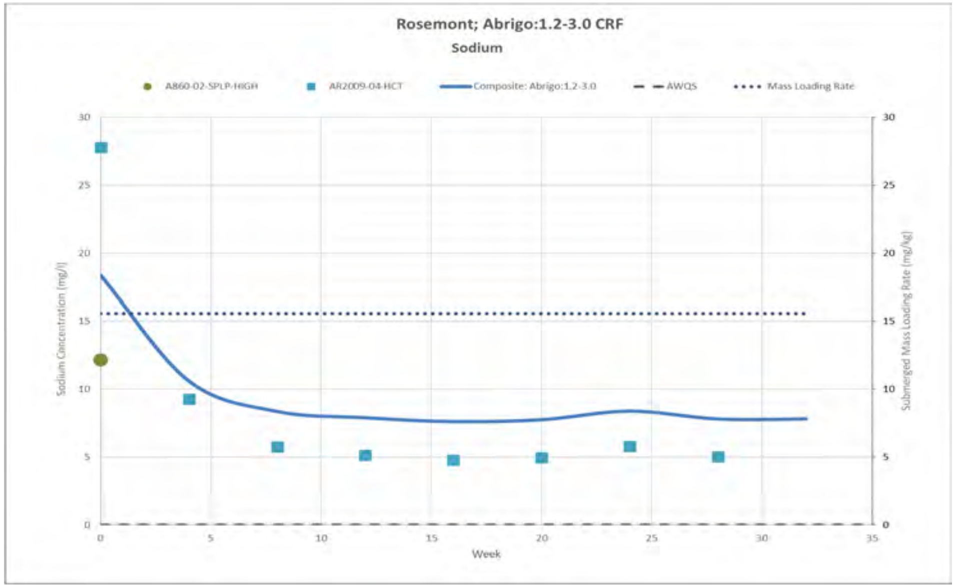
Appendix - H
Composite CRF Charts

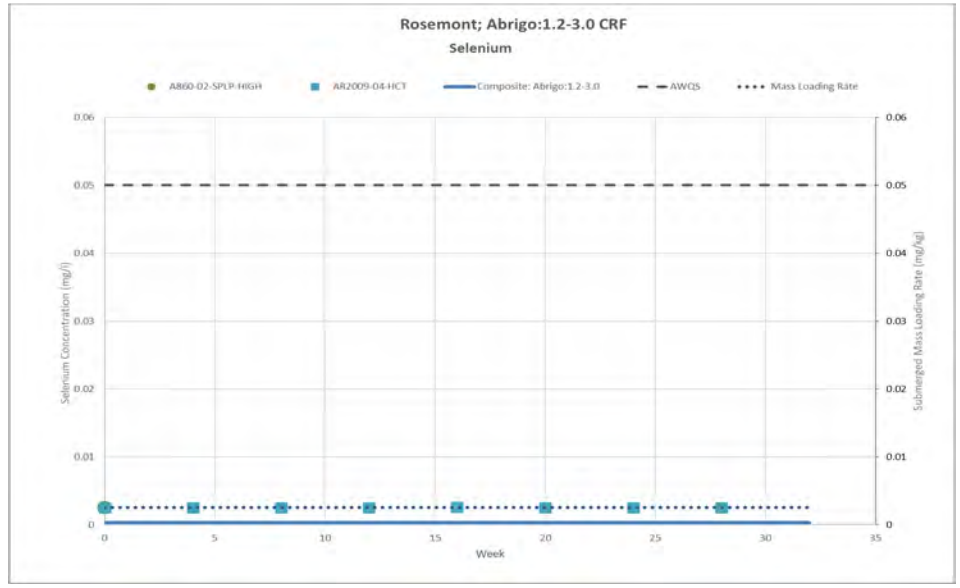


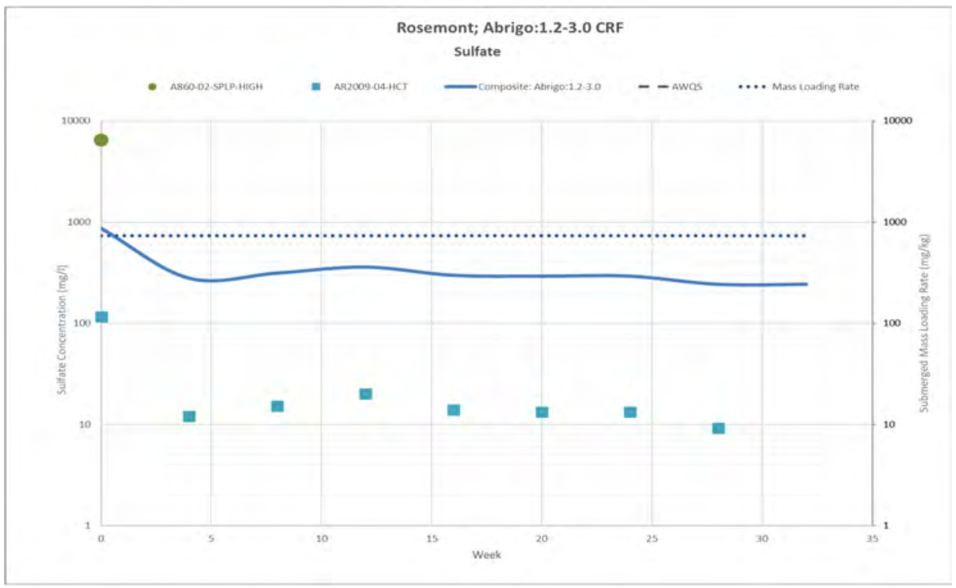


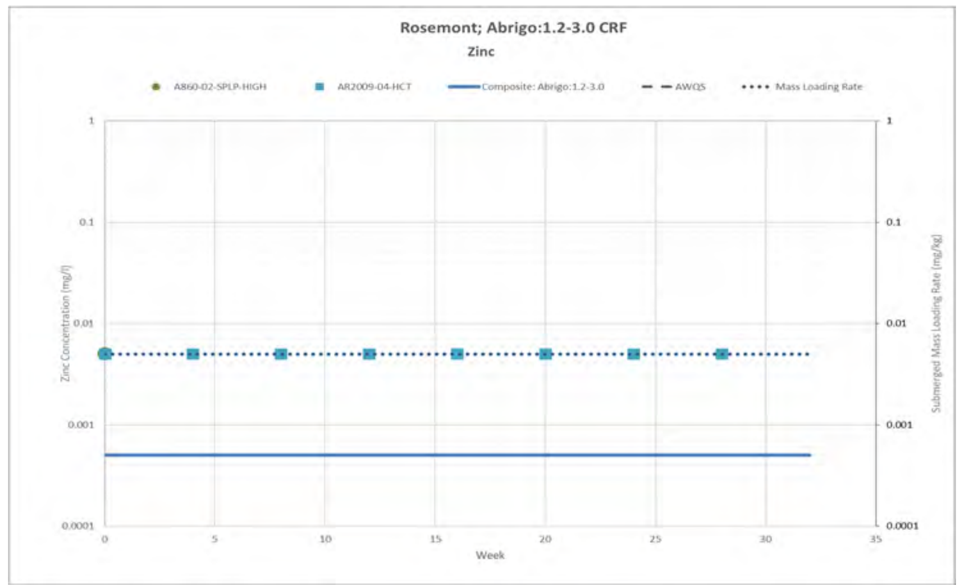


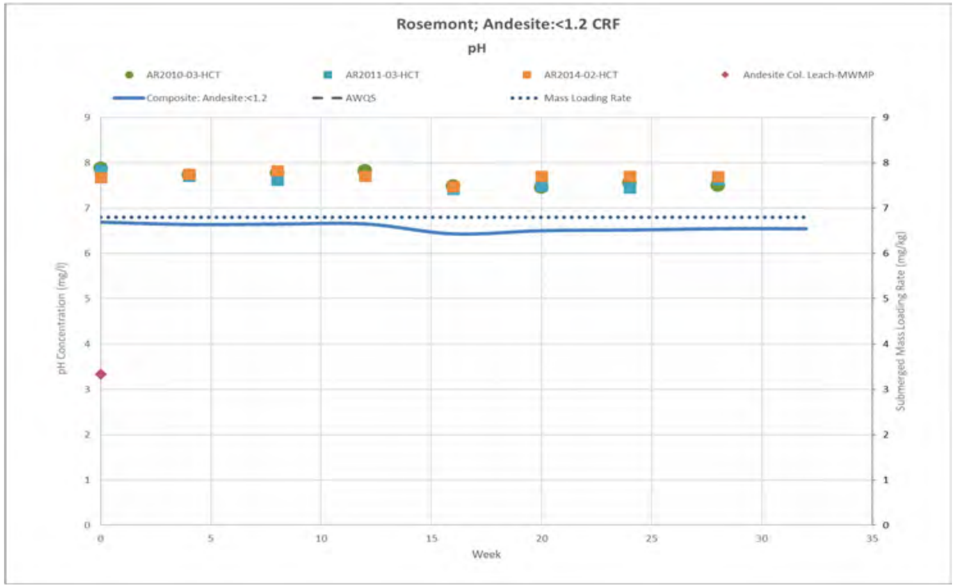


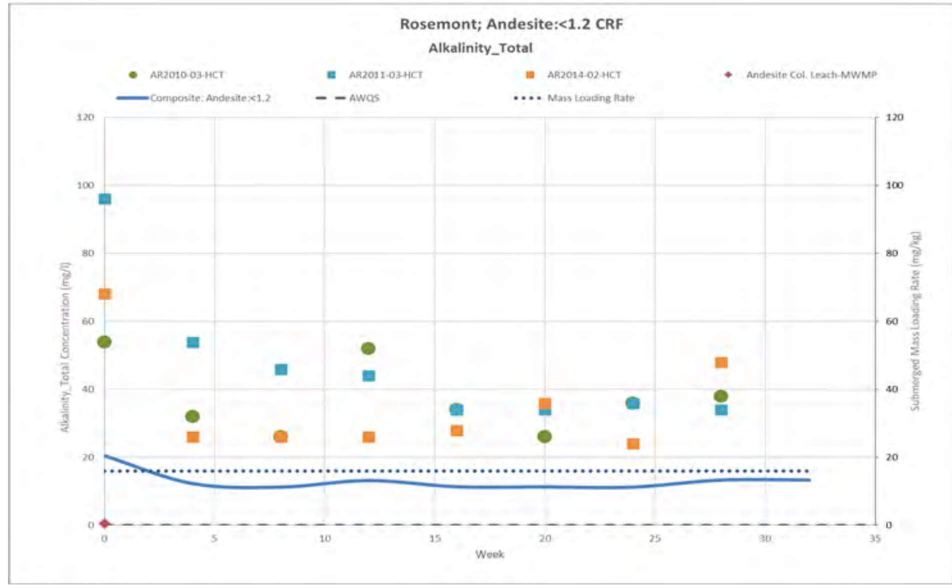

Rosemont; Abrigo:1.2-3.0 CRF
Sodium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

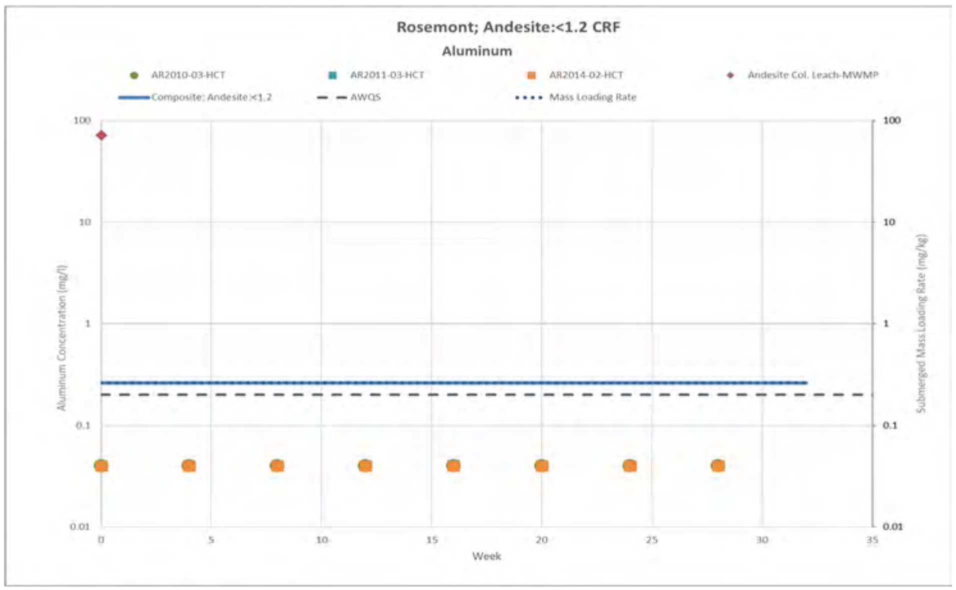

Rosemont; Abrigo:1.2-3.0 CRF
Selenium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

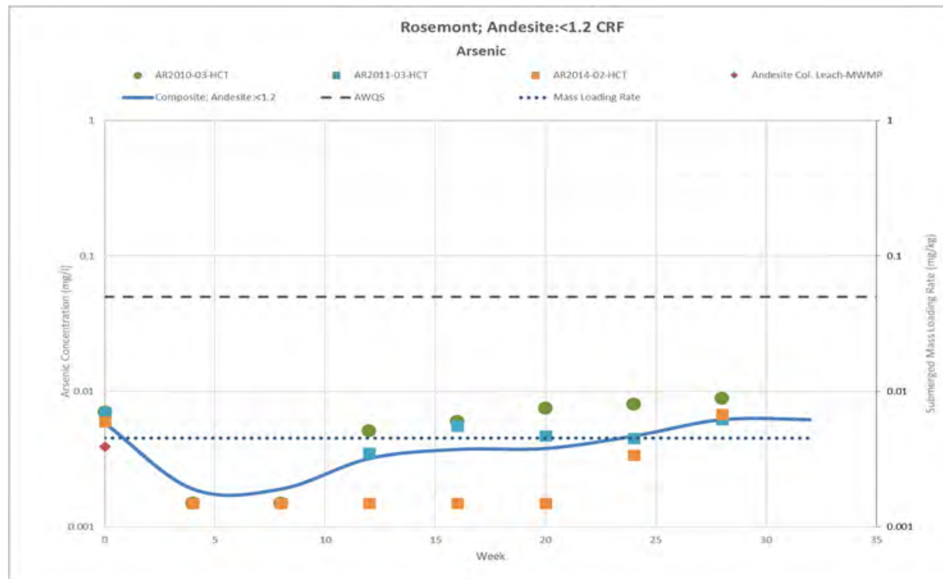

Rosemont; Abrigo:1.2-3.0 CRF
Sulfate
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Abrigo:1.2-3.0 CRF
Zinc
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Abrigo:1.2-3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

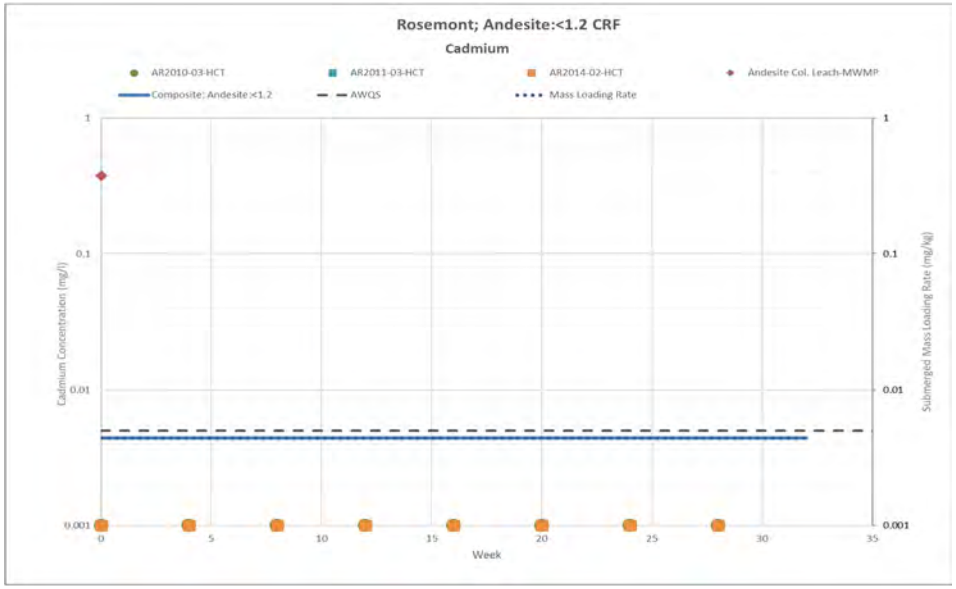

Rosemont; Andesite:<1.2 CRF
pH
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

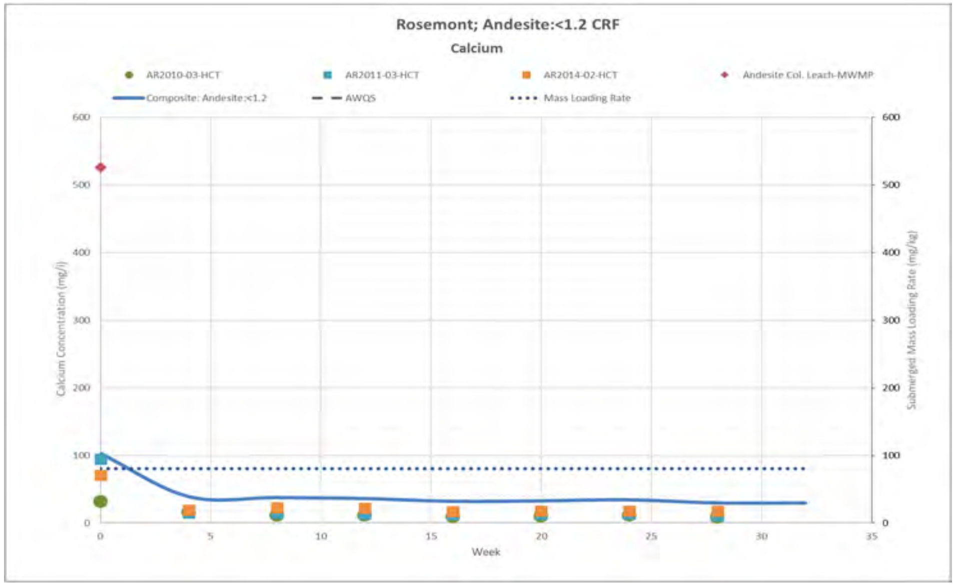

Rosemont; Andesite:<1.2 CRF
Alkalinity_Total
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

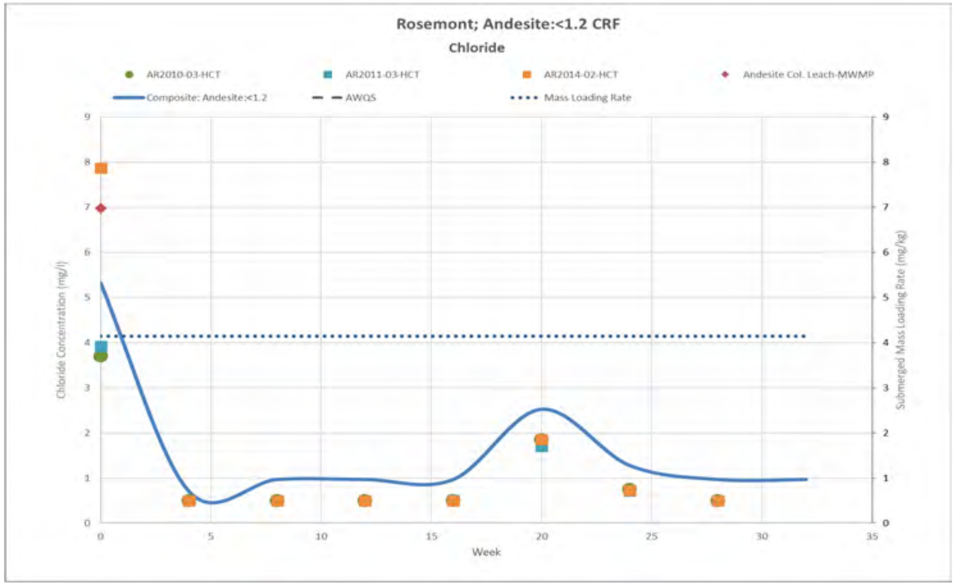

Rosemont; Andesite:<1.2 CRF
Aluminum
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

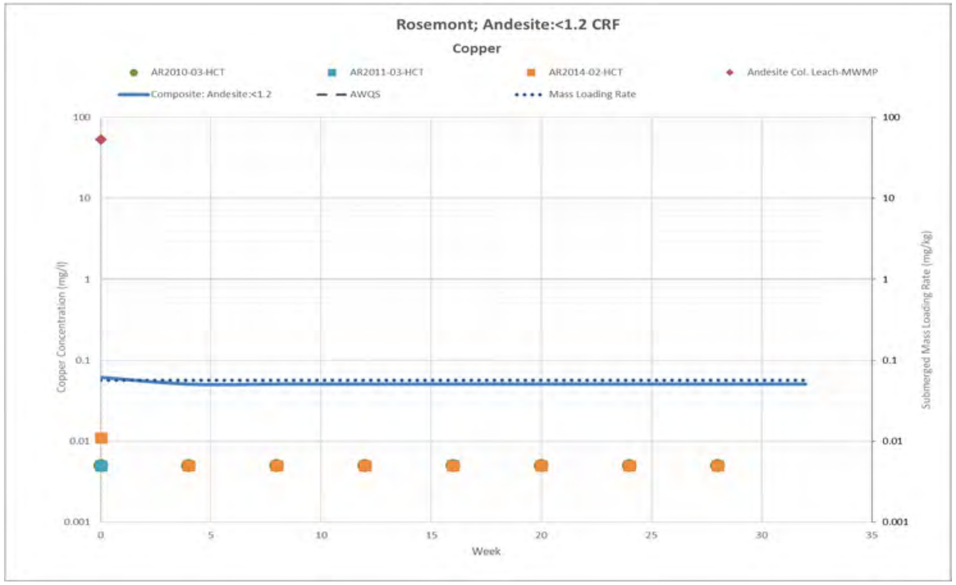

Rosemont; Andesite:<1.2 CRF
Arsenic
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

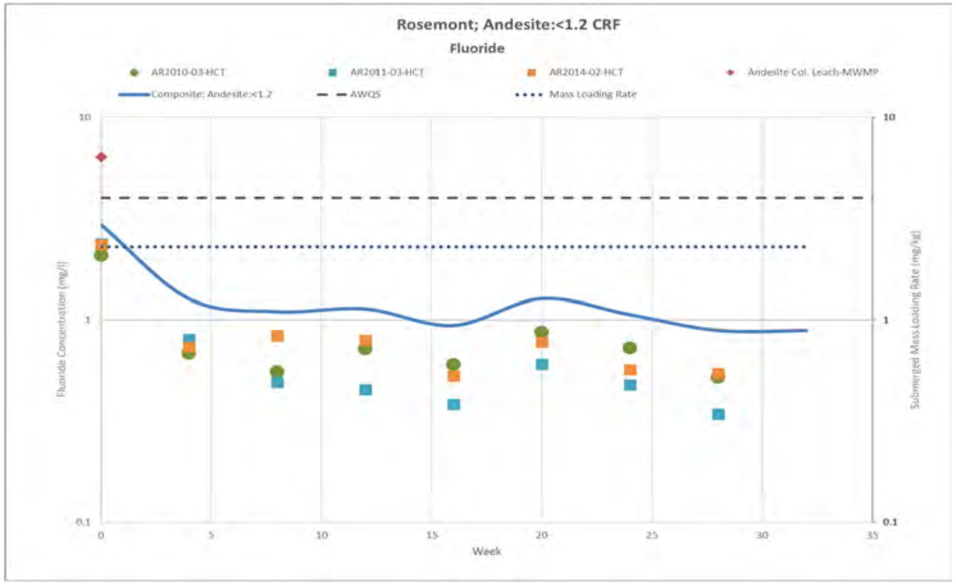
Appendix - H
Composite CRF Charts

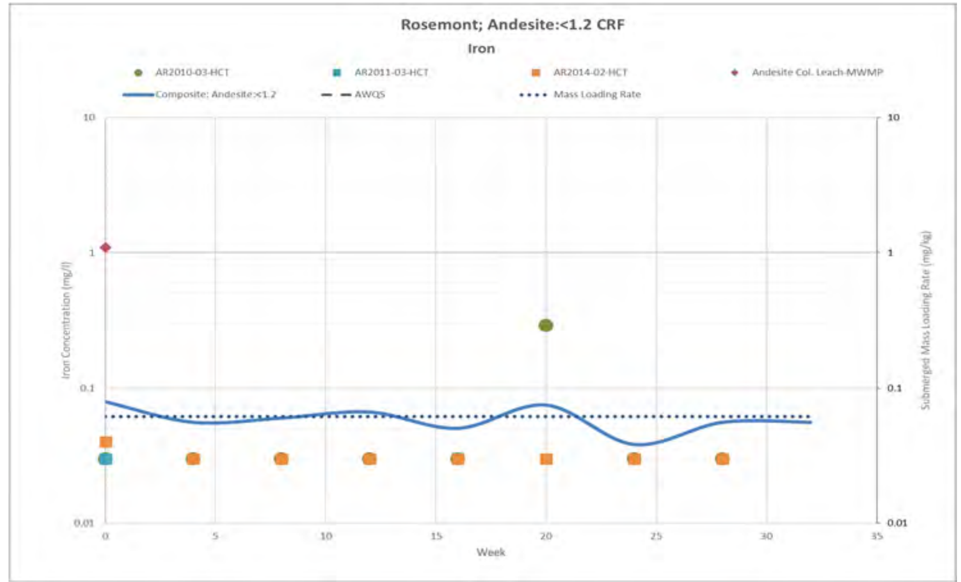


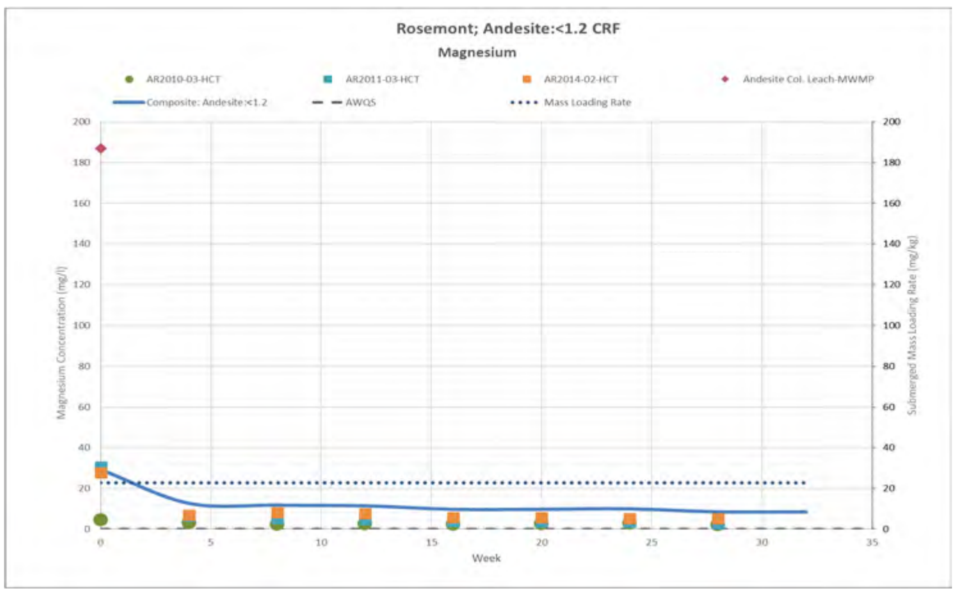


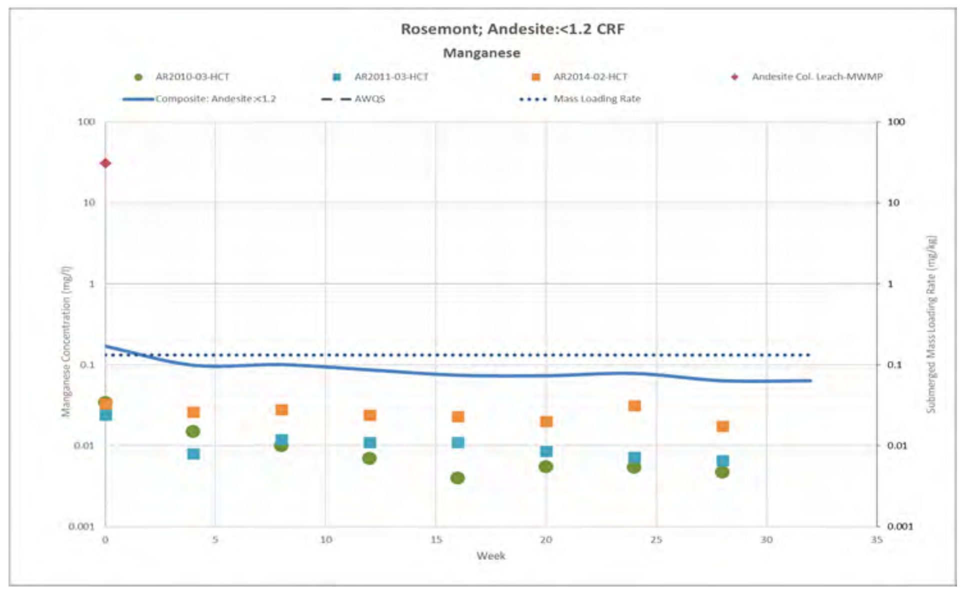


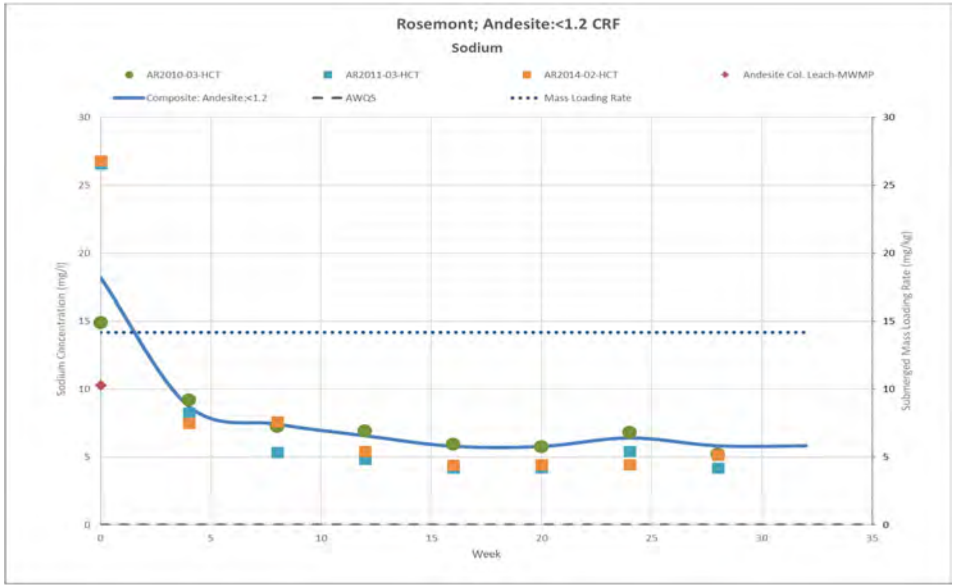


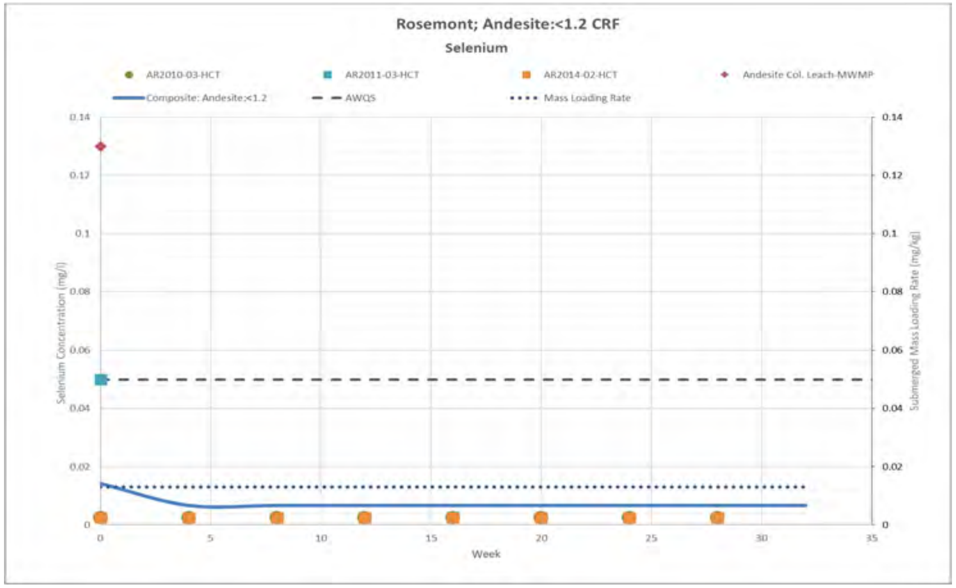

Rosemont; Andesite:<1.2 CRF
Fluoride
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

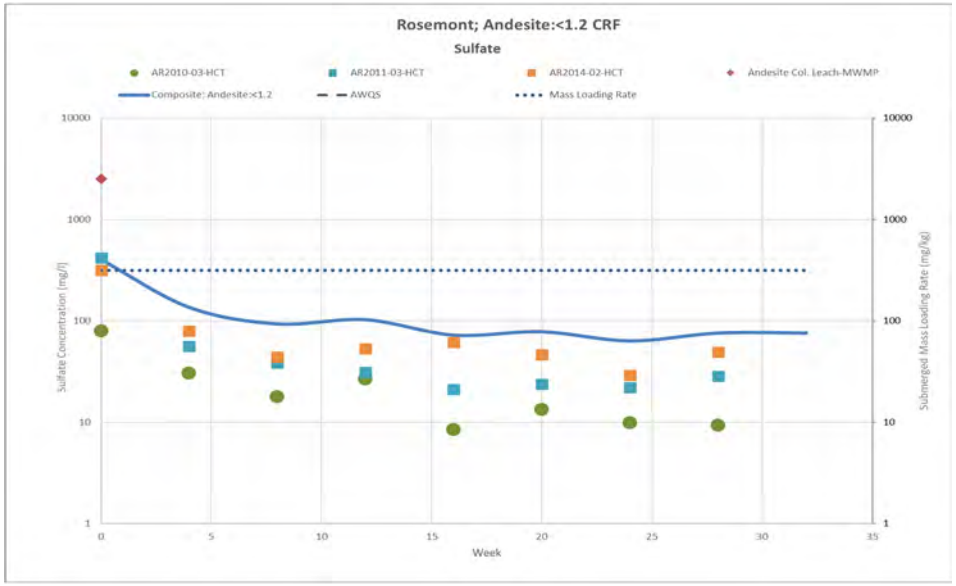

Rosemont; Andesite:<1.2 CRF
Iron
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

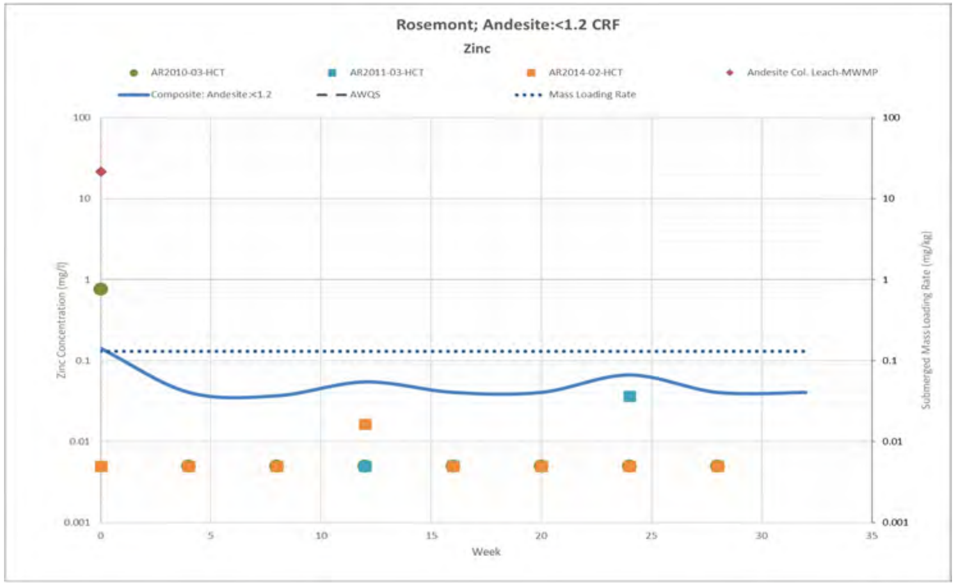

Rosemont; Andesite:<1.2 CRF
Magnesium
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Andesite:<1.2 CRF
Manganese
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

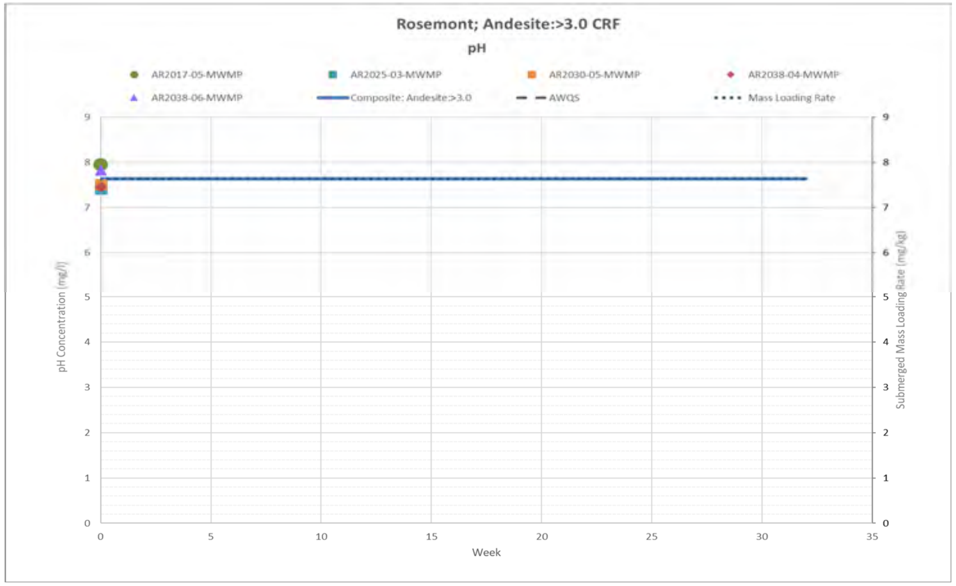

Rosemont; Andesite:<1.2 CRF
Sodium
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

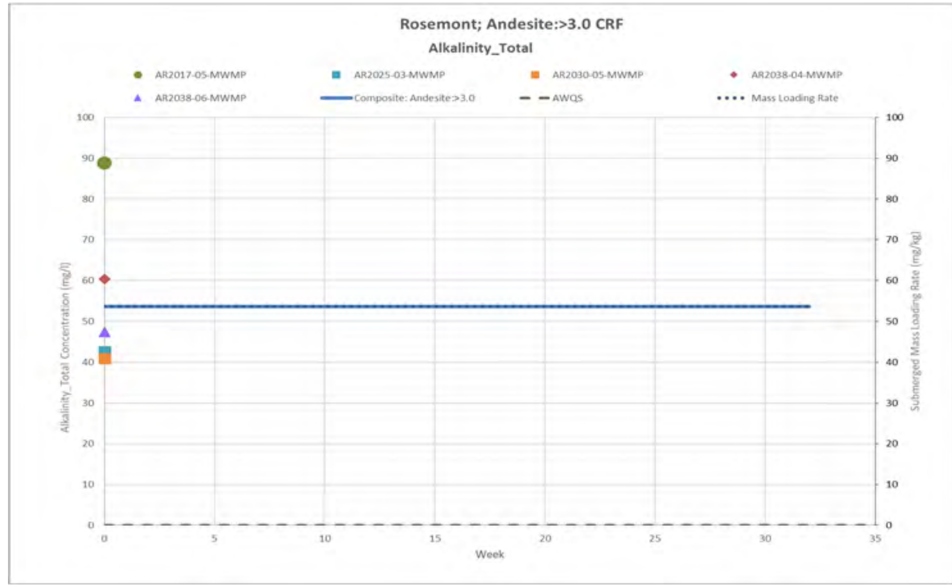

Rosemont; Andesite:<1.2 CRF
Selenium
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

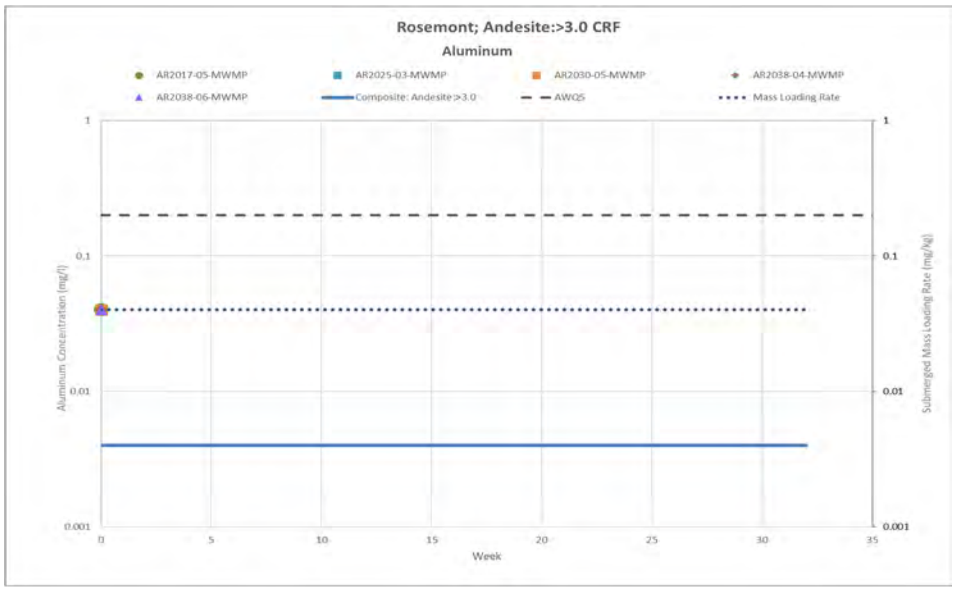

Rosemont; Andesite:<1.2 CRF
Sulfate
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

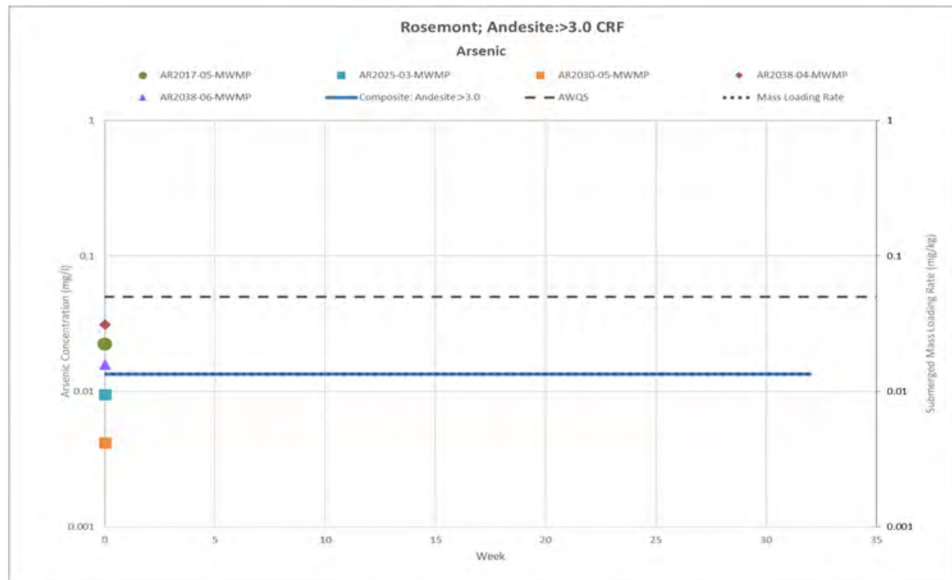

Rosemont; Andesite:<1.2 CRF
Zinc
AR2010-03-HCT
AR2011-03-HCT
AR2014-02-HCT
Andesite Col. Leach-MWMP
Composite: Andesite:<1.2
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

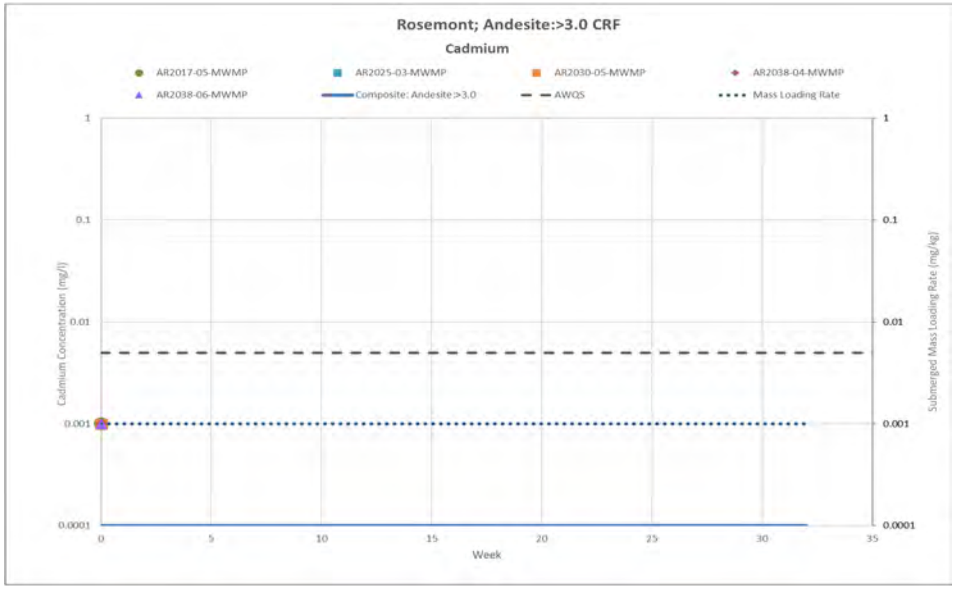


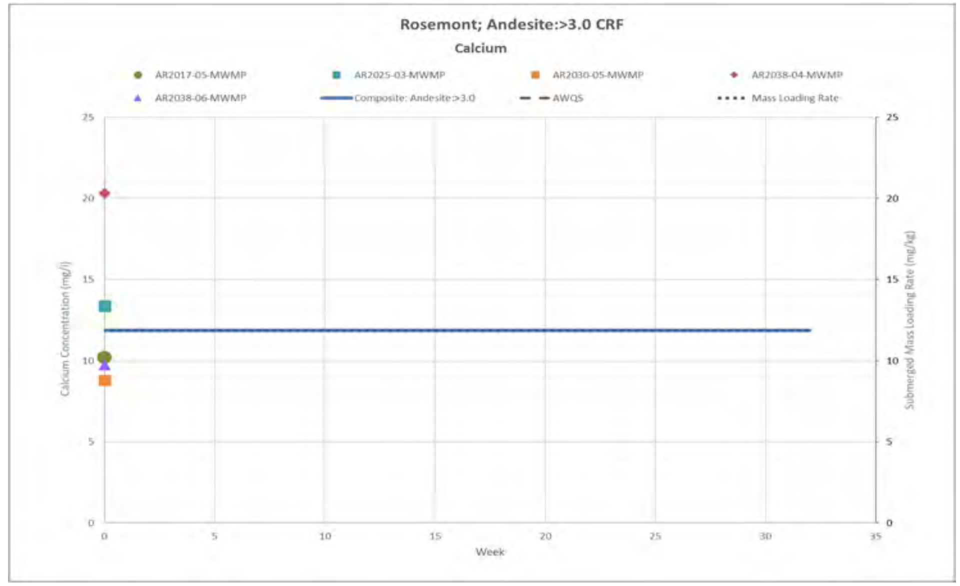


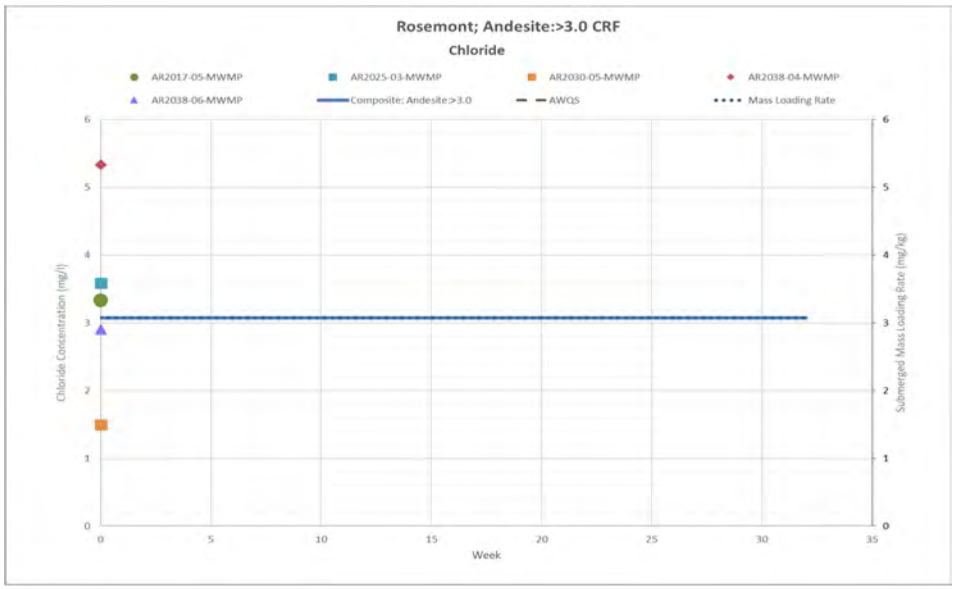


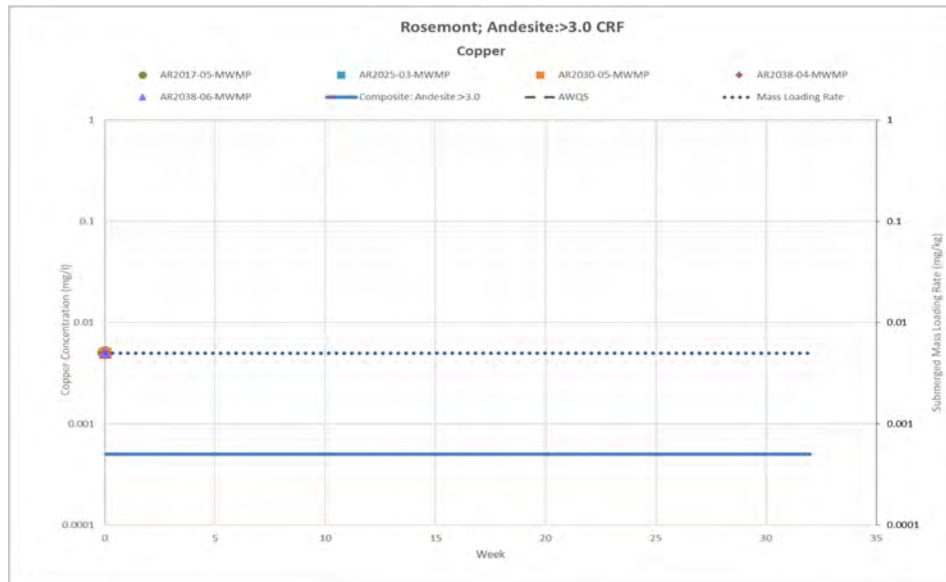


Appendix - H
Composite CRF Charts

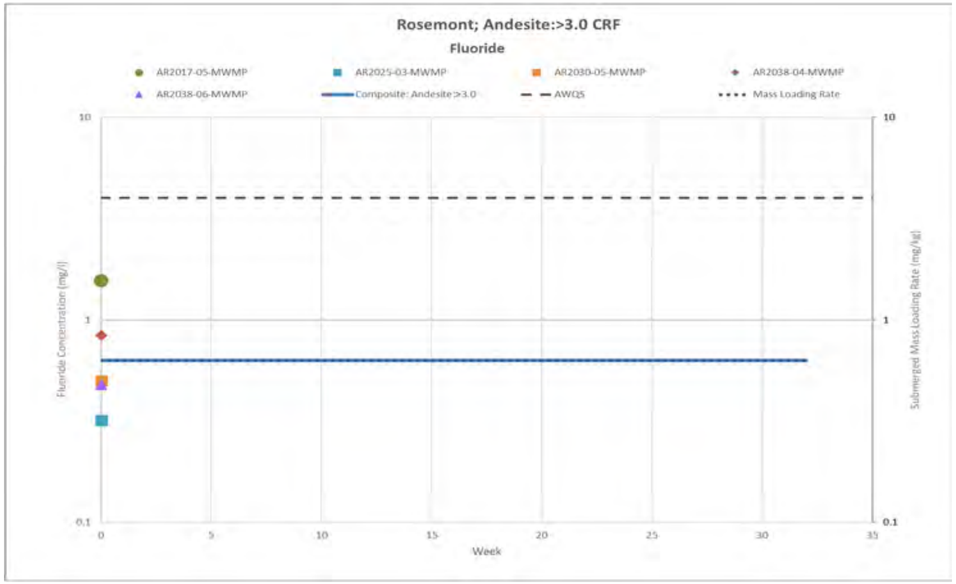


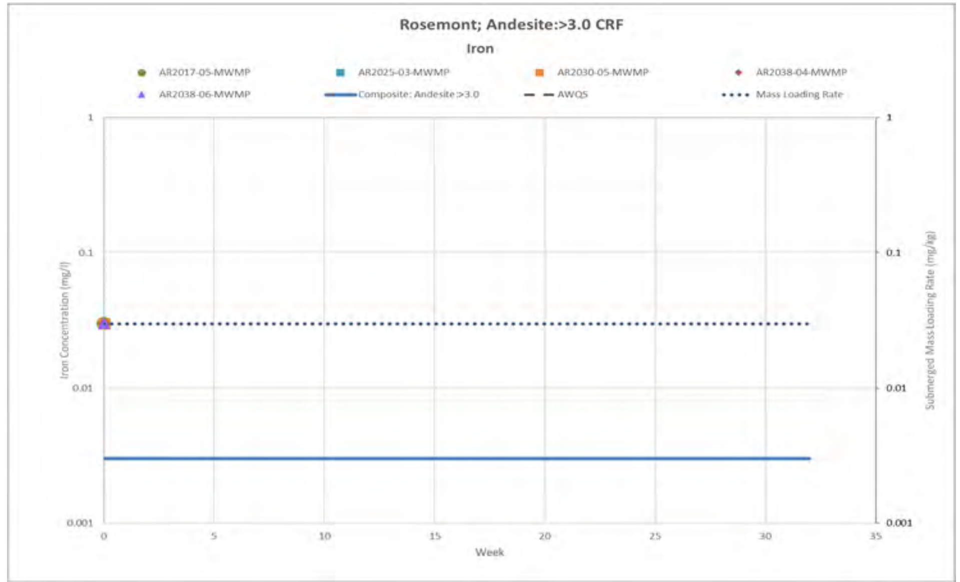


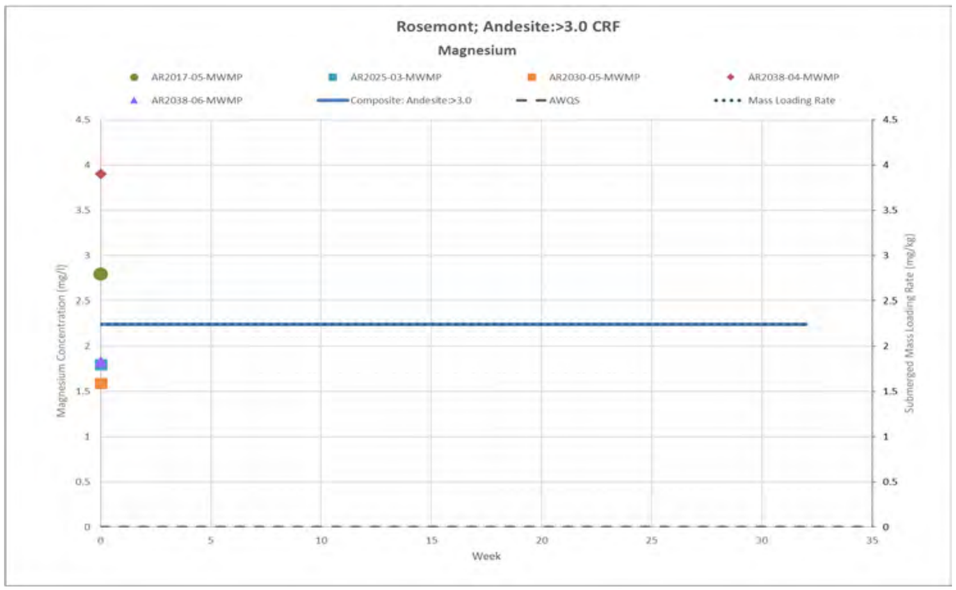


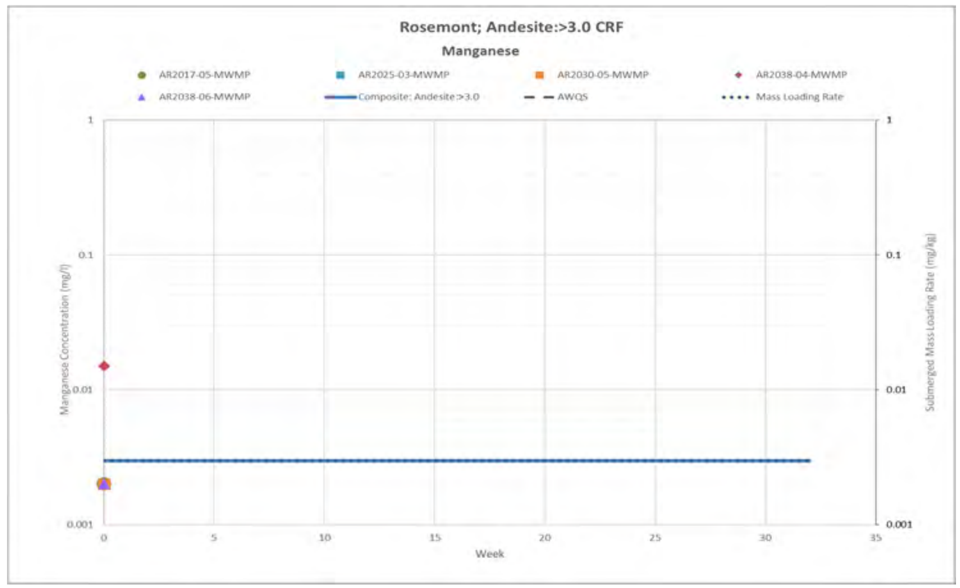


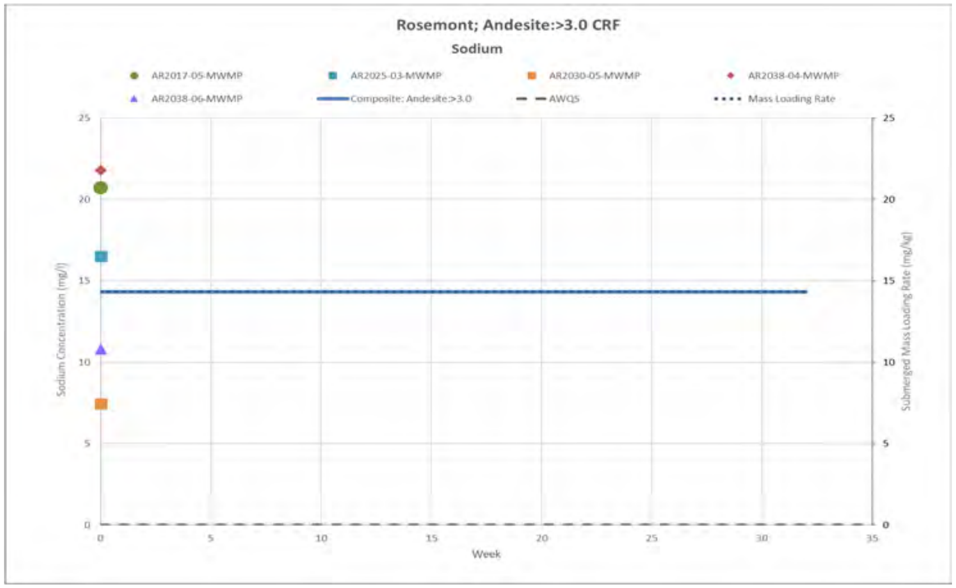
Appendix - H
Composite CRF Charts

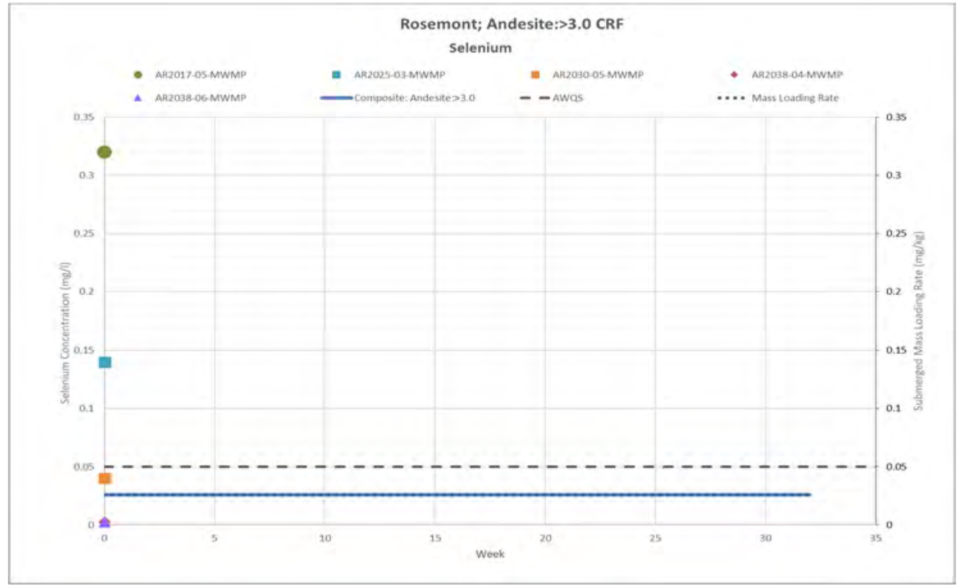


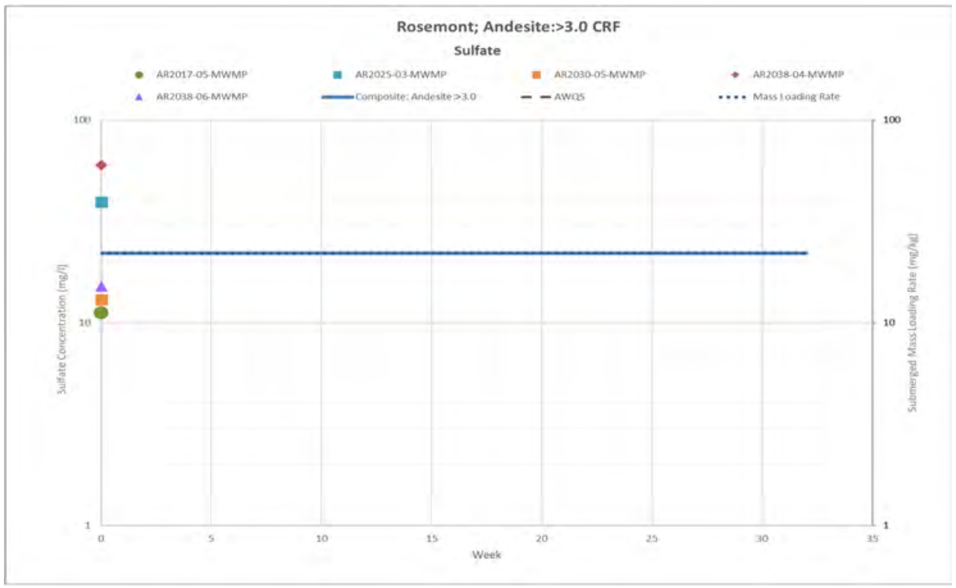


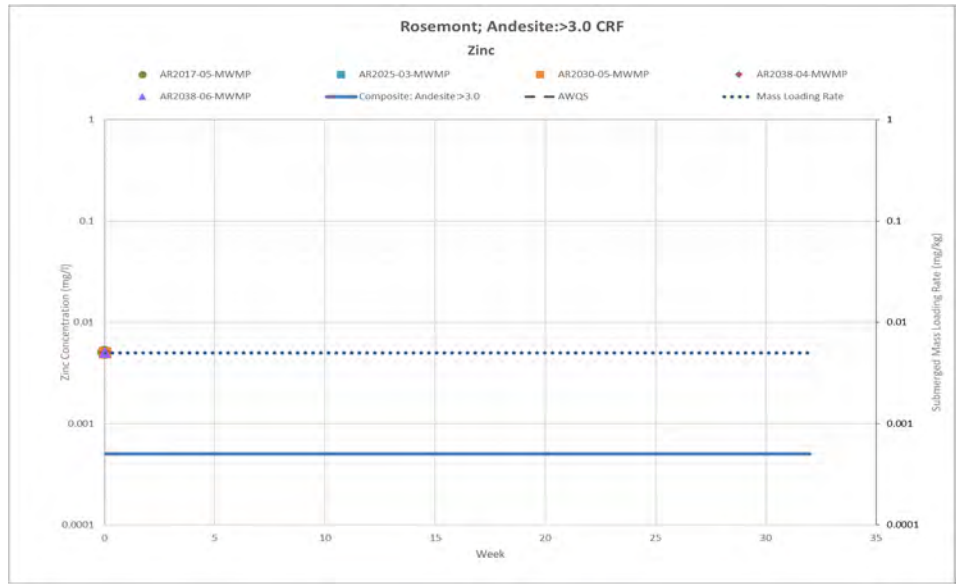


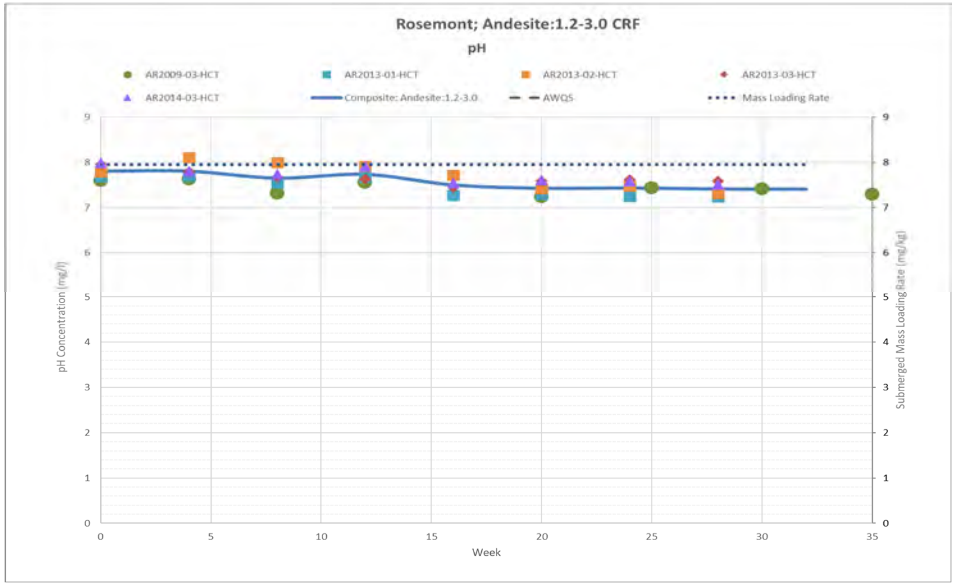


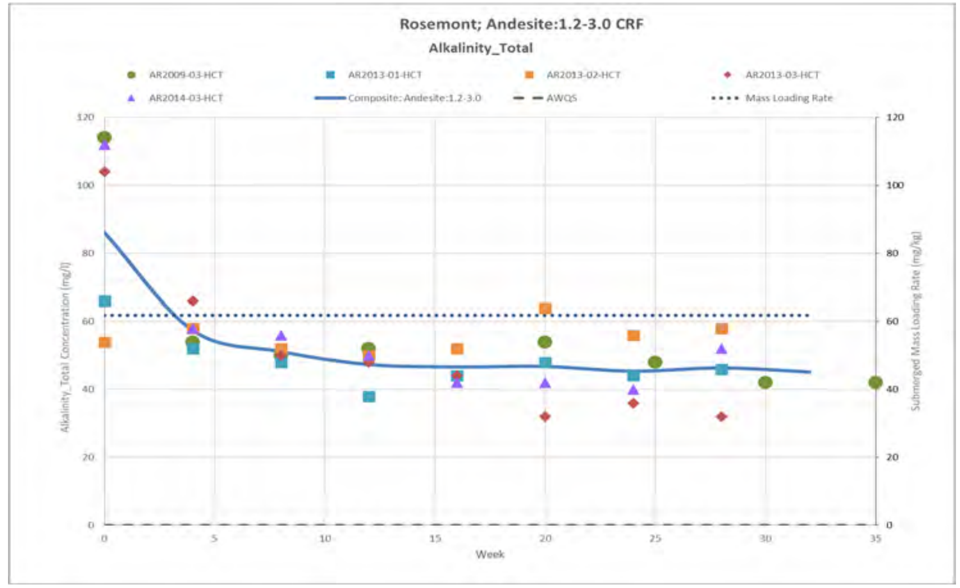

Rosemont; Andesite:>3.0 CRF
Sodium
AR2017-05-MWMP
AR2025-03-MWMP
AR2030-05-MWMP
AR2038-04-MWMP
AR2038-06-MWMP
Composite: Andesite>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

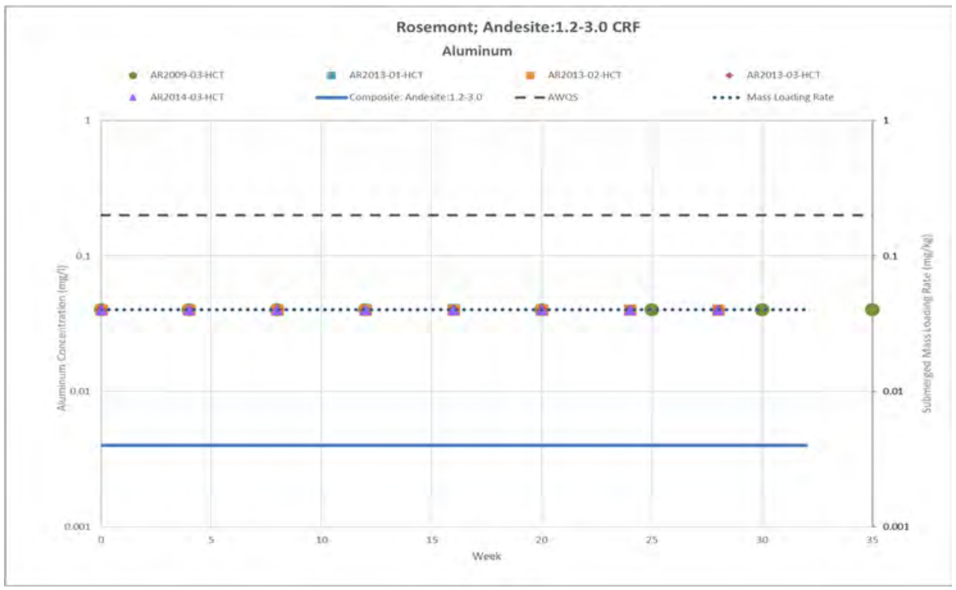

Rosemont; Andesite:>3.0 CRF
Selenium
AR2017-05-MWMP
AR2025-03-MWMP
AR2030-05-MWMP
AR2038-04-MWMP
AR2038-06-MWMP
Composite: Andesite>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

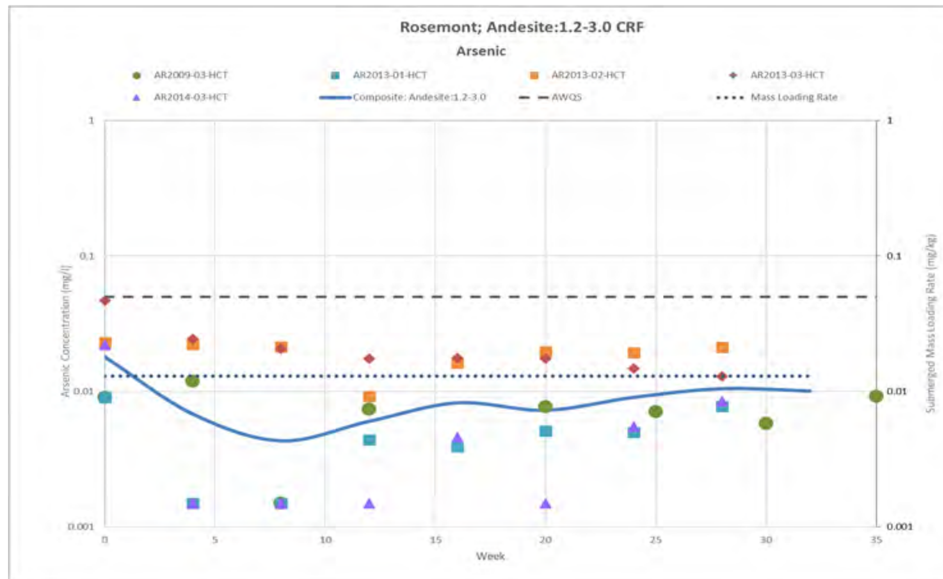

Rosemont; Andesite:>3.0 CRF
Sulfate
AR2017-05-MWMP
AR2025-03-MWMP
AR2030-05-MWMP
AR2038-04-MWMP
AR2038-06-MWMP
Composite: Andesite>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Andesite:>3.0 CRF
Zinc
AR2017-05-MWMP
AR2025-03-MWMP
AR2030-05-MWMP
AR2038-04-MWMP
AR2038-06-MWMP
Composite: Andesite>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

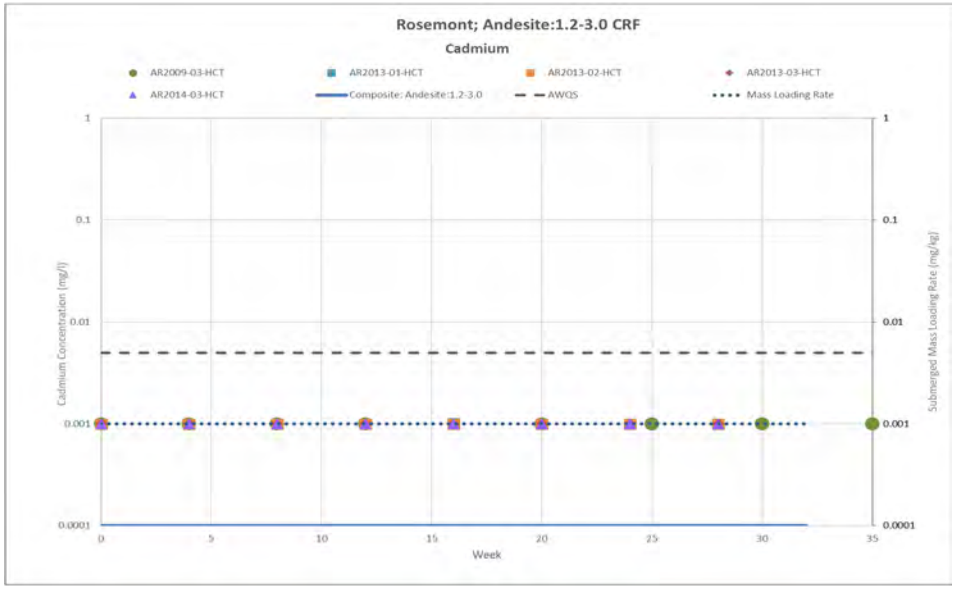

Rosemont; Andesite:1.2-3.0 CRF
pH
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

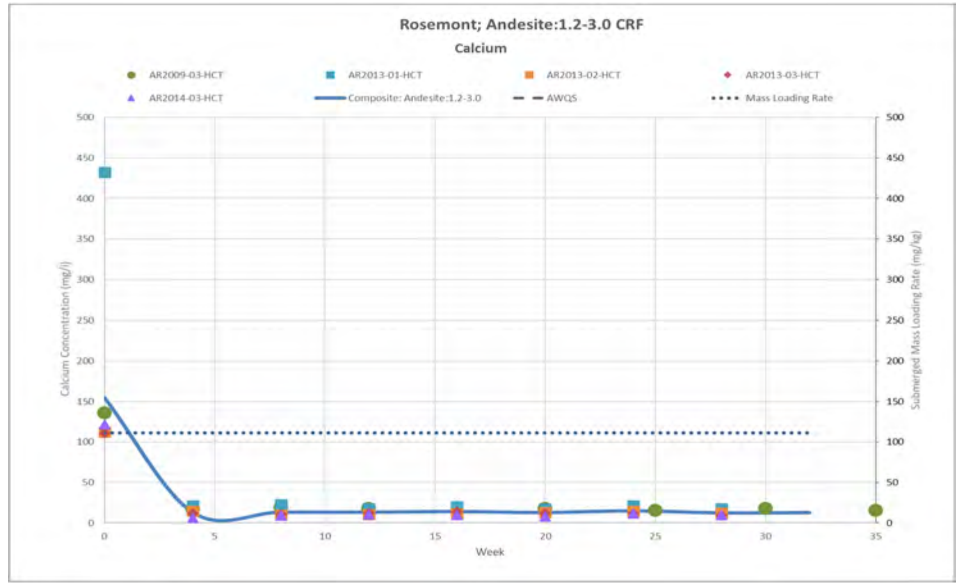

Rosemont; Andesite:1.2-3.0 CRF
Alkalinity_Total
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

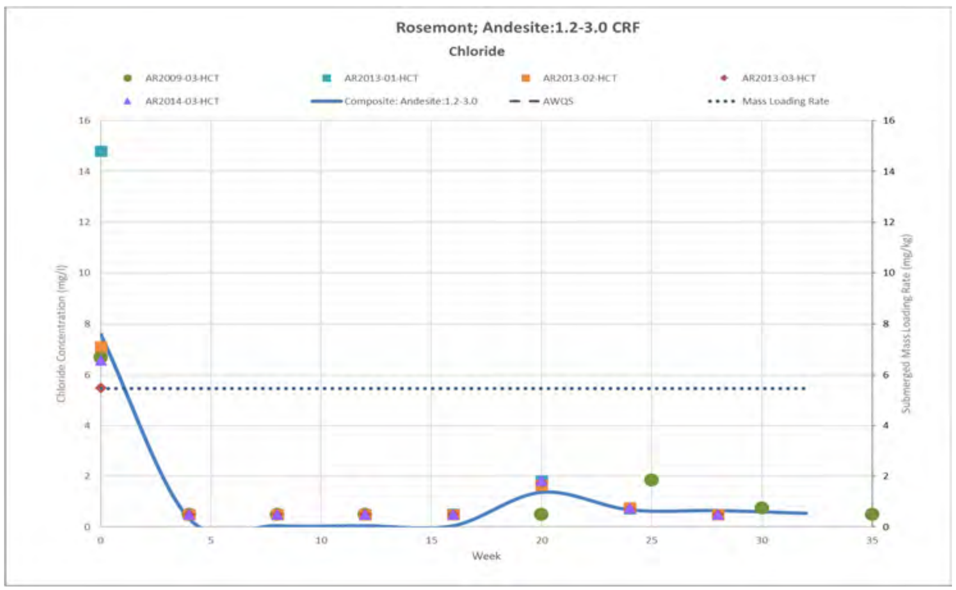

Rosemont; Andesite:1.2-3.0 CRF
Aluminum
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

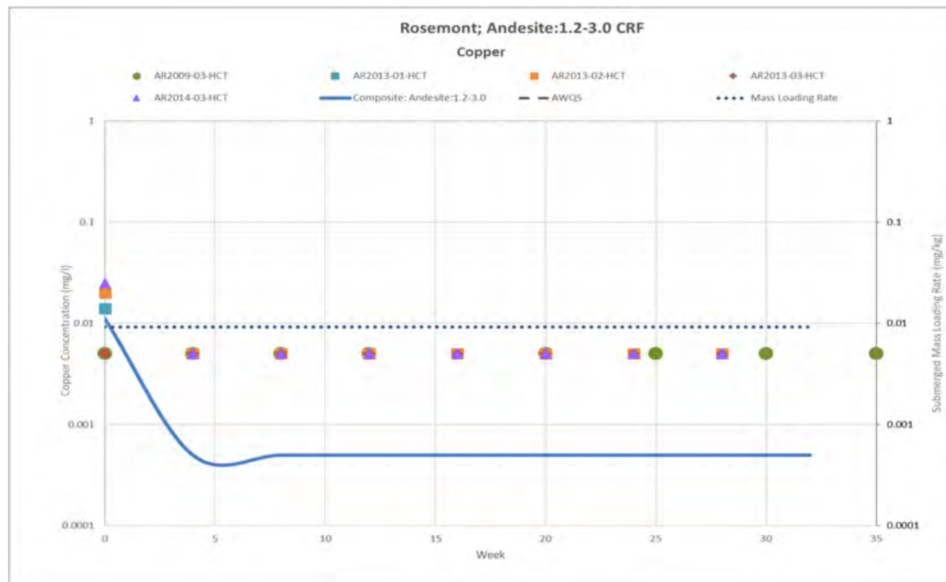

Rosemont; Andesite:1.2-3.0 CRF
Arsenic
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

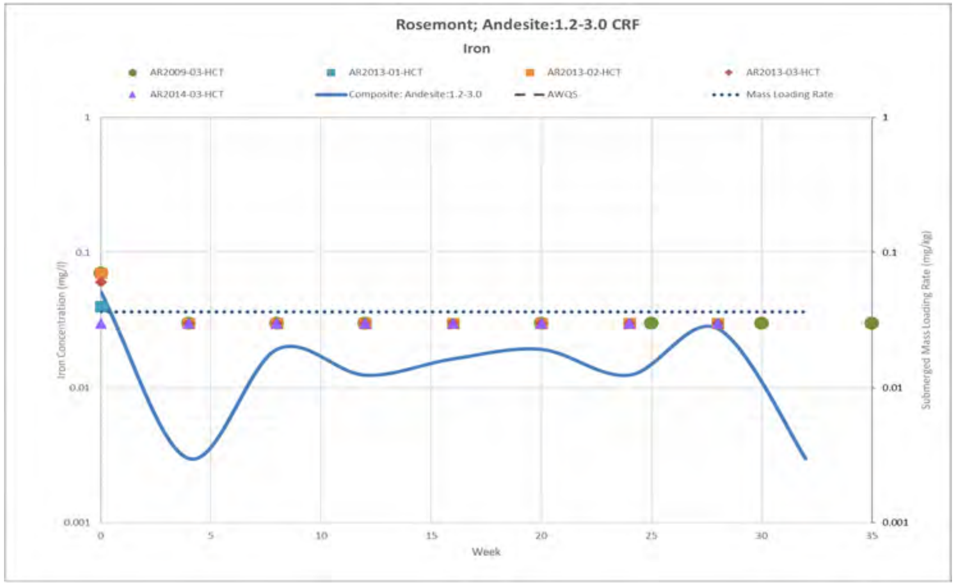


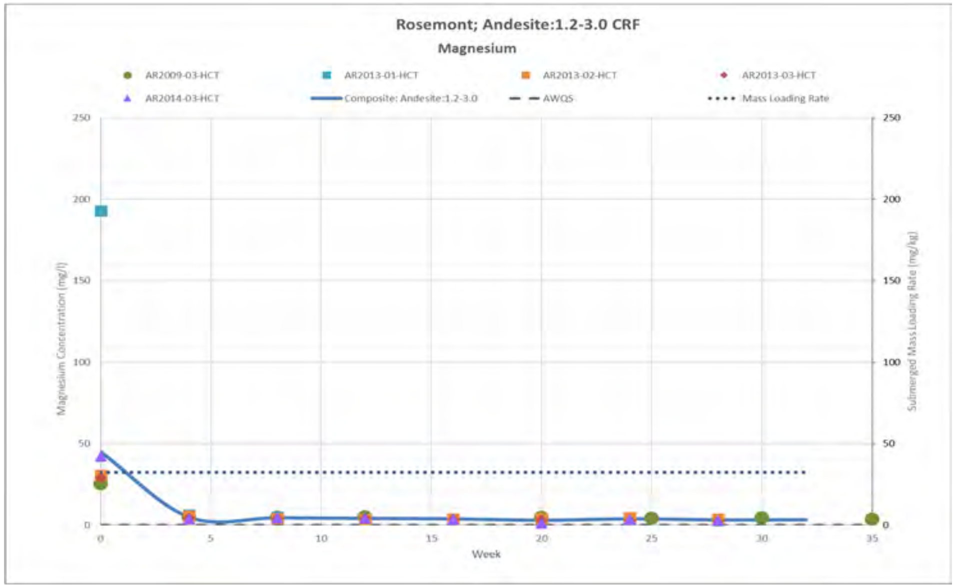


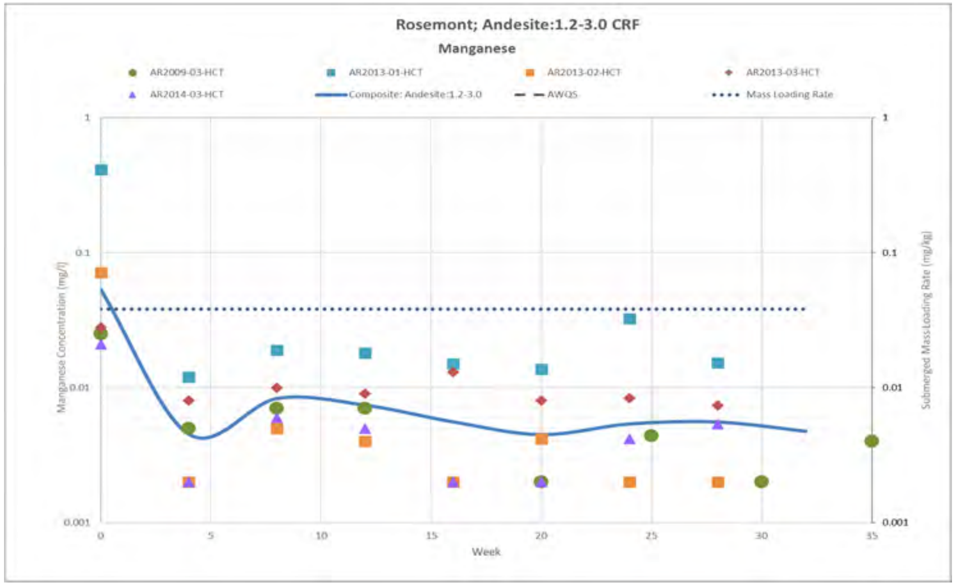


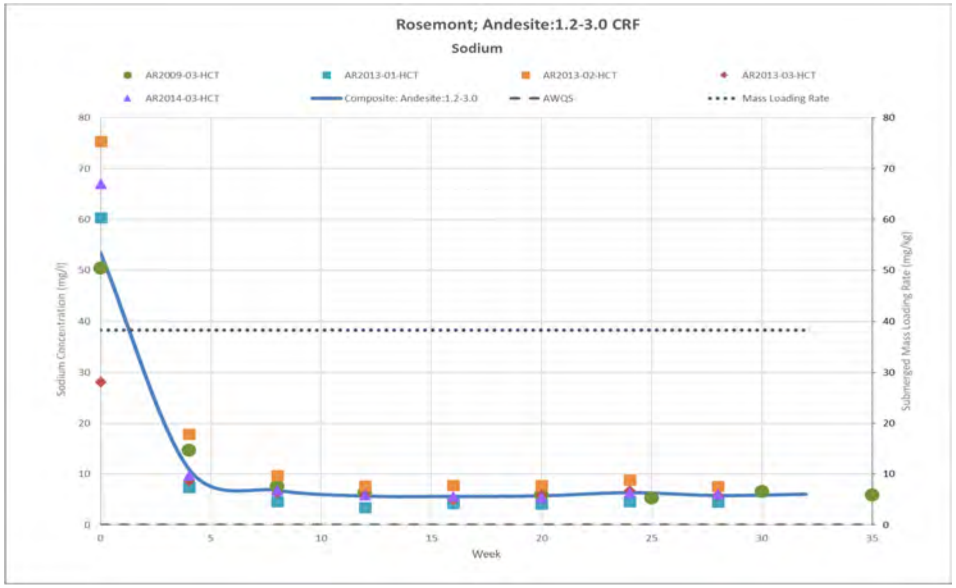


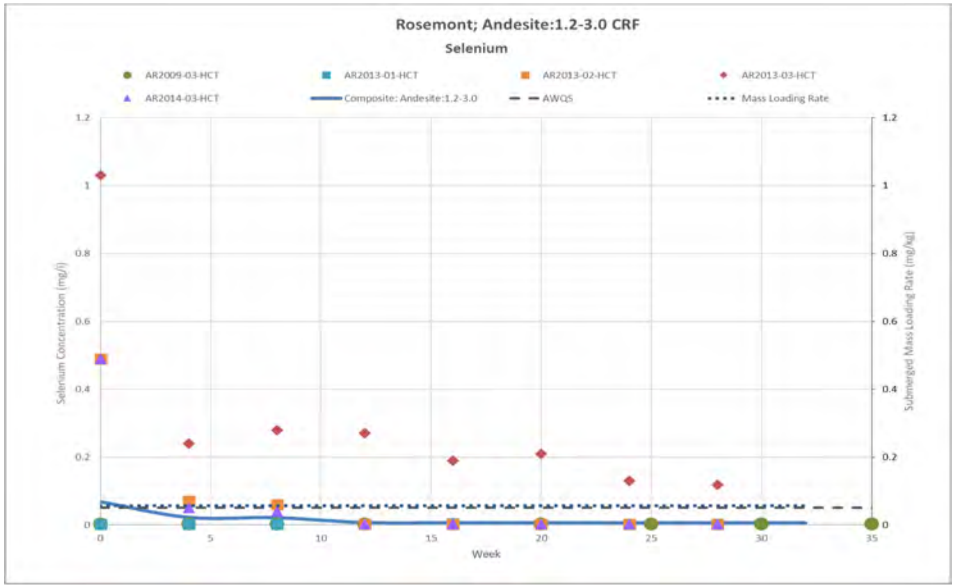

Rosemont; Andesite:1.2-3.0 CRF
Fluoride
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

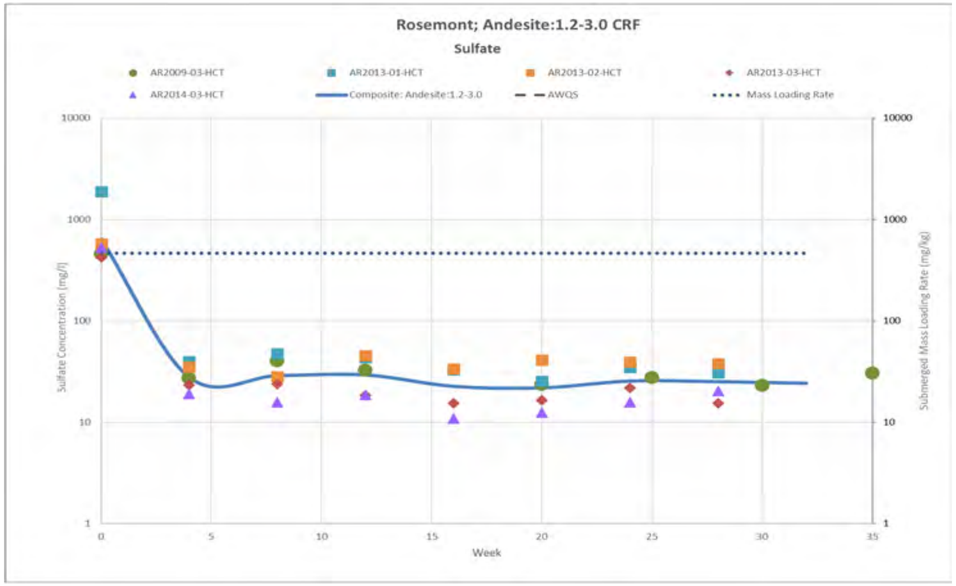

Rosemont; Andesite:1.2-3.0 CRF
Iron
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

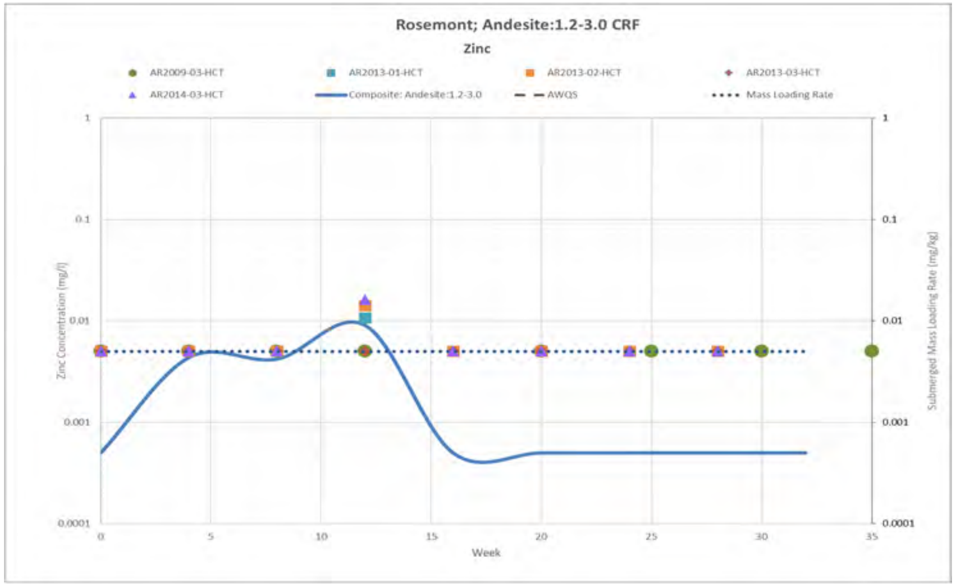

Rosemont; Andesite:1.2-3.0 CRF
Magnesium
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Andesite:1.2-3.0 CRF
Manganese
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

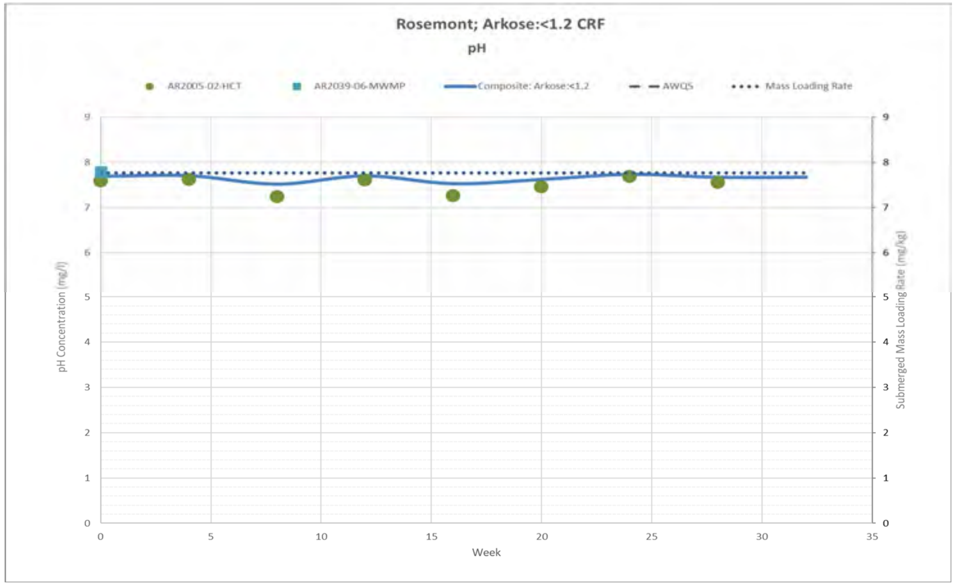

Rosemont; Andesite:1.2-3.0 CRF
Sodium
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

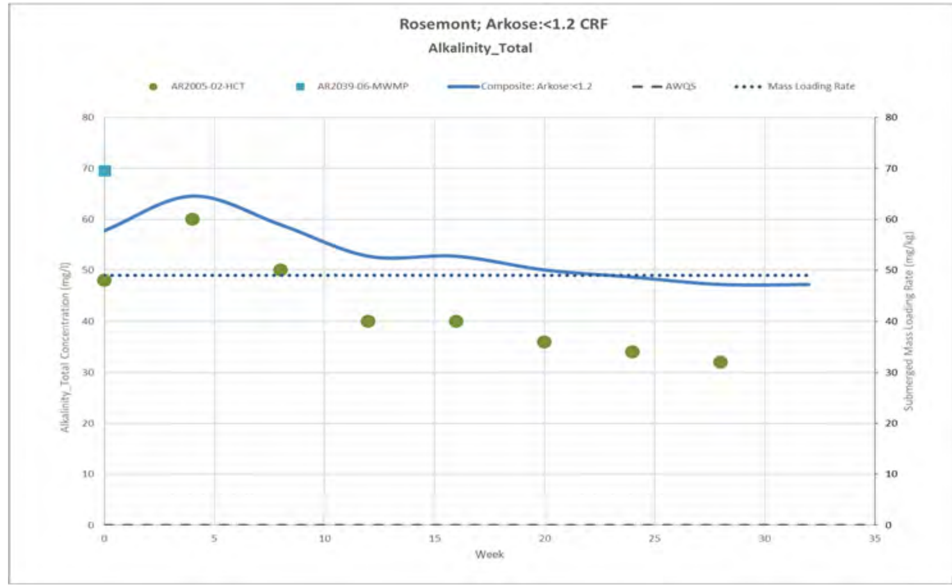

Rosemont; Andesite:1.2-3.0 CRF
Selenium
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

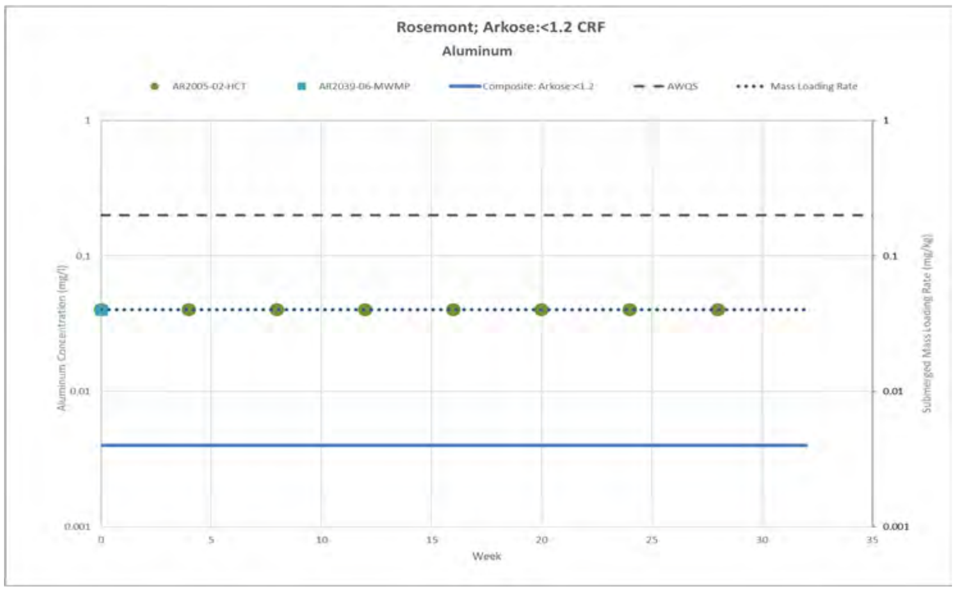

Rosemont; Andesite:1.2-3.0 CRF
Sulfate
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

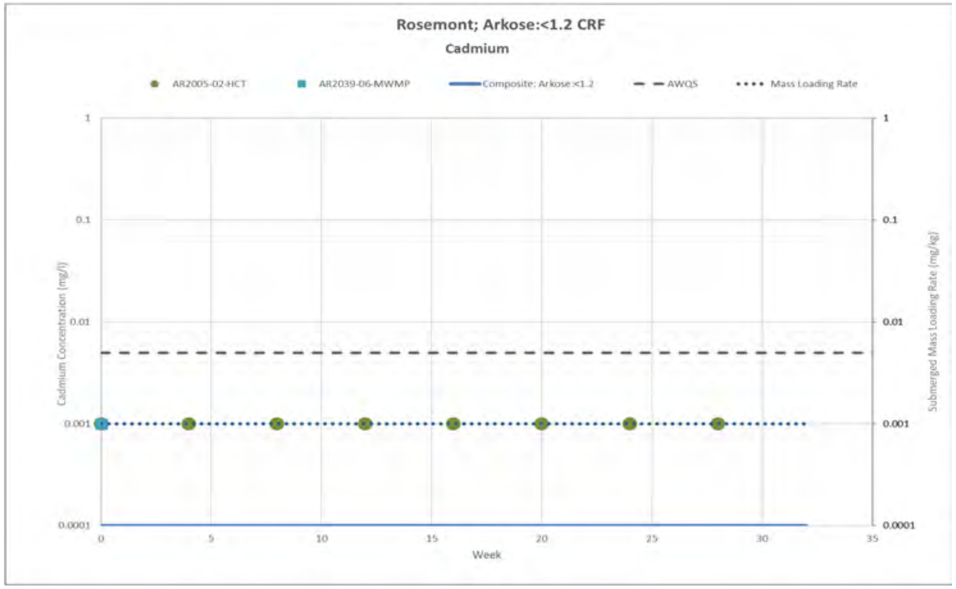

Rosemont; Andesite:1.2-3.0 CRF
Zinc
AR2009-03-HCT
AR2013-01-HCT
AR2013-02-HCT
AR2013-03-HCT
AR2014-03-HCT
Composite: Andesite:1.2-3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

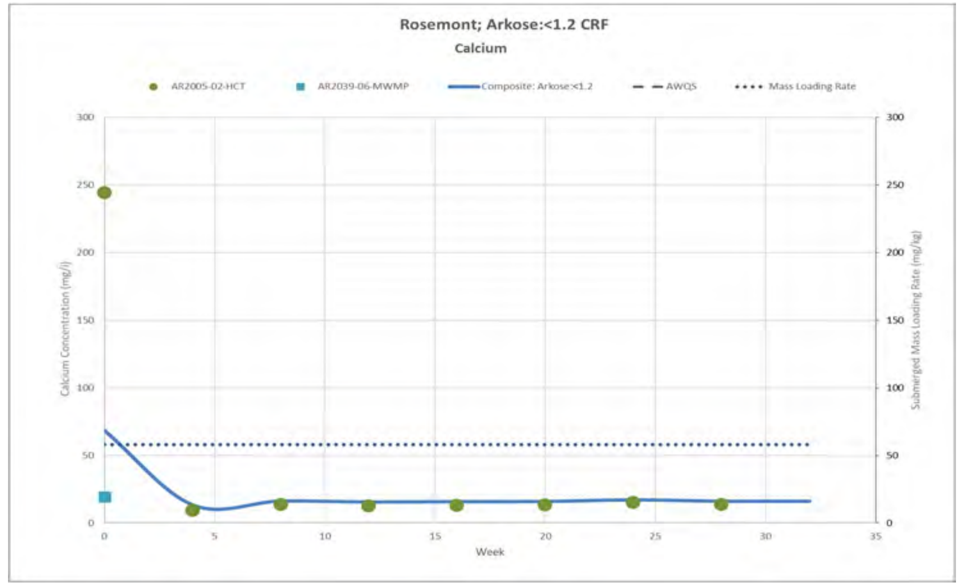
Appendix - H
Composite CRF Charts

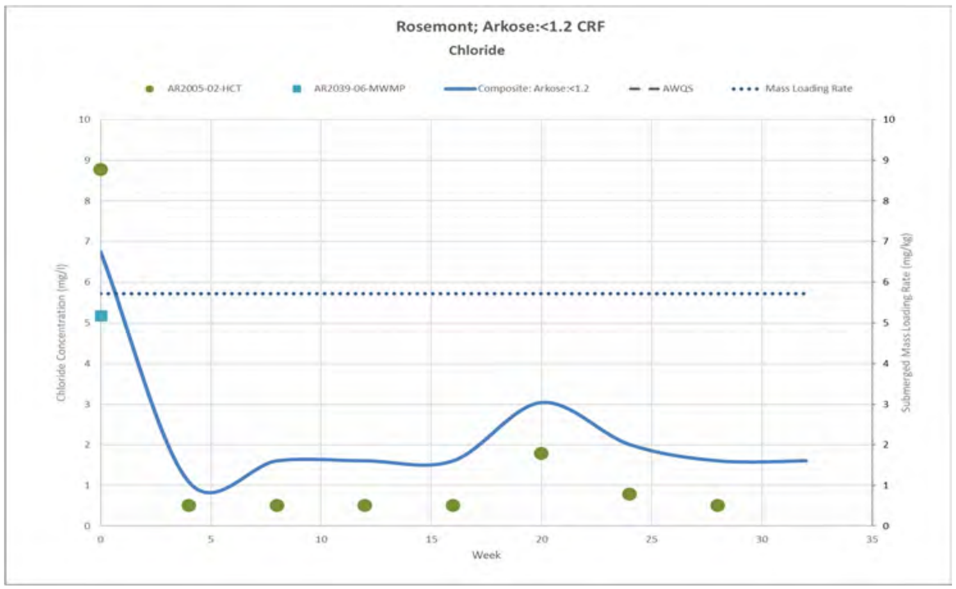


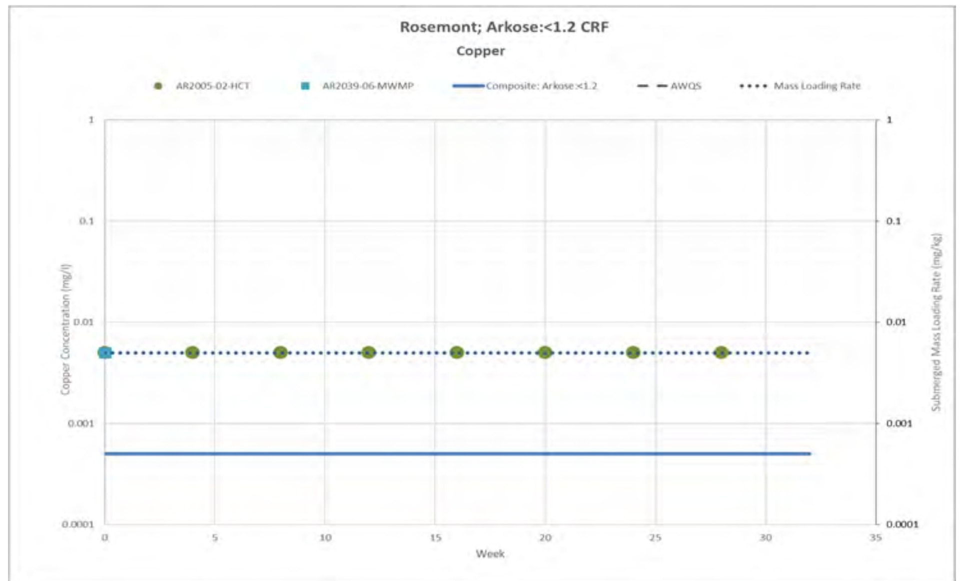


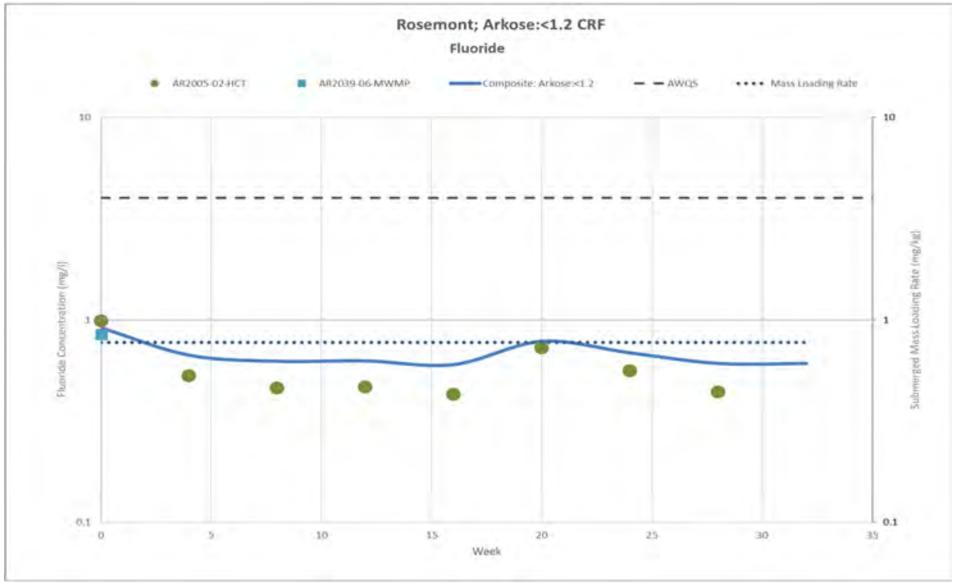


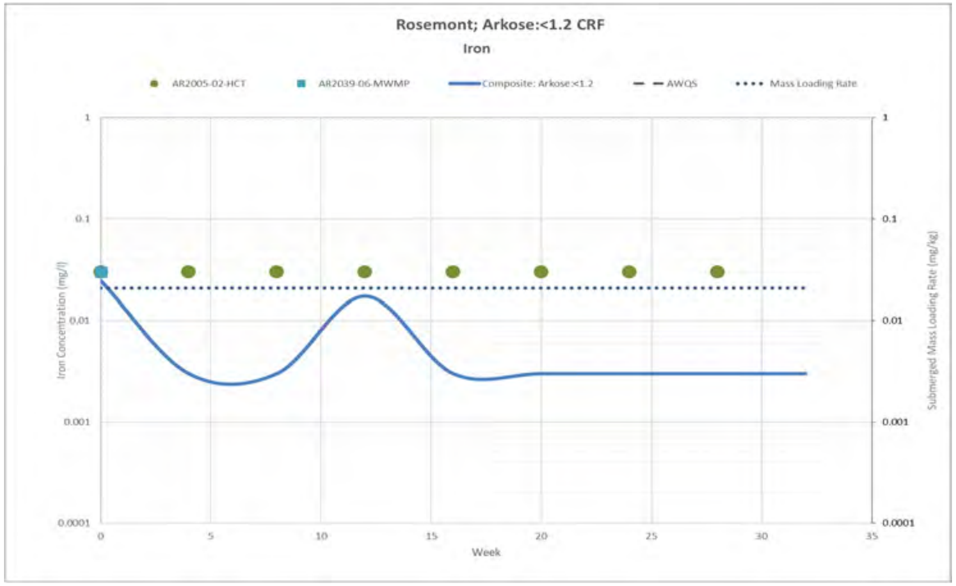

Rosemont; Arkose:<1.2 CRF
Cadmium
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose<1.2
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

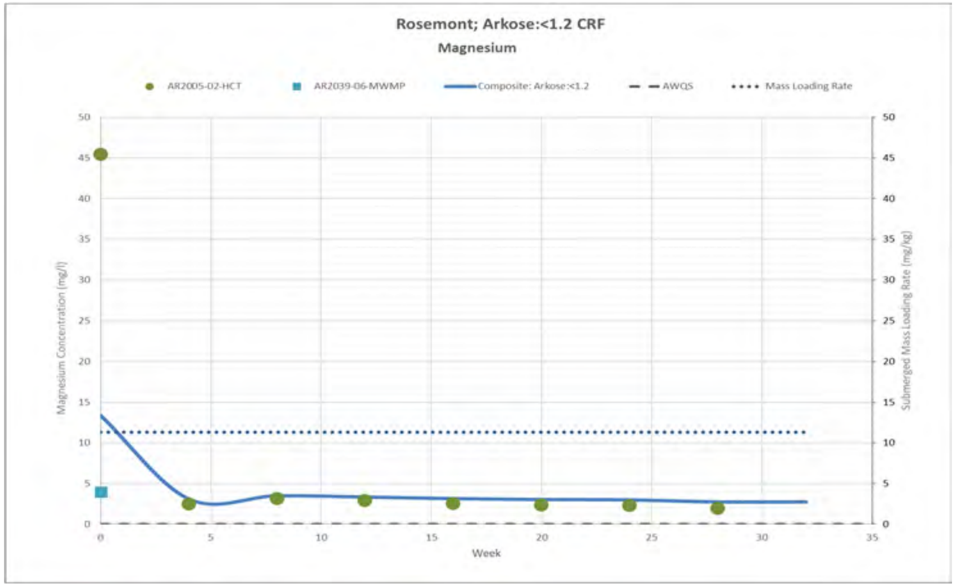

Rosemont; Arkose:<1.2 CRF
Calcium
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose<1.2
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

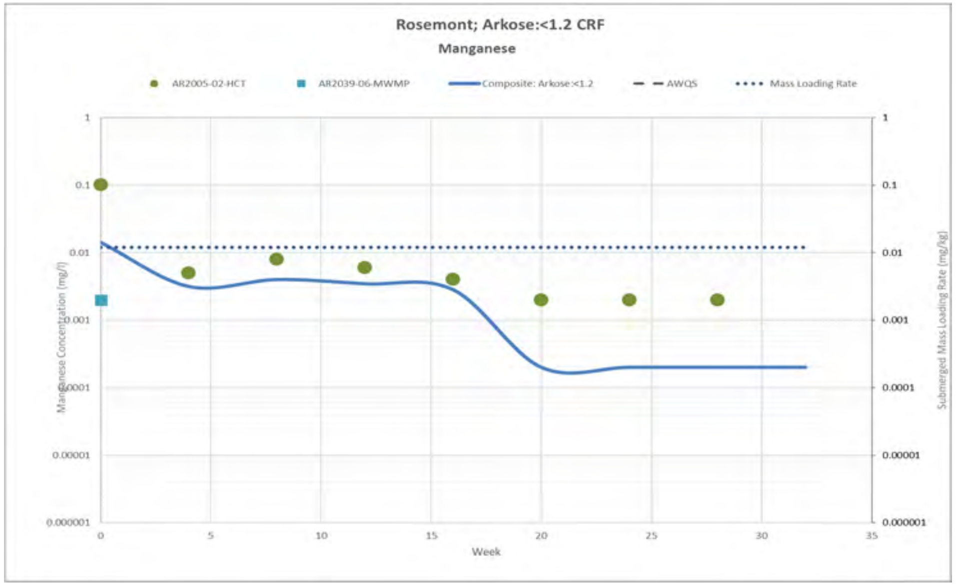

Rosemont; Arkose:<1.2 CRF
Chloride
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose<1.2
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

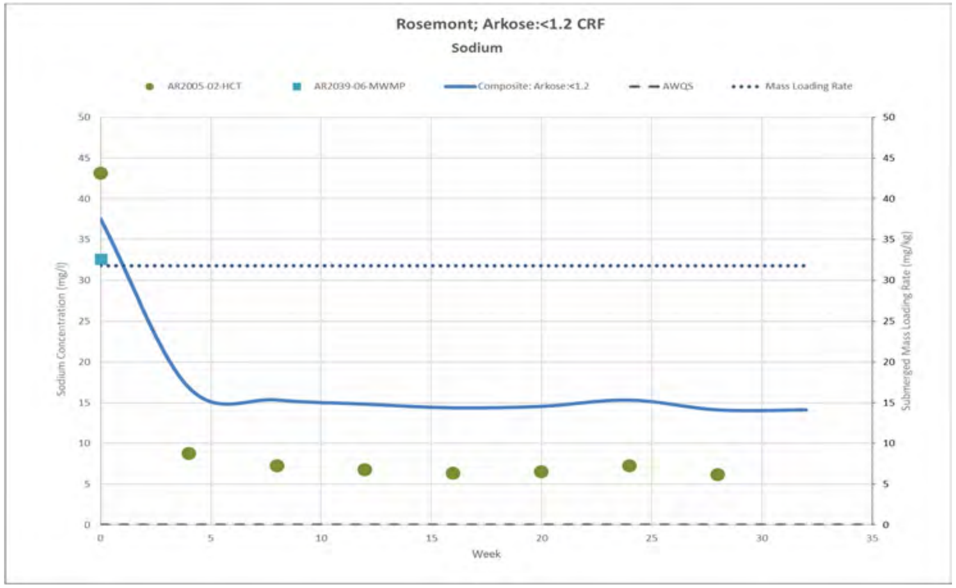

Rosemont; Arkose:<1.2 CRF
Copper
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose<1.2
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

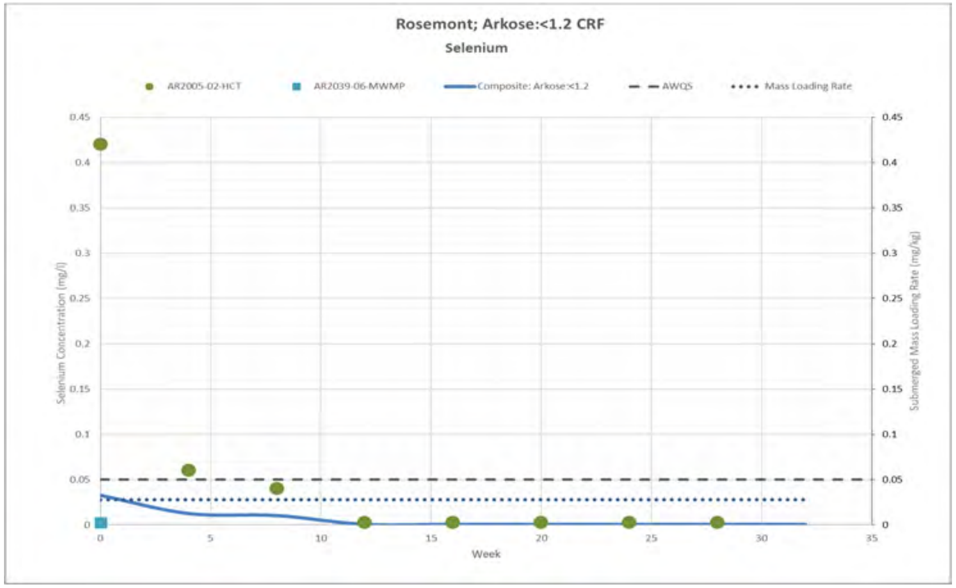

Rosemont; Arkose:<1.2 CRF
Fluoride
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose<1.2
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

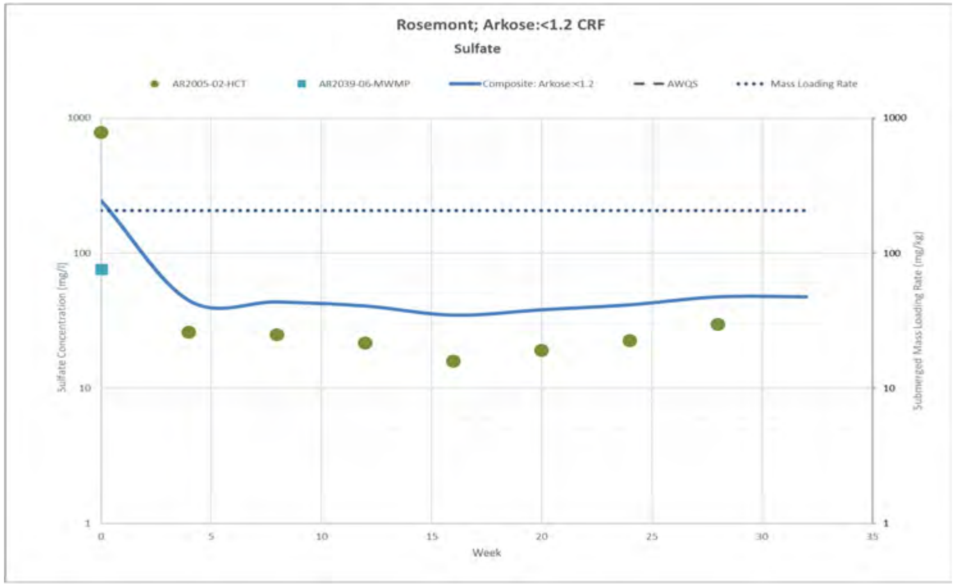

Rosemont; Arkose:<1.2 CRF
Iron
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose<1.2
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

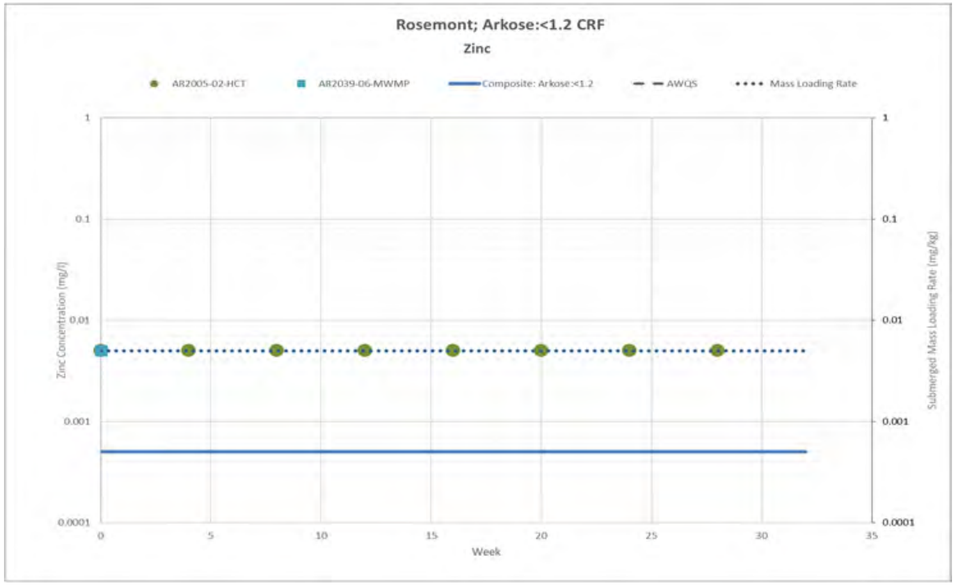

Rosemont; Arkose:<1.2 CRF
Magnesium
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose<1.2
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

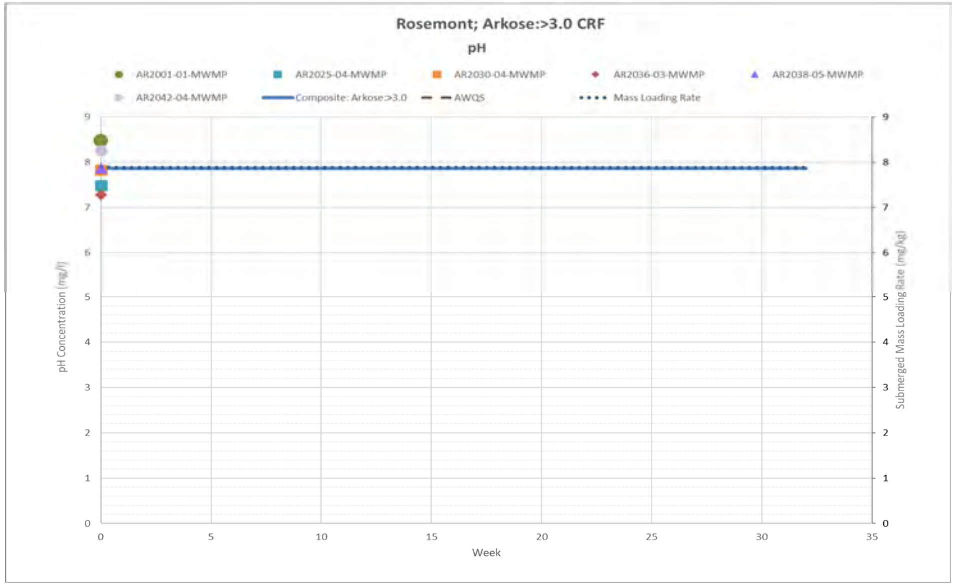

Rosemont; Arkose:<1.2 CRF
Manganese
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose<1.2
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

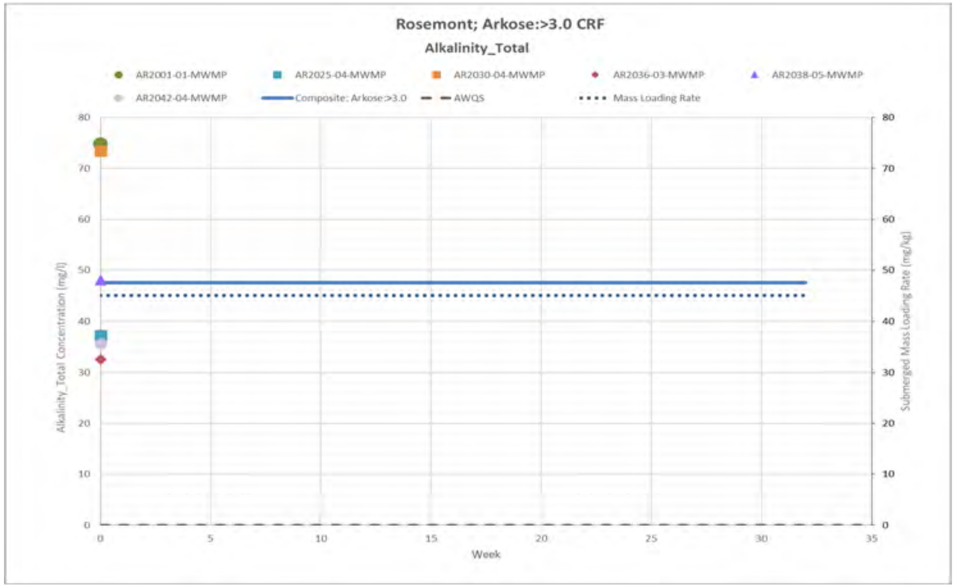

Rosemont; Arkose:<1.2 CRF
Sodium
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose:<1.2
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

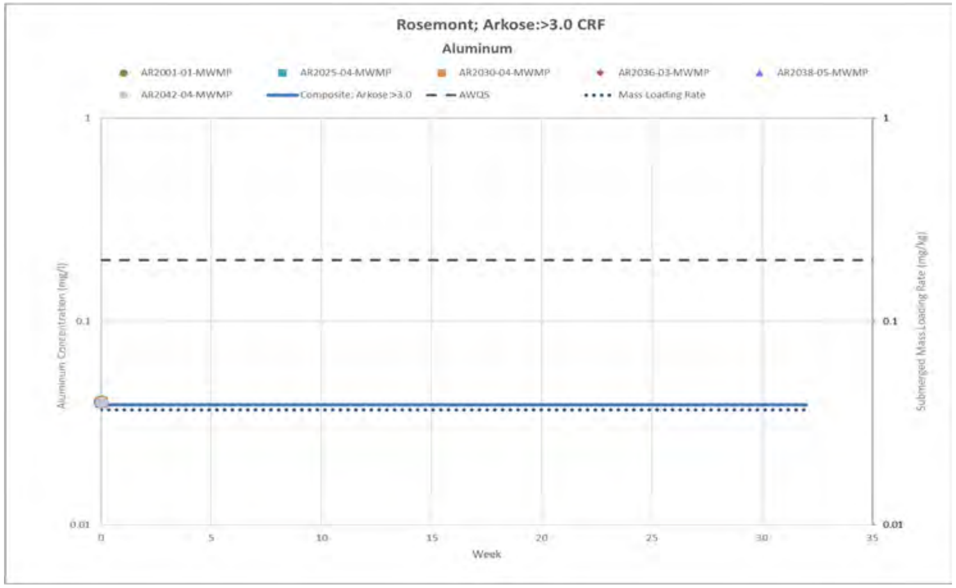

Rosemont; Arkose:<1.2 CRF
Selenium
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose:<1.2
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

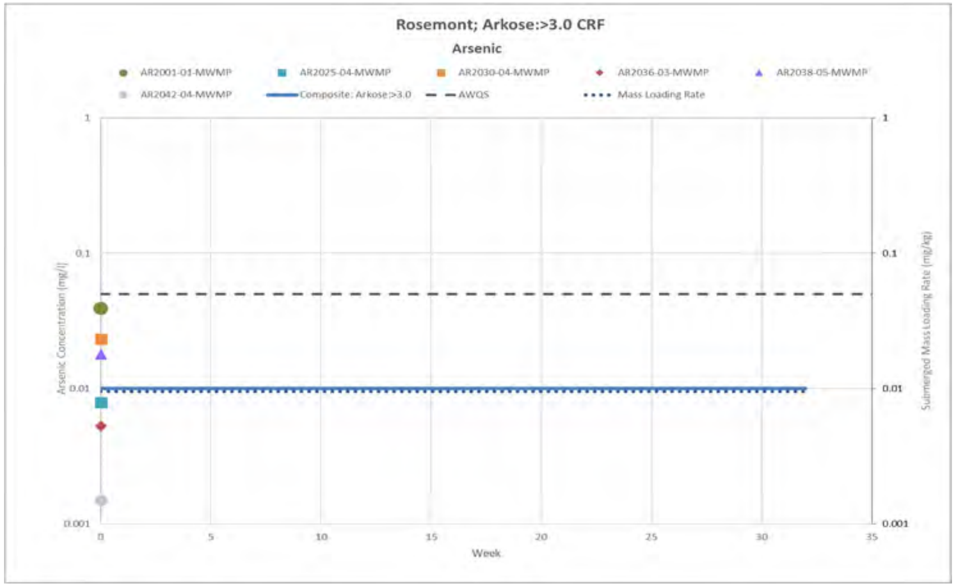

Rosemont; Arkose:<1.2 CRF
Sulfate
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose:<1.2
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

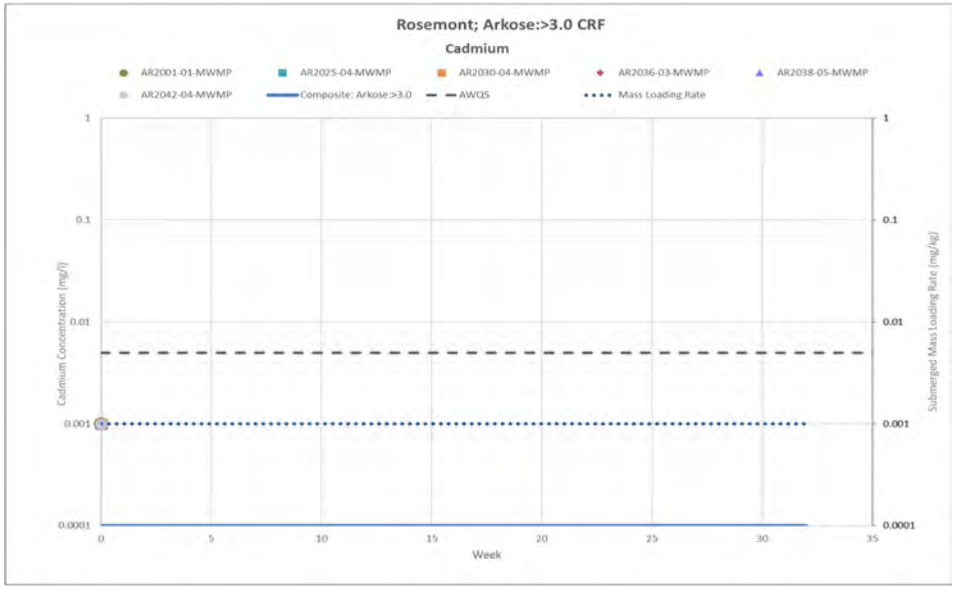

Rosemont; Arkose:<1.2 CRF
Zinc
AR2005-02-HCT
AR2039-06-MWMP
Composite: Arkose:<1.2
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

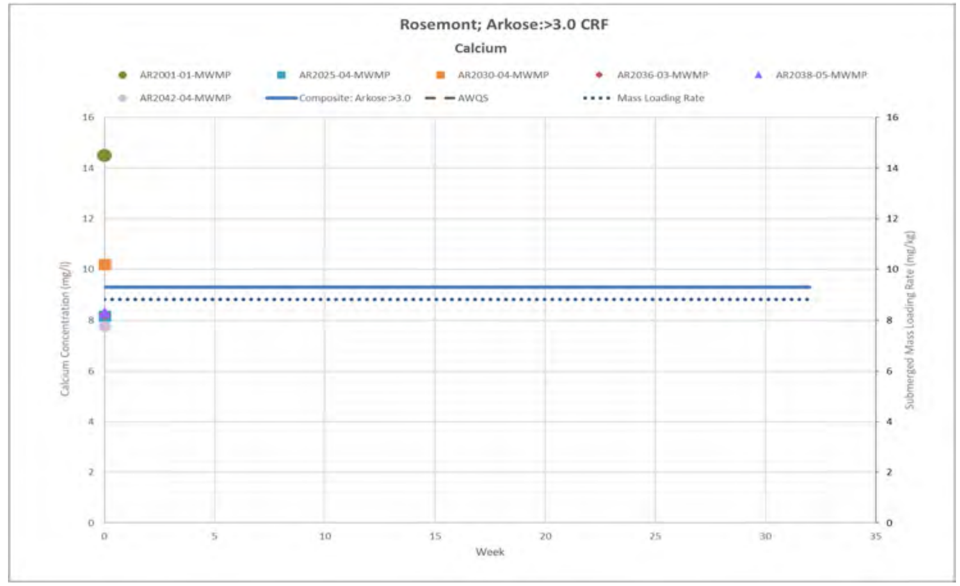

Rosemont; Arkose:>3.0 CRF
pH
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

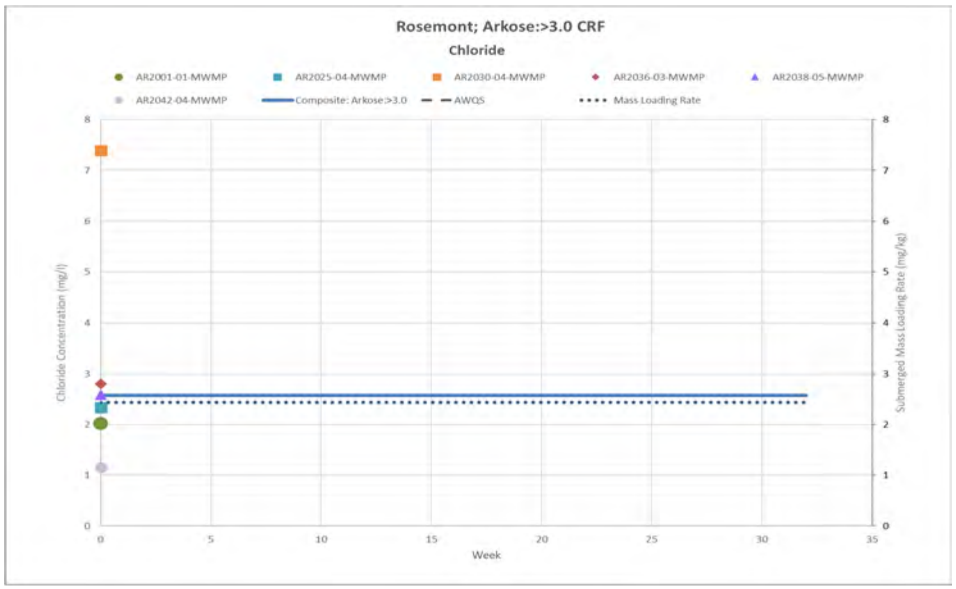

Rosemont; Arkose:>3.0 CRF
Alkalinity_Total
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

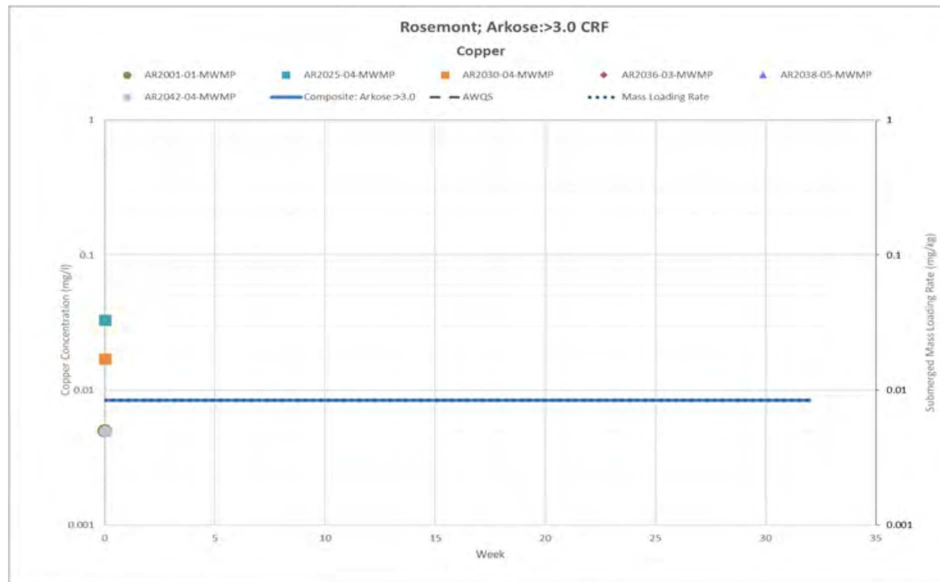

Rosemont; Arkose:>3.0 CRF
Aluminum
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

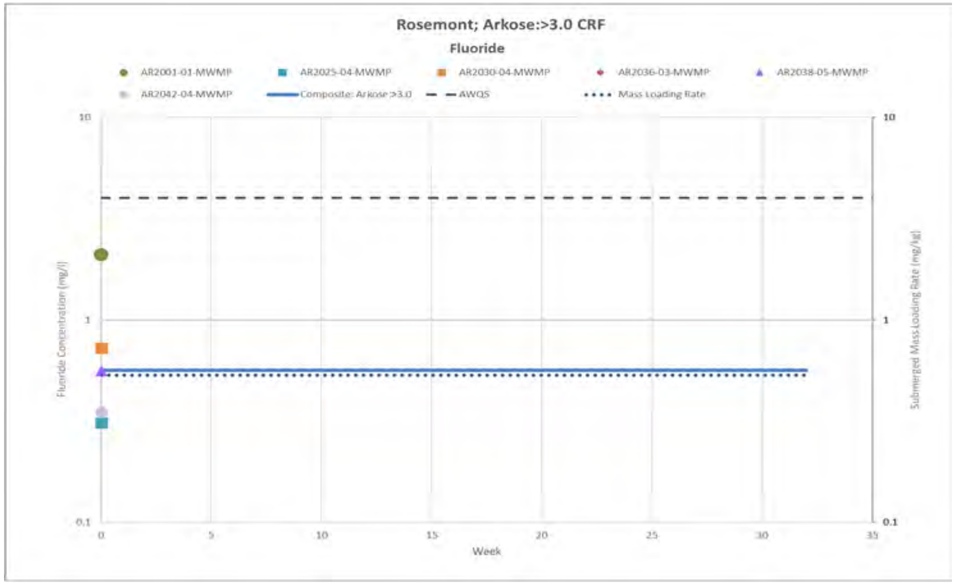

Rosemont; Arkose:>3.0 CRF
Arsenic
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

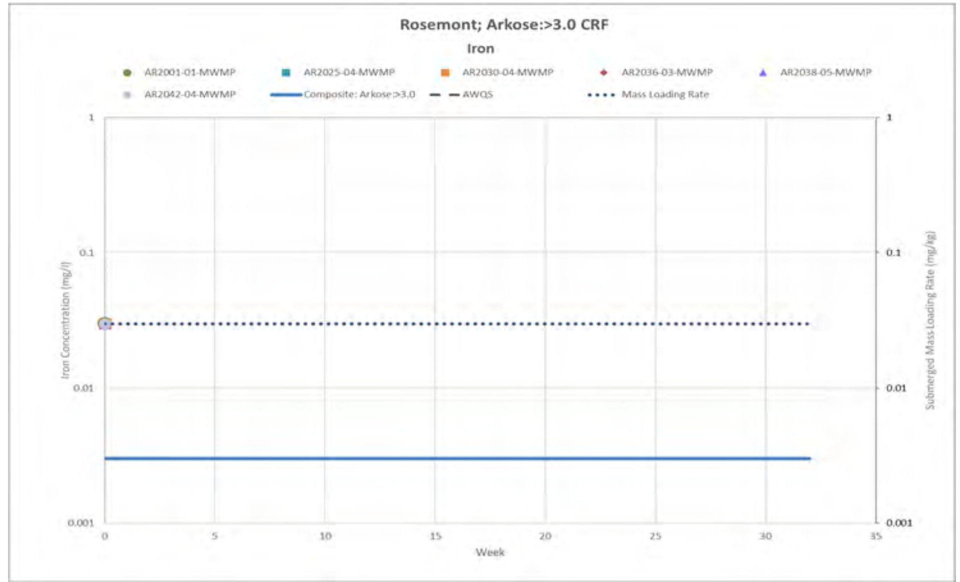

Rosemont; Arkose:>3.0 CRF
Cadmium
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

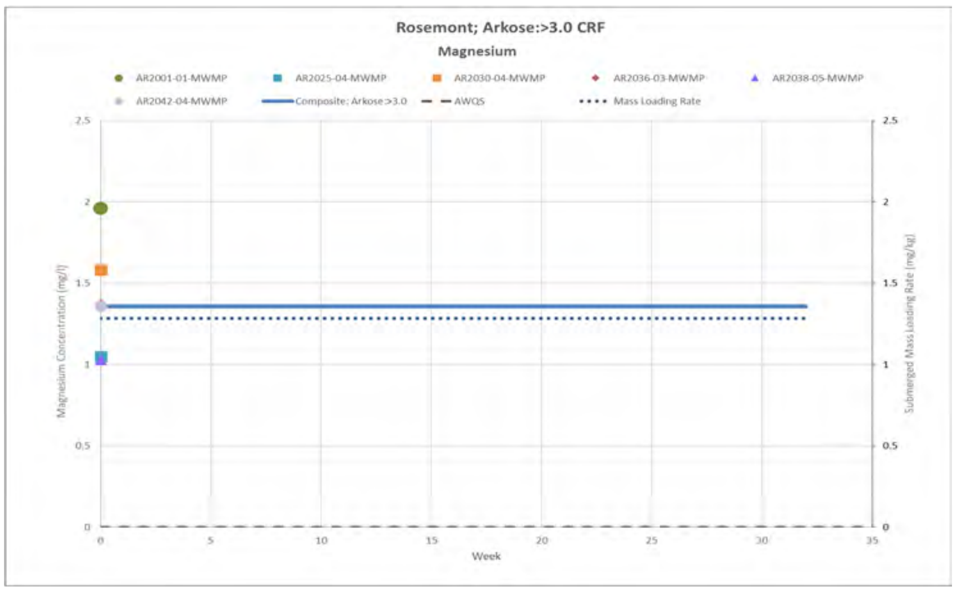

Rosemont; Arkose:>3.0 CRF
Calcium
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

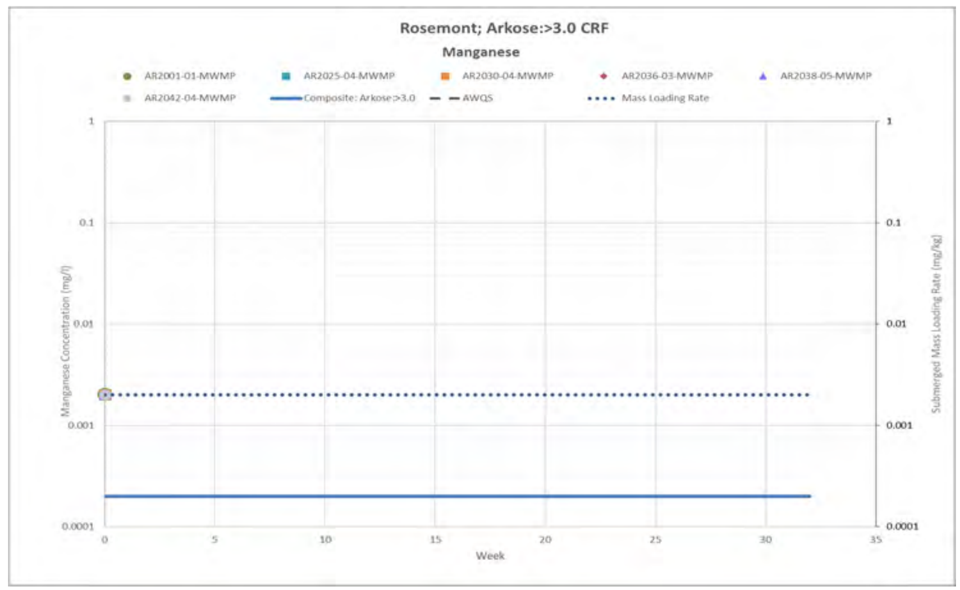

Rosemont; Arkose:>3.0 CRF
Chloride
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

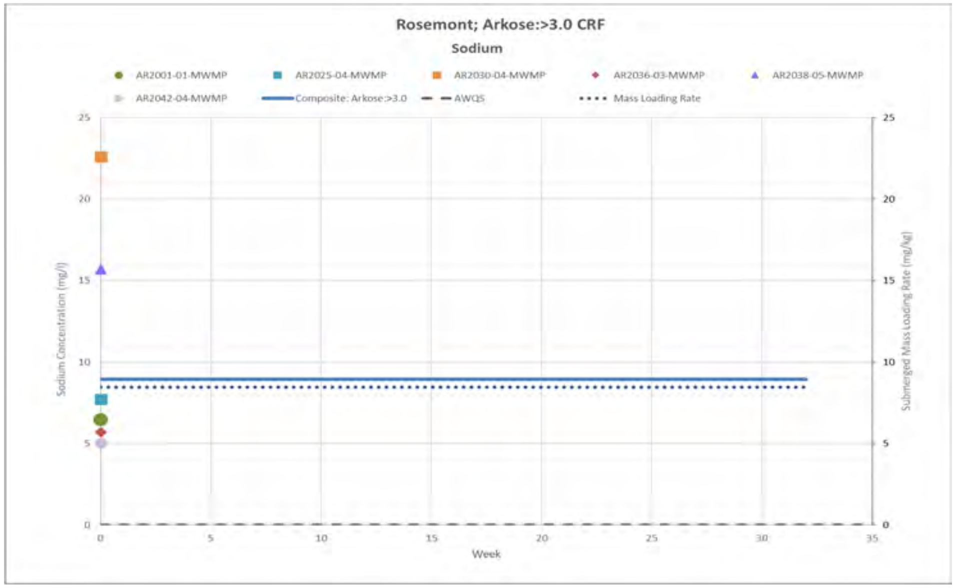

Rosemont; Arkose:>3.0 CRF
Copper
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

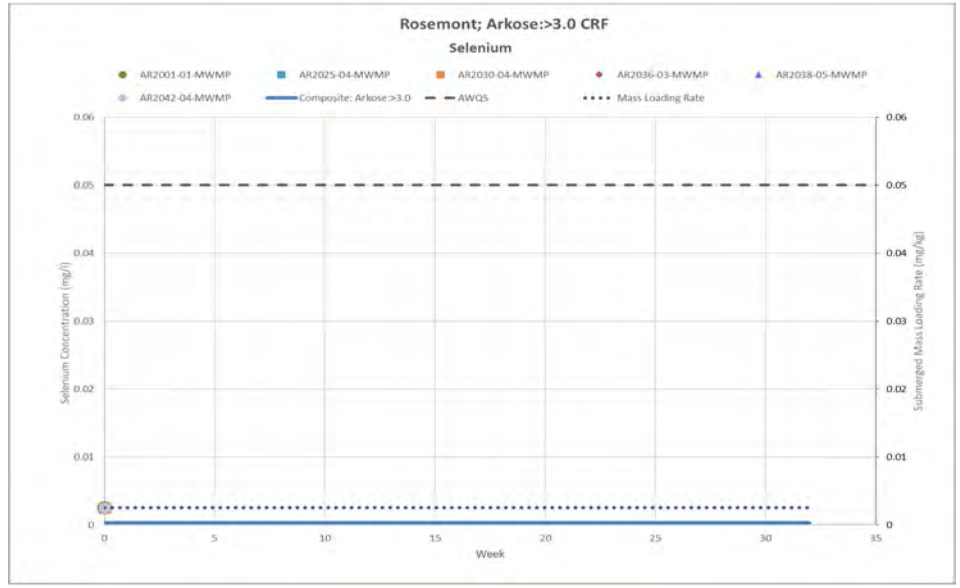

Rosemont; Arkose:>3.0 CRF
Fluoride
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose>3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

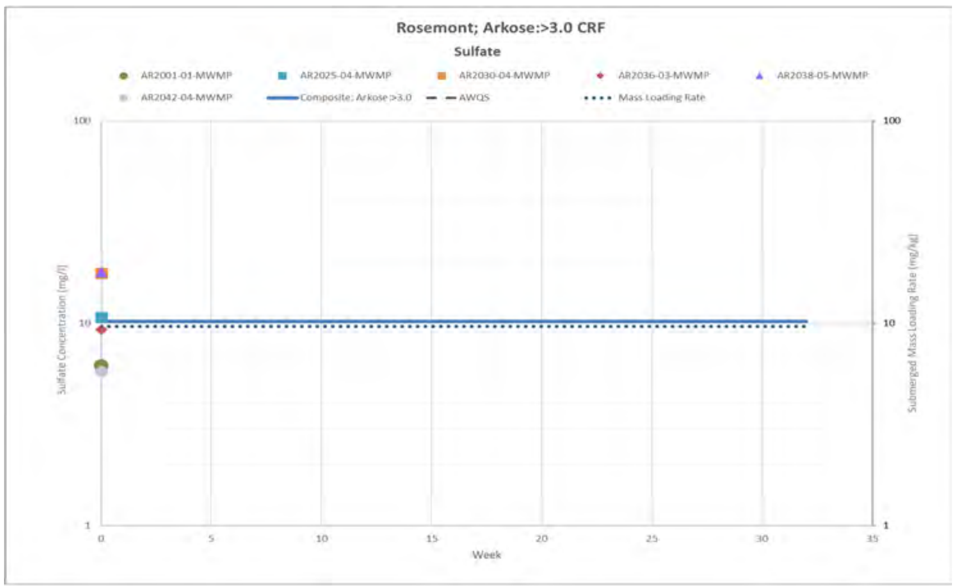

Rosemont; Arkose:>3.0 CRF
Iron
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose>3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

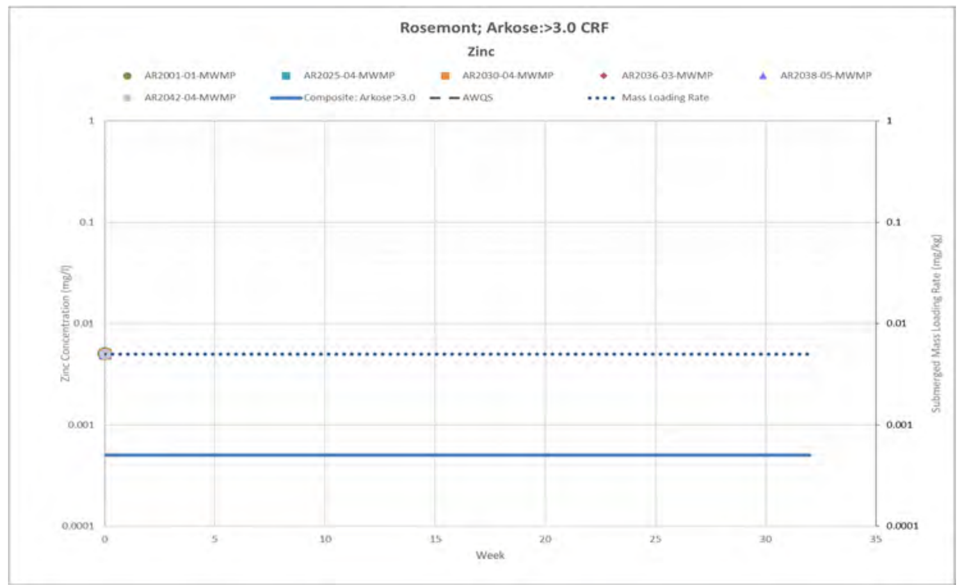

Rosemont; Arkose:>3.0 CRF
Magnesium
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose>3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

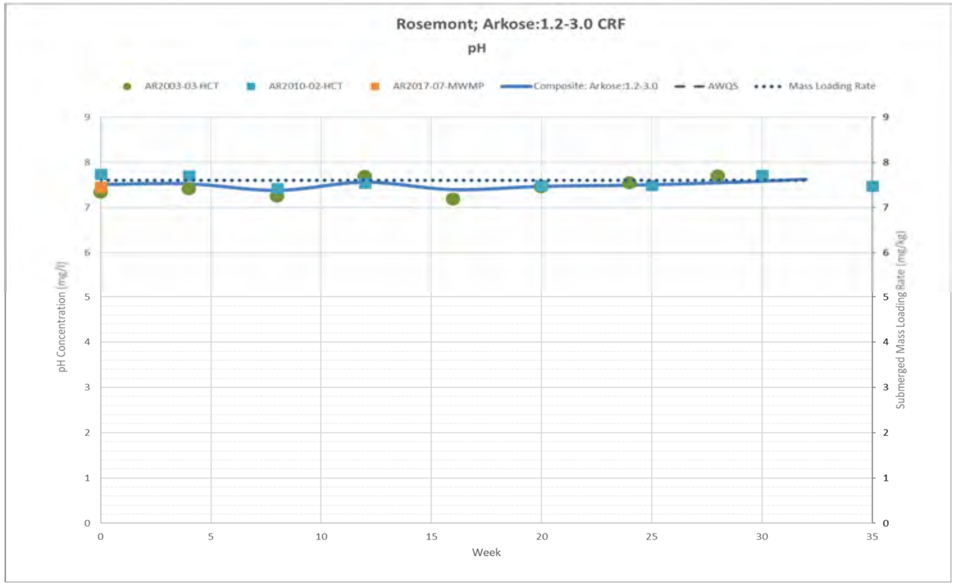

Rosemont; Arkose:>3.0 CRF
Manganese
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose>3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

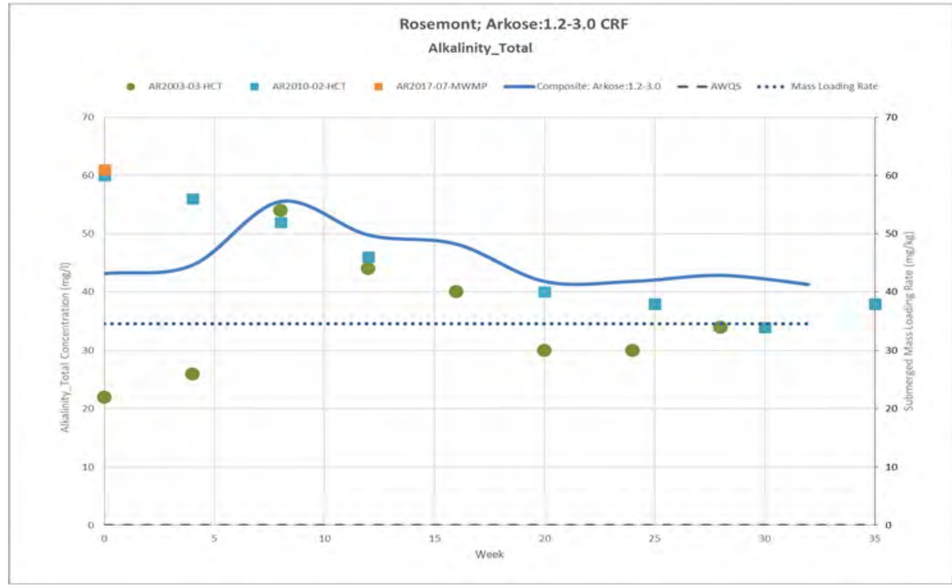

Rosemont; Arkose:>3.0 CRF
Sodium
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

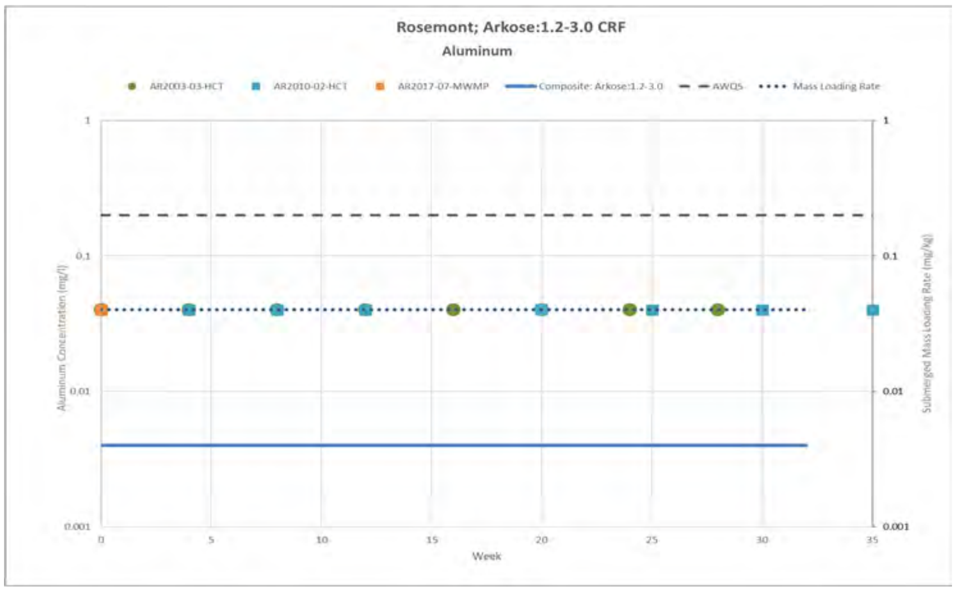

Rosemont; Arkose:>3.0 CRF
Selenium
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

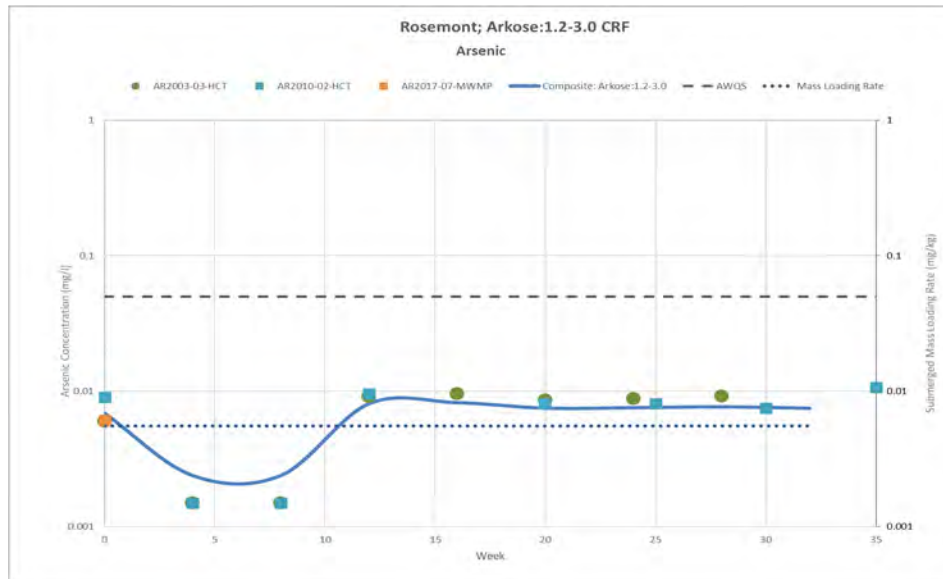

Rosemont; Arkose:>3.0 CRF
Sulfate
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

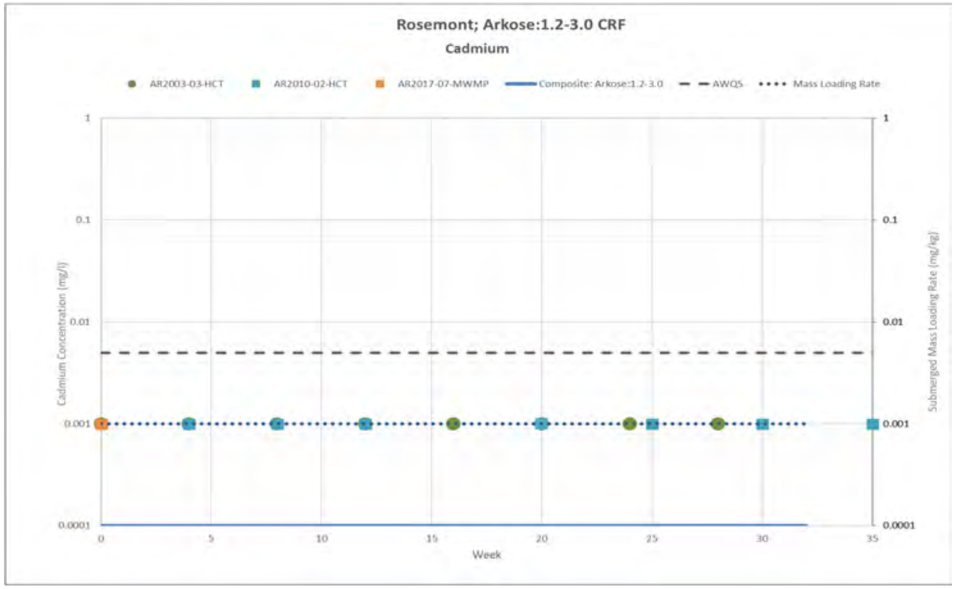

Rosemont; Arkose:>3.0 CRF
Zinc
AR2001-01-MWMP
AR2025-04-MWMP
AR2030-04-MWMP
AR2036-03-MWMP
AR2038-05-MWMP
AR2042-04-MWMP
Composite: Arkose:>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

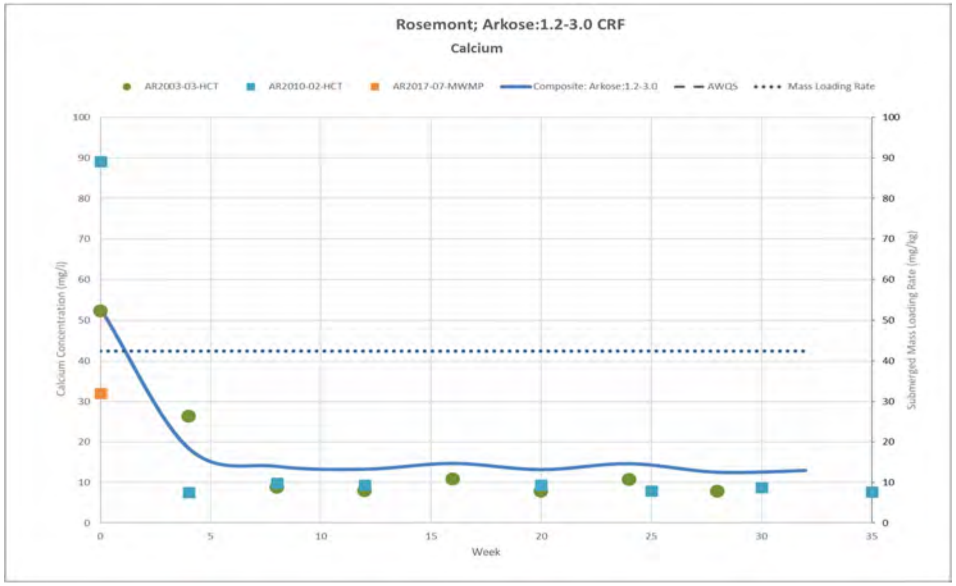

Rosemont; Arkose:1.2-3.0 CRF
pH
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

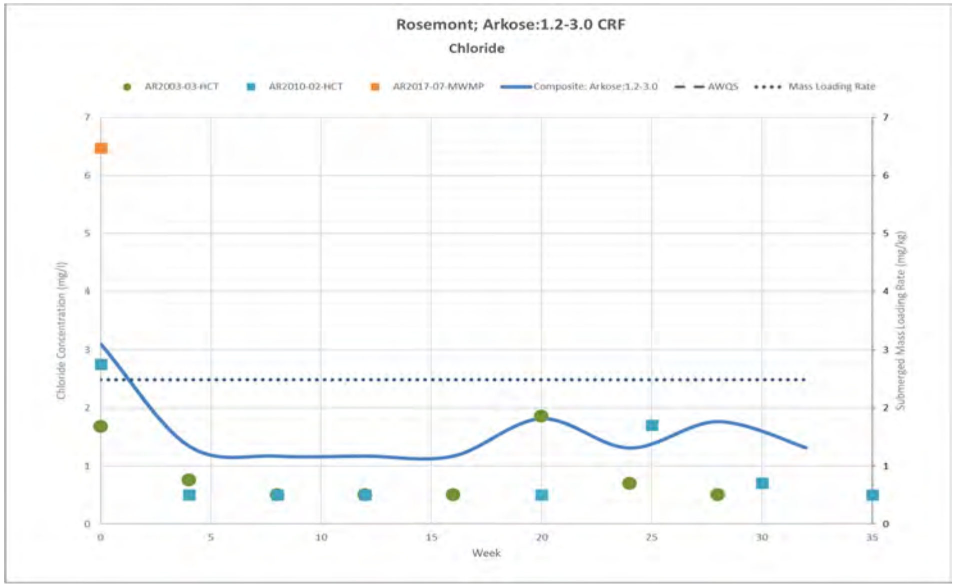

Rosemont; Arkose:1.2-3.0 CRF
Alkalinity_Total
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

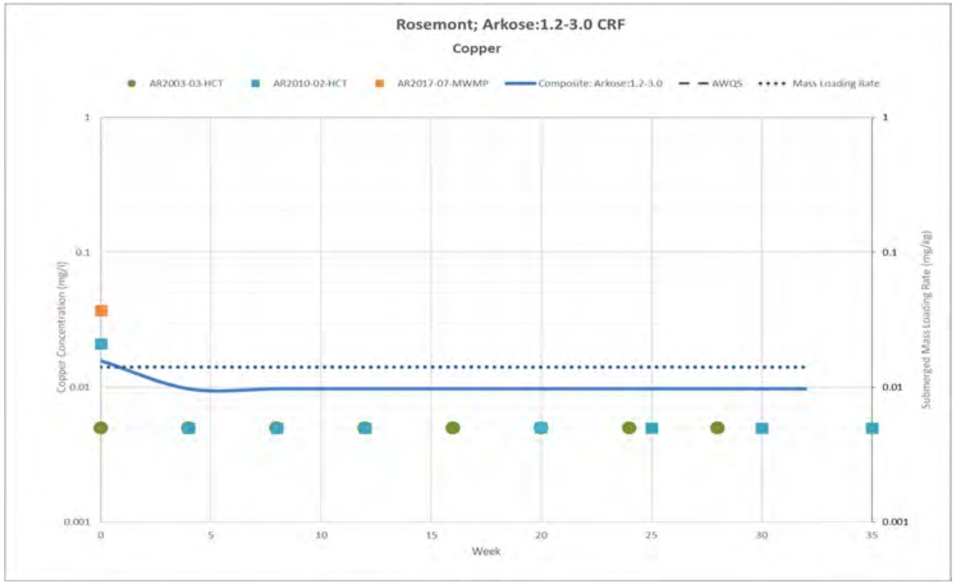

Rosemont; Arkose:1.2-3.0 CRF
Aluminum
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Arkose:1.2-3.0 CRF
Arsenic
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

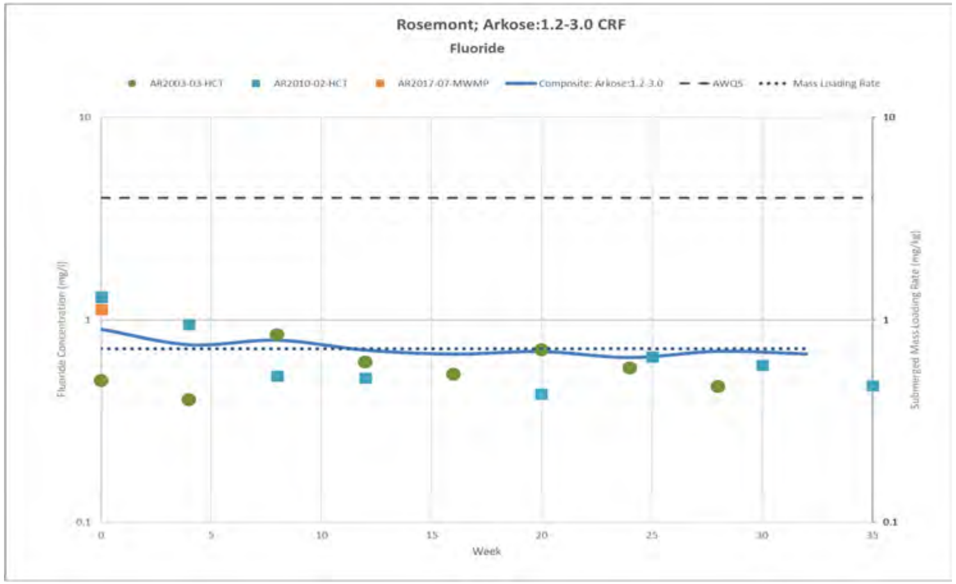

Rosemont; Arkose:1.2-3.0 CRF
Cadmium
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

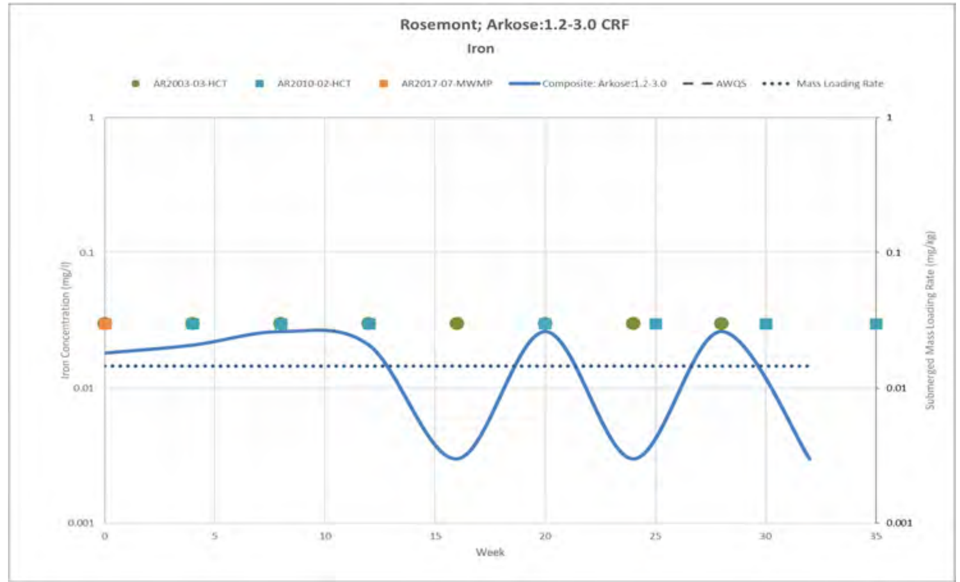

Rosemont; Arkose:1.2-3.0 CRF
Calcium
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

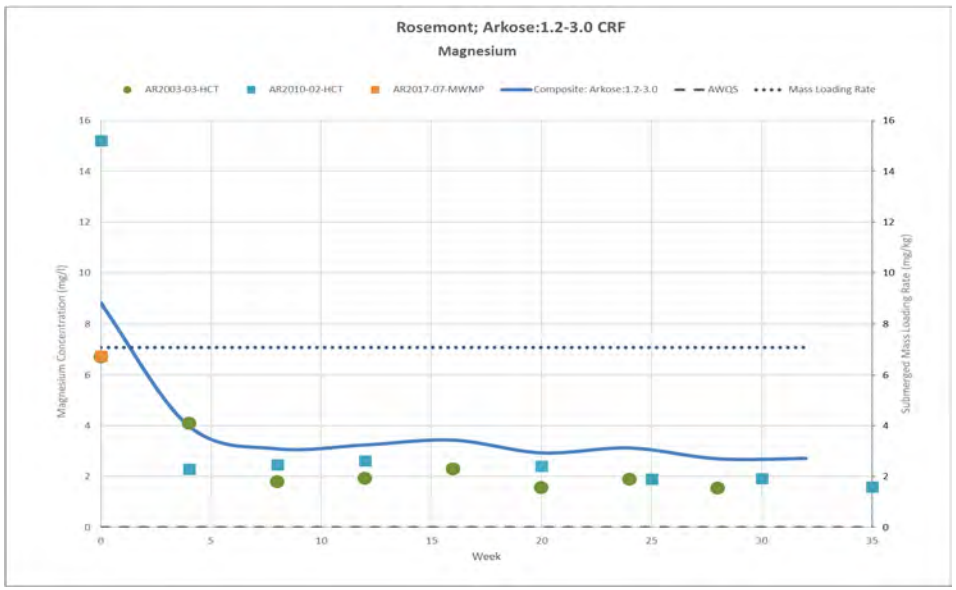

Rosemont; Arkose:1.2-3.0 CRF
Chloride
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

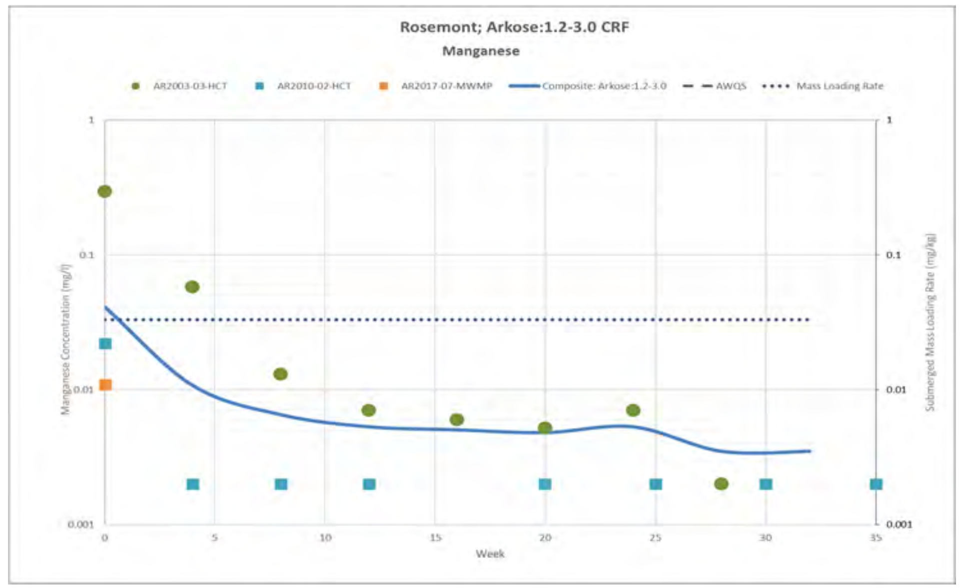

Rosemont; Arkose:1.2-3.0 CRF
Copper
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

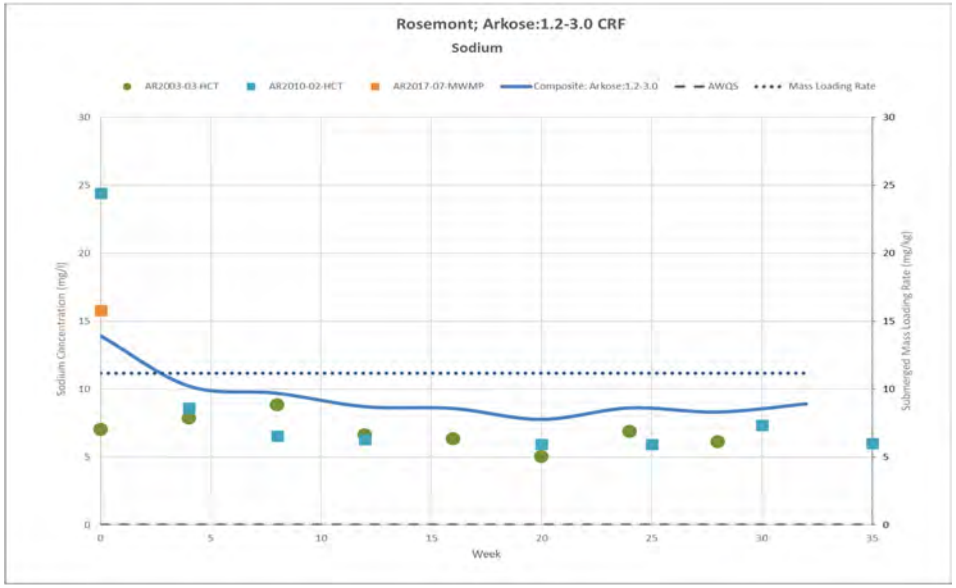
Appendix - H
Composite CRF Charts

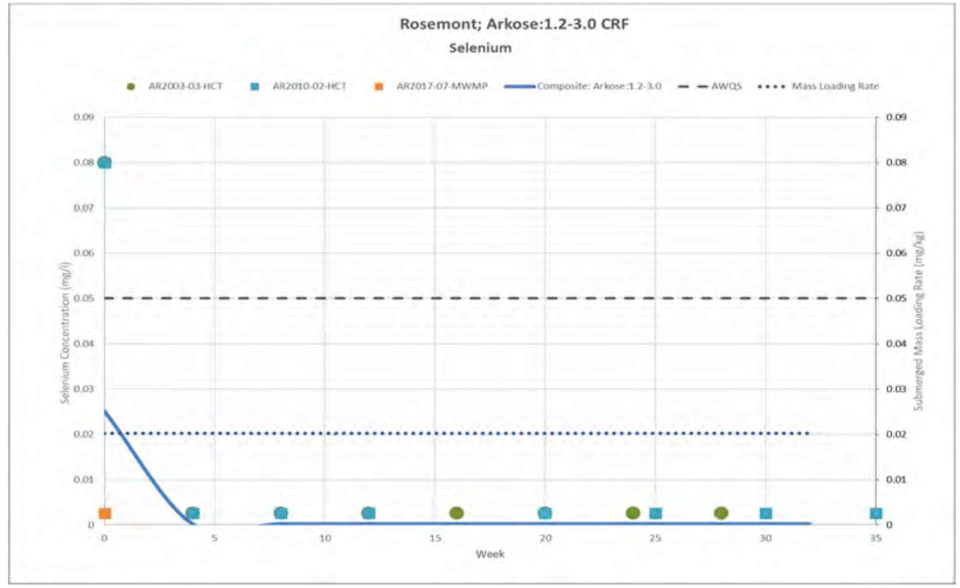


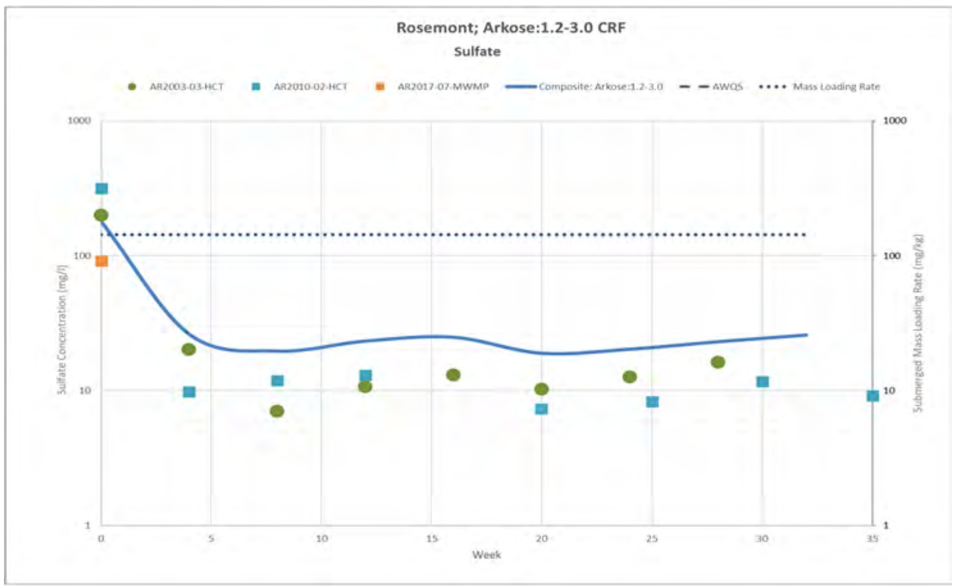


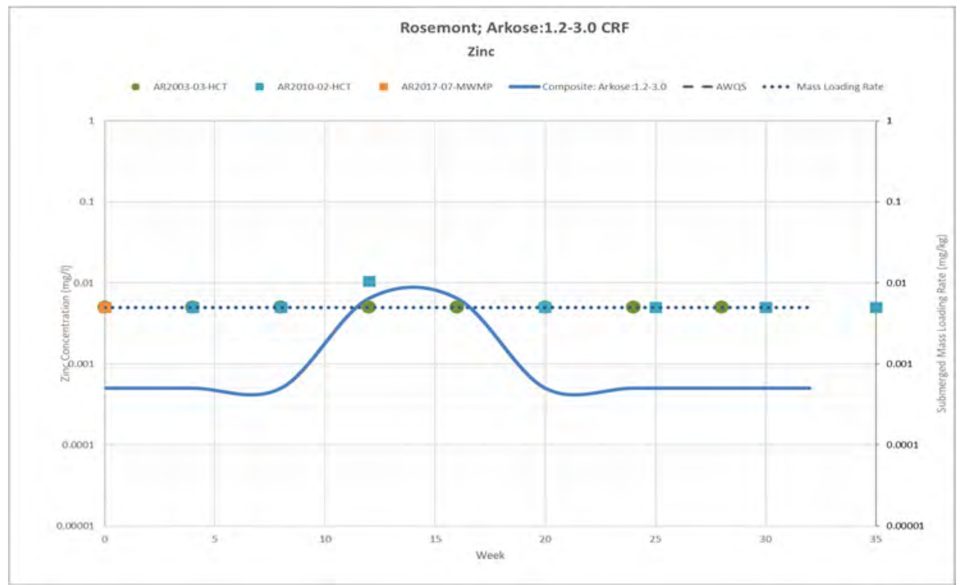




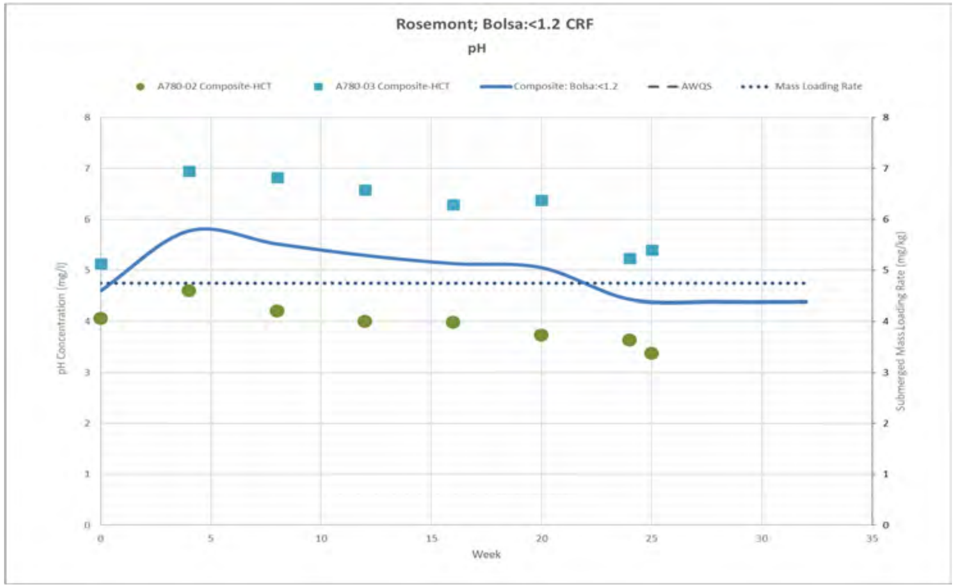

Rosemont; Arkose:1.2-3.0 CRF
Sodium
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

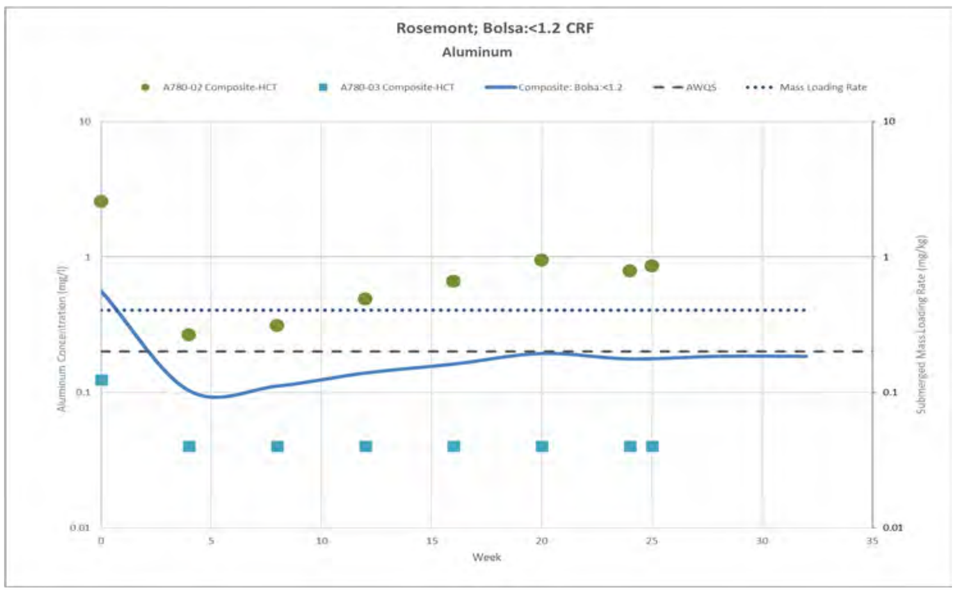

Rosemont; Arkose:1.2-3.0 CRF
Selenium
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

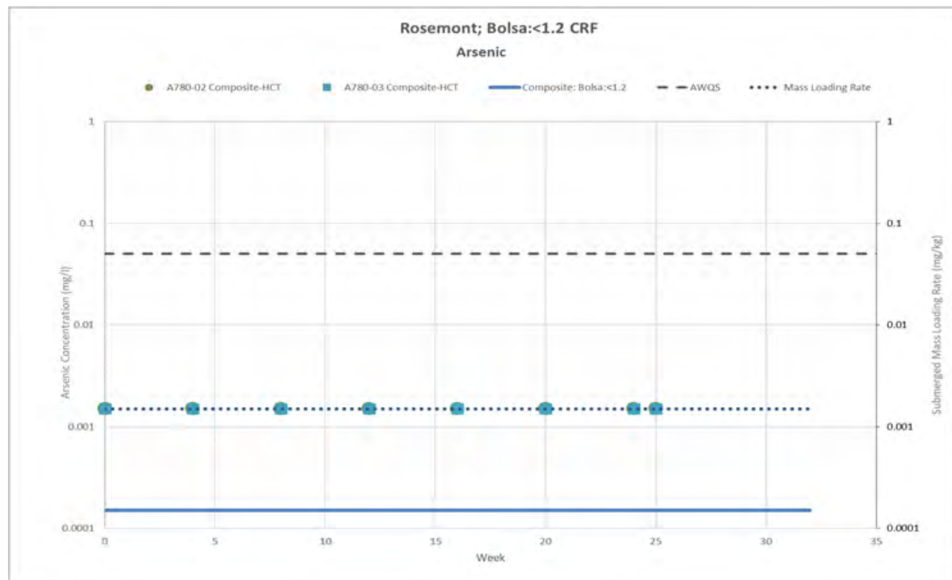

Rosemont; Arkose:1.2-3.0 CRF
Sulfate
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Arkose:1.2-3.0 CRF
Zinc
AR2003-03-HCT
AR2010-02-HCT
AR2017-07-MWMP
Composite: Arkose:1.2-3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

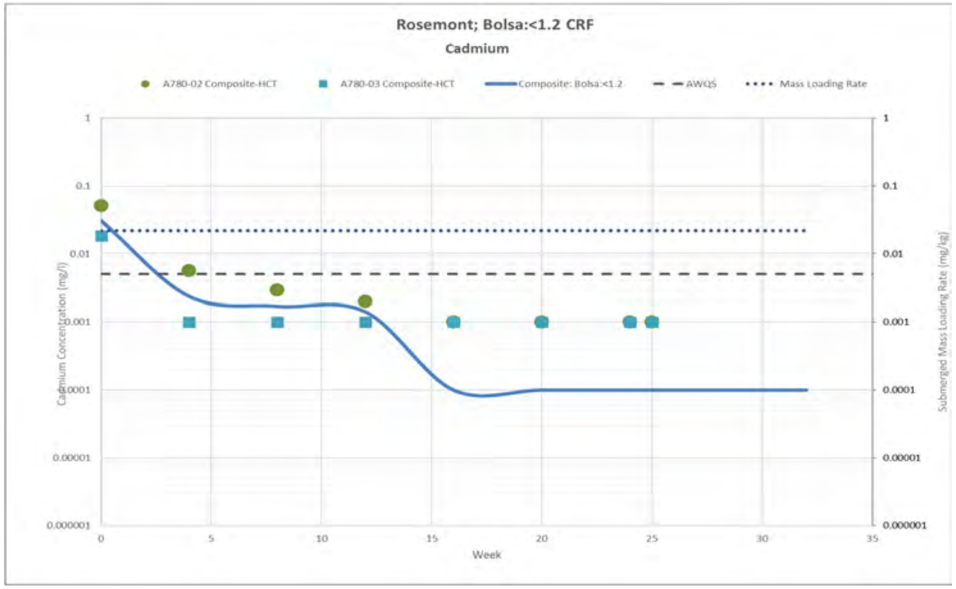
Appendix - H
Composite CRF Charts

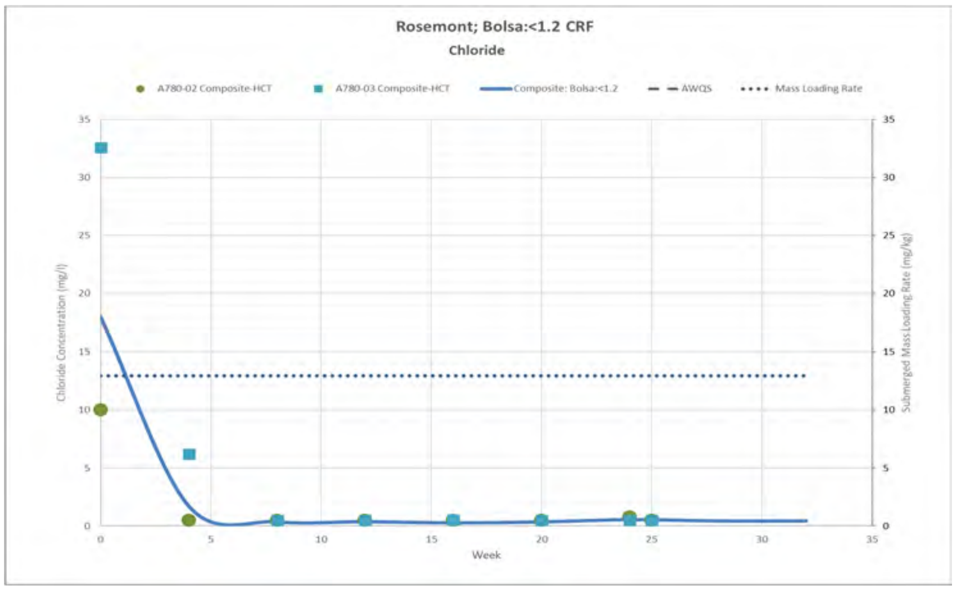


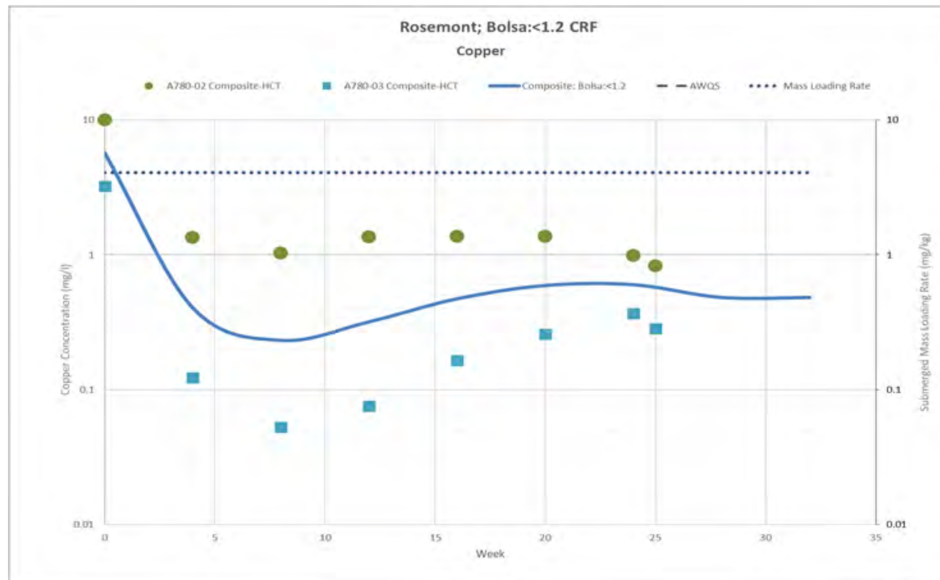


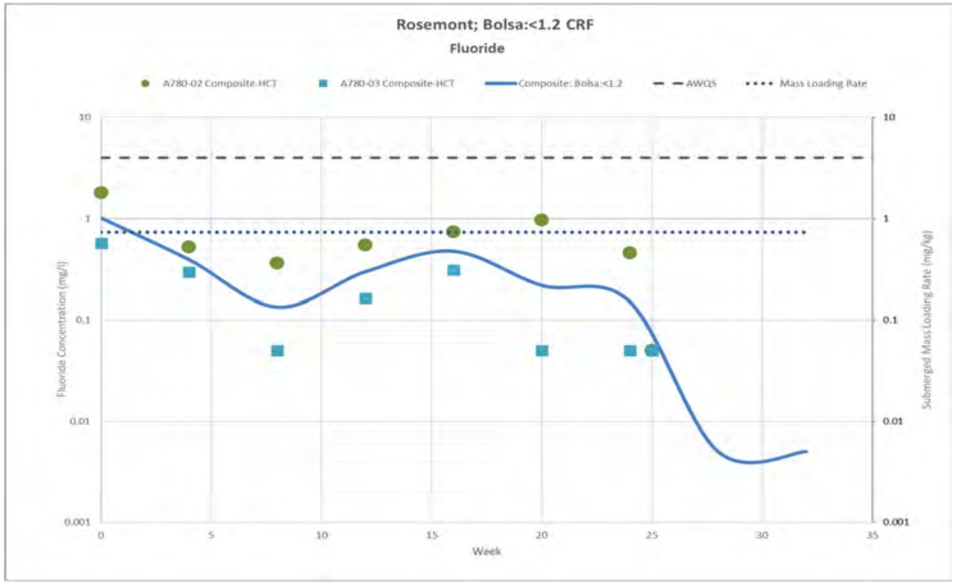


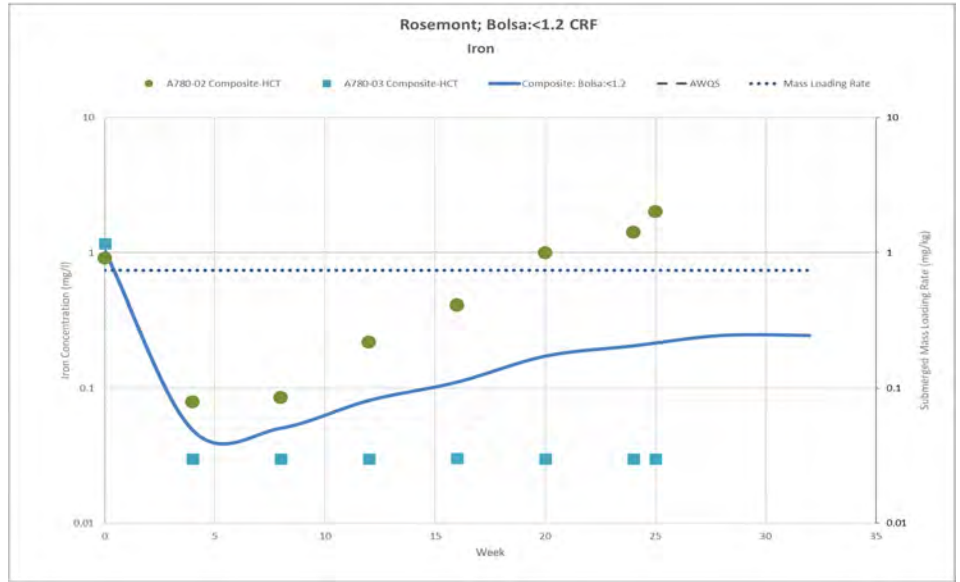
Appendix - H
Composite CRF Charts

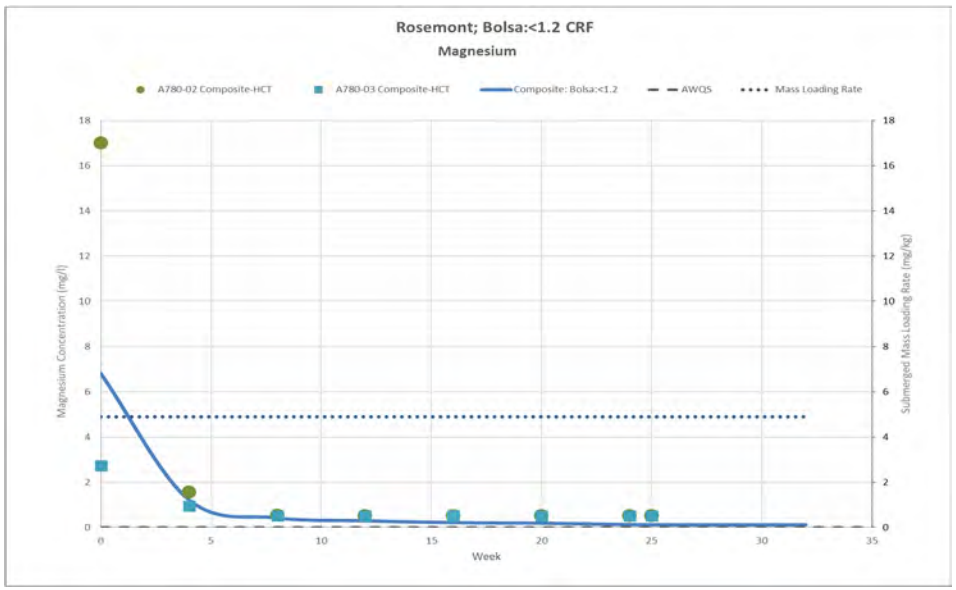


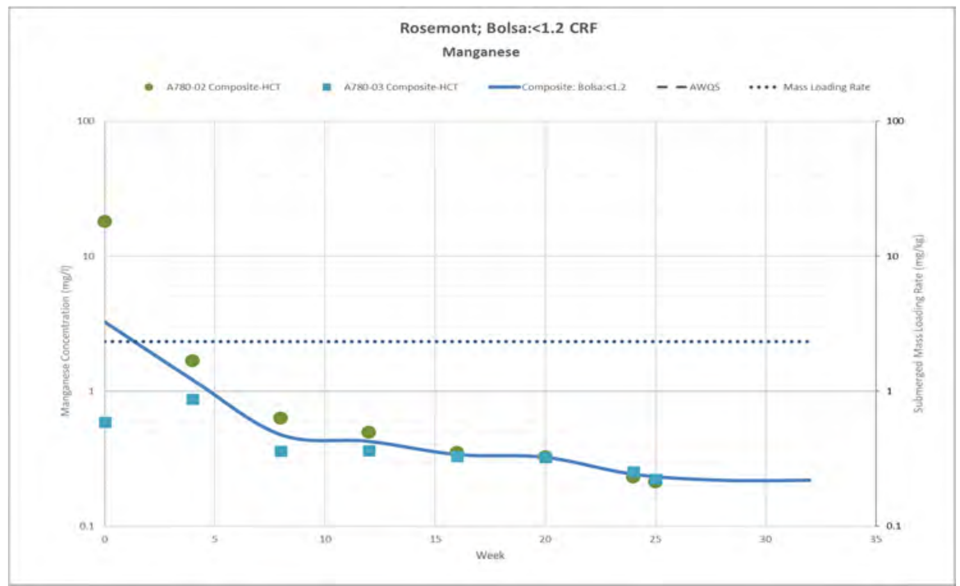


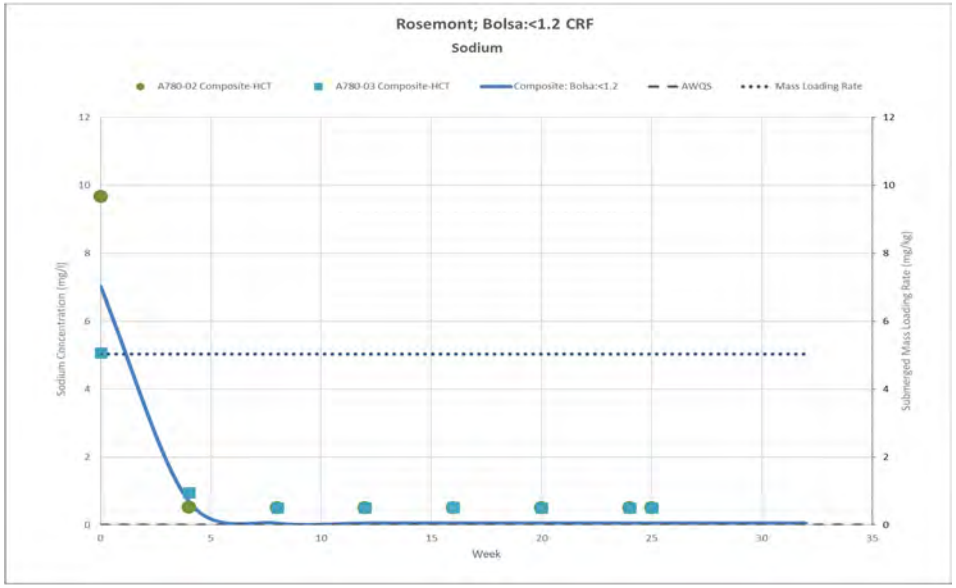


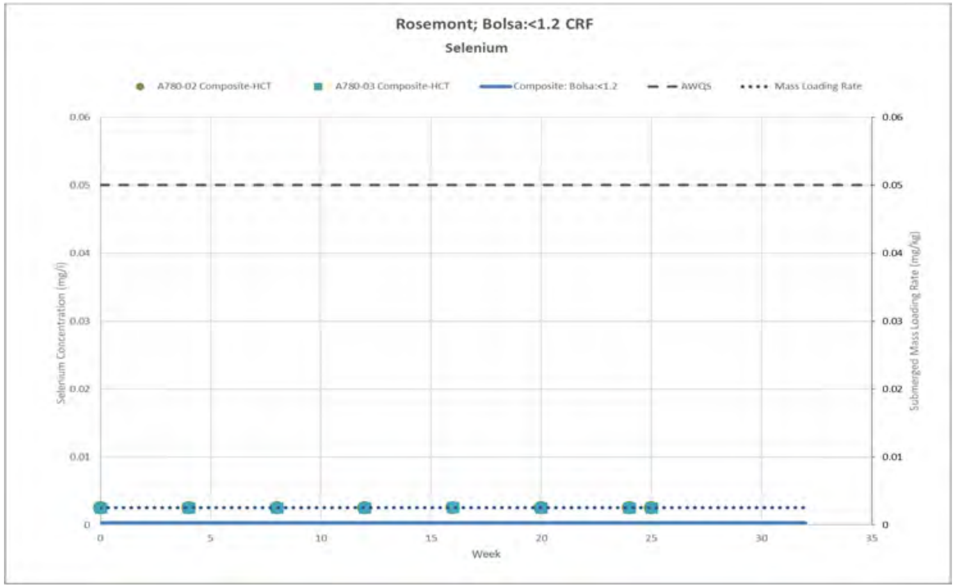

Rosemont; Bolsa:<1.2 CRF
Fluoride
A780-02 Composite-HCT
A780-03 Composite-HCT
Composite: Bolsa:<1.2
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Bolsa:<1.2 CRF
Iron
A780-02 Composite-HCT
A780-03 Composite-HCT
Composite: Bolsa:<1.2
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Bolsa:<1.2 CRF
Magnesium
A780-02 Composite-HCT
A780-03 Composite-HCT
Composite: Bolsa:<1.2
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Bolsa:<1.2 CRF
Manganese
A780-02 Composite-HCT
A780-03 Composite-HCT
Composite: Bolsa:<1.2
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

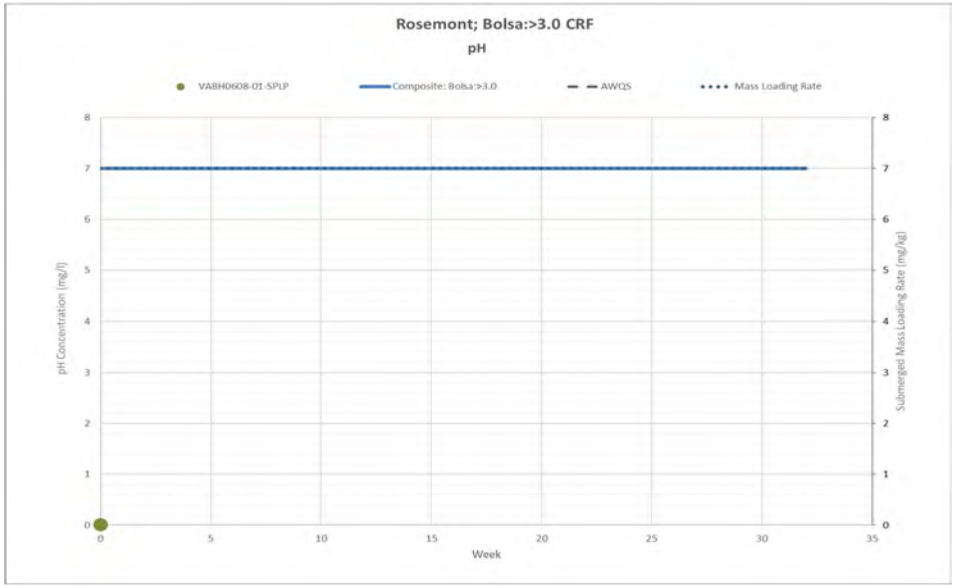

Rosemont; Bolsa:<1.2 CRF
Sodium
A780-02 Composite-HCT
A780-03 Composite-HCT
Composite: Bolsa:<1.2
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

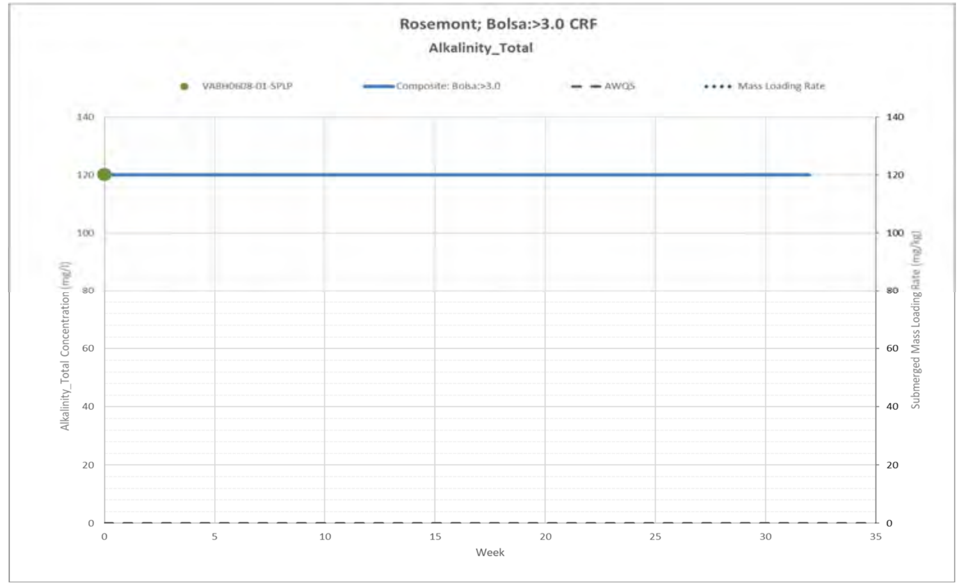

Rosemont; Bolsa:<1.2 CRF
Selenium
A780-02 Composite-HCT
A780-03 Composite-HCT
Composite: Bolsa:<1.2
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

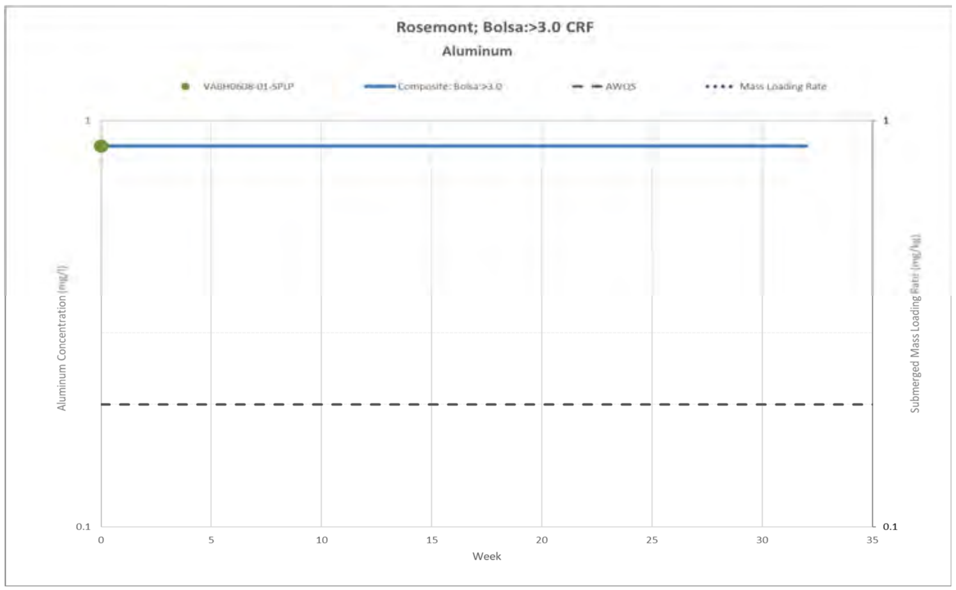

Rosemont; Bolsa:<1.2 CRF
Sulfate
A780-02 Composite-HCT
A780-03 Composite-HCT
Composite: Bolsa:<1.2
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

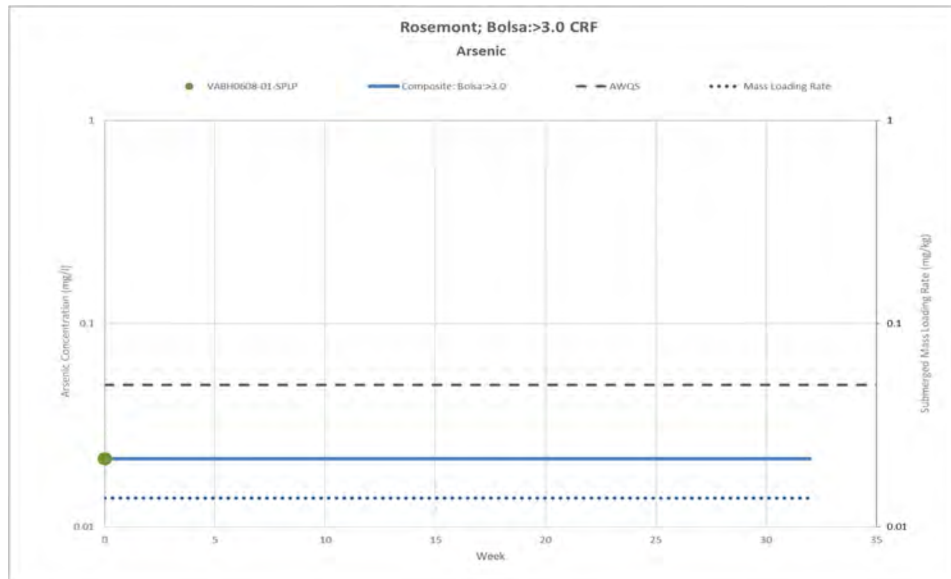

Rosemont; Bolsa:<1.2 CRF
Zinc
A780-02 Composite-HCT
A780-03 Composite-HCT
Composite: Bolsa:<1.2
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

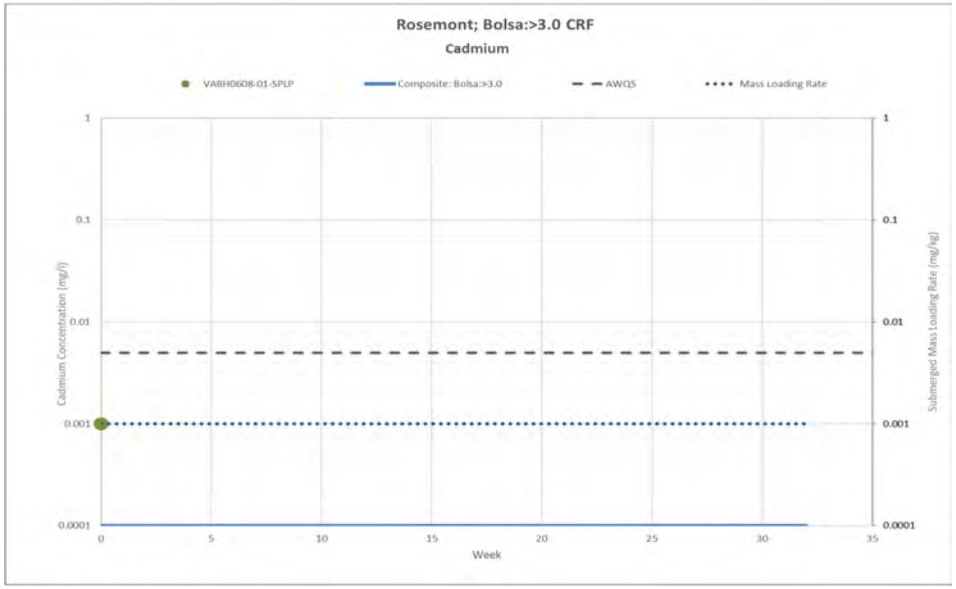


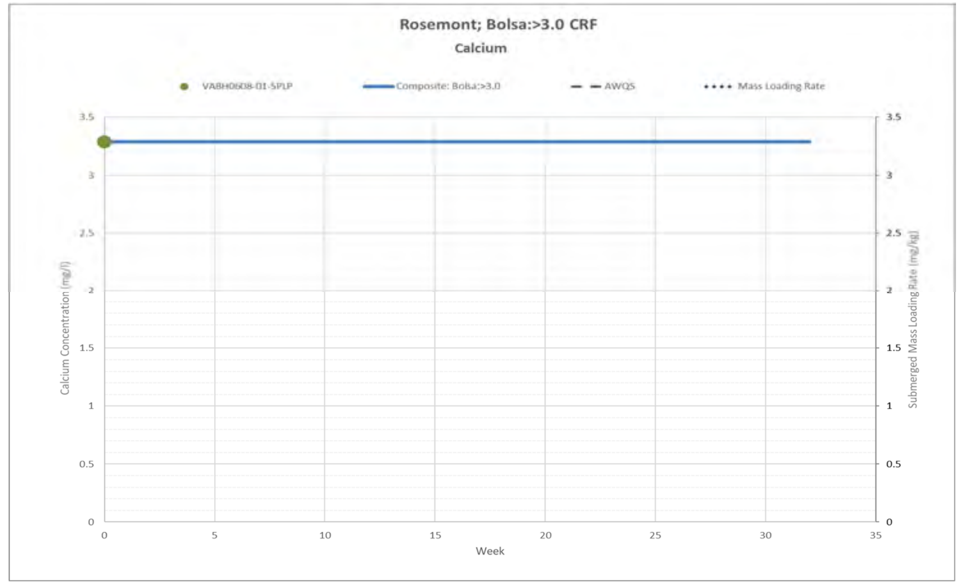


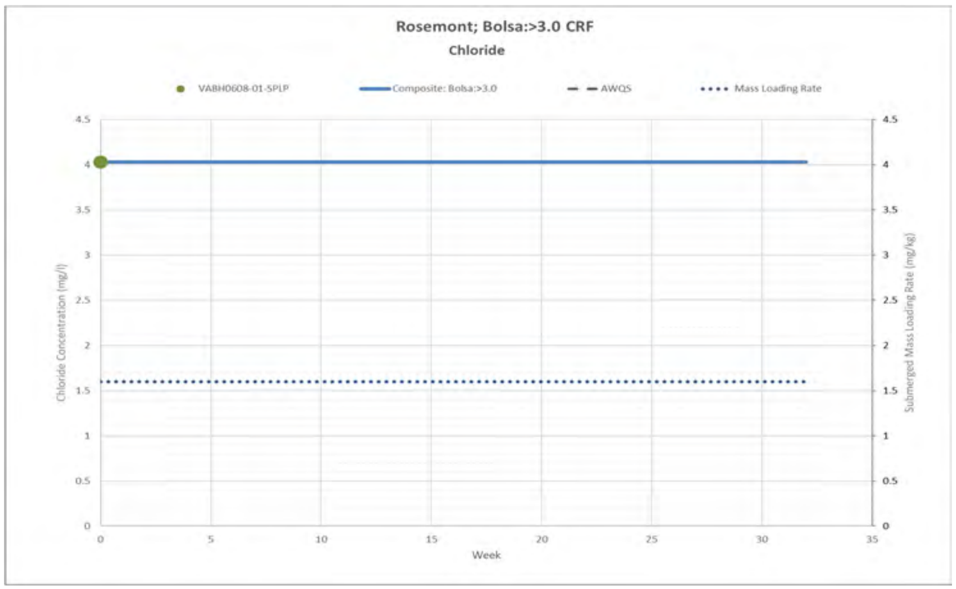


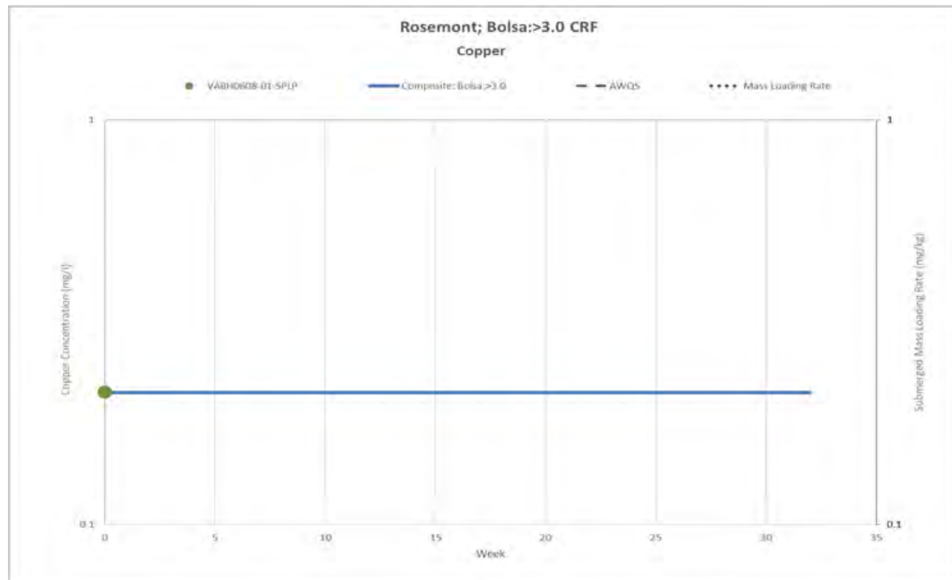


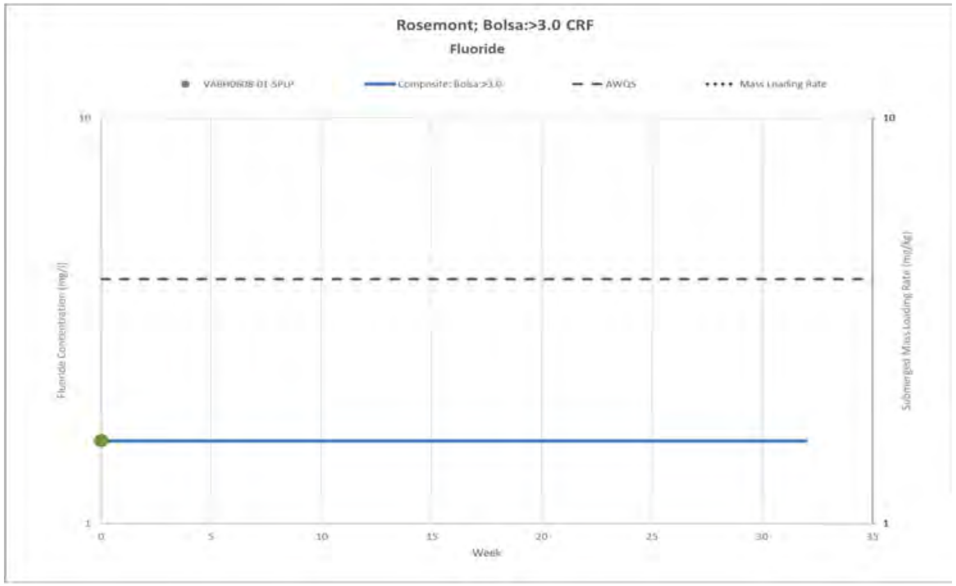
Appendix - H
Composite CRF Charts

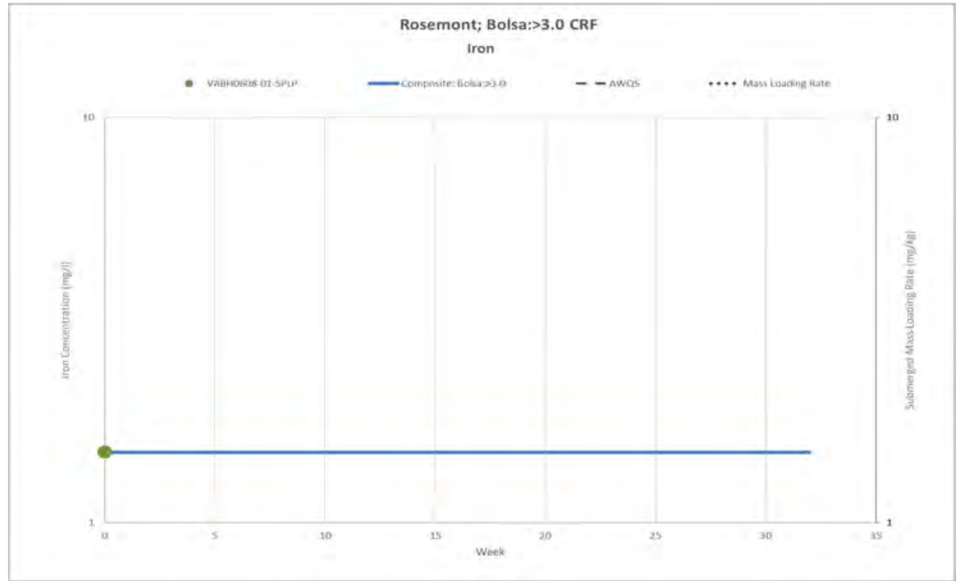


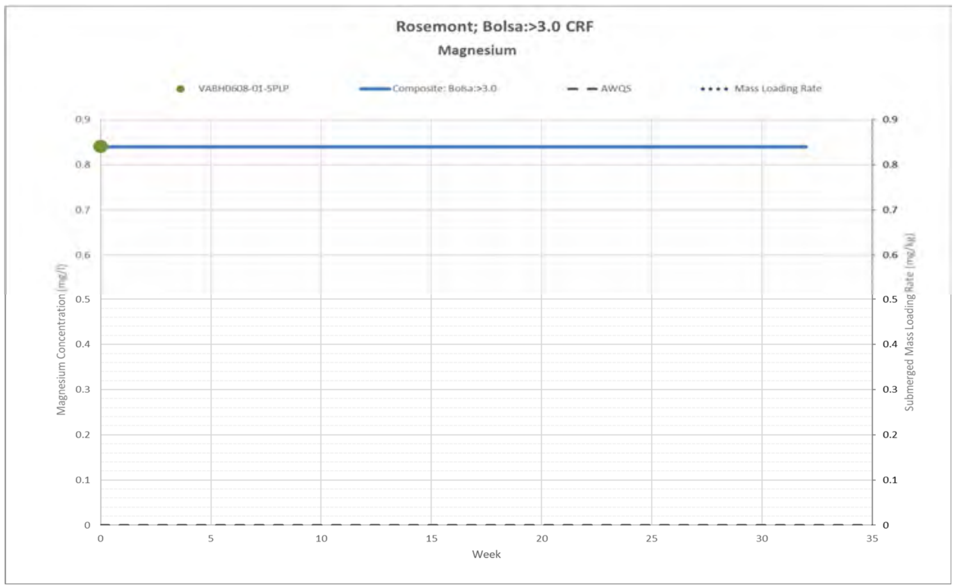


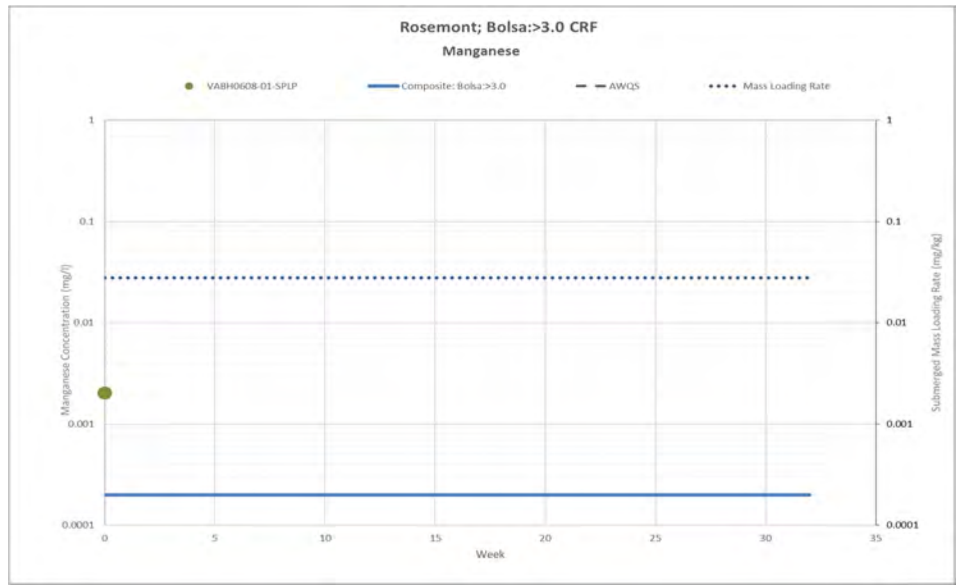


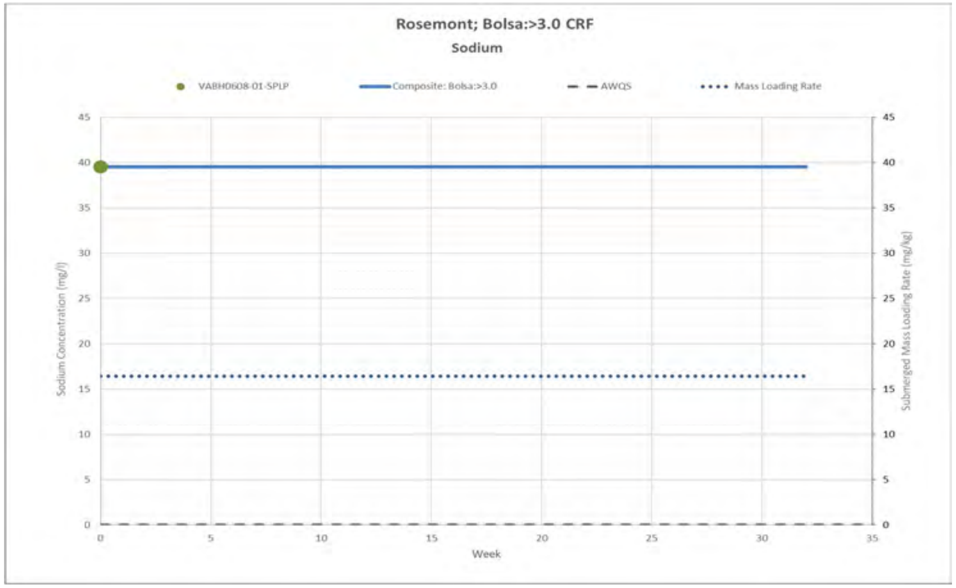


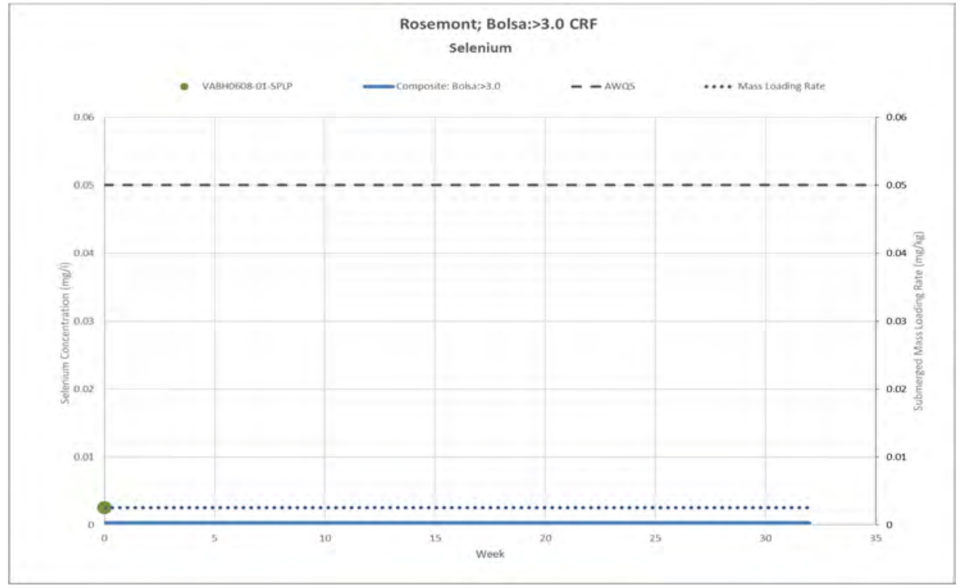

Rosemont; Bolsa:>3.0 CRF
Fluoride
VABH0608-01-SPLP
Composite: Bolsa:>3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

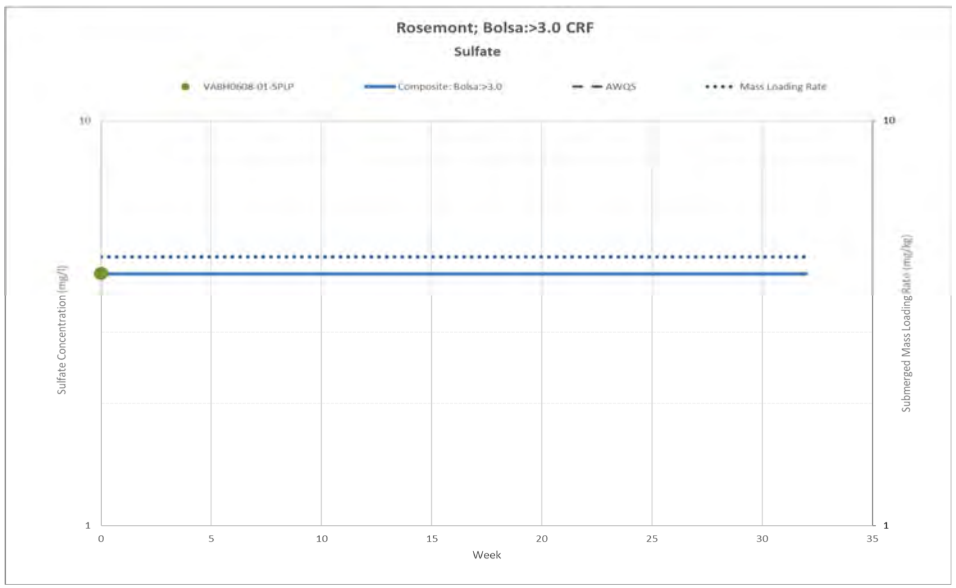

Rosemont; Bolsa:>3.0 CRF
Iron
VABH0608-01-SPLP
Composite: Bolsa:>3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

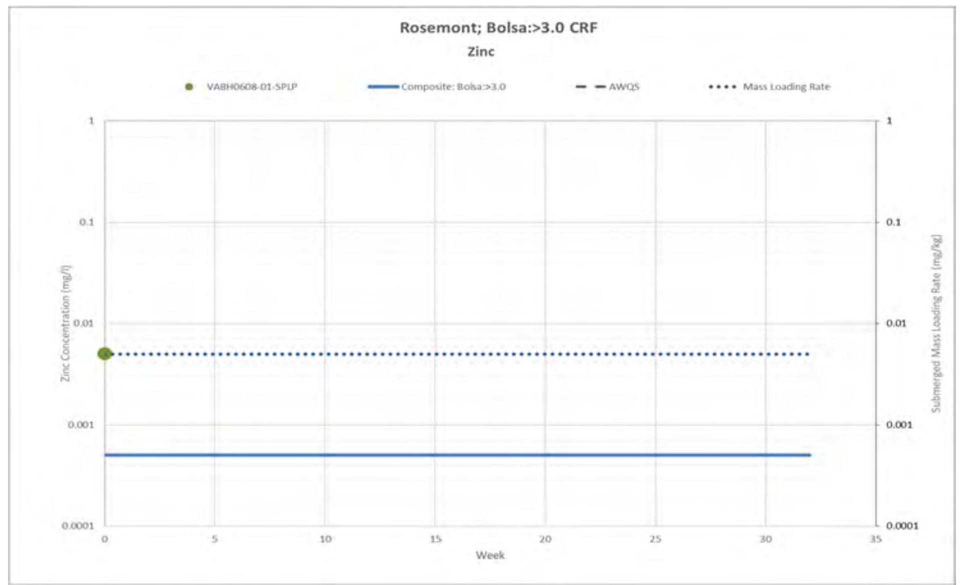

Rosemont; Bolsa:>3.0 CRF
Magnesium
VABH0608-01-SPLP
Composite: Bolsa:>3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

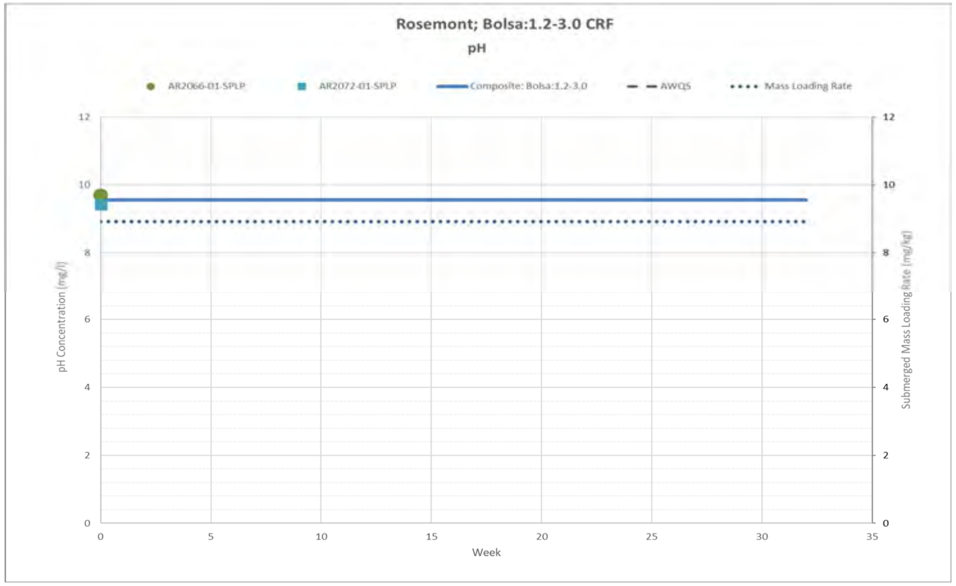

Rosemont; Bolsa:>3.0 CRF
Manganese
VABH0608-01-SPLP
Composite: Bolsa:>3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Bolsa:>3.0 CRF
Sodium
VABH0608-01-SPLP
Composite: Bolsa:>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

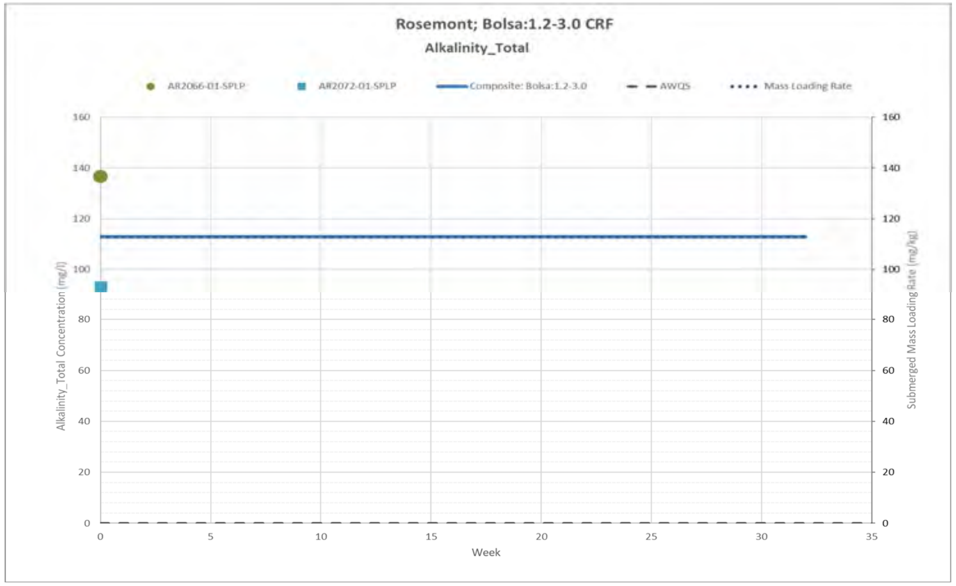

Rosemont; Bolsa:>3.0 CRF
Selenium
VABH0608-01-SPLP
Composite: Bolsa:>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Bolsa:>3.0 CRF
Sulfate
VABH0608-01-SPLP
Composite: Bolsa:>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

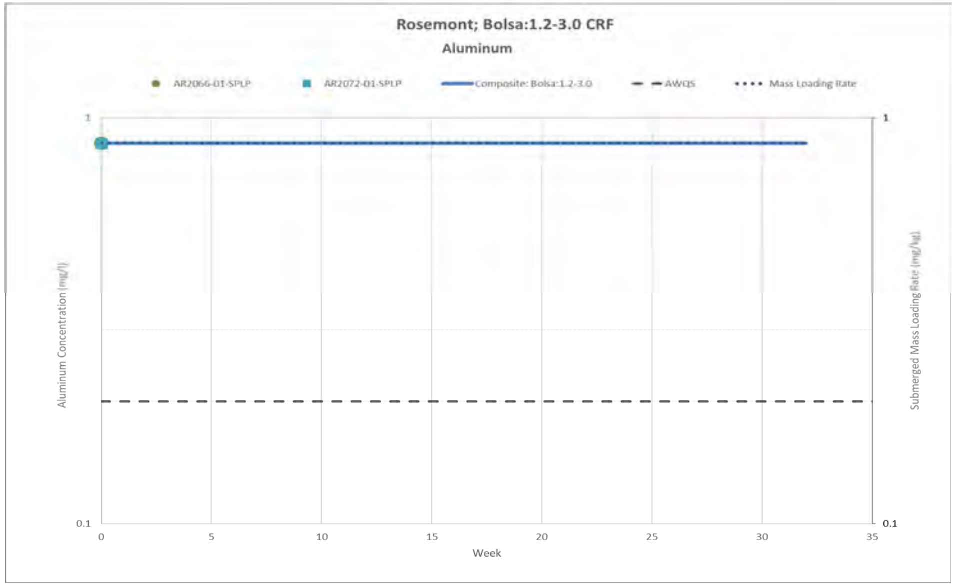

Rosemont; Bolsa:>3.0 CRF
Zinc
VABH0608-01-SPLP
Composite: Bolsa:>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week



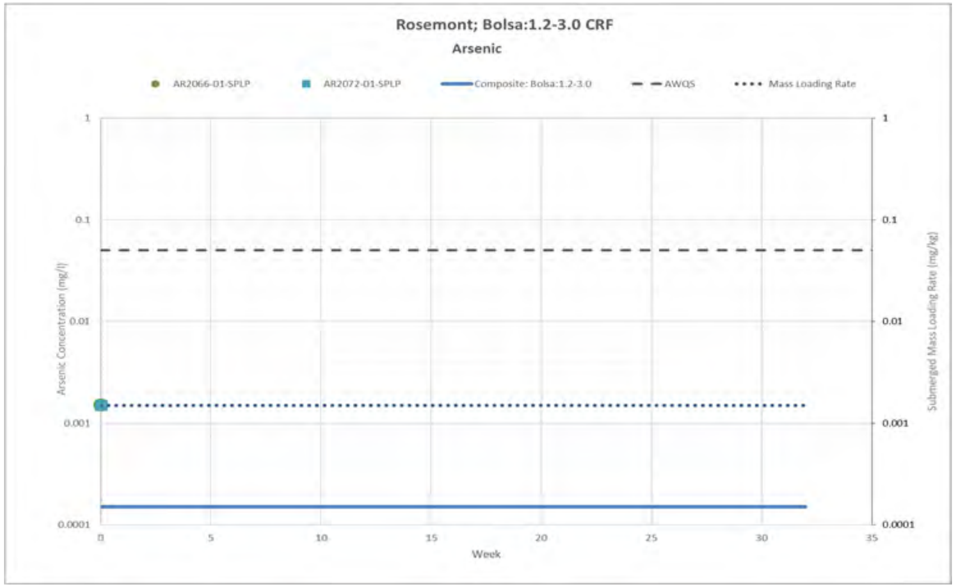
Rosemont; Bolsa:1.2-3.0 CRF
pH
AR2066-01-SPLP
AR2072-01-SPLP
Composite: Bolsa:1.2-3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week



Rosemont; Bolsa:1.2-3.0 CRF
Alkalinity_Total
AR2066-01-SPLP
AR2072-01-SPLP
Composite: Bolsa:1.2-3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

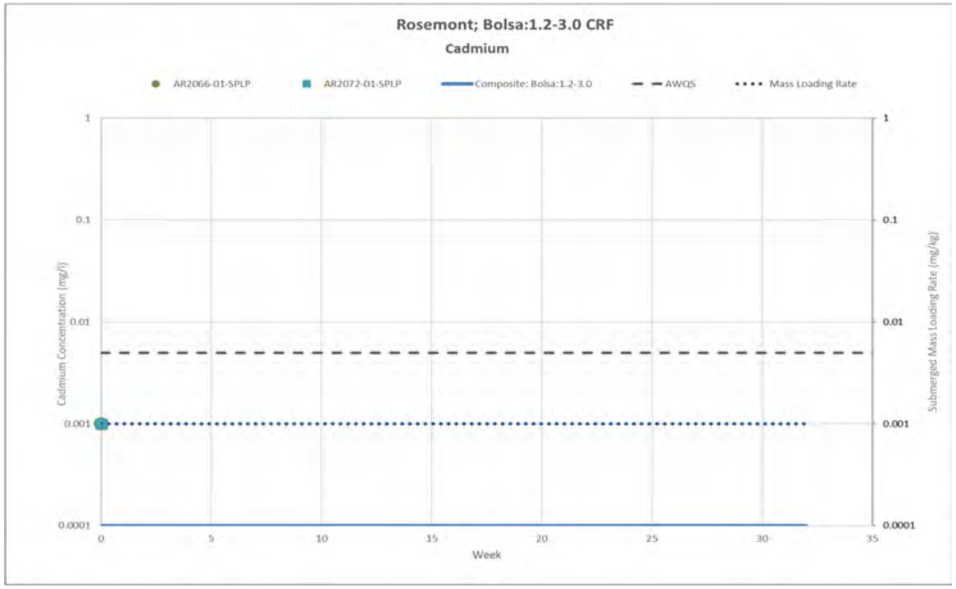


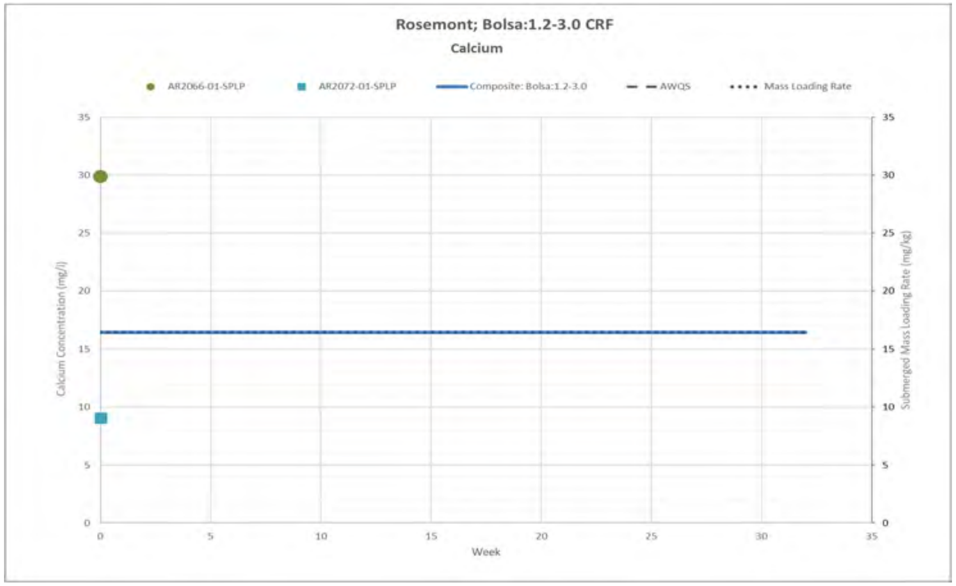
Rosemont; Bolsa:1.2-3.0 CRF
Aluminum
AR2066-01-SPLP
AR2072-01-SPLP
Composite: Bolsa:1.2-3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

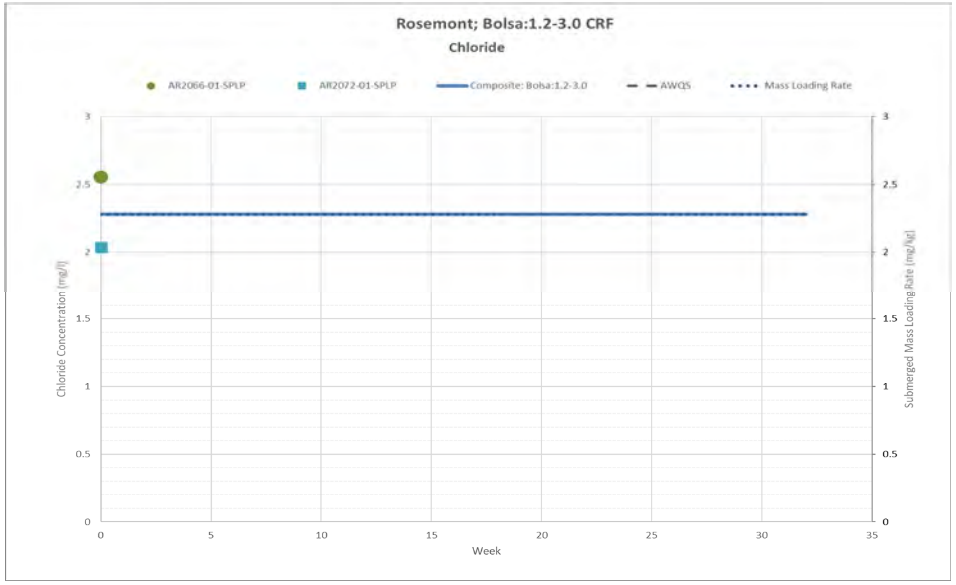


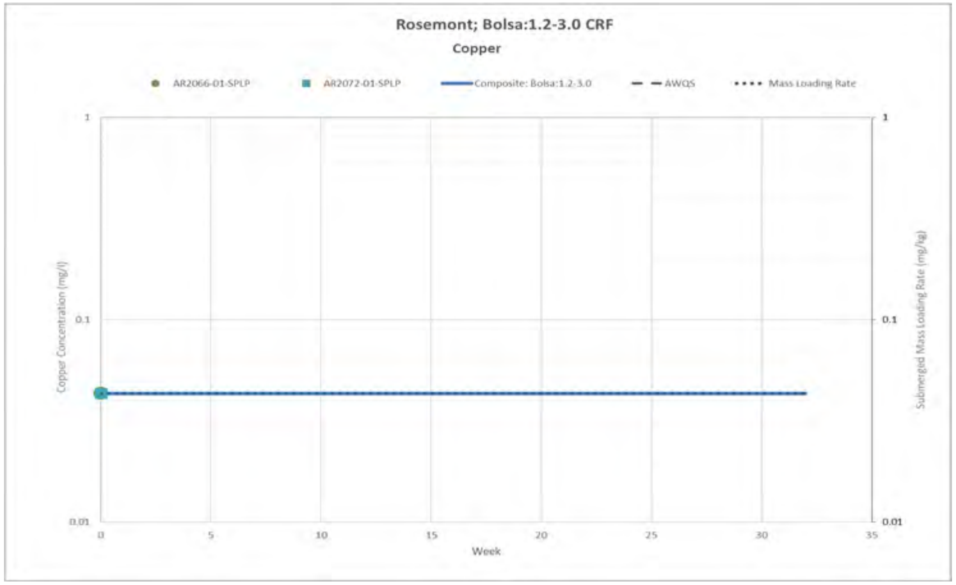
Rosemont; Bolsa:1.2-3.0 CRF
Arsenic
AR2066-01-SPLP
AR2072-01-SPLP
Composite: Bolsa:1.2-3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

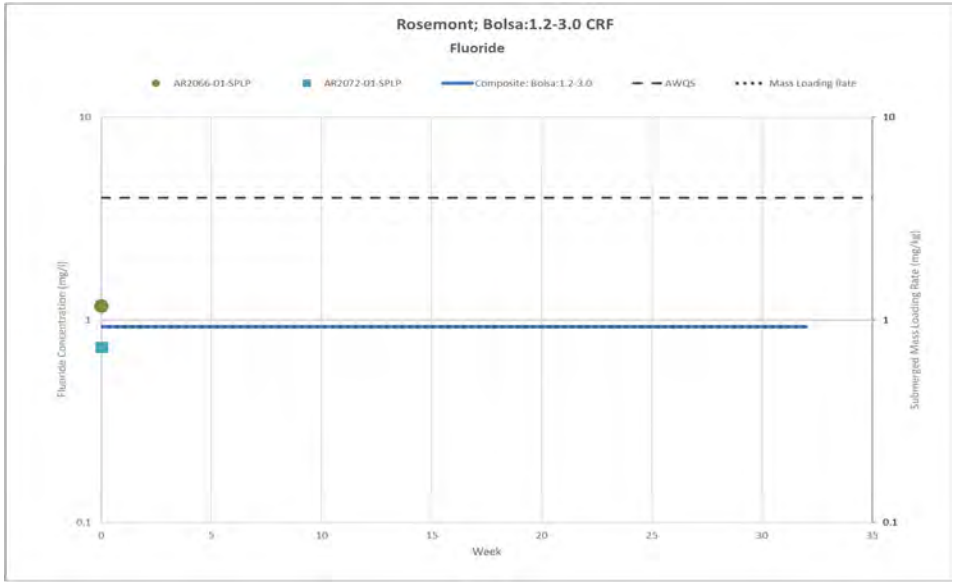


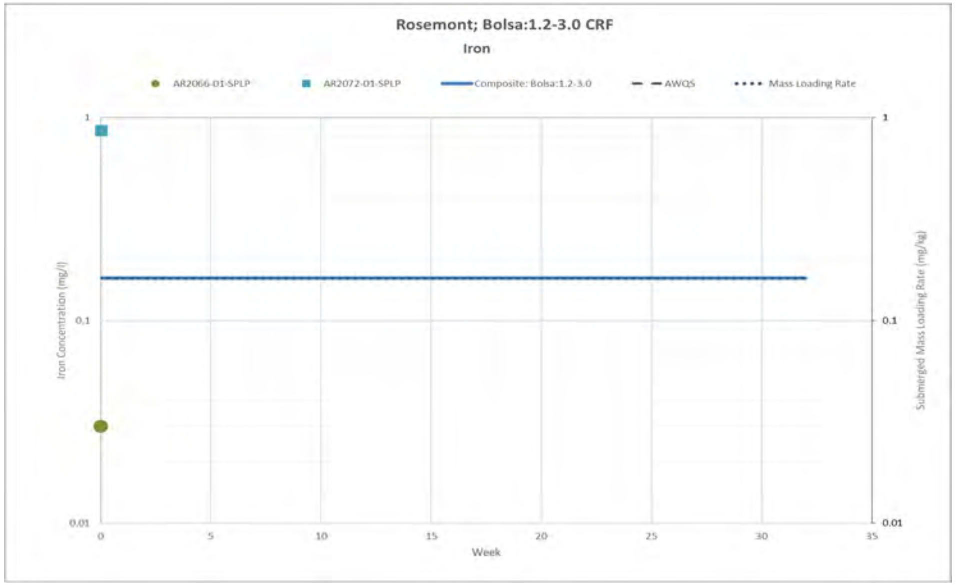


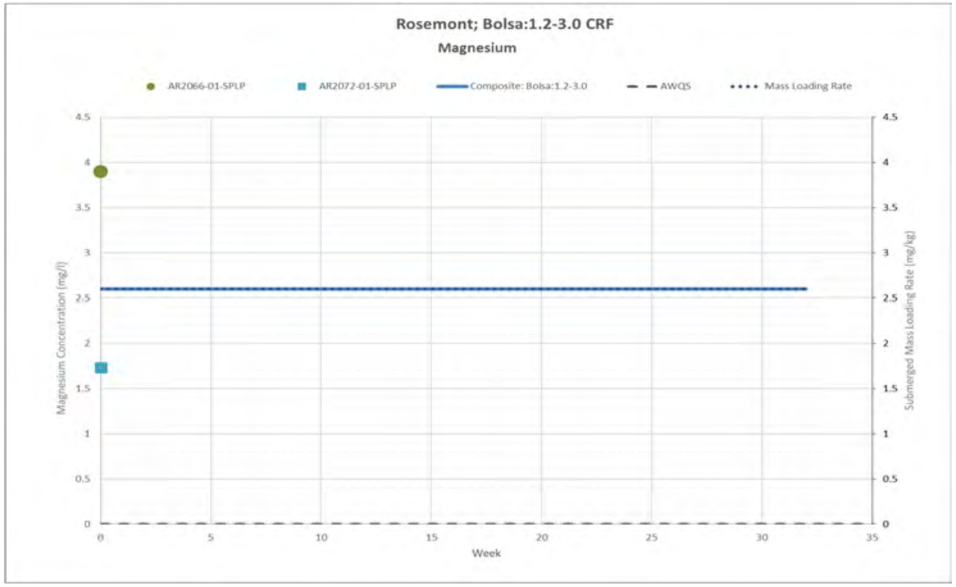


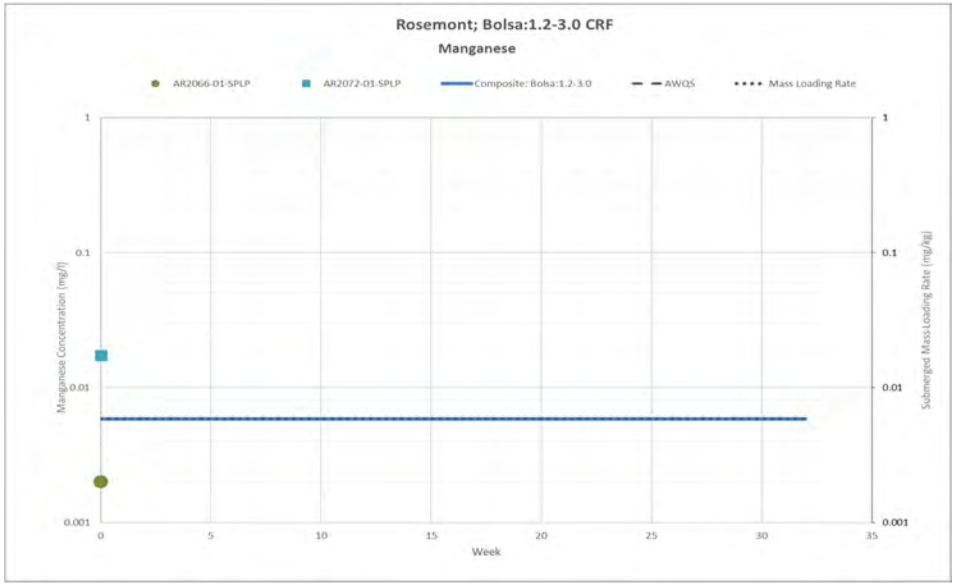


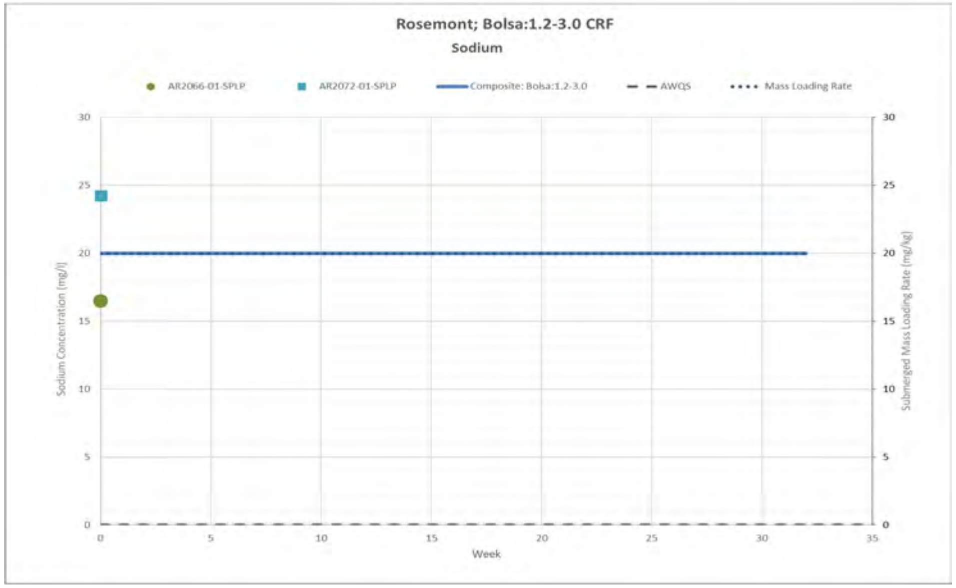
Appendix - H
Composite CRF Charts

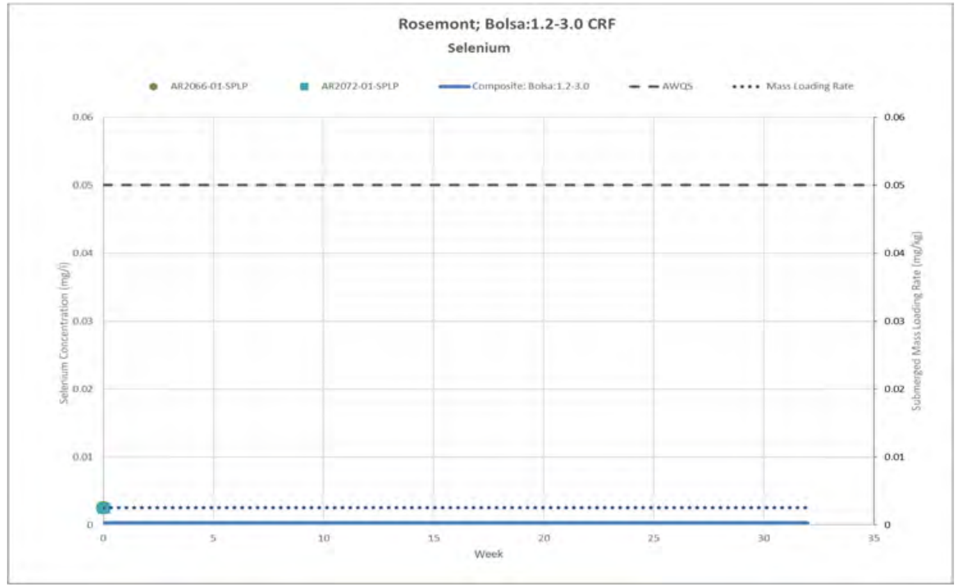


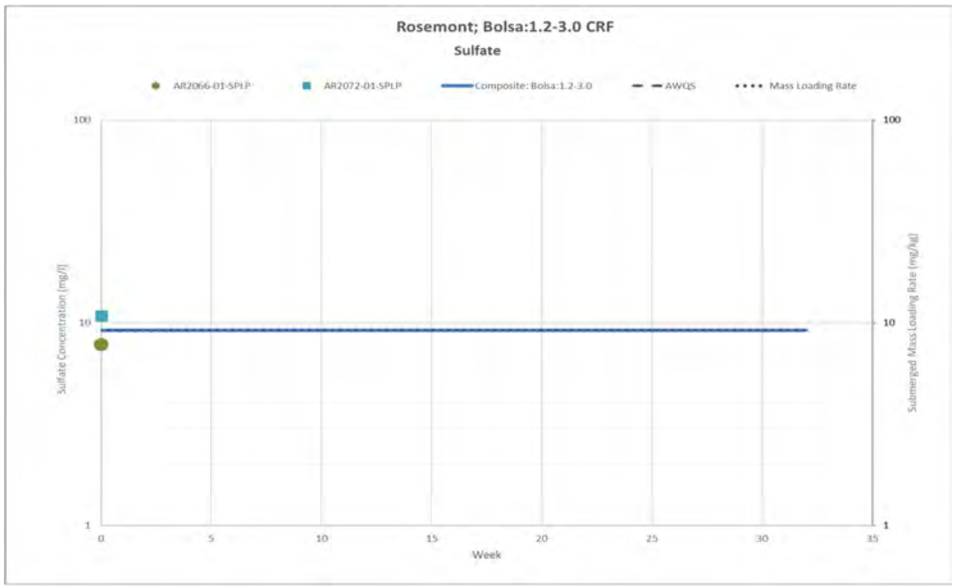


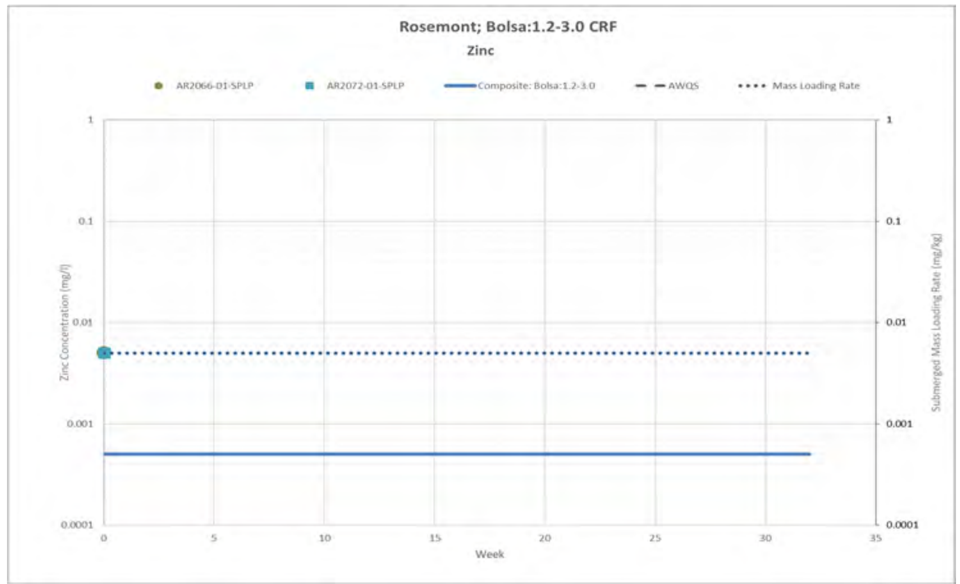




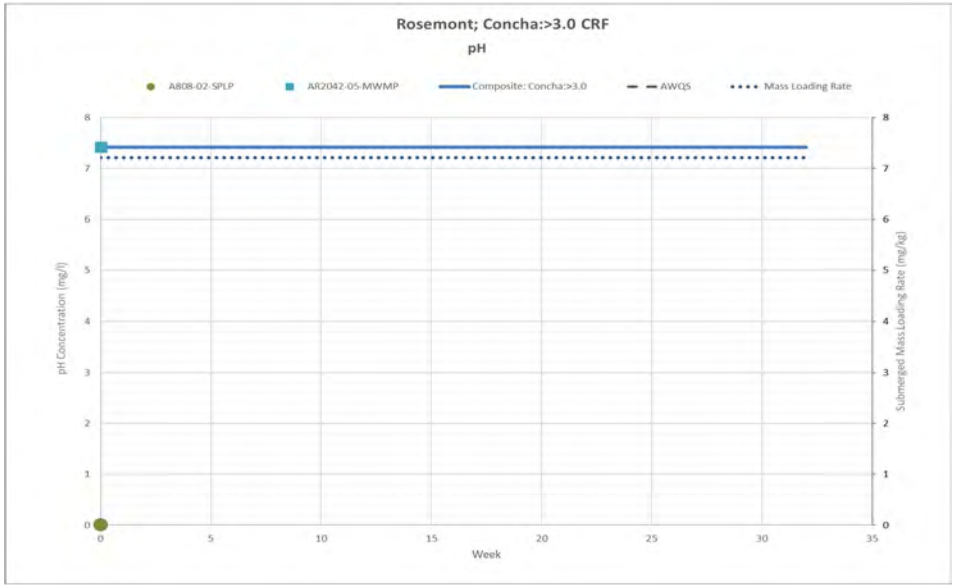

Rosemont; Bolsa:1.2-3.0 CRF
Sodium
AR2066-01-SPLP
AR2072-01-SPLP
Composite: Bolsa:1.2-3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

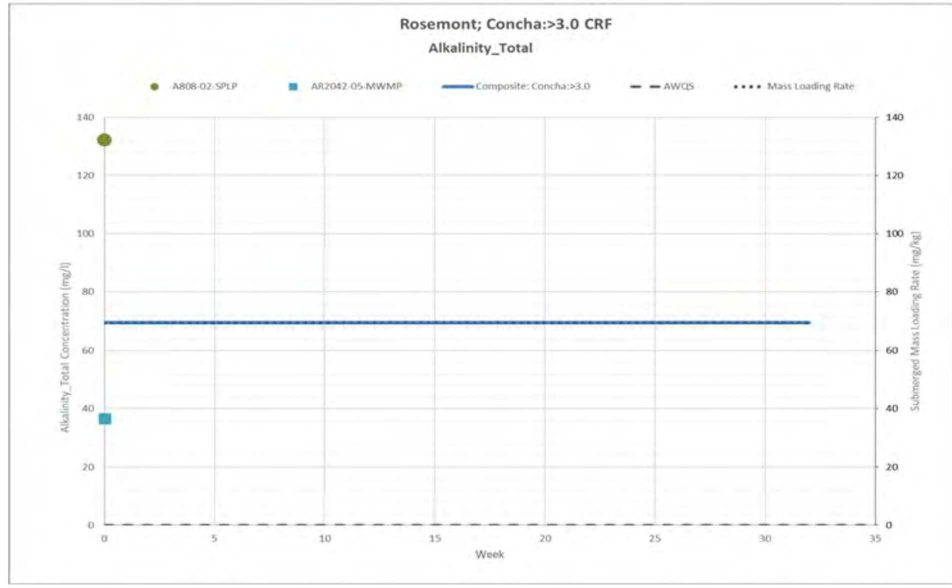

Rosemont; Bolsa:1.2-3.0 CRF
Selenium
AR2066-01-SPLP
AR2072-01-SPLP
Composite: Bolsa:1.2-3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

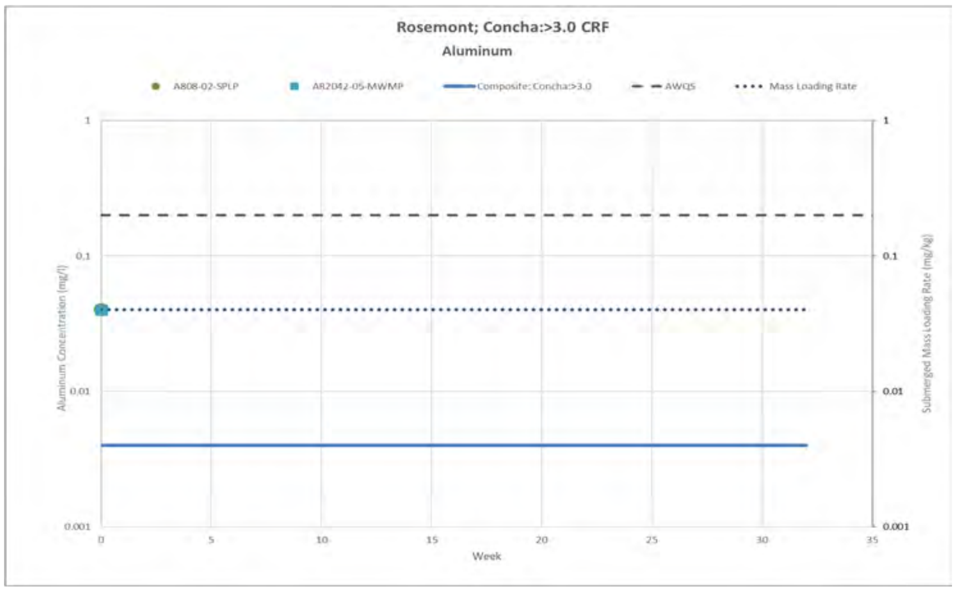

Rosemont; Bolsa:1.2-3.0 CRF
Sulfate
AR2066-01-SPLP
AR2072-01-SPLP
Composite: Bolsa:1.2-3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

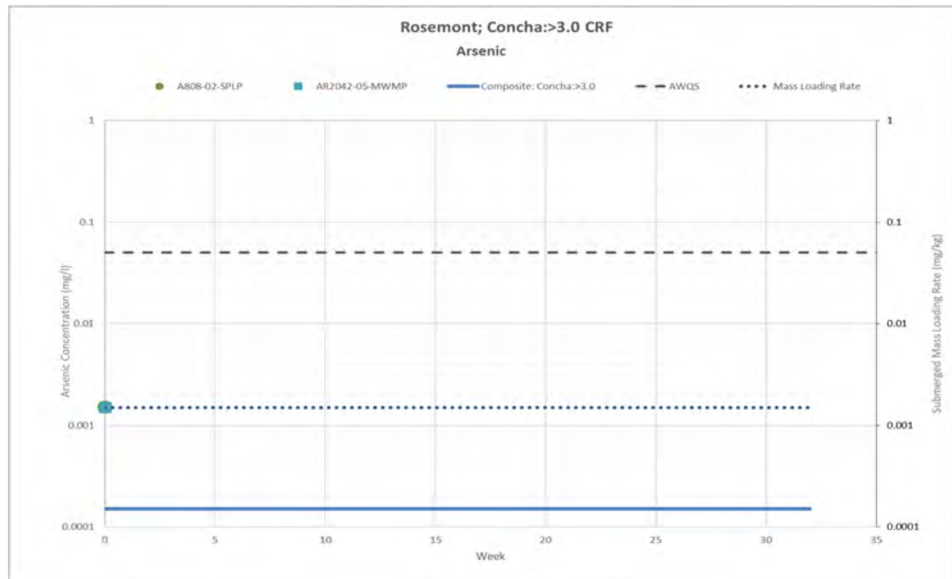

Rosemont; Bolsa:1.2-3.0 CRF
Zinc
AR2066-01-SPLP
AR2072-01-SPLP
Composite: Bolsa:1.2-3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

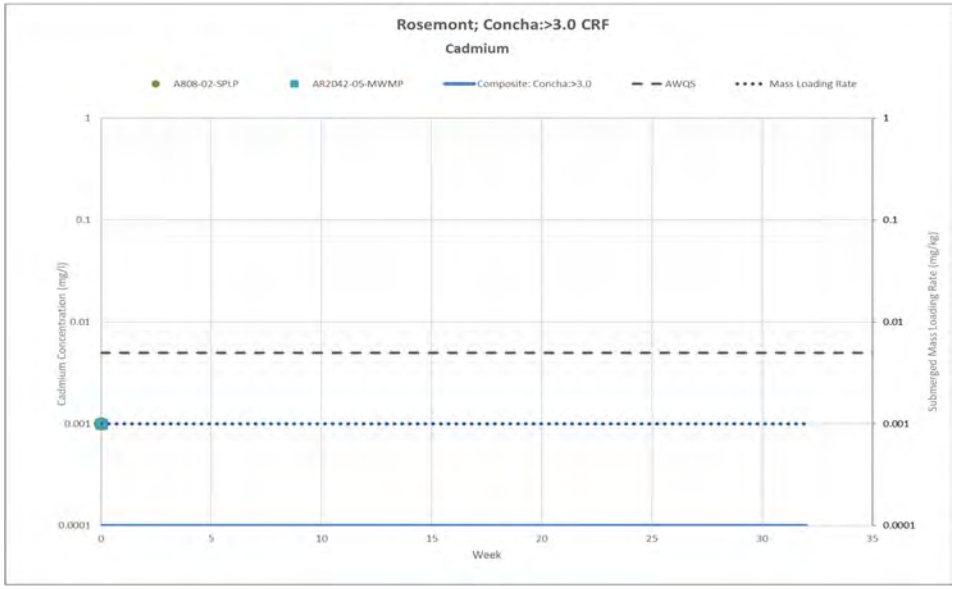
Appendix - H
Composite CRF Charts

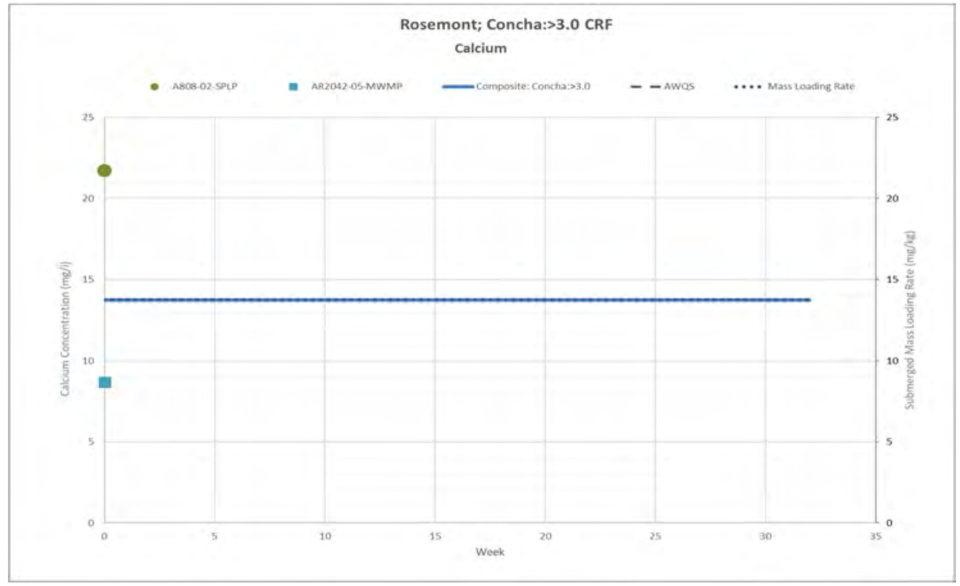


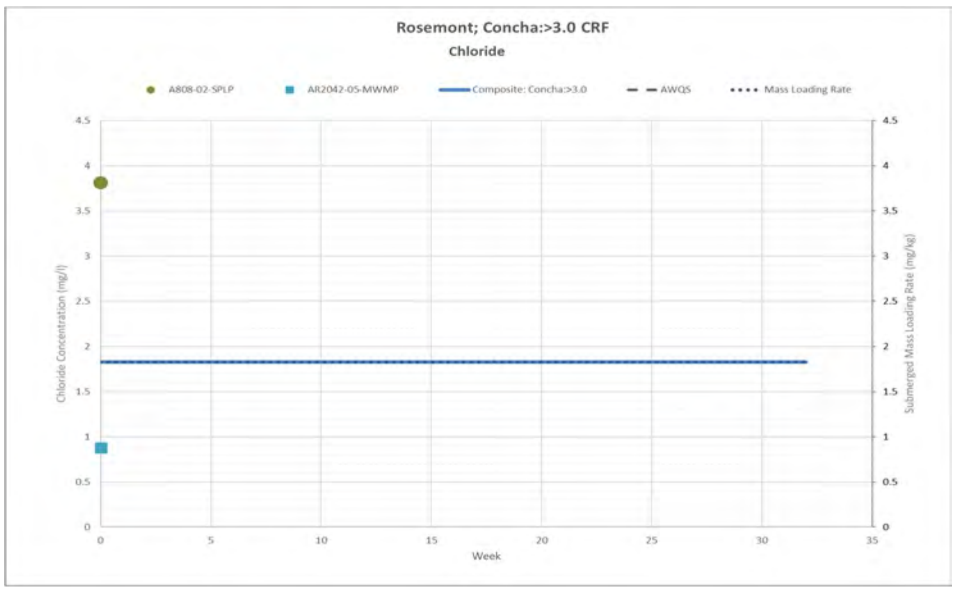


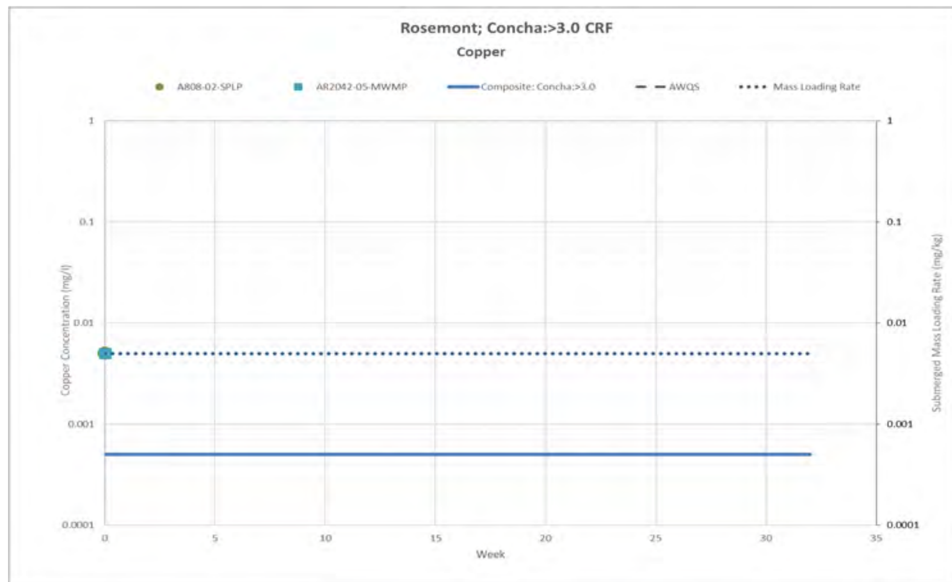




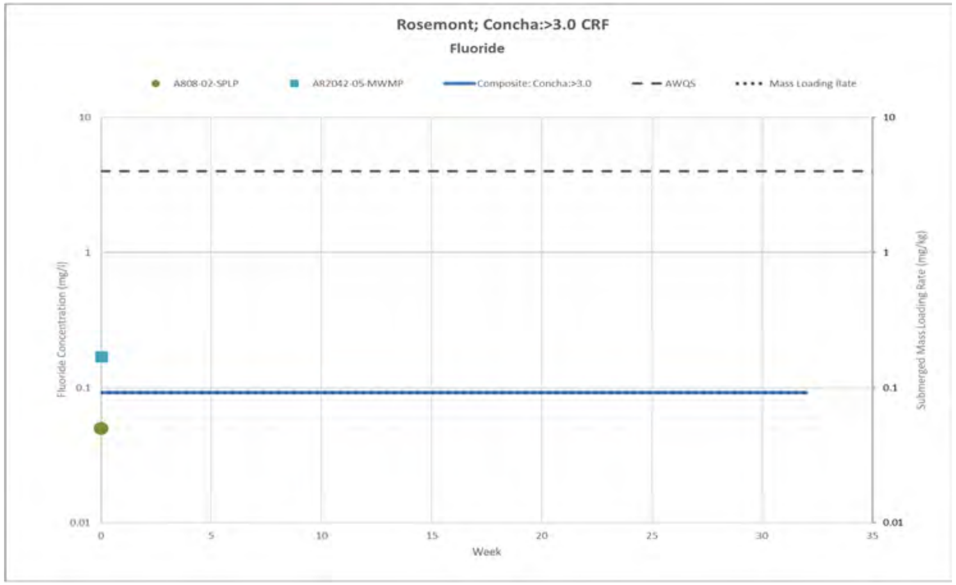

Rosemont; Concha:>3.0 CRF
Cadmium
A808-02-SPLP
AR2042-05-MWMP
Composite: Concha:>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

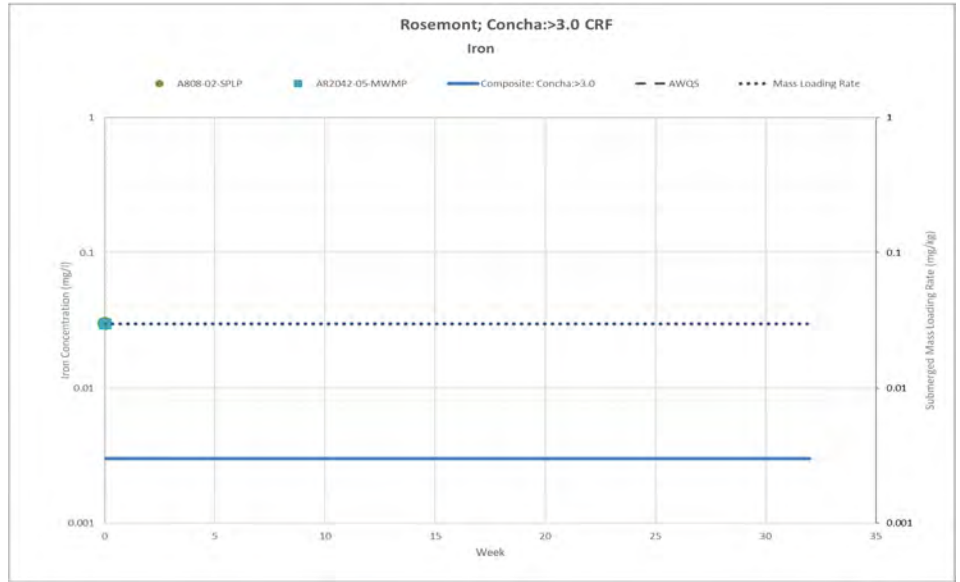

Rosemont; Concha:>3.0 CRF
Calcium
A808-02-SPLP
AR2042-05-MWMP
Composite: Concha:>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

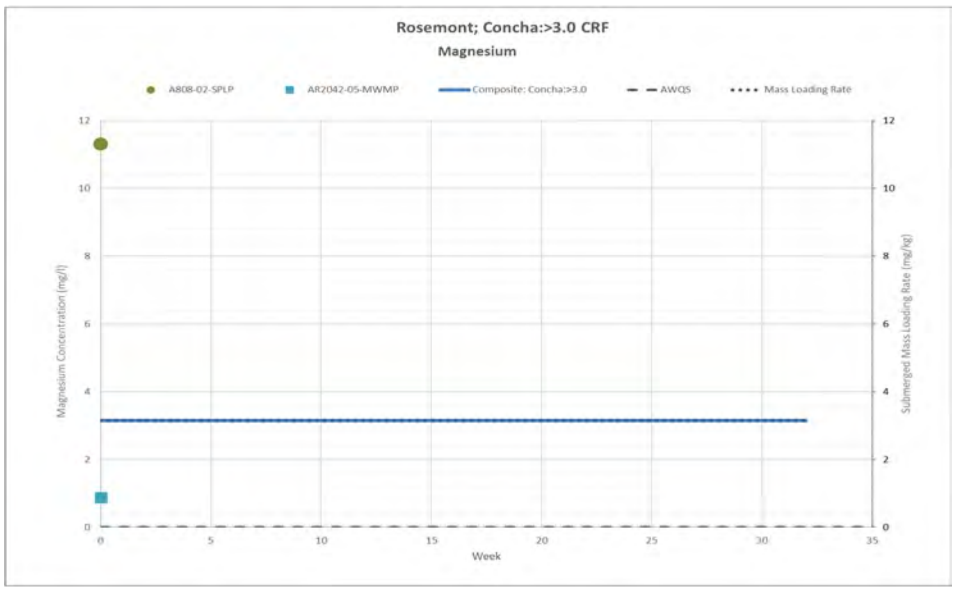

Rosemont; Concha:>3.0 CRF
Chloride
A808-02-SPLP
AR2042-05-MWMP
Composite: Concha:>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

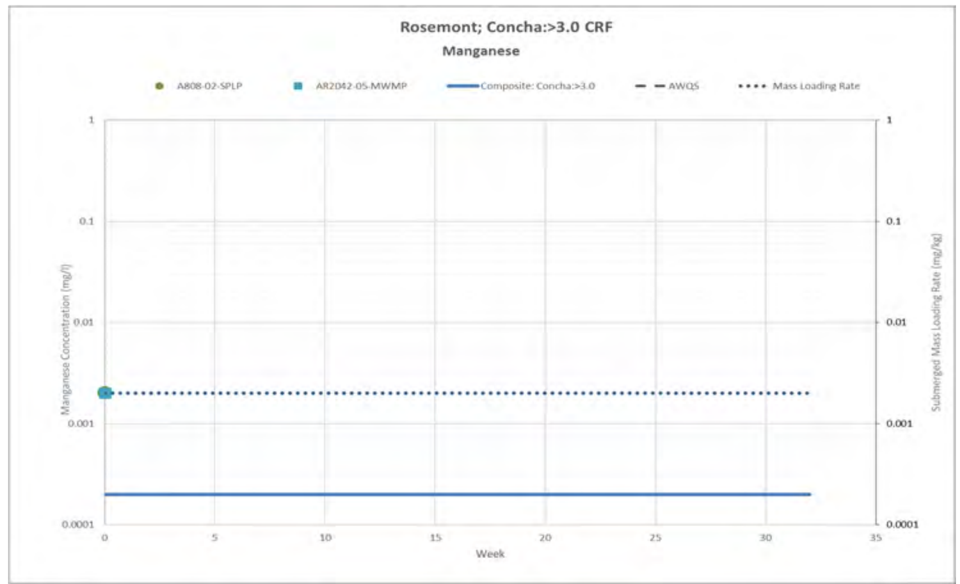

Rosemont; Concha:>3.0 CRF
Copper
A808-02-SPLP
AR2042-05-MWMP
Composite: Concha:>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

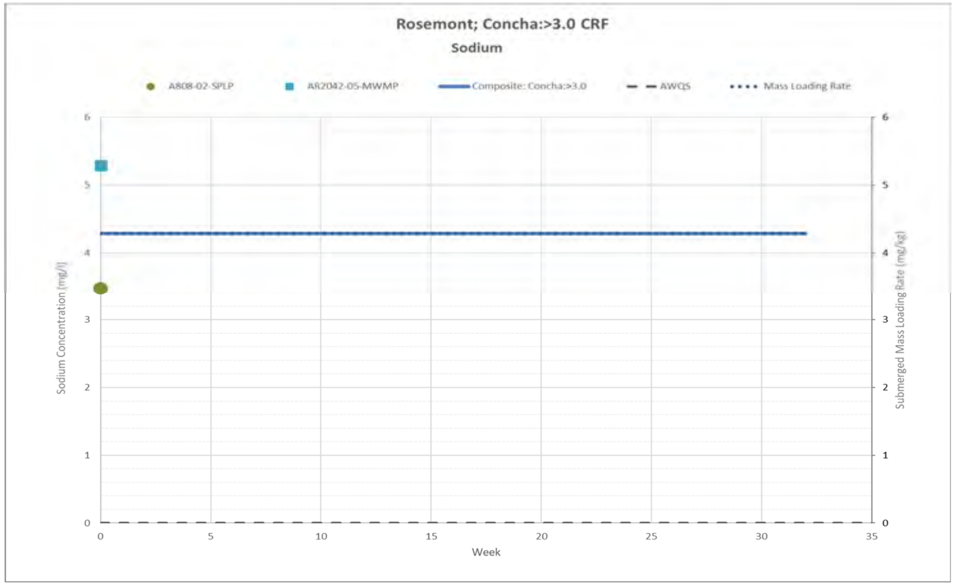


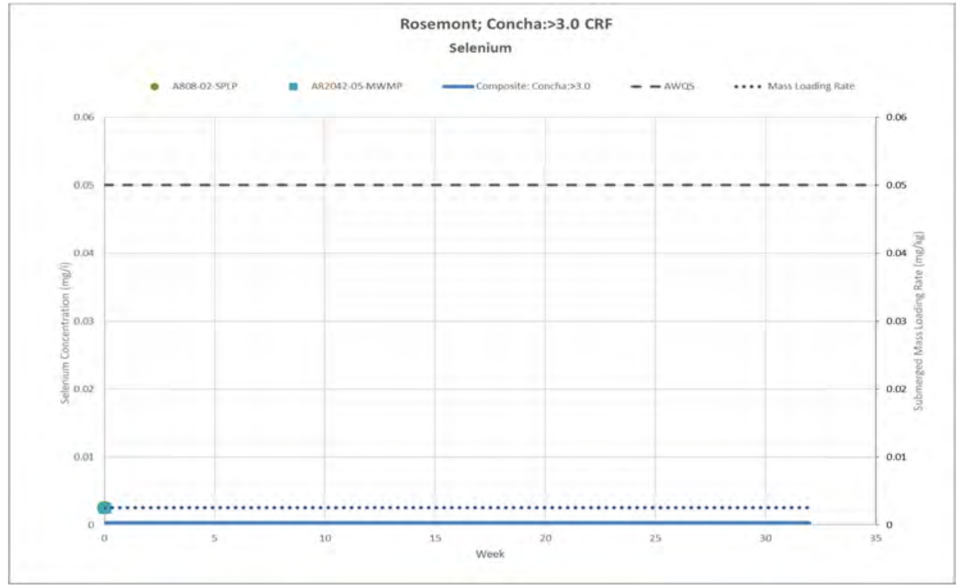


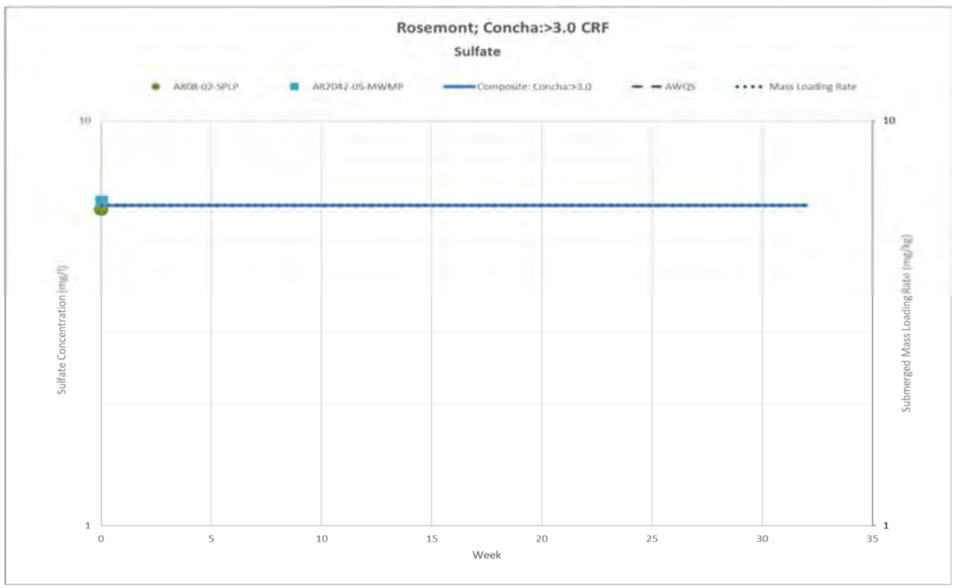


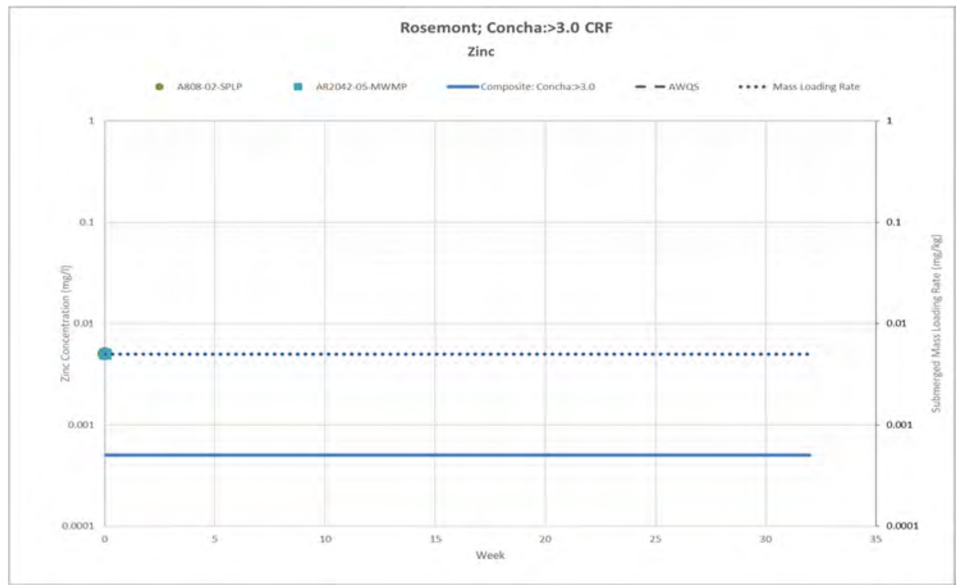


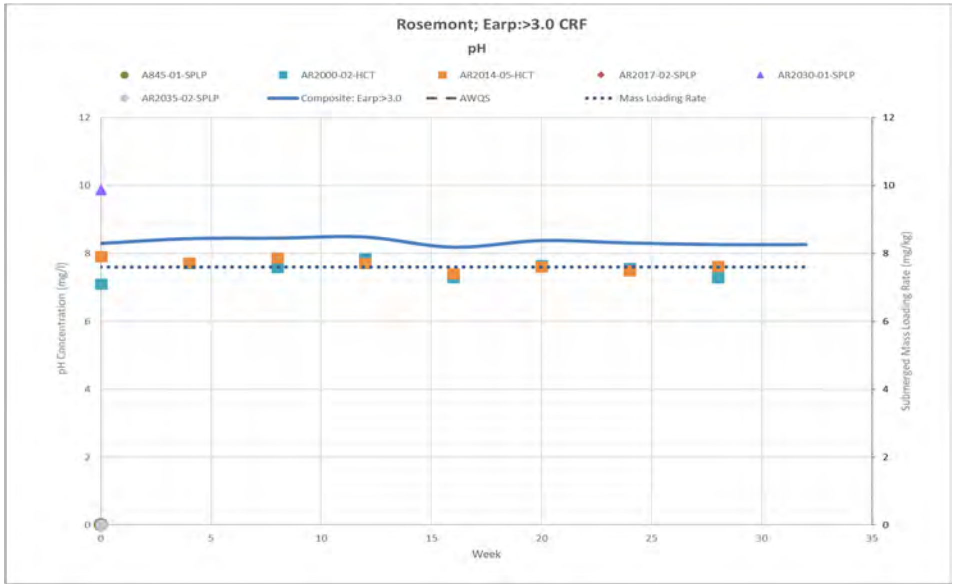
Appendix - H
Composite CRF Charts

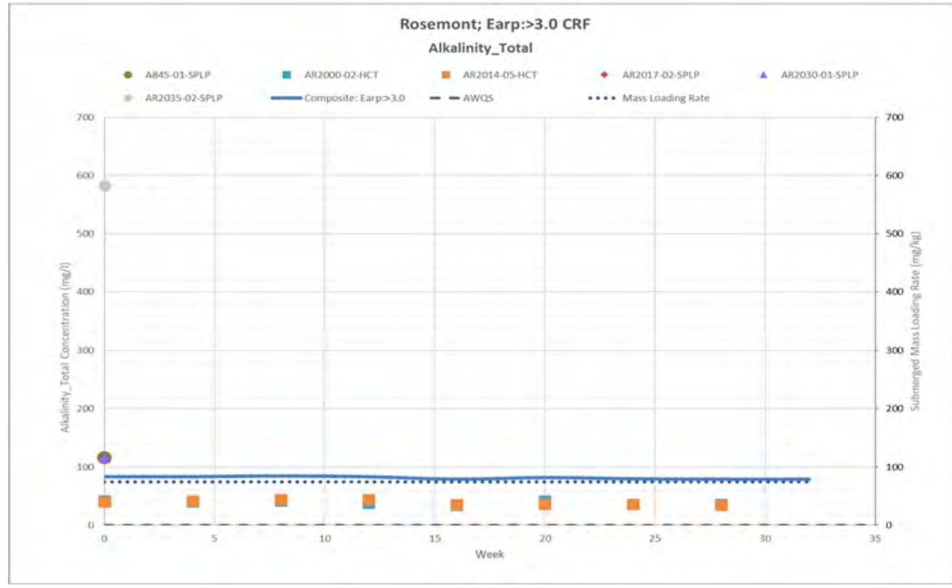


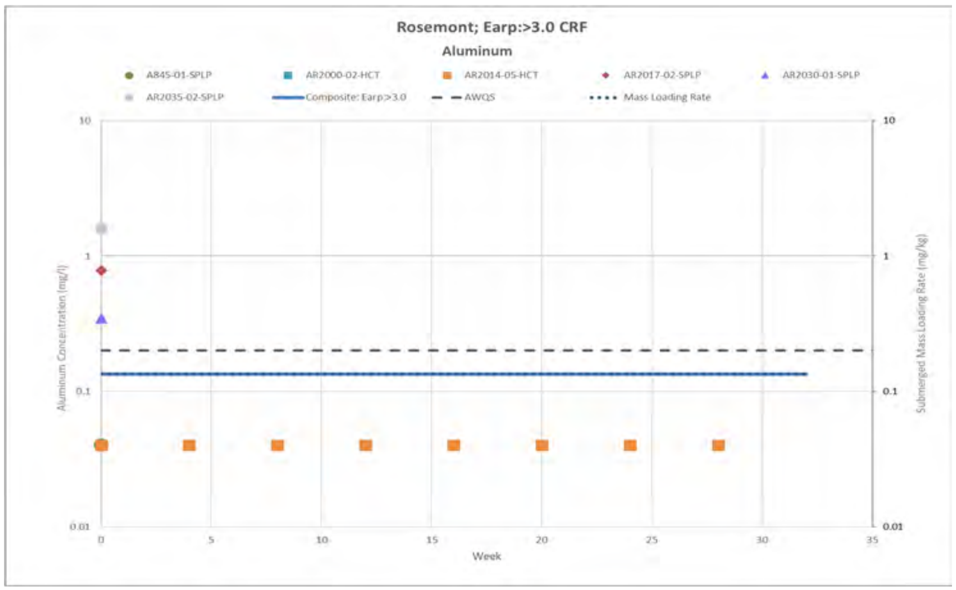


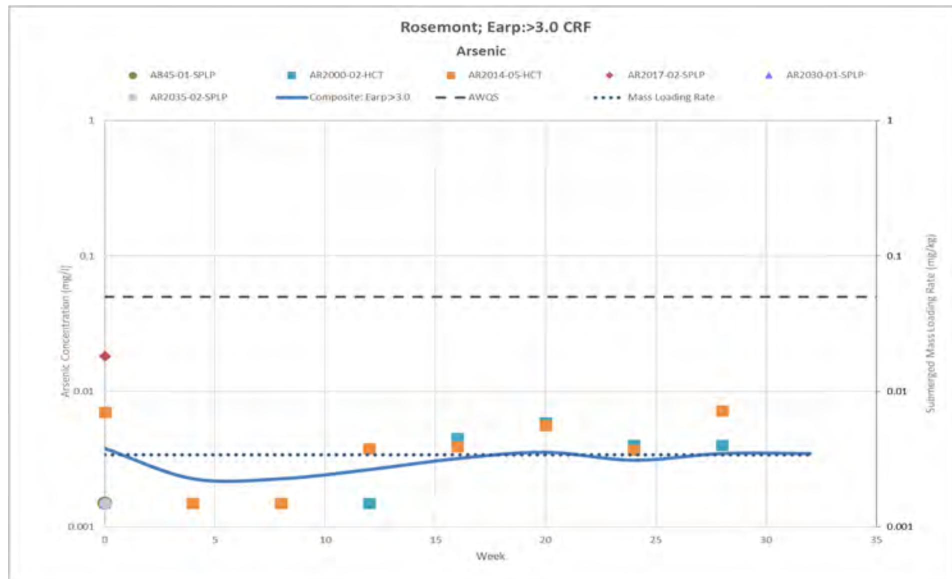


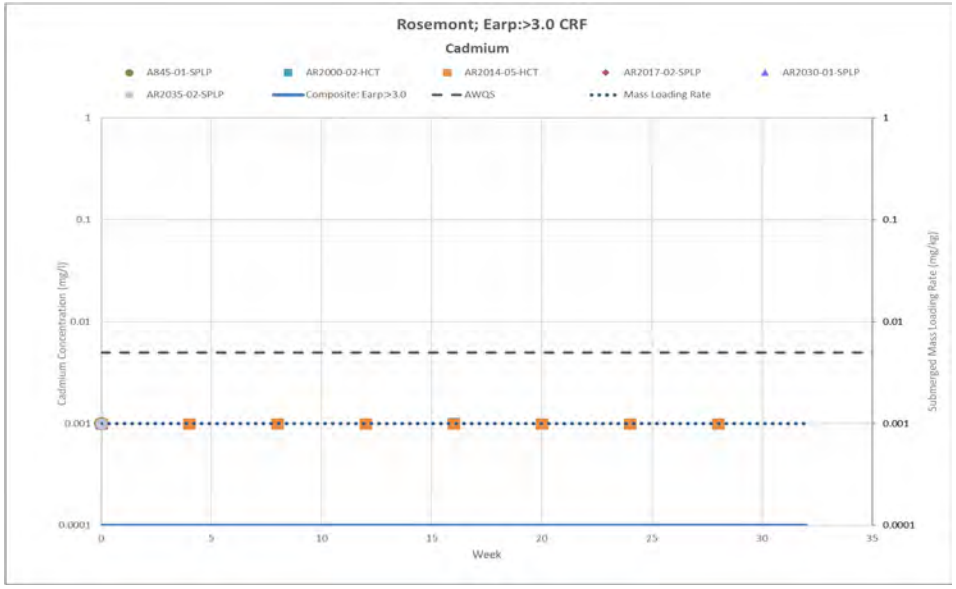


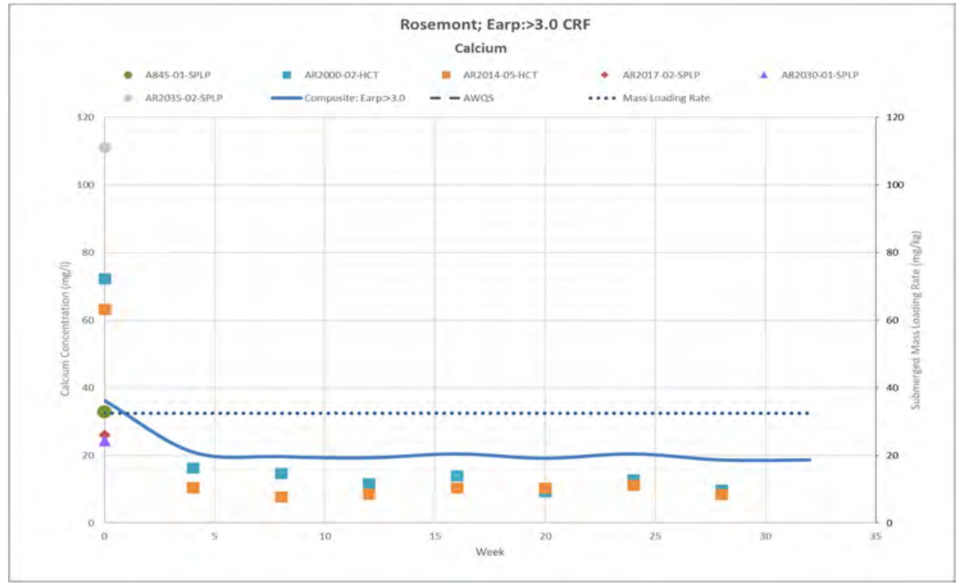

Rosemont; Earp:>3.0 CRF
pH
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

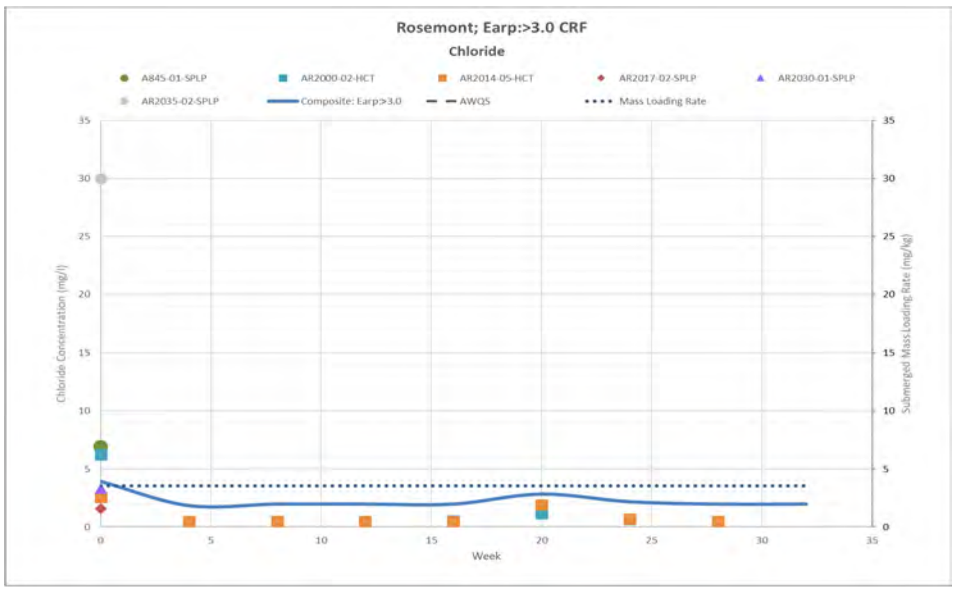

Rosemont; Earp:>3.0 CRF
Alkalinity_Total
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

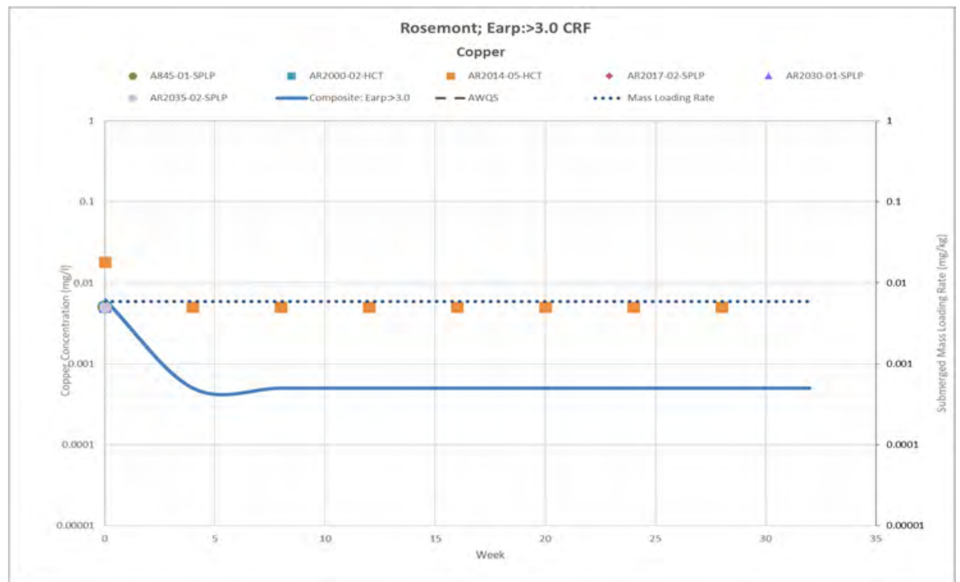

Rosemont; Earp:>3.0 CRF
Aluminum
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Earp:>3.0 CRF
Arsenic
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

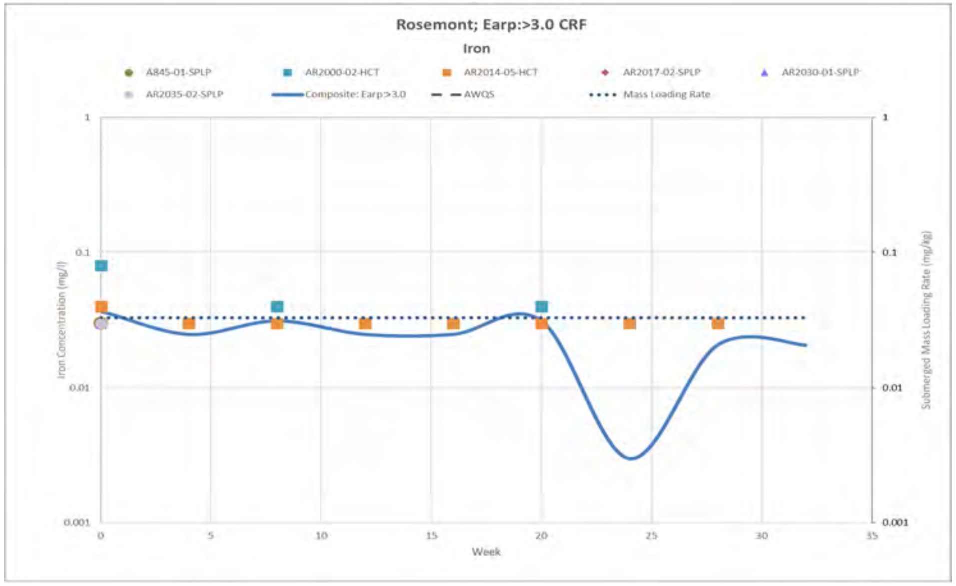

Rosemont; Earp:>3.0 CRF
Cadmium
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

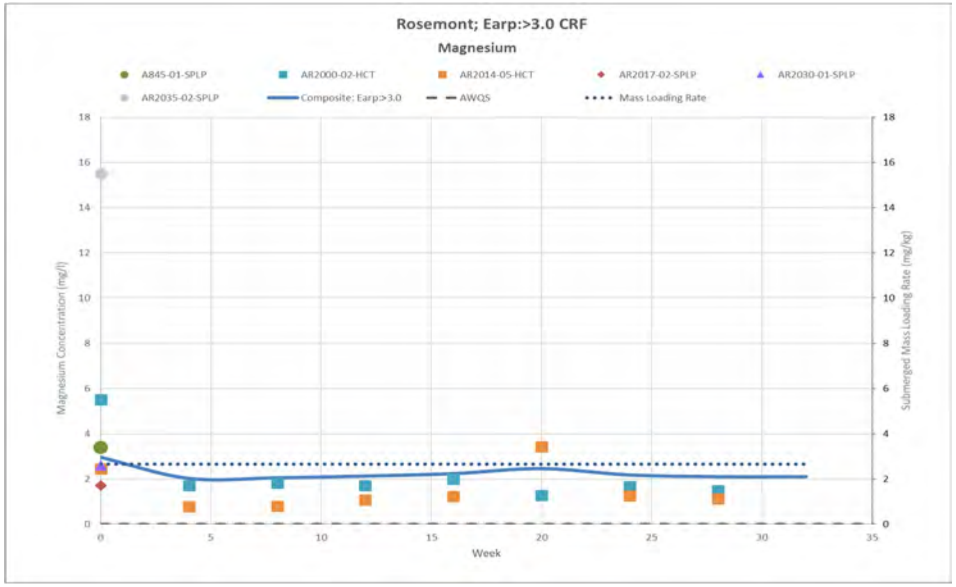

Rosemont; Earp:>3.0 CRF
Calcium
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

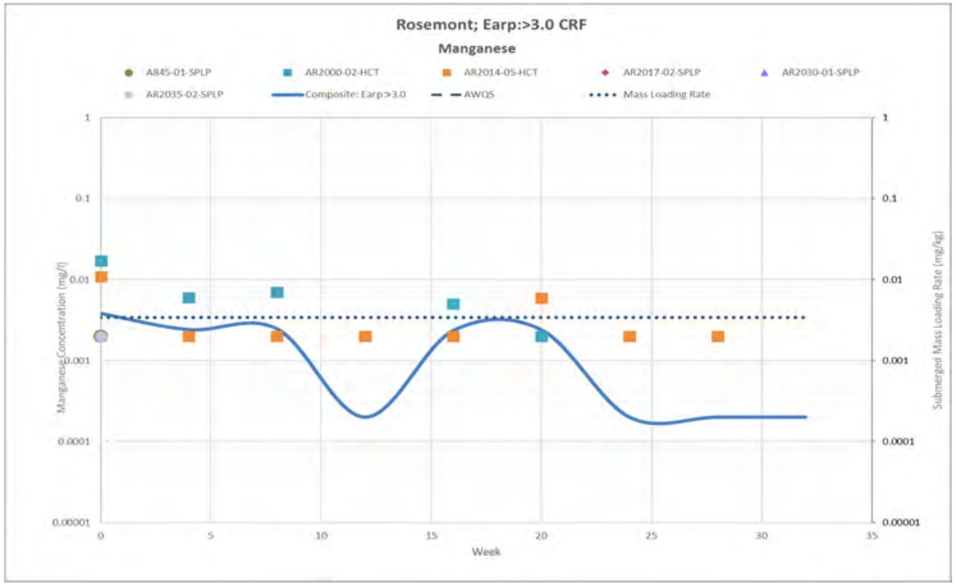

Rosemont; Earp:>3.0 CRF
Chloride
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Earp:>3.0 CRF
Copper
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

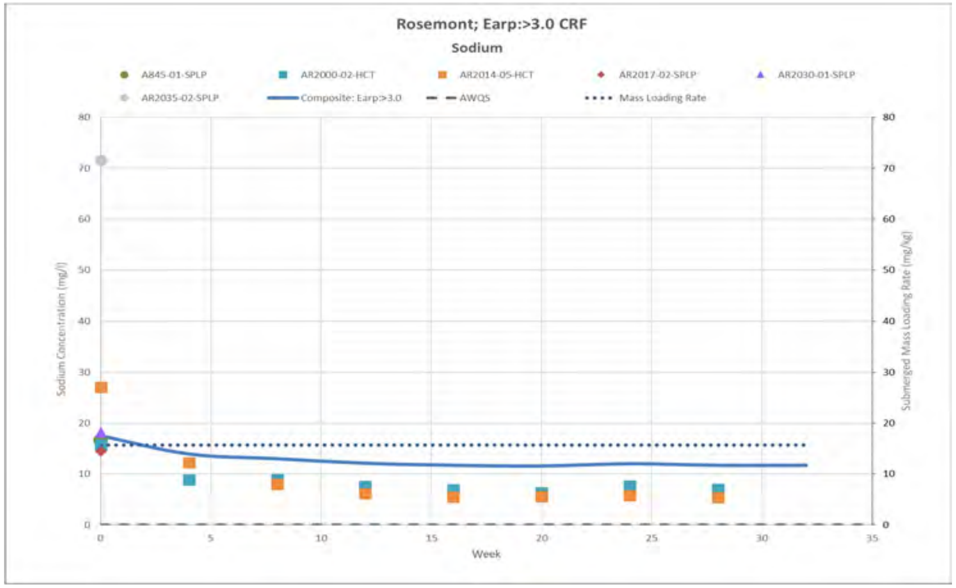

Rosemont; Earp:>3.0 CRF
Fluoride
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

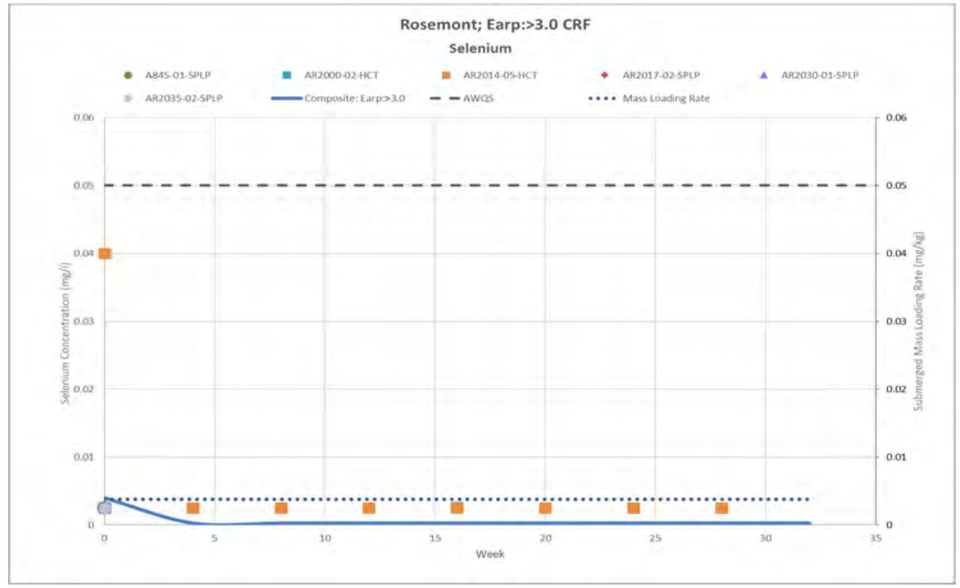

Rosemont; Earp:>3.0 CRF
Iron
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

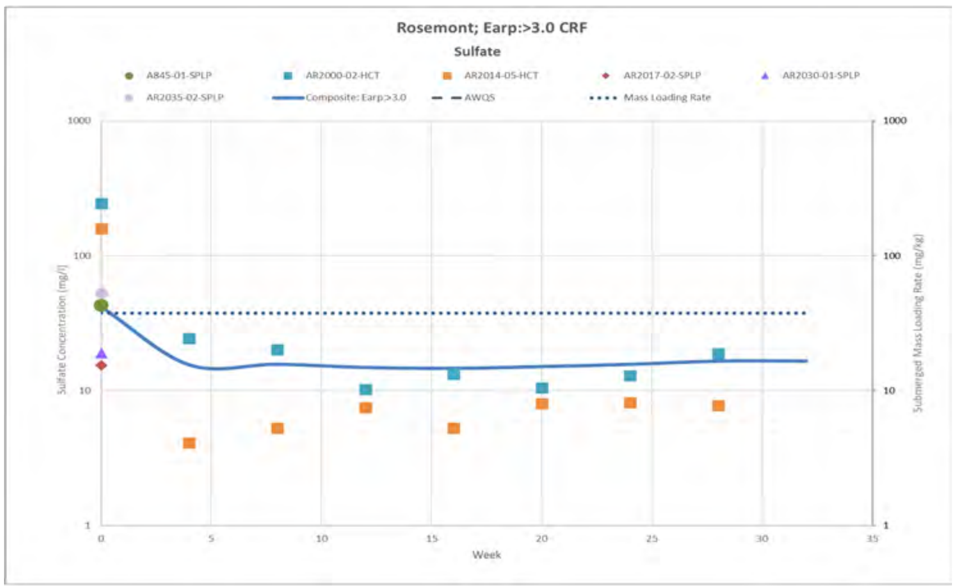

Rosemont; Earp:>3.0 CRF
Magnesium
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

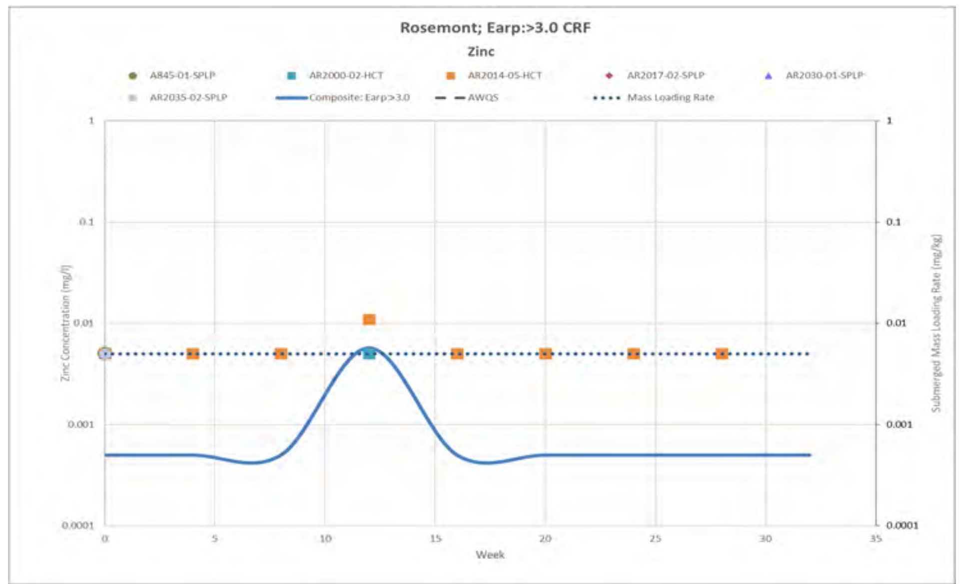

Rosemont; Earp:>3.0 CRF
Manganese
A845-01-SPLP
AR2000-02-HCT
AR2014-05-HCT
AR2017-02-SPLP
AR2030-01-SPLP
AR2035-02-SPLP
Composite: Earp>3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

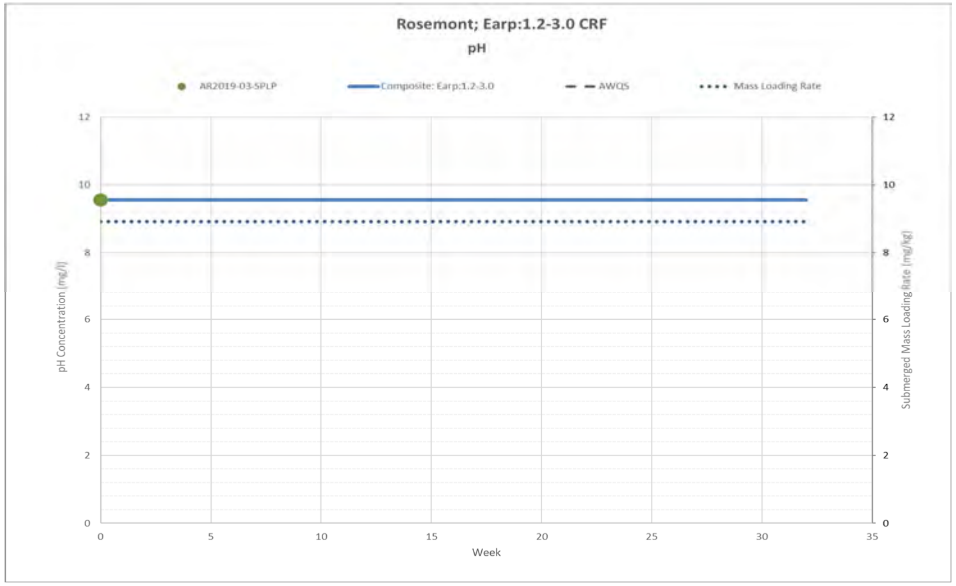


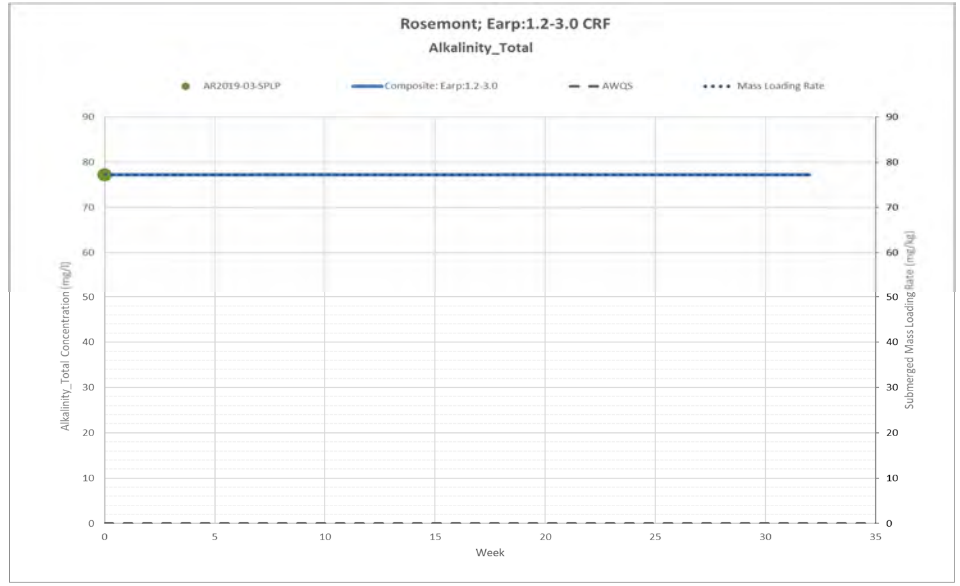


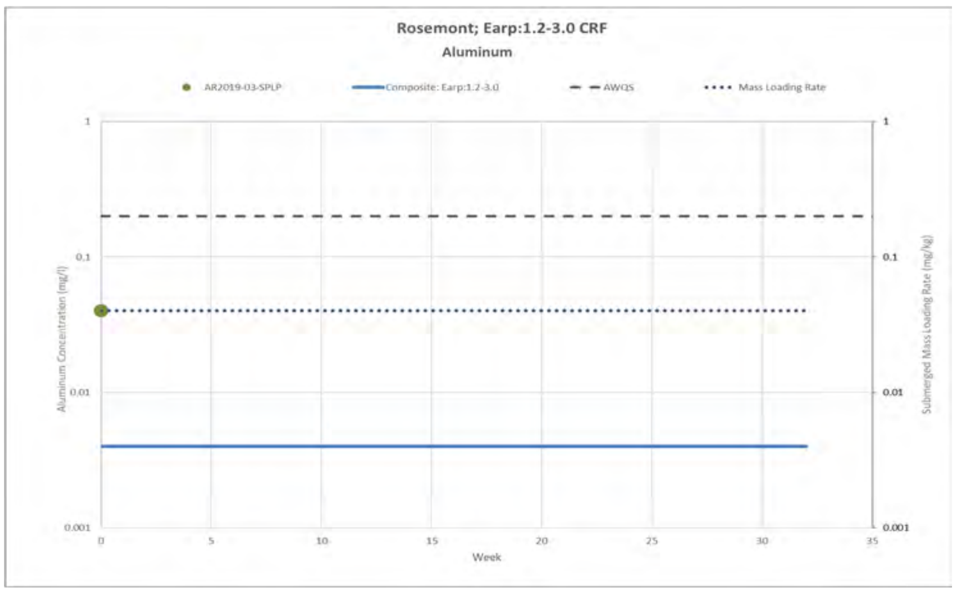


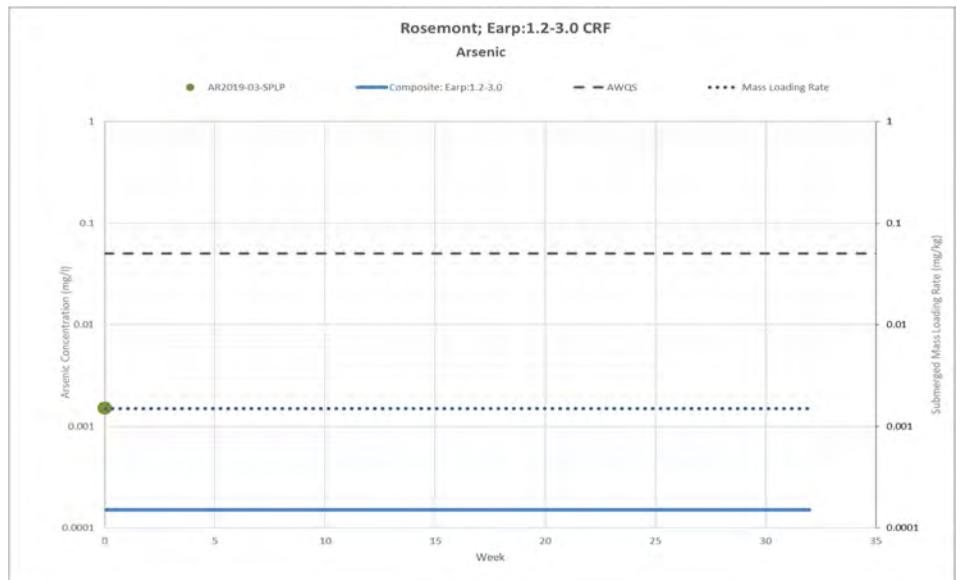


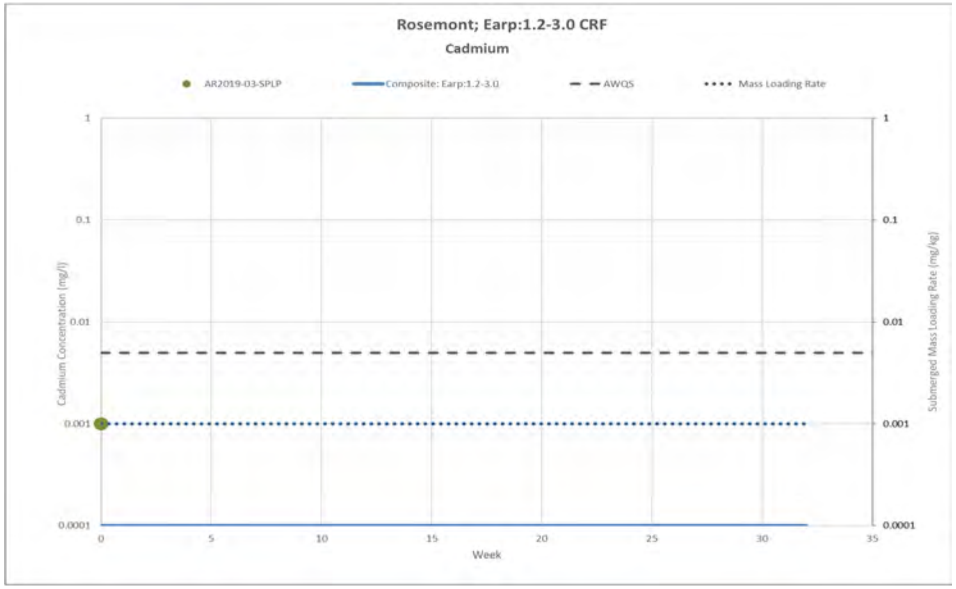
Appendix - H
Composite CRF Charts

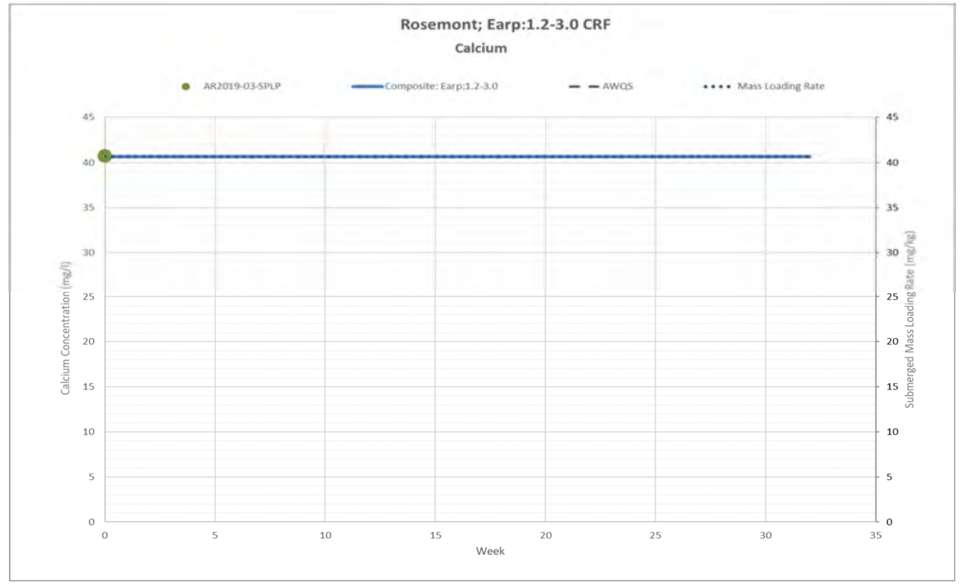


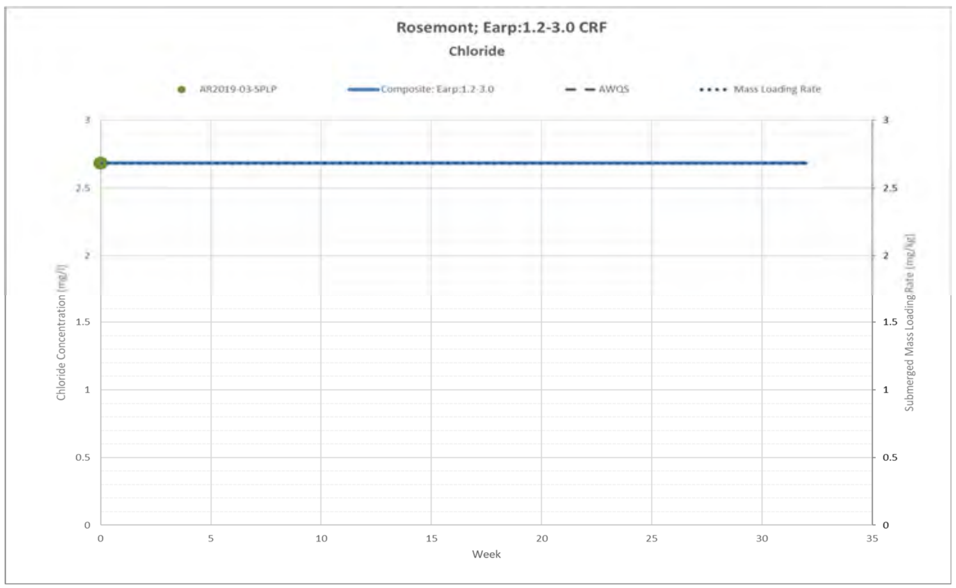


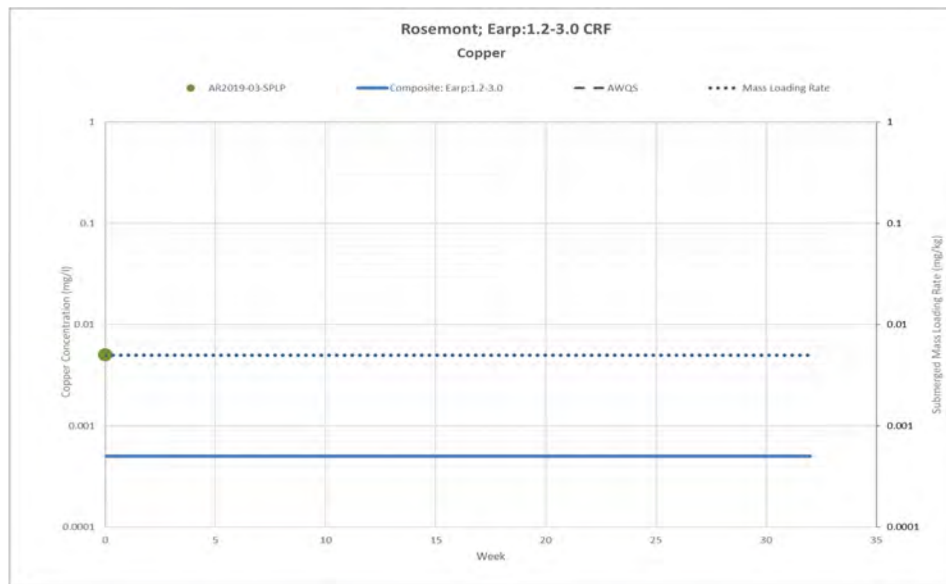




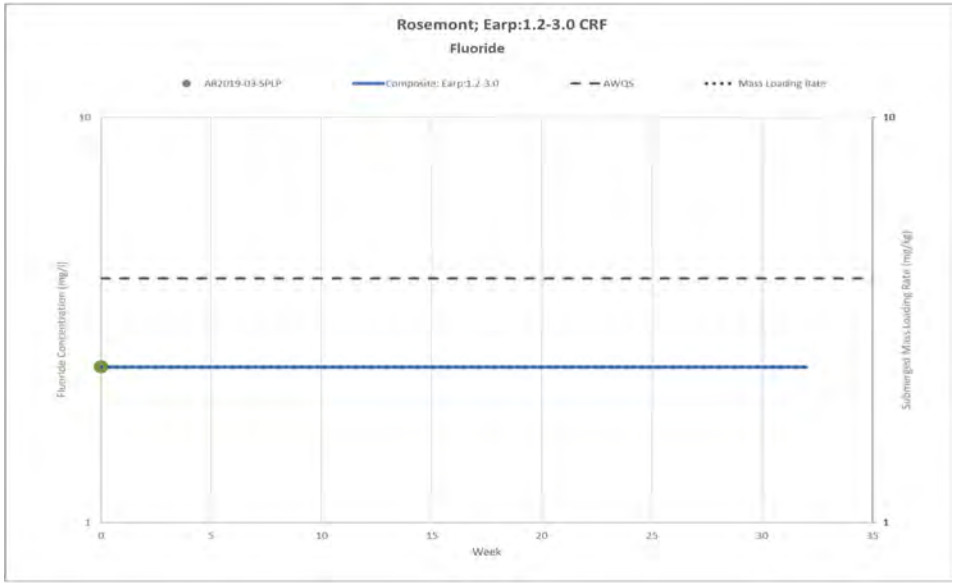

Rosemont; Earp:1.2-3.0 CRF
Cadmium
AR2019-03-SPLP
Composite: Earp:1.2-3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

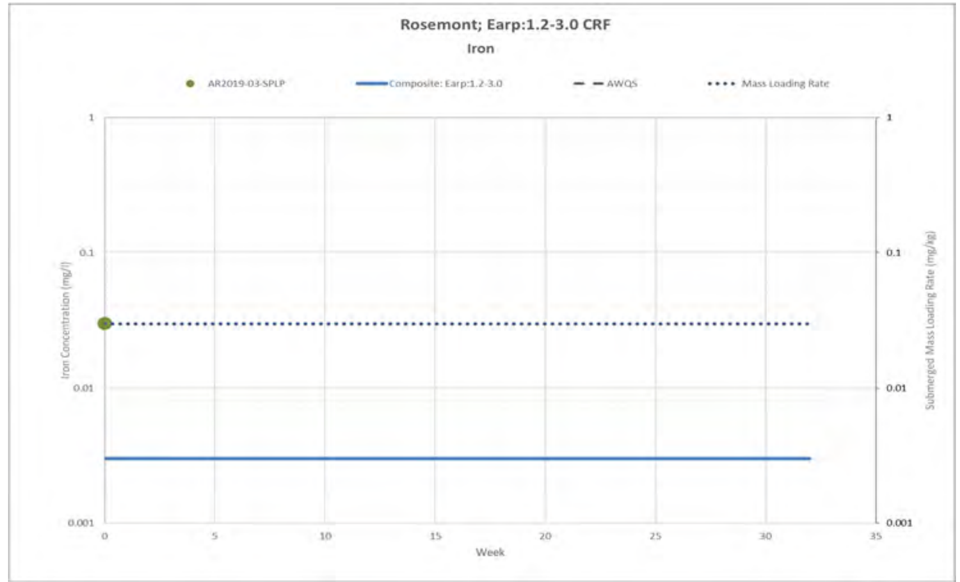

Rosemont; Earp:1.2-3.0 CRF
Calcium
AR2019-03-SPLP
Composite: Earp:1.2-3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

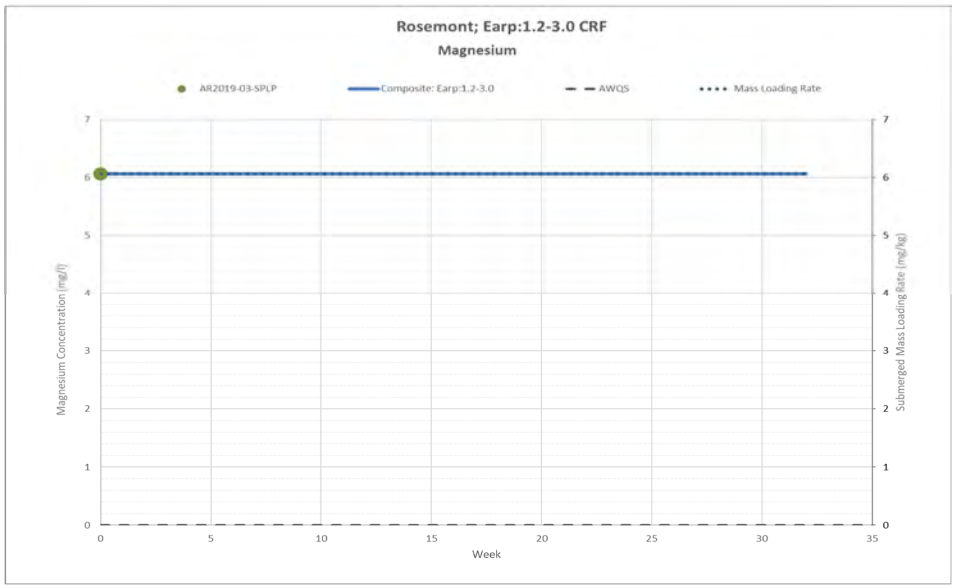

Rosemont; Earp:1.2-3.0 CRF
Chloride
AR2019-03-SPLP
Composite: Earp:1.2-3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

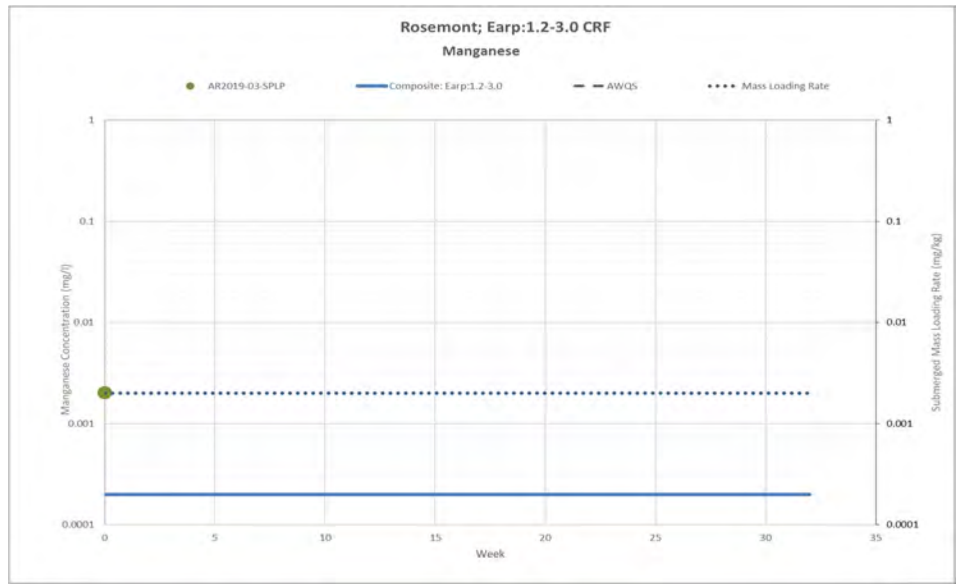

Rosemont; Earp:1.2-3.0 CRF
Copper
AR2019-03-SPLP
Composite: Earp:1.2-3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

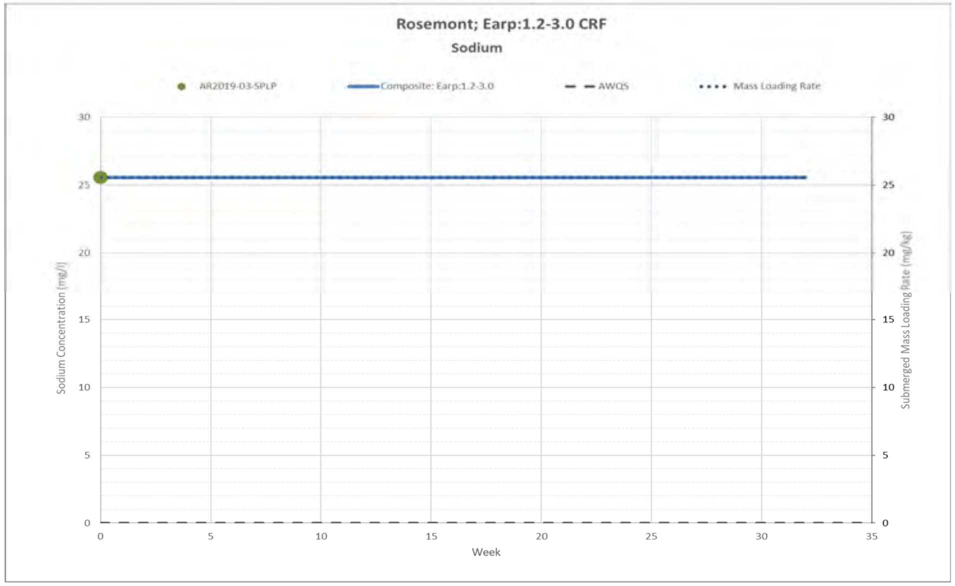
Appendix - H
Composite CRF Charts



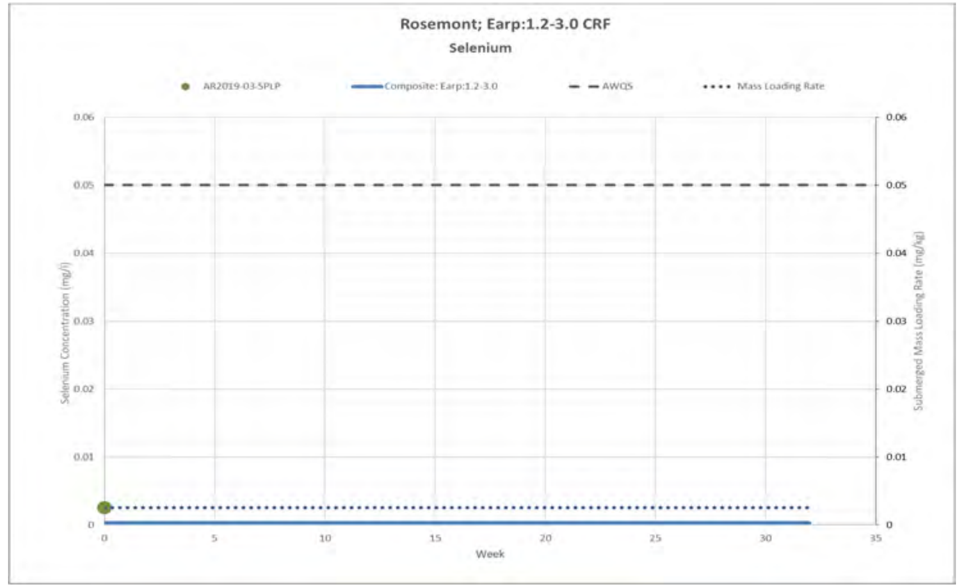




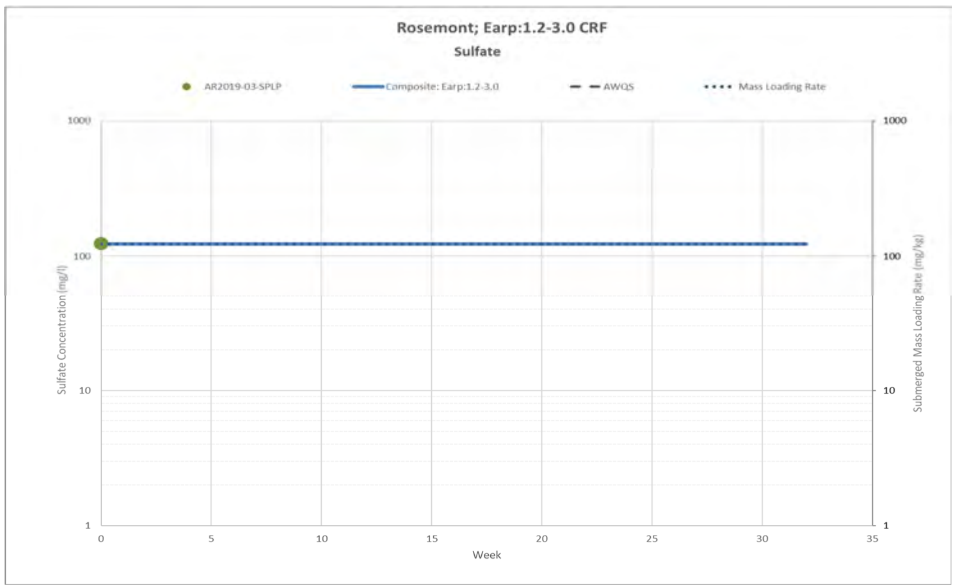




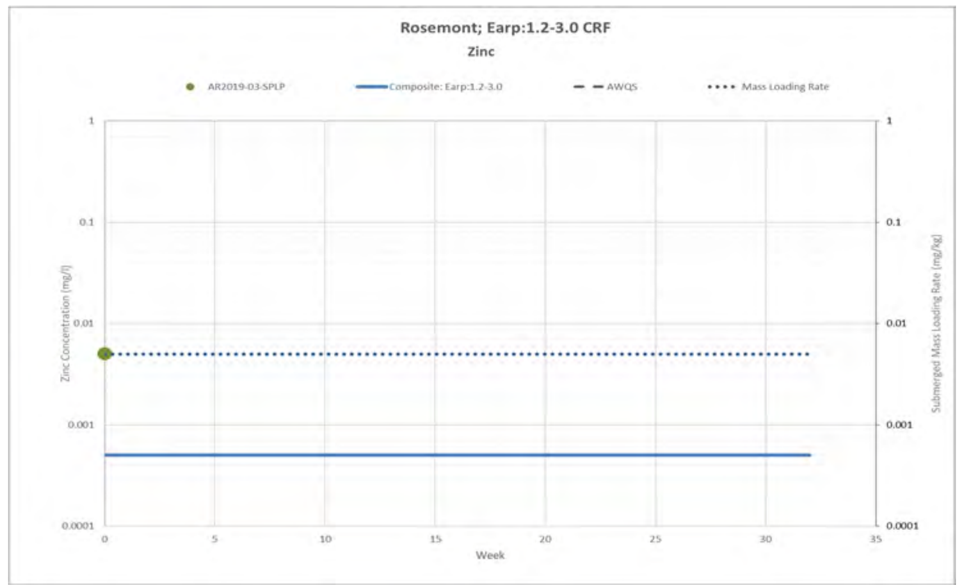
Rosemont; Earp:1.2-3.0 CRF
Sodium
AR2019-03-SPLP
Composite: Earp:1.2-3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week



Rosemont; Earp:1.2-3.0 CRF
Selenium
AR2019-03-SPLP
Composite: Earp:1.2-3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

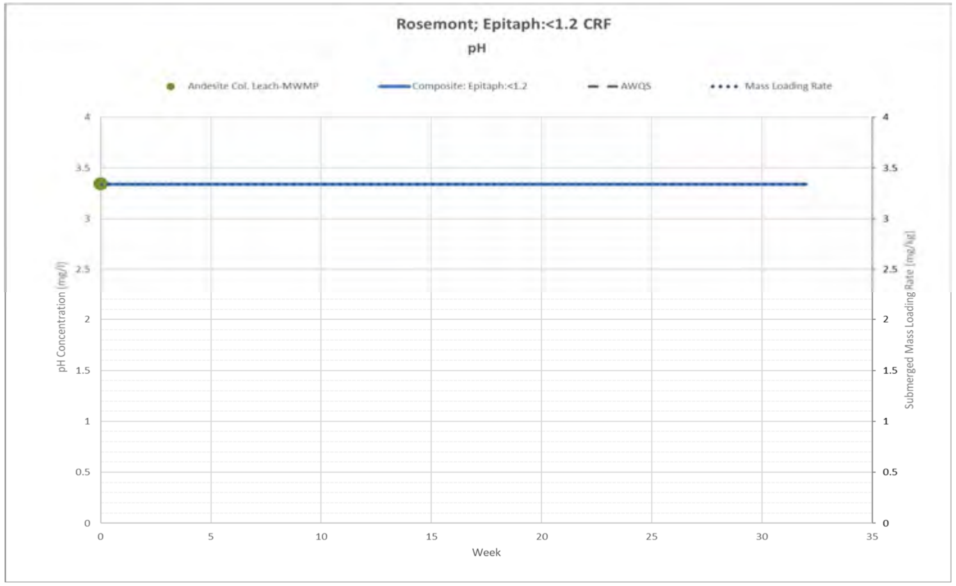


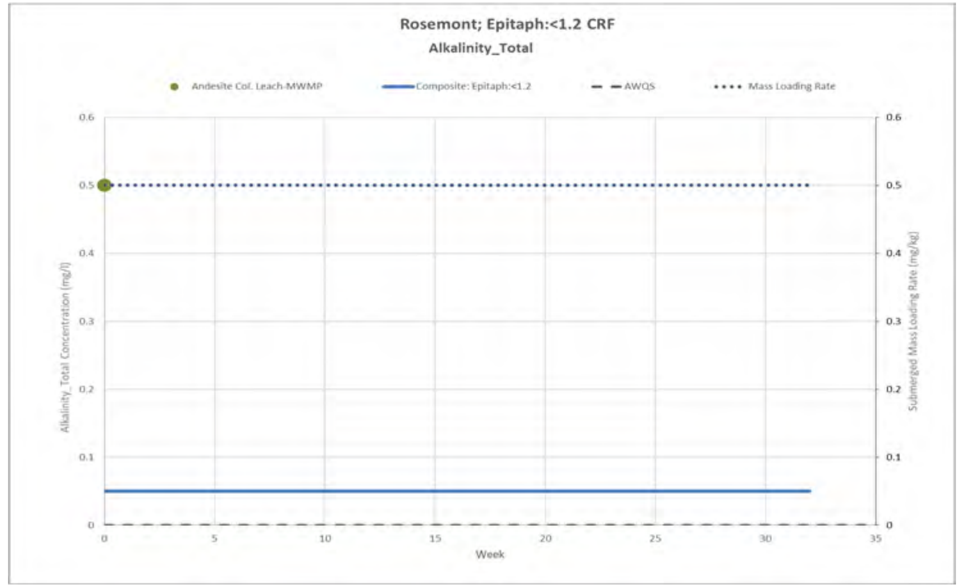
Rosemont; Earp:1.2-3.0 CRF
Sulfate
AR2019-03-SPLP
Composite: Earp:1.2-3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

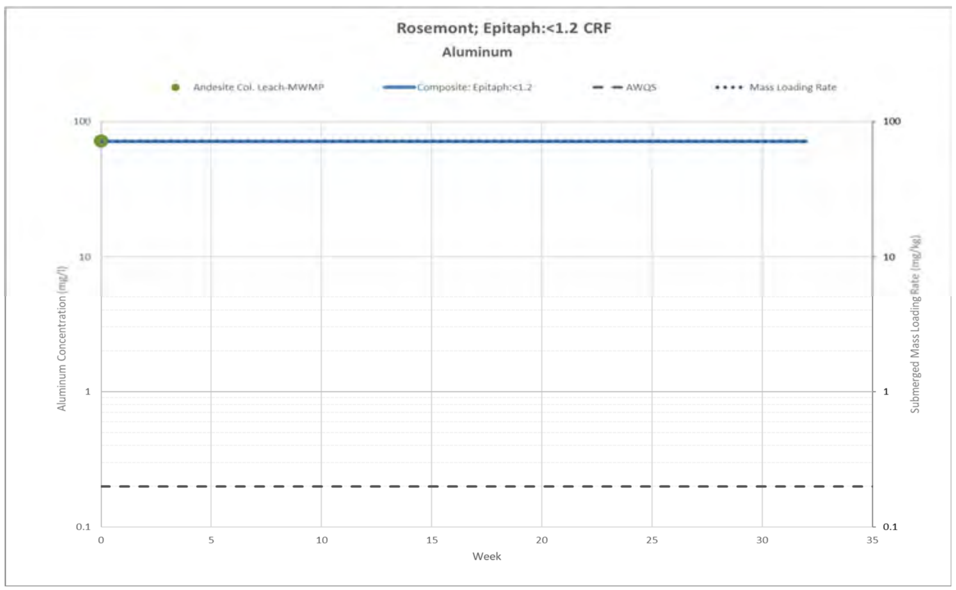


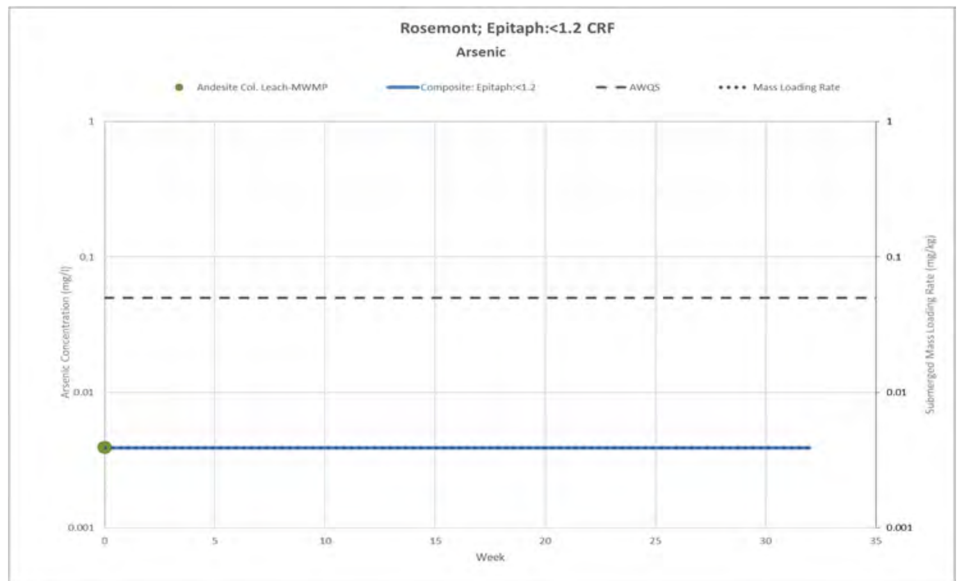
Rosemont; Earp:1.2-3.0 CRF
Zinc
AR2019-03-SPLP
Composite: Earp:1.2-3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

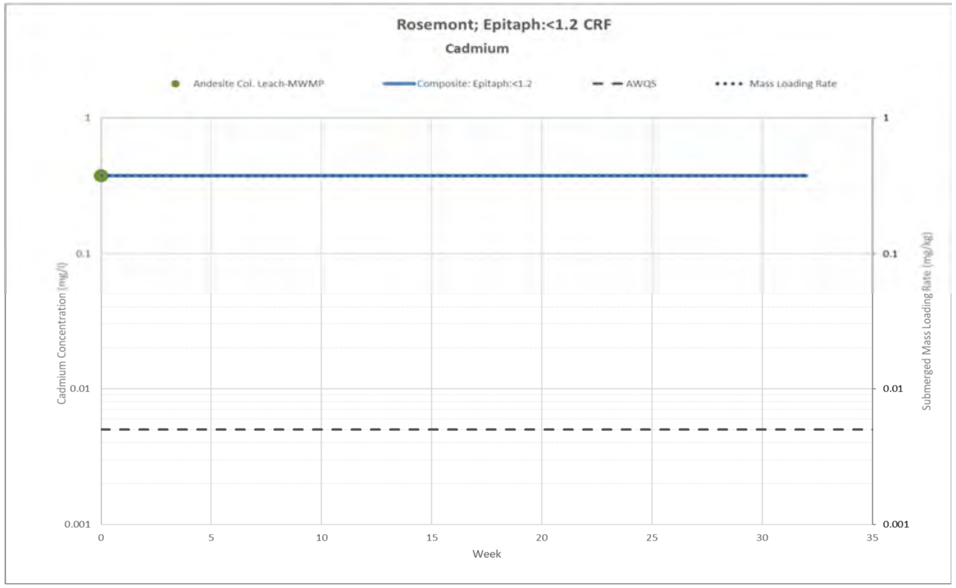


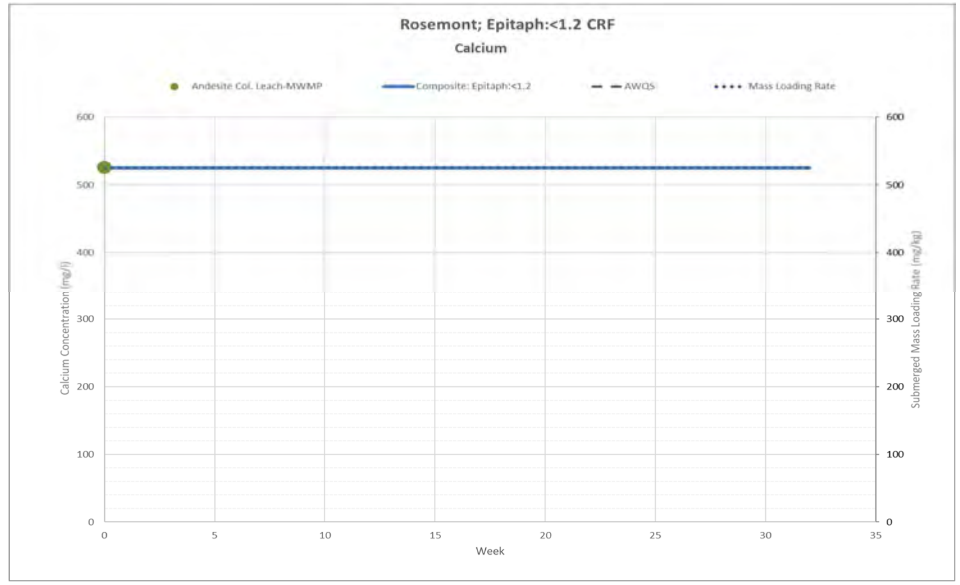


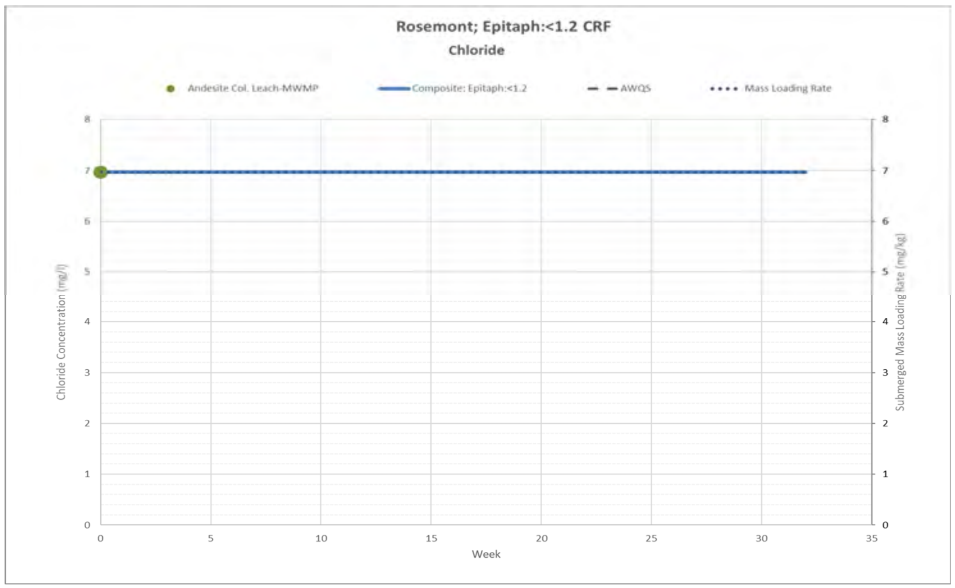


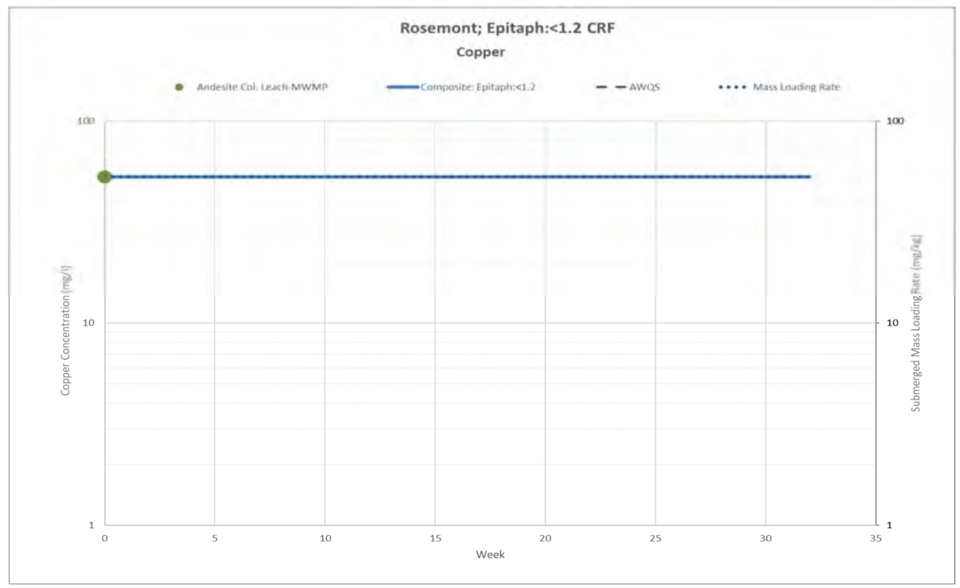


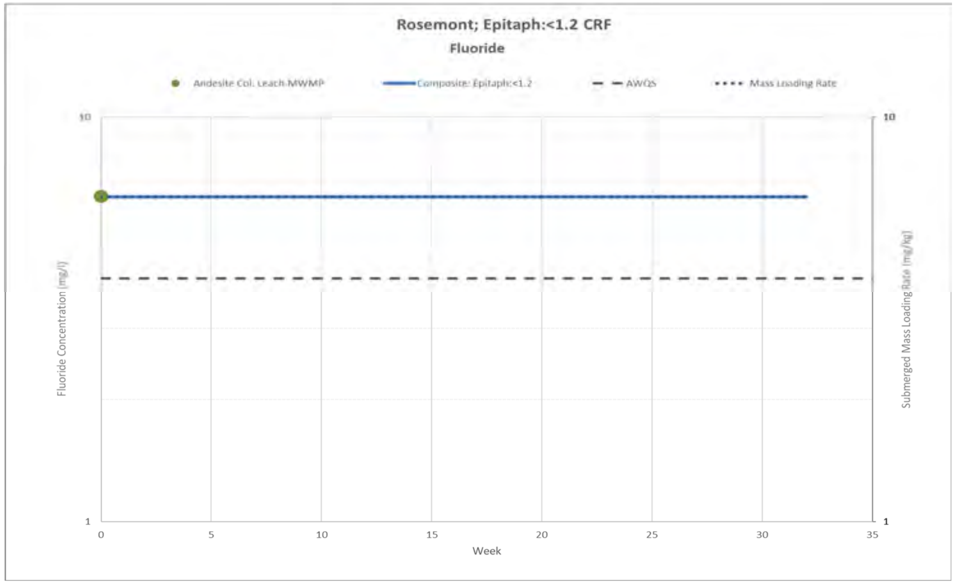
Appendix - H
Composite CRF Charts

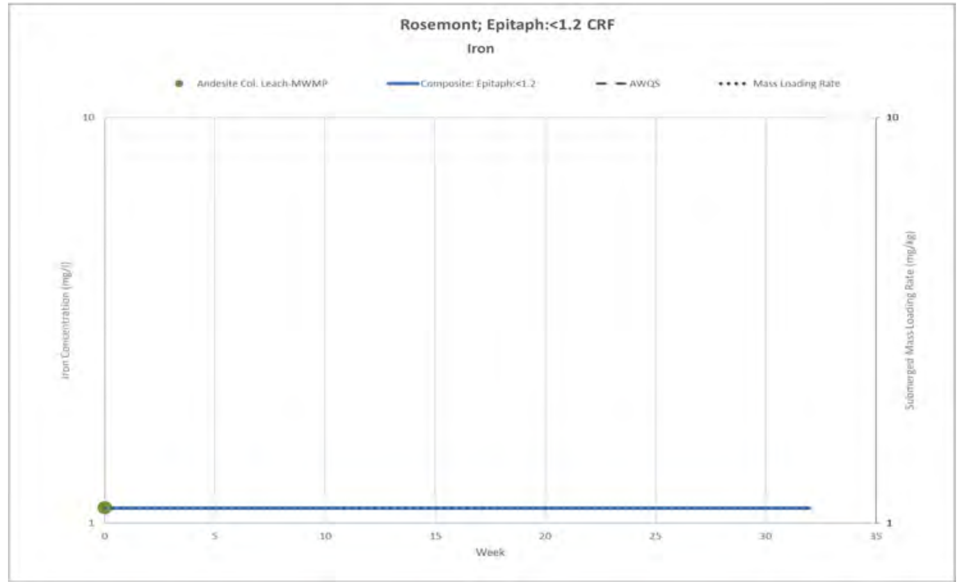


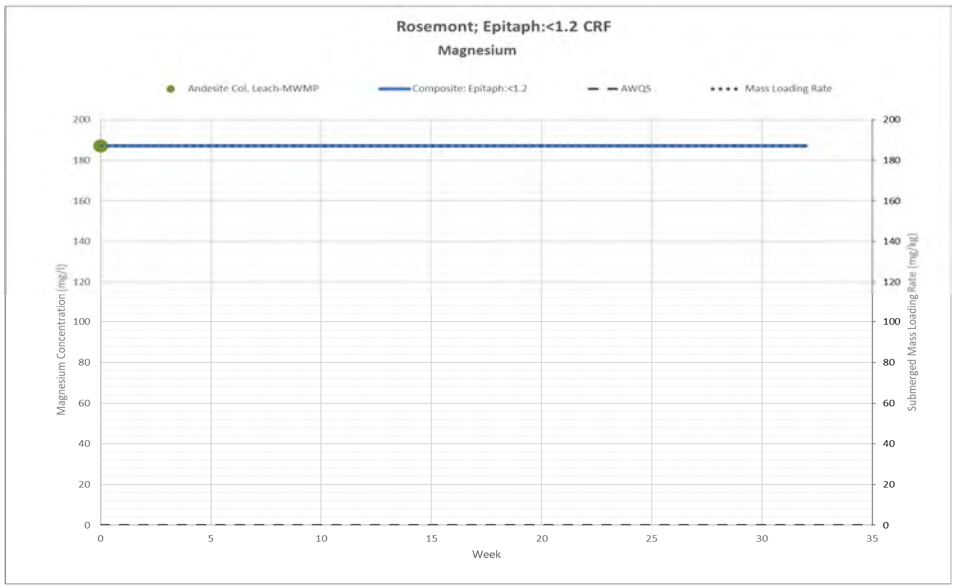


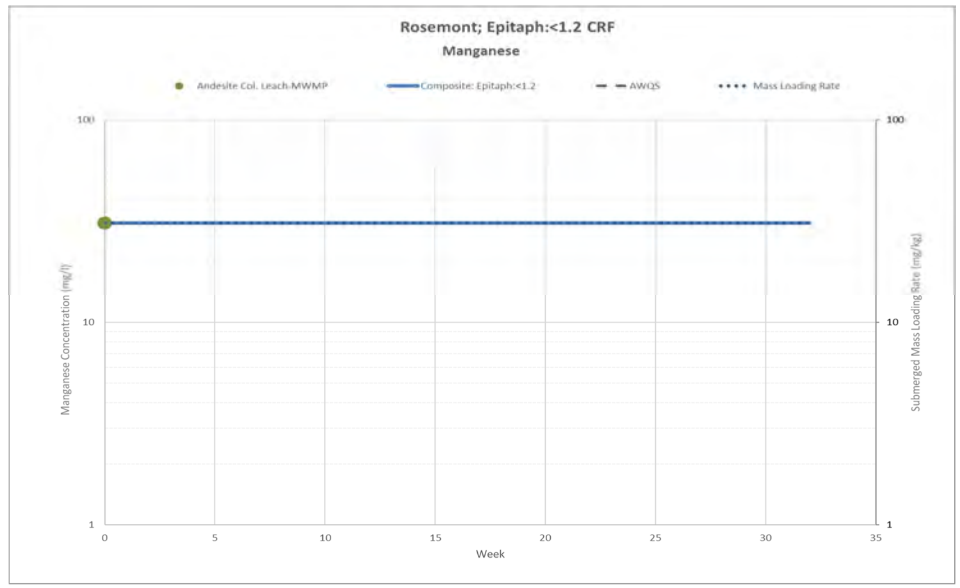


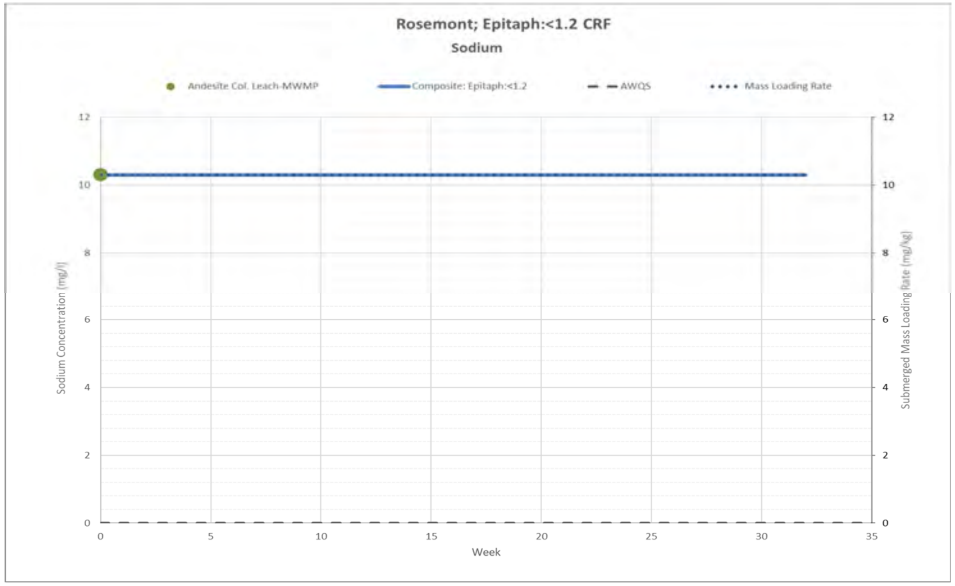


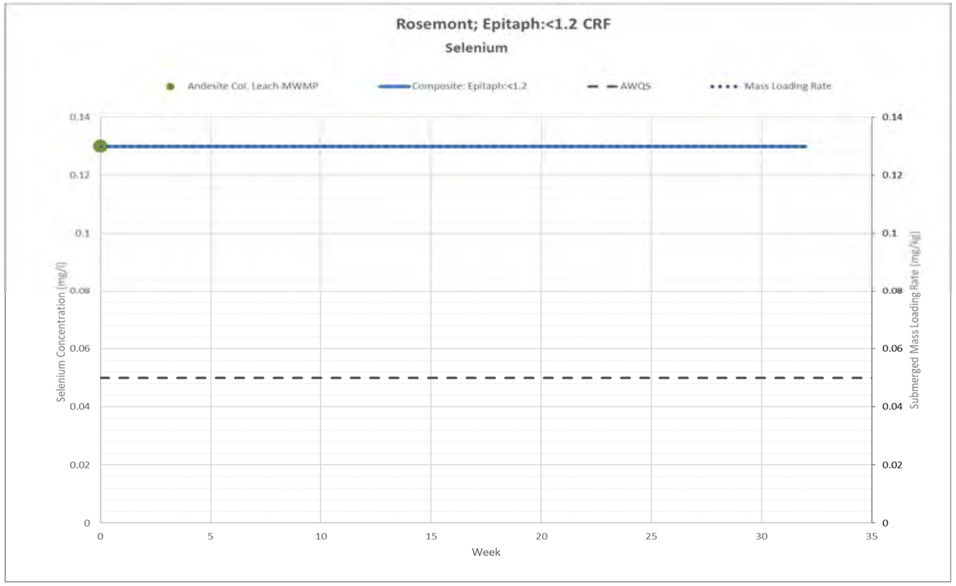

Rosemont; Epitaph:<1.2 CRF
Fluoride
Andesite Col. Leach-MWMP
Composite: Epitaph:<1.2
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

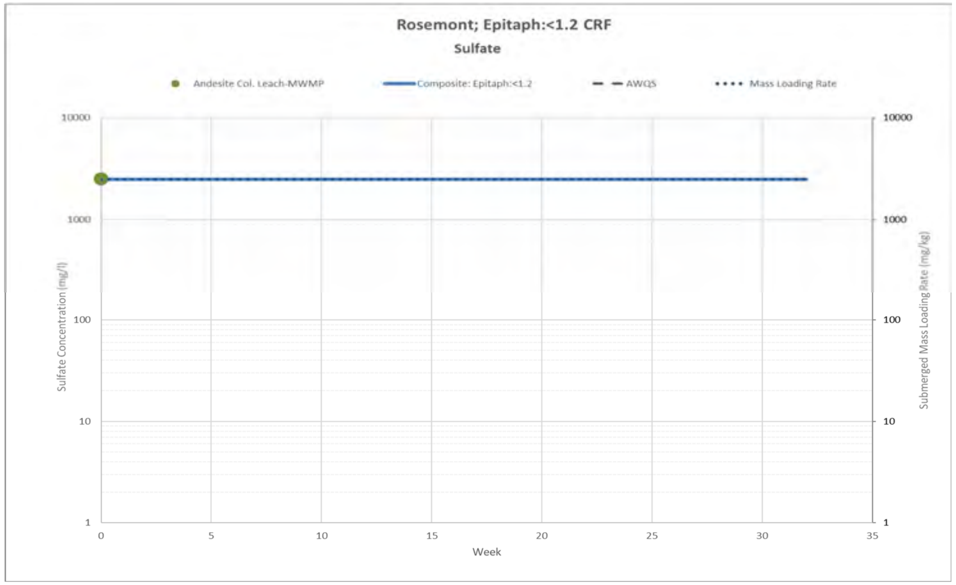

Rosemont; Epitaph:<1.2 CRF
Iron
Andesite Col. Leach-MWMP
Composite: Epitaph:<1.2
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

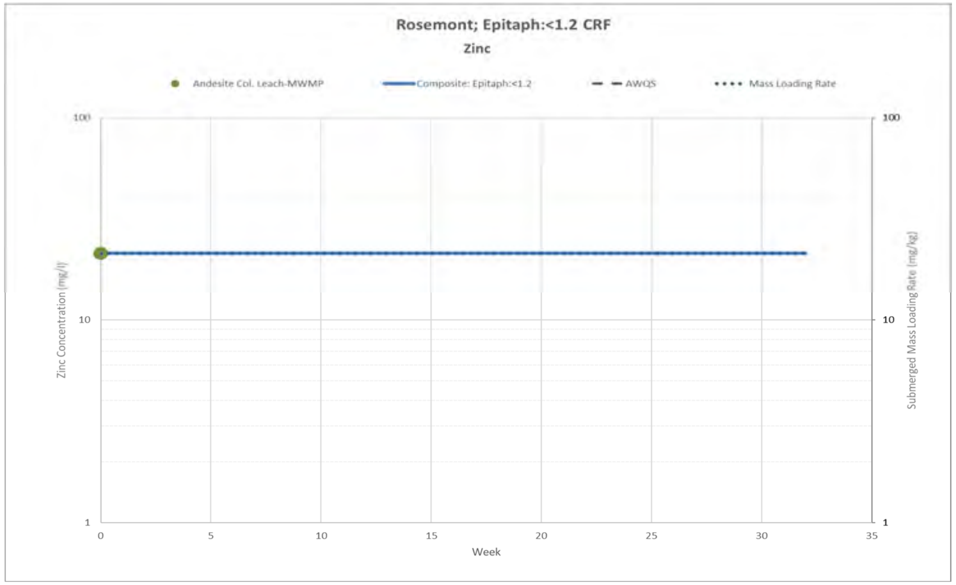

Rosemont; Epitaph:<1.2 CRF
Magnesium
Andesite Col. Leach-MWMP
Composite: Epitaph:<1.2
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Epitaph:<1.2 CRF
Manganese
Andesite Col. Leach-MWMP
Composite: Epitaph:<1.2
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

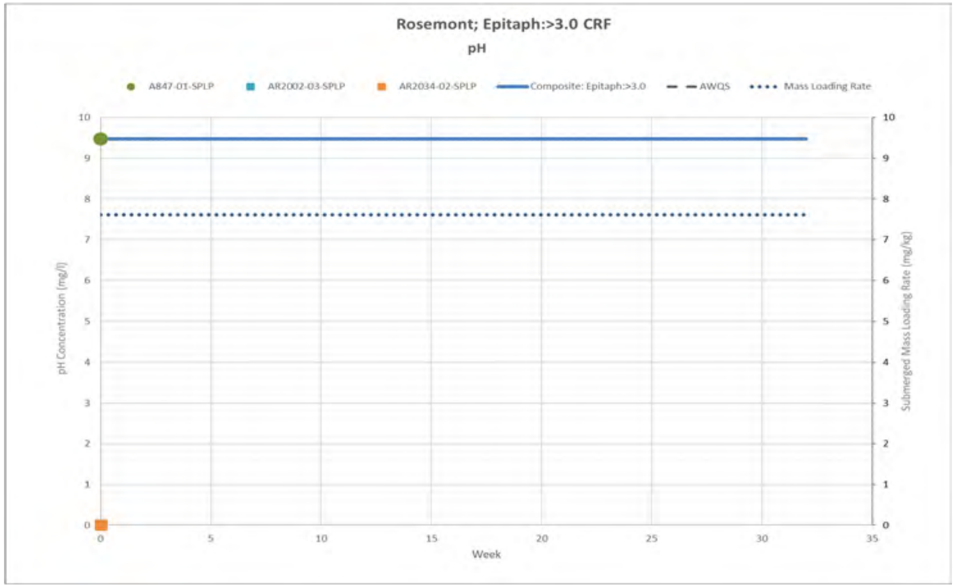

Rosemont; Epitaph:<1.2 CRF
Sodium
Andesite Col. Leach-MWMP
Composite: Epitaph:<1.2
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

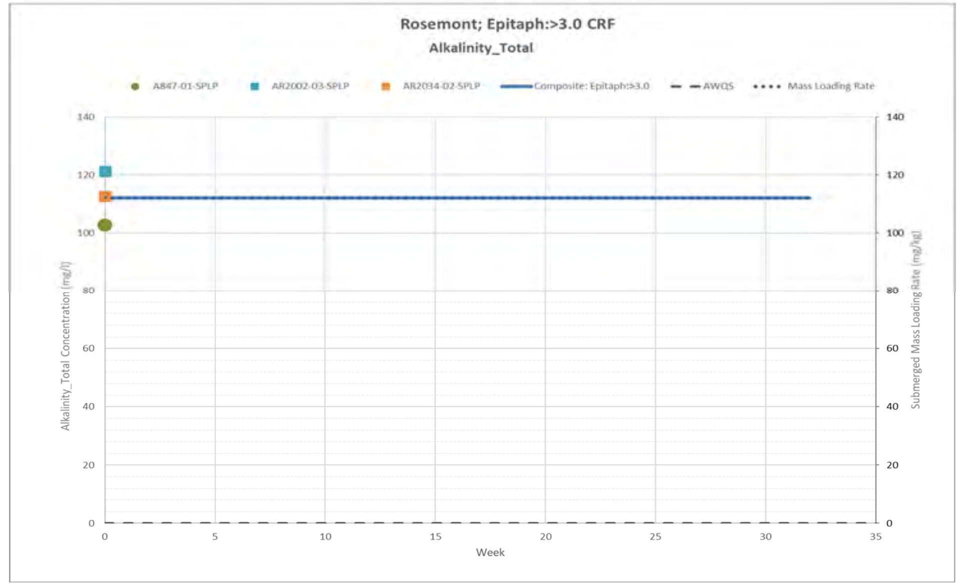

Rosemont; Epitaph:<1.2 CRF
Selenium
Andesite Col. Leach-MWMP
Composite: Epitaph:<1.2
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

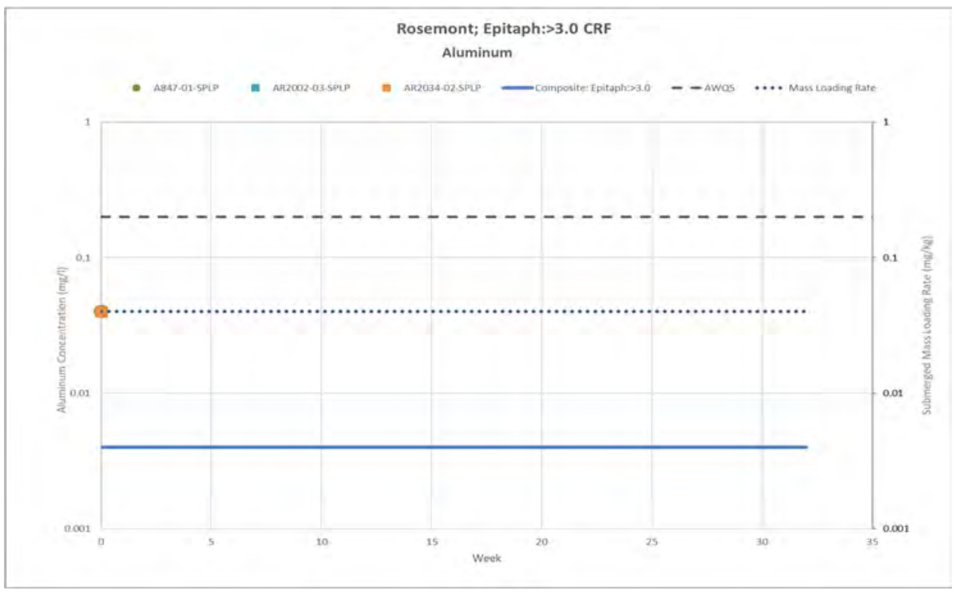

Rosemont; Epitaph:<1.2 CRF
Sulfate
Andesite Col. Leach-MWMP
Composite: Epitaph:<1.2
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

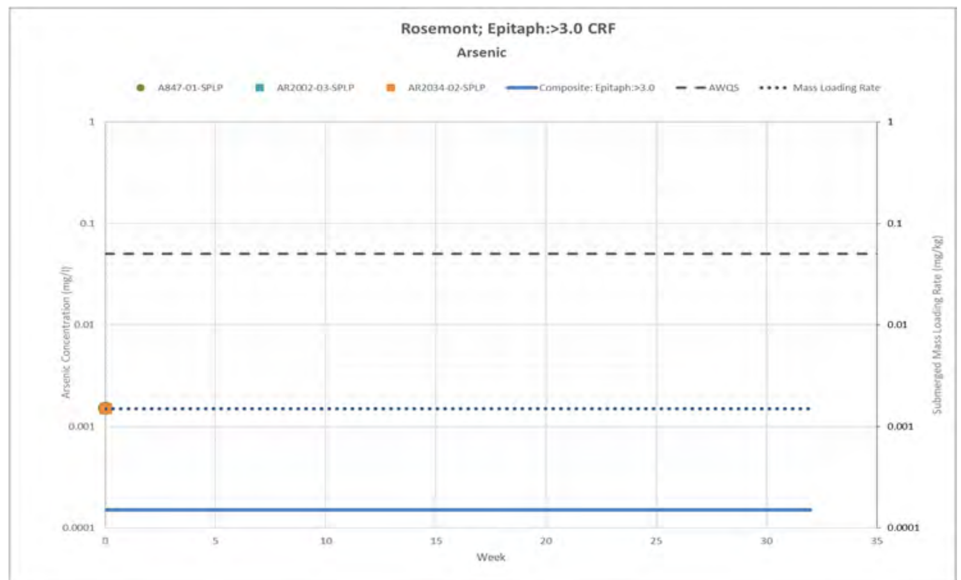

Rosemont; Epitaph:<1.2 CRF
Zinc
Andesite Col. Leach-MWMP
Composite: Epitaph:<1.2
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

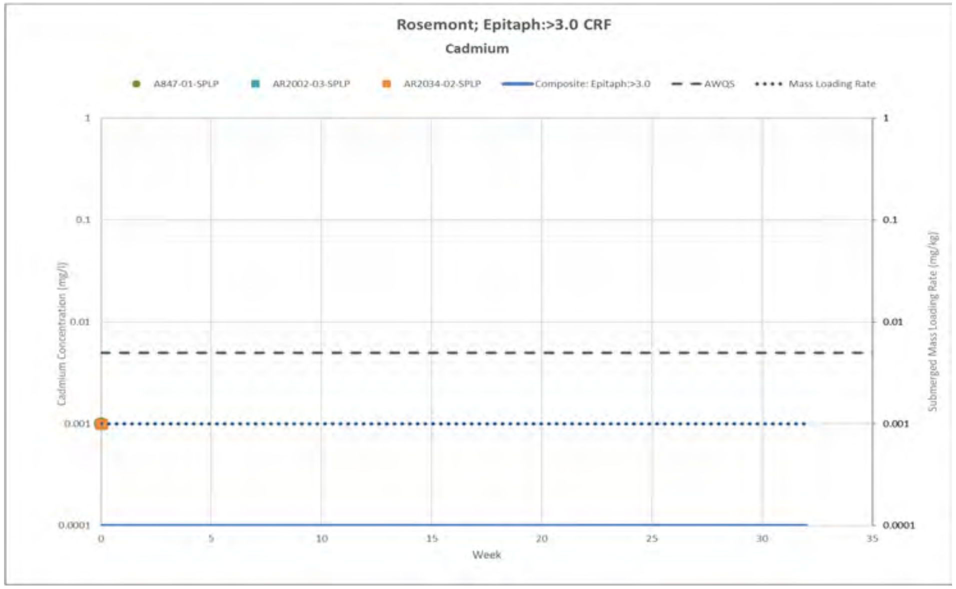
Appendix - H
Composite CRF Charts

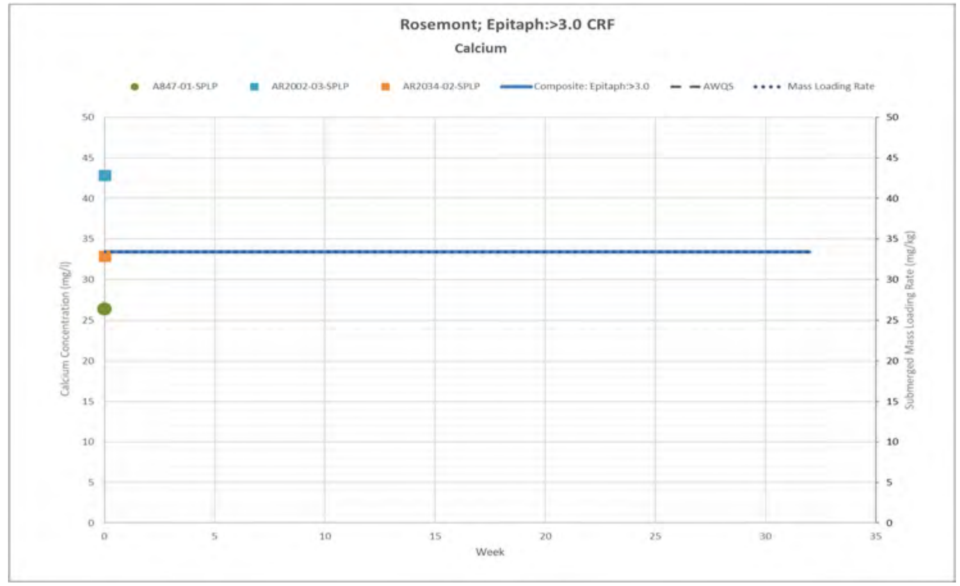


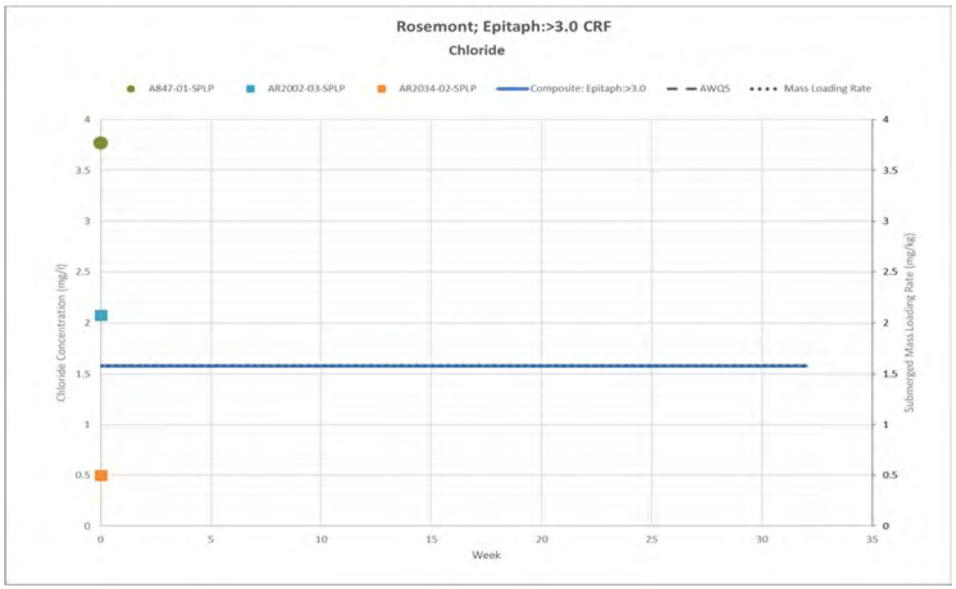


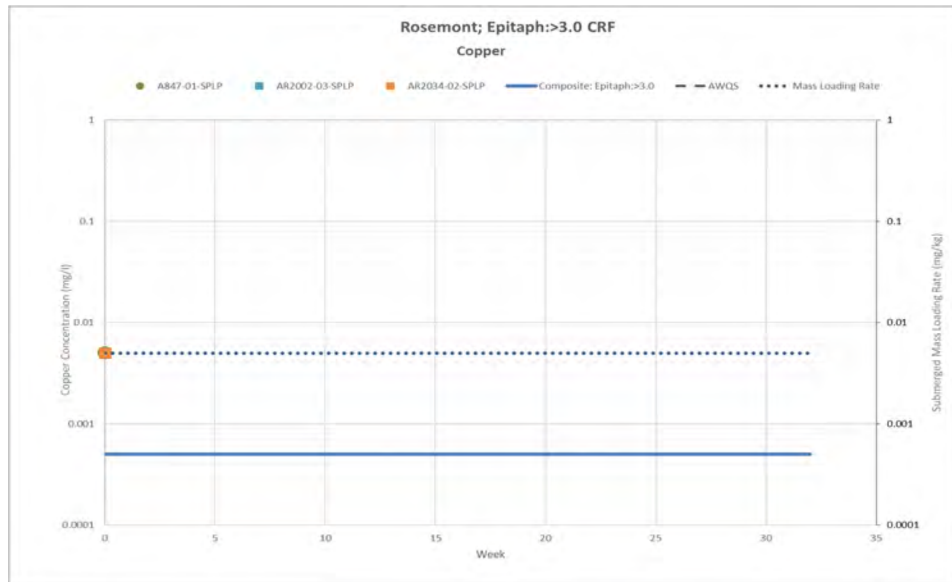


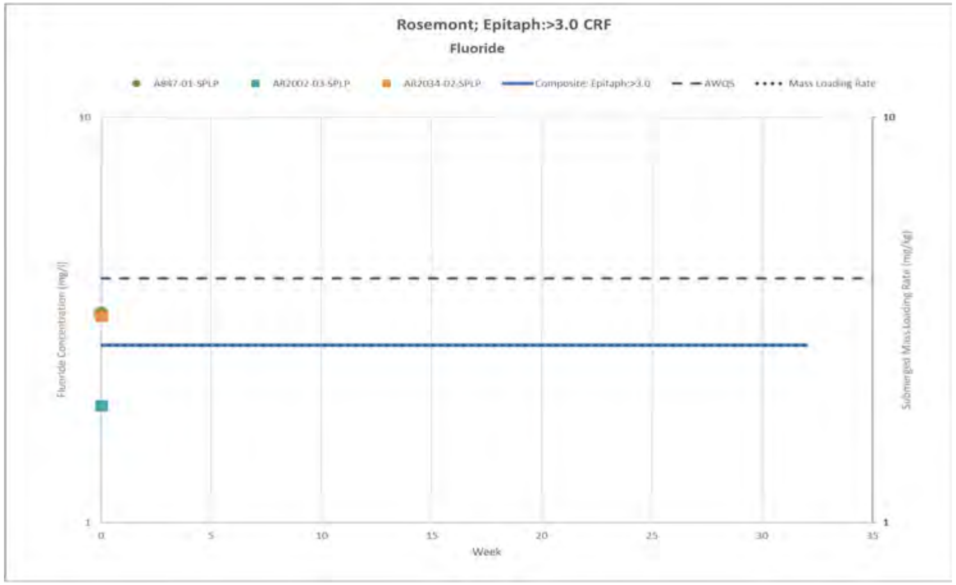


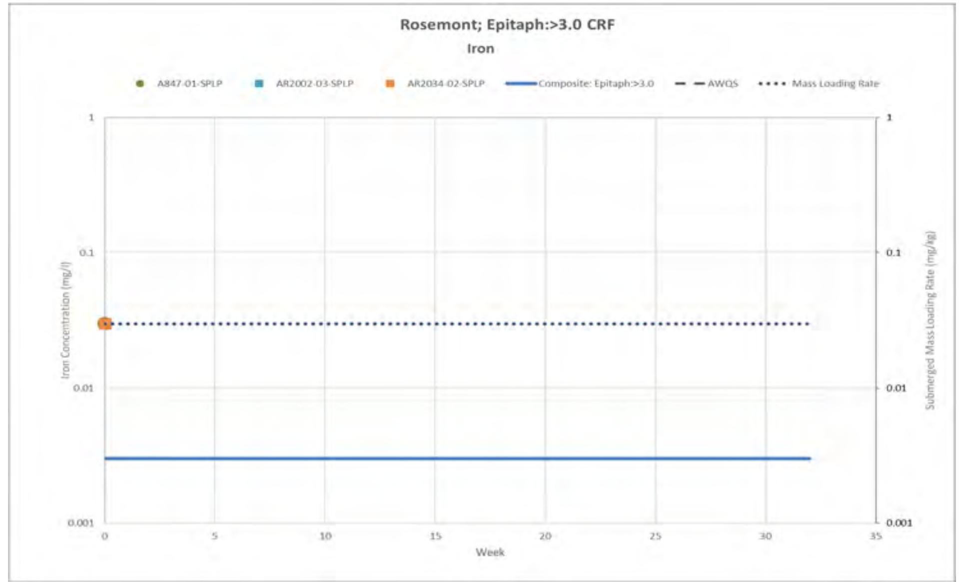

Rosemont; Epitaph:>3.0 CRF
Cadmium
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph:>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

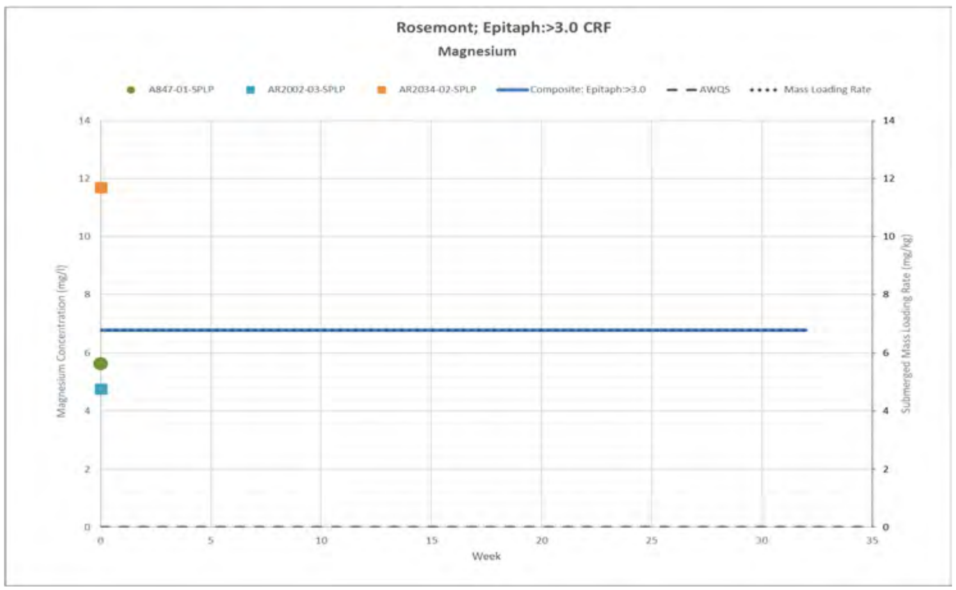

Rosemont; Epitaph:>3.0 CRF
Calcium
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph:>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

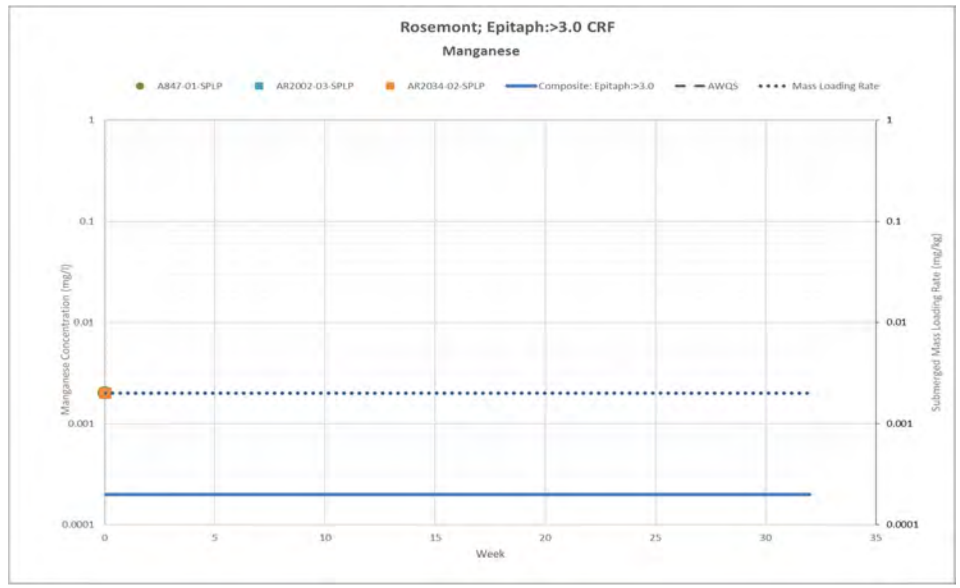

Rosemont; Epitaph:>3.0 CRF
Chloride
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph:>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

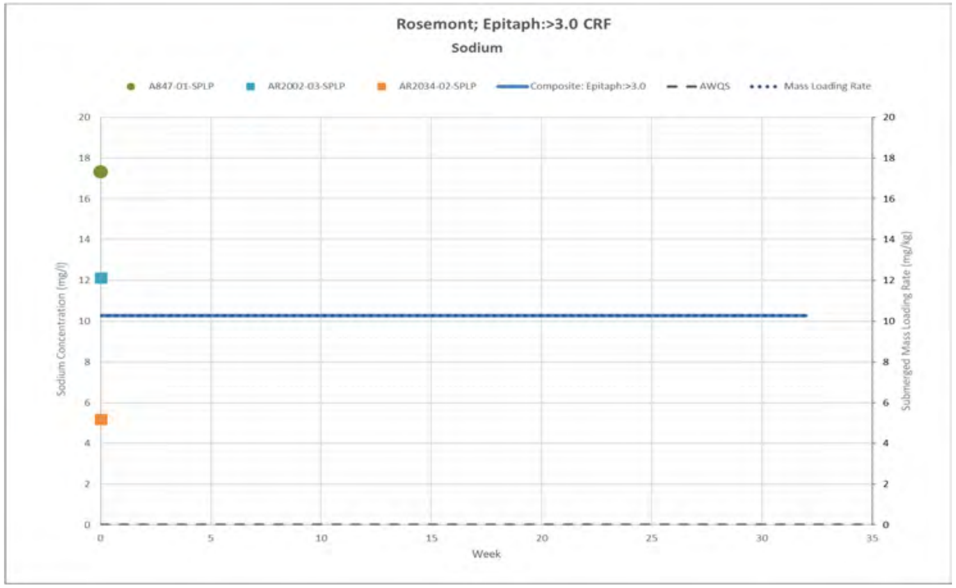

Rosemont; Epitaph:>3.0 CRF
Copper
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph:>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

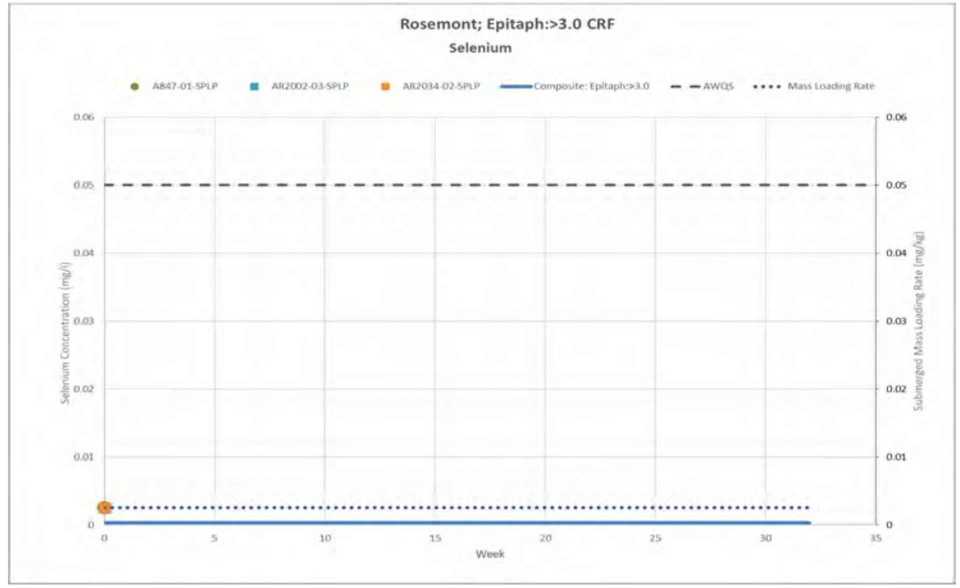

Rosemont; Epitaph:>3.0 CRF
Fluoride
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph:>3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

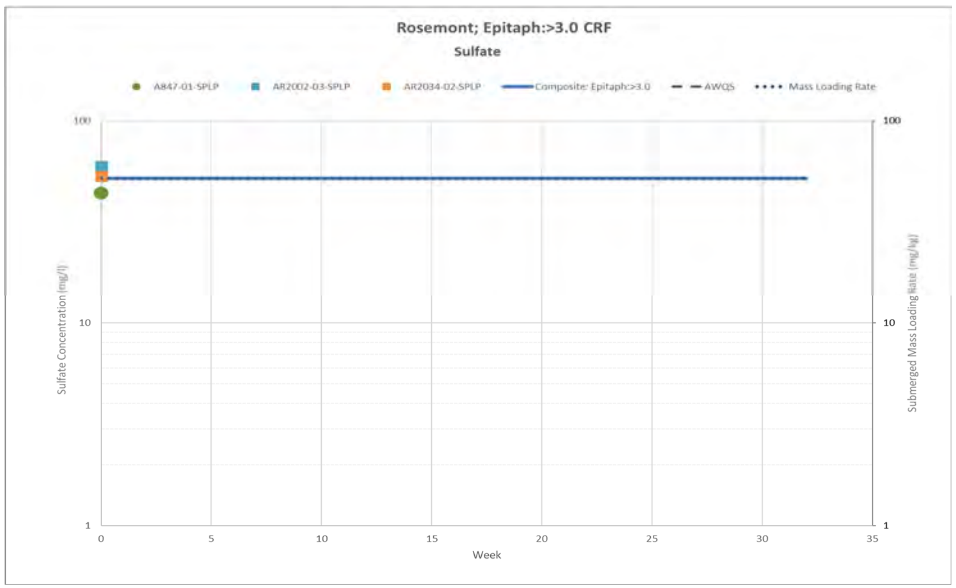

Rosemont; Epitaph:>3.0 CRF
Iron
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph:>3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

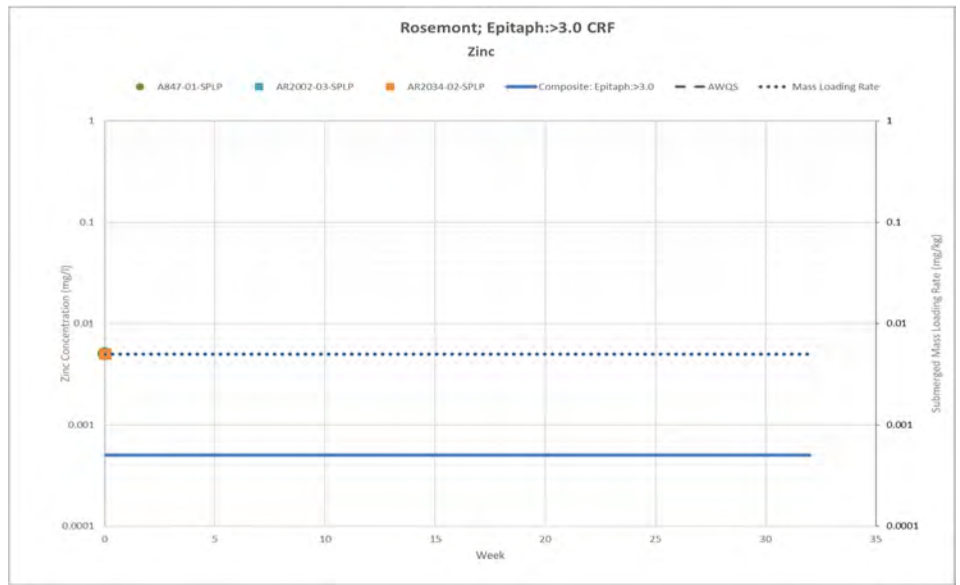

Rosemont; Epitaph:>3.0 CRF
Magnesium
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph:>3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

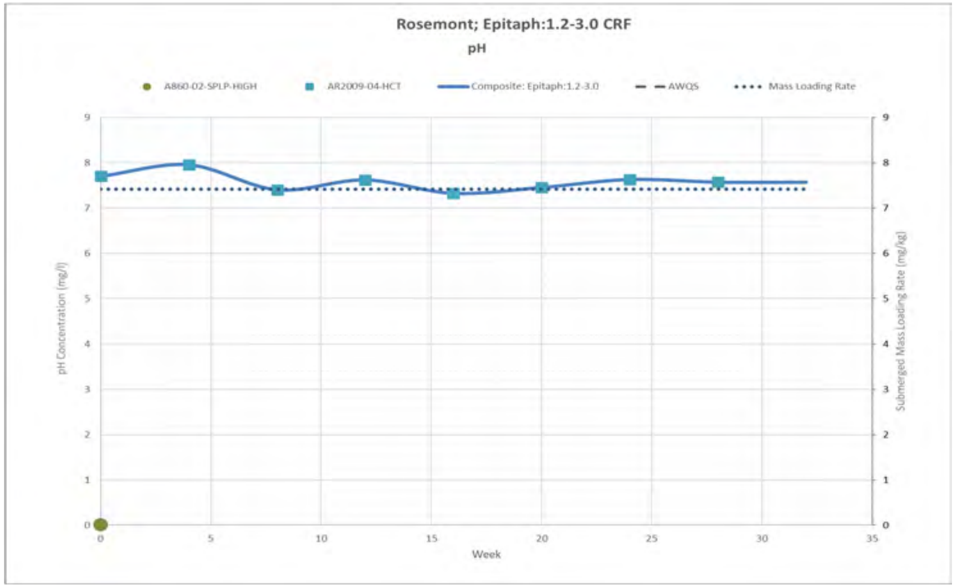

Rosemont; Epitaph:>3.0 CRF
Manganese
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph:>3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

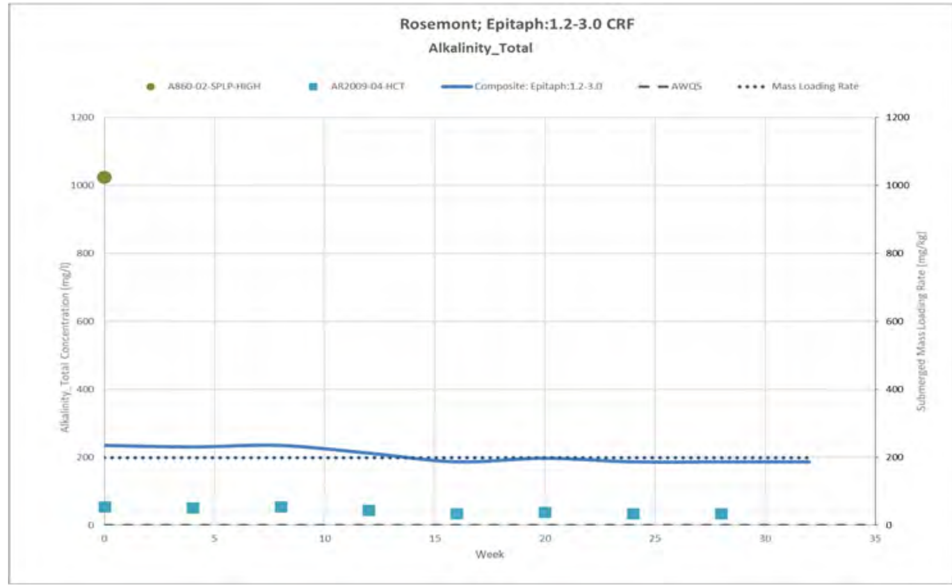

Rosemont; Epitaph:>3.0 CRF
Sodium
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

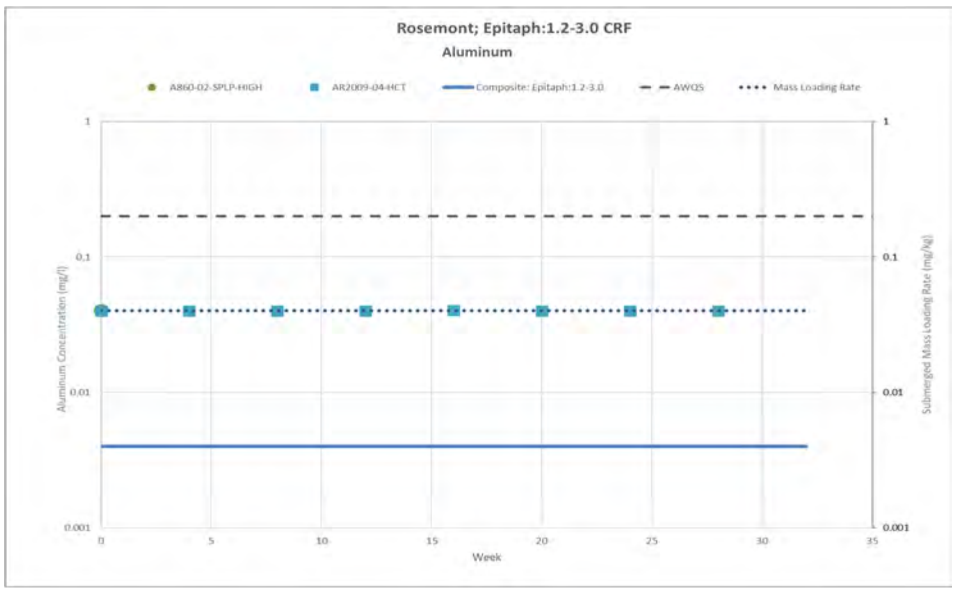

Rosemont; Epitaph:>3.0 CRF
Selenium
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

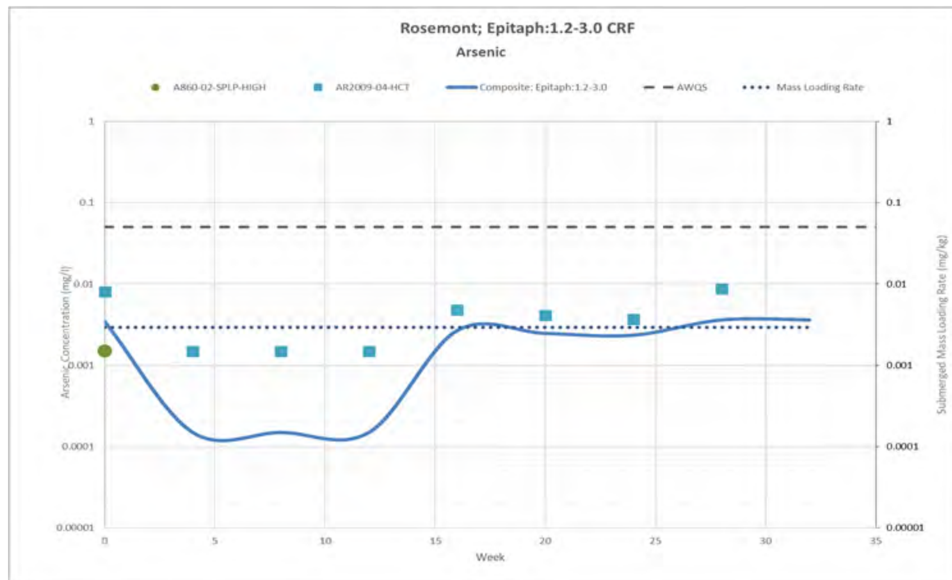

Rosemont; Epitaph:>3.0 CRF
Sulfate
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

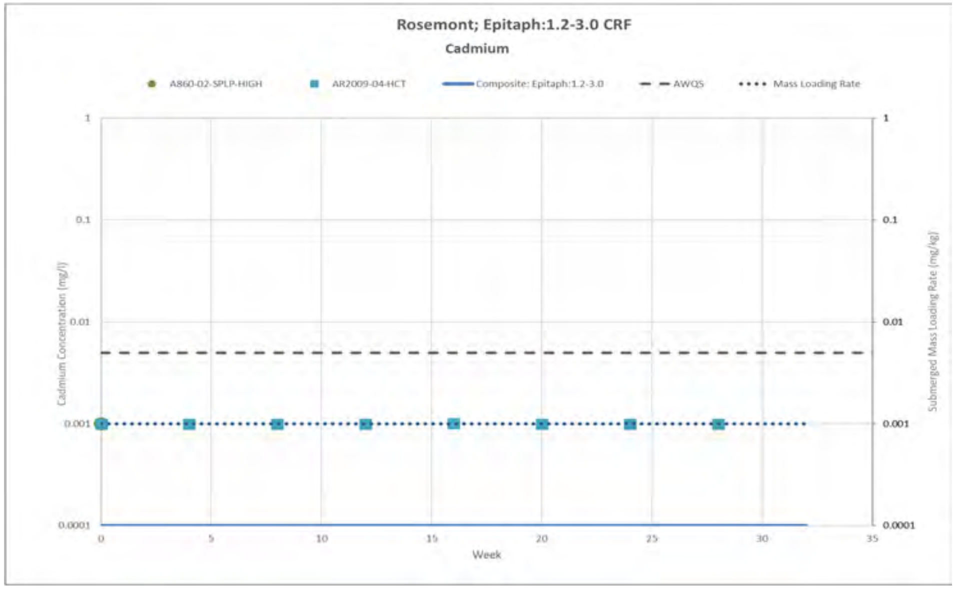

Rosemont; Epitaph:>3.0 CRF
Zinc
A847-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Epitaph>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

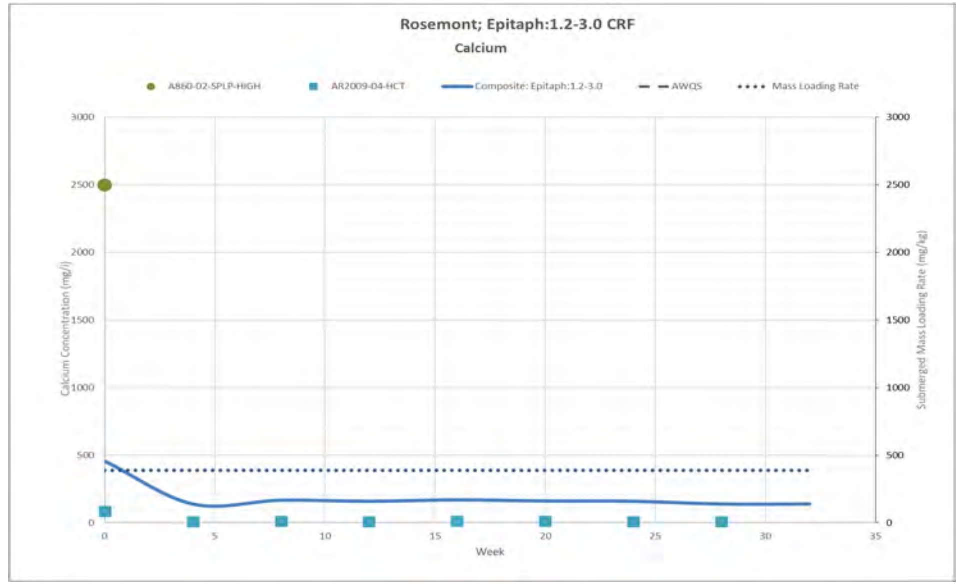

Rosemont; Epitaph:1.2-3.0 CRF
pH
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

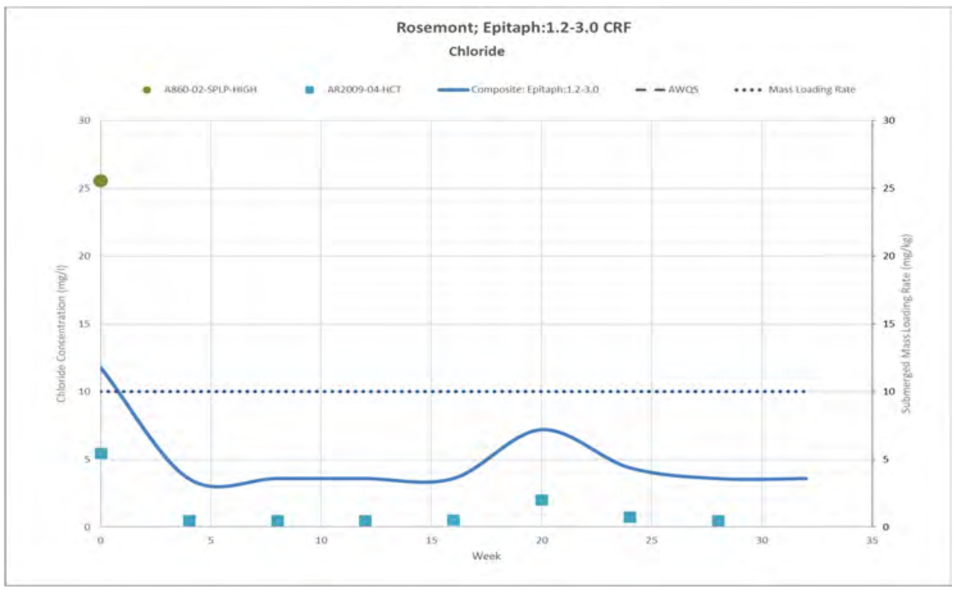

Rosemont; Epitaph:1.2-3.0 CRF
Alkalinity_Total
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

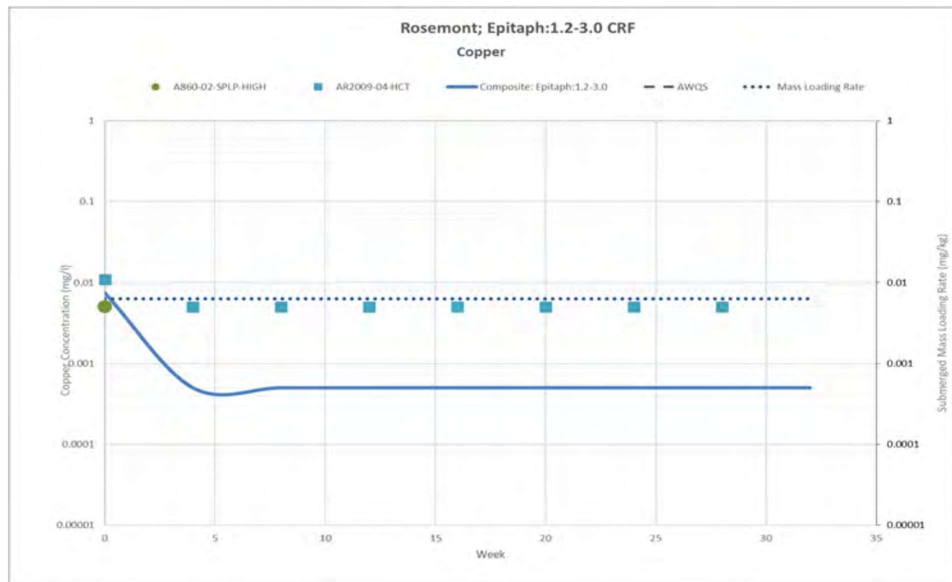

Rosemont; Epitaph:1.2-3.0 CRF
Aluminum
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

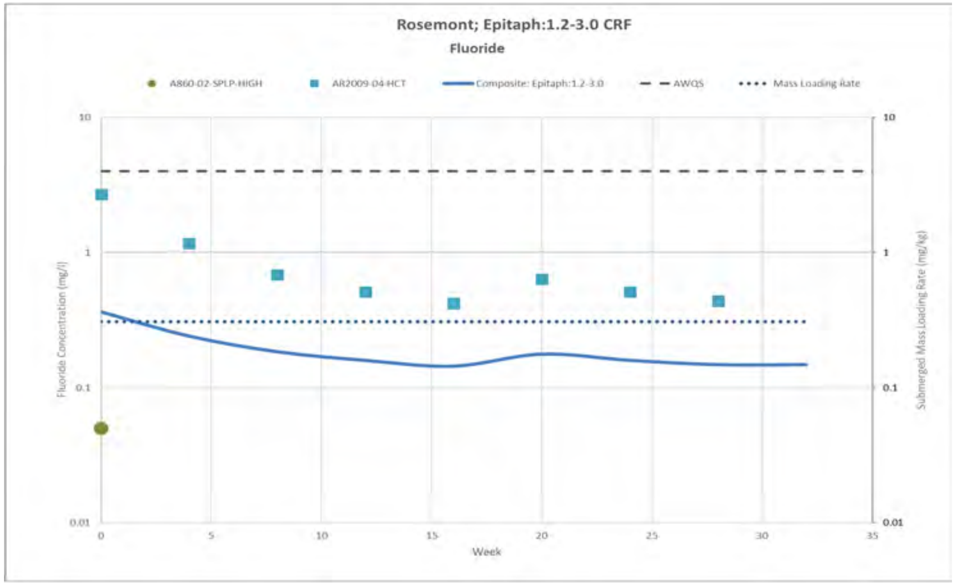

Rosemont; Epitaph:1.2-3.0 CRF
Arsenic
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

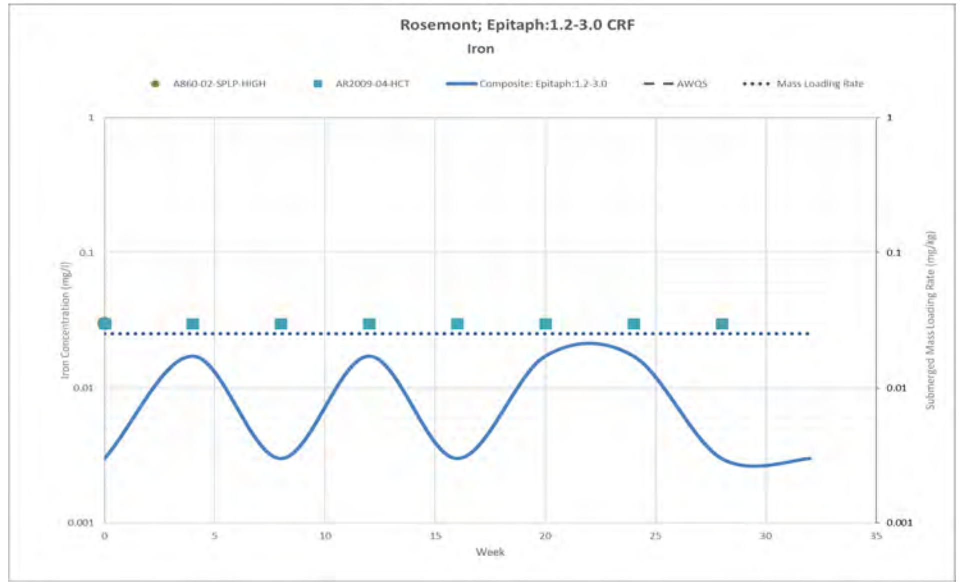

Rosemont; Epitaph:1.2-3.0 CRF
Cadmium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

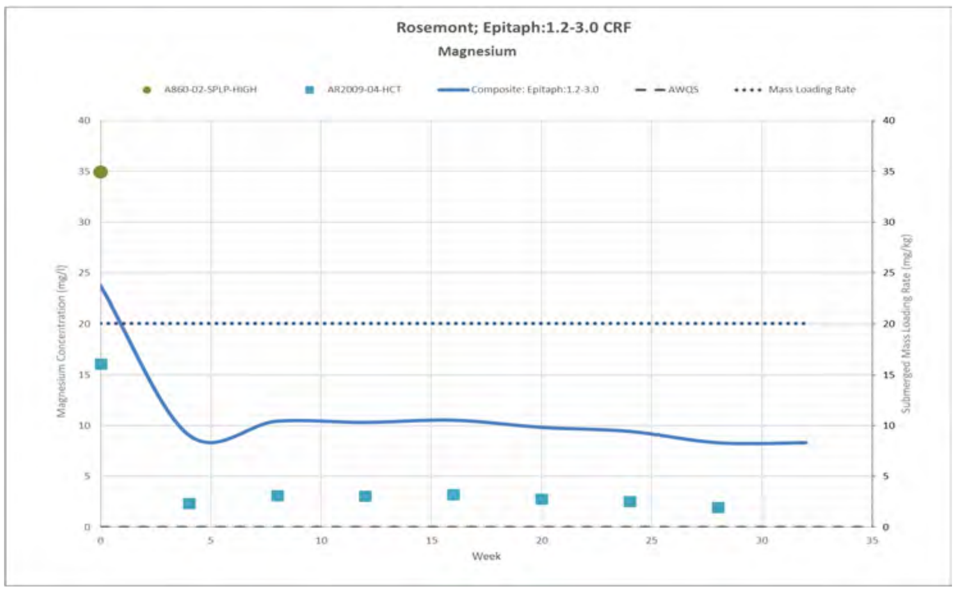

Rosemont; Epitaph:1.2-3.0 CRF
Calcium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

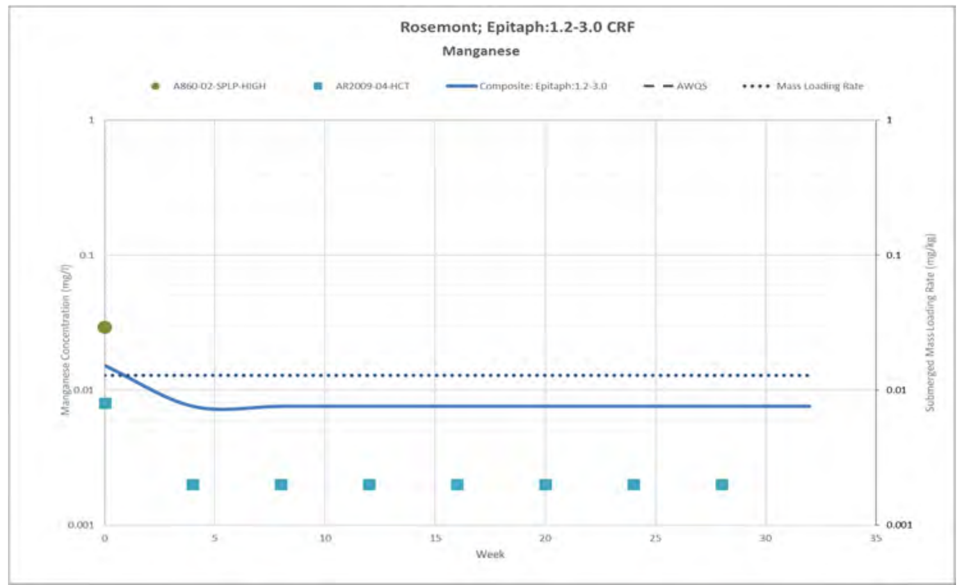

Rosemont; Epitaph:1.2-3.0 CRF
Chloride
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

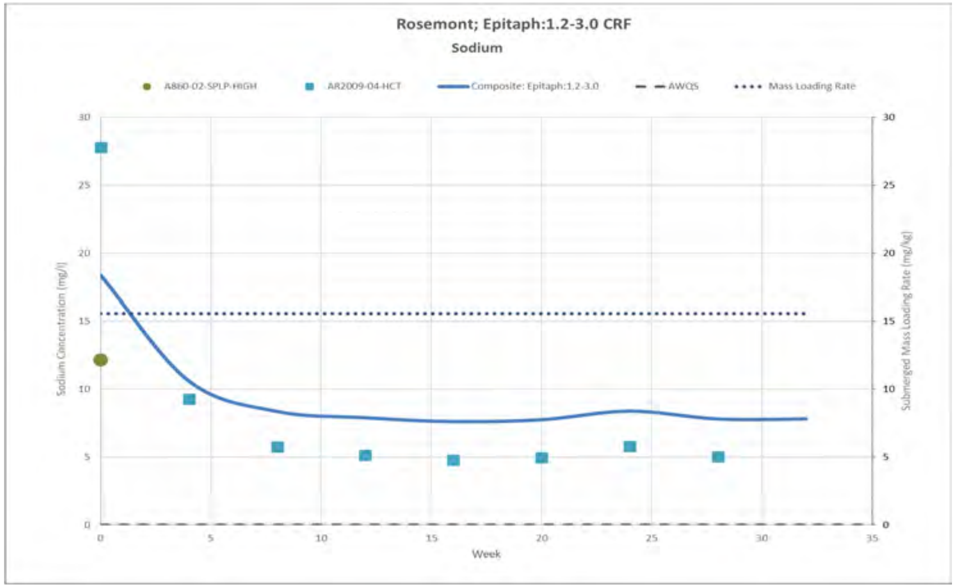

Rosemont; Epitaph:1.2-3.0 CRF
Copper
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

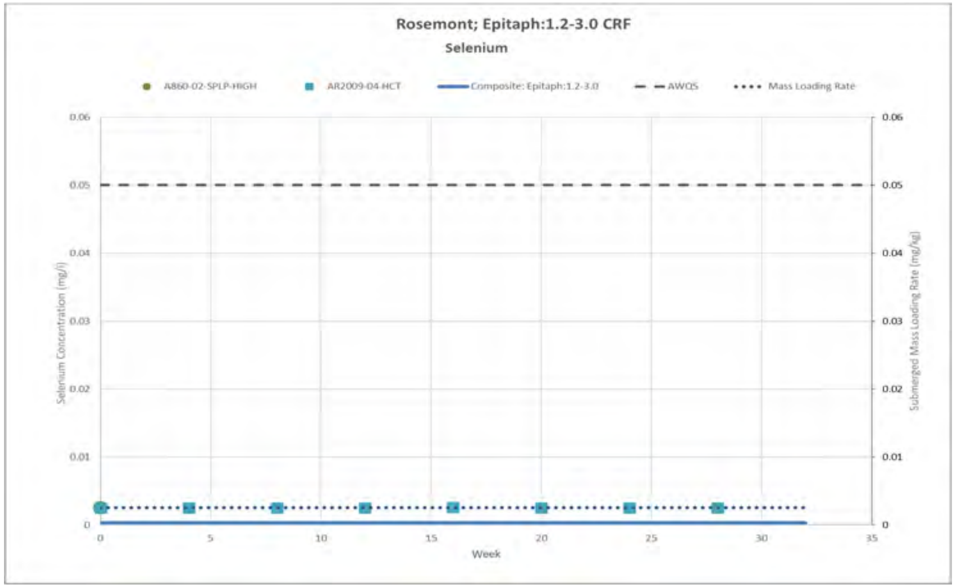

Rosemont; Epitaph:1.2-3.0 CRF
Fluoride
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

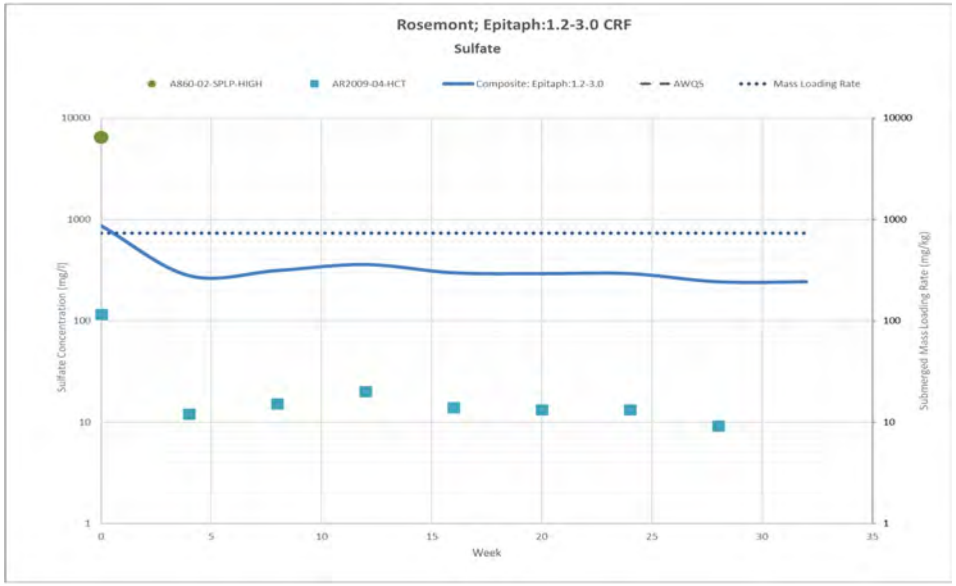

Rosemont; Epitaph:1.2-3.0 CRF
Iron
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

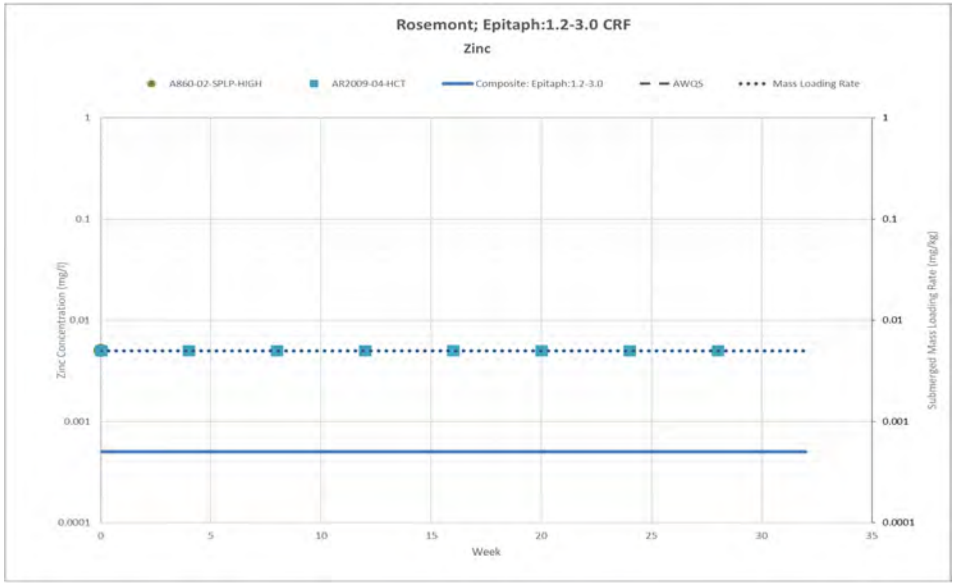

Rosemont; Epitaph:1.2-3.0 CRF
Magnesium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

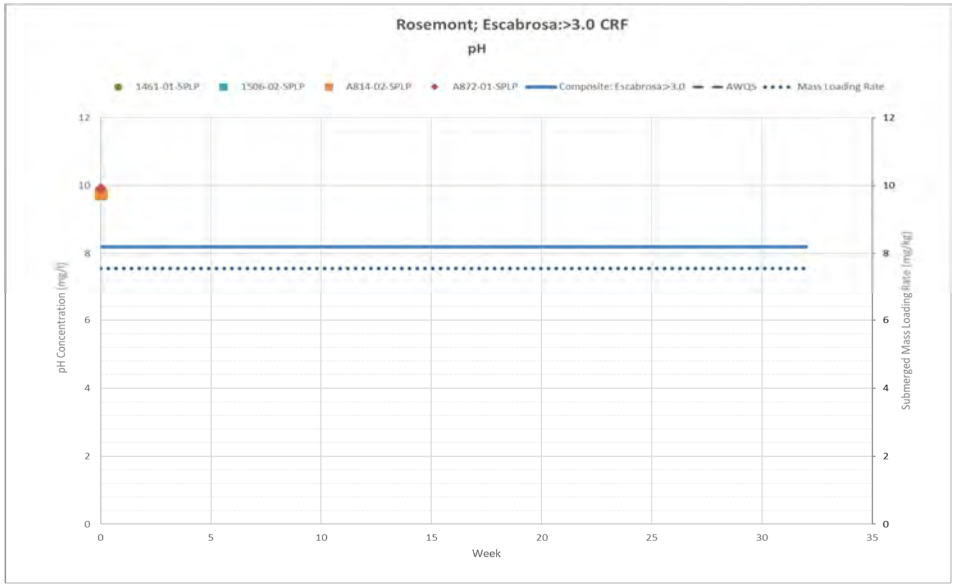

Rosemont; Epitaph:1.2-3.0 CRF
Manganese
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

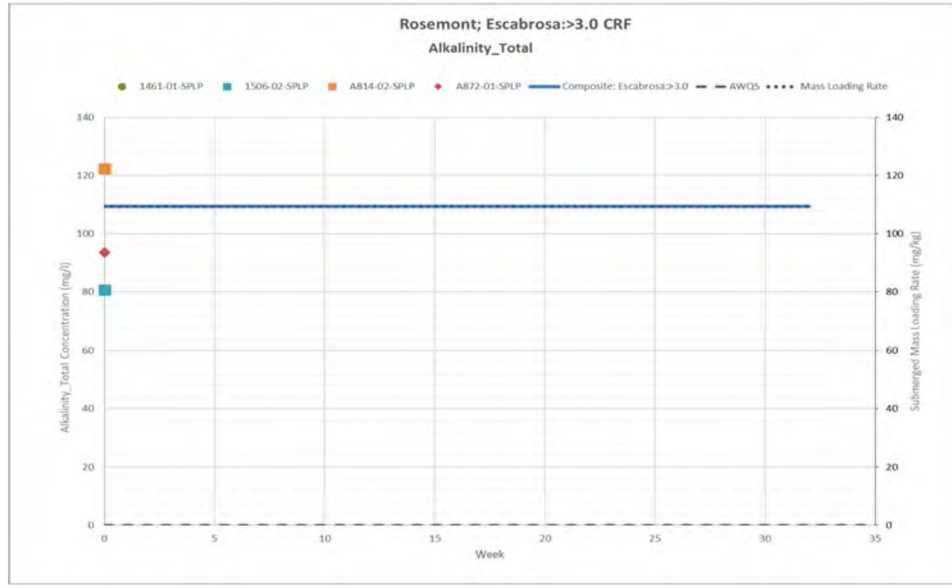

Rosemont; Epitaph:1.2-3.0 CRF
Sodium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

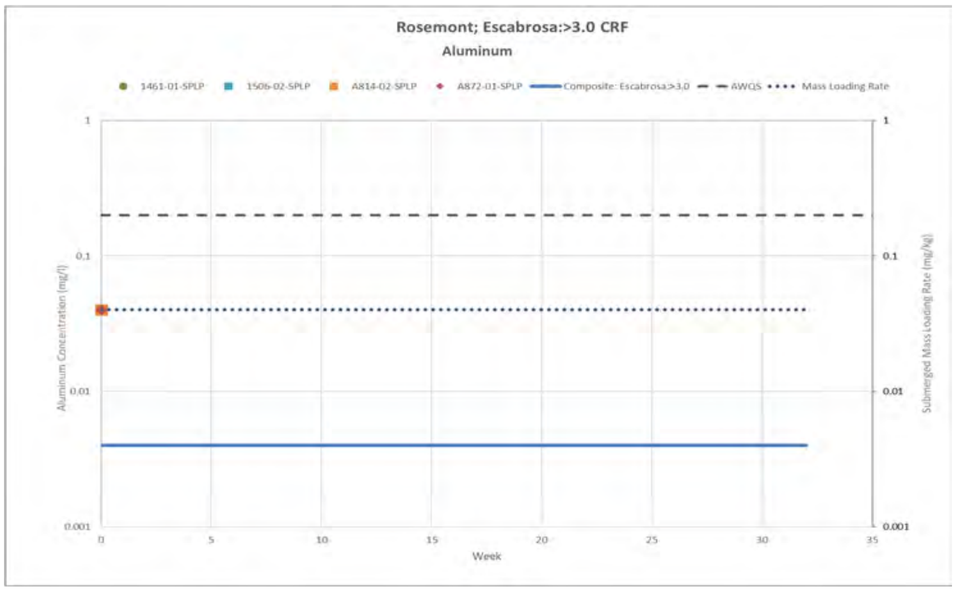

Rosemont; Epitaph:1.2-3.0 CRF
Selenium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

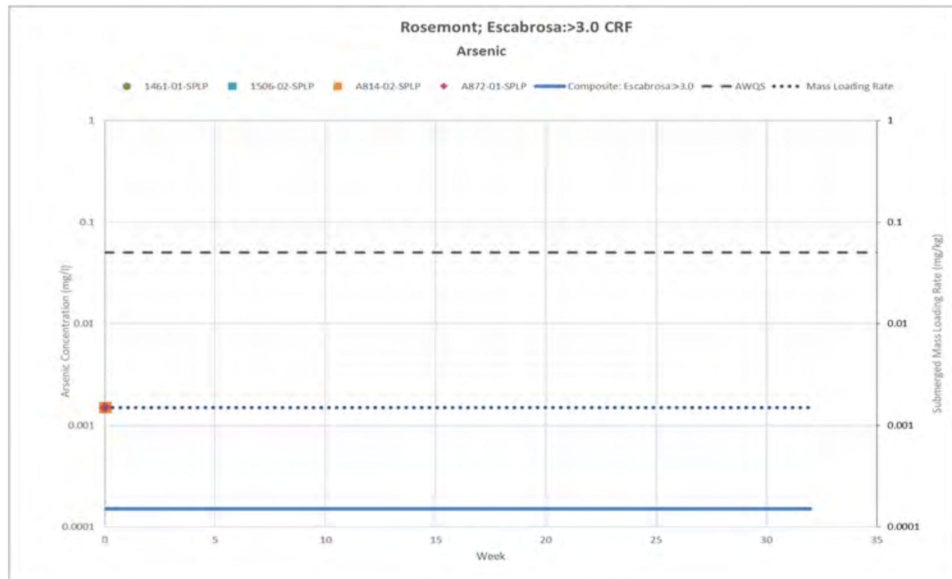

Rosemont; Epitaph:1.2-3.0 CRF
Sulfate
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

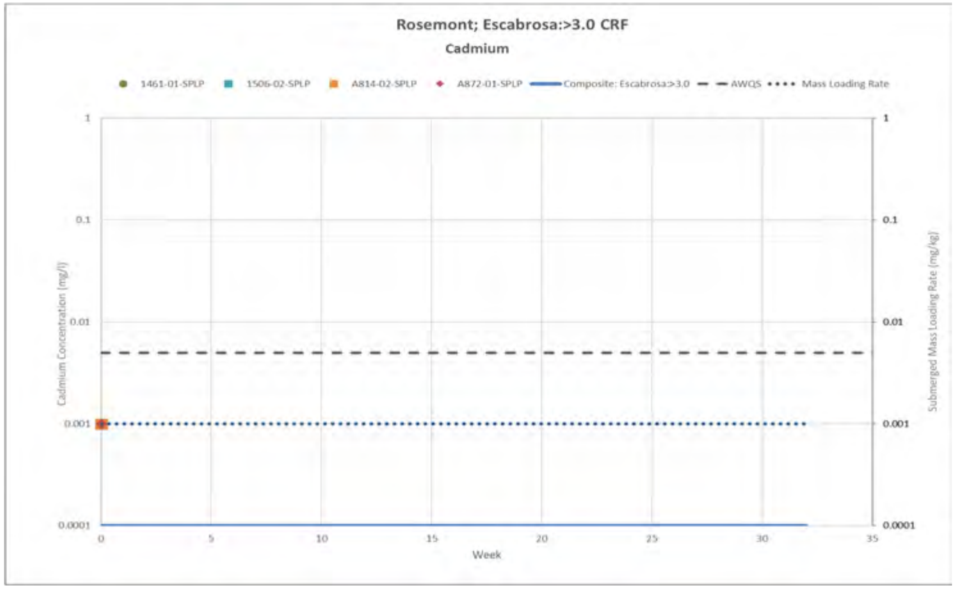

Rosemont; Epitaph:1.2-3.0 CRF
Zinc
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Epitaph:1.2-3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

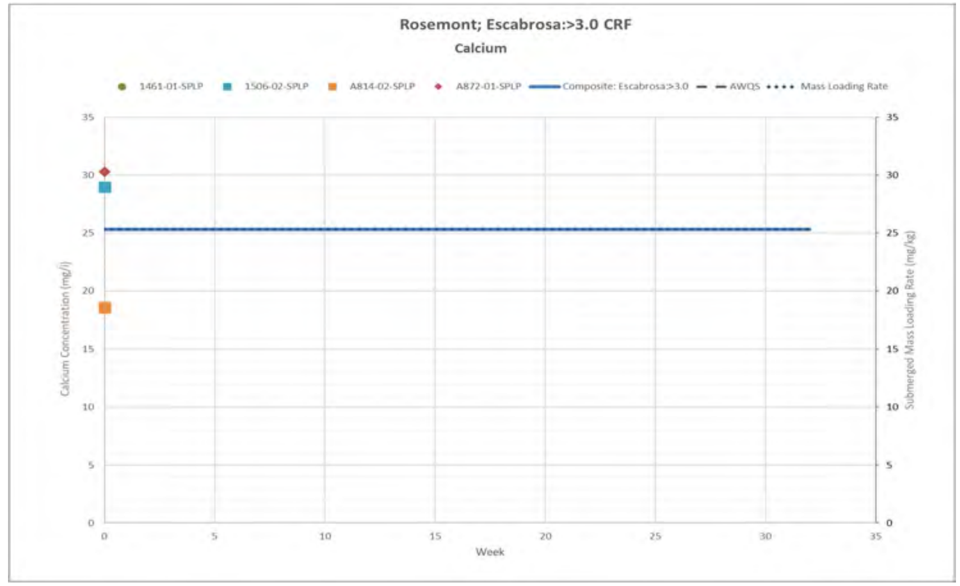

Rosemont; Escabrosa:>3.0 CRF
pH
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

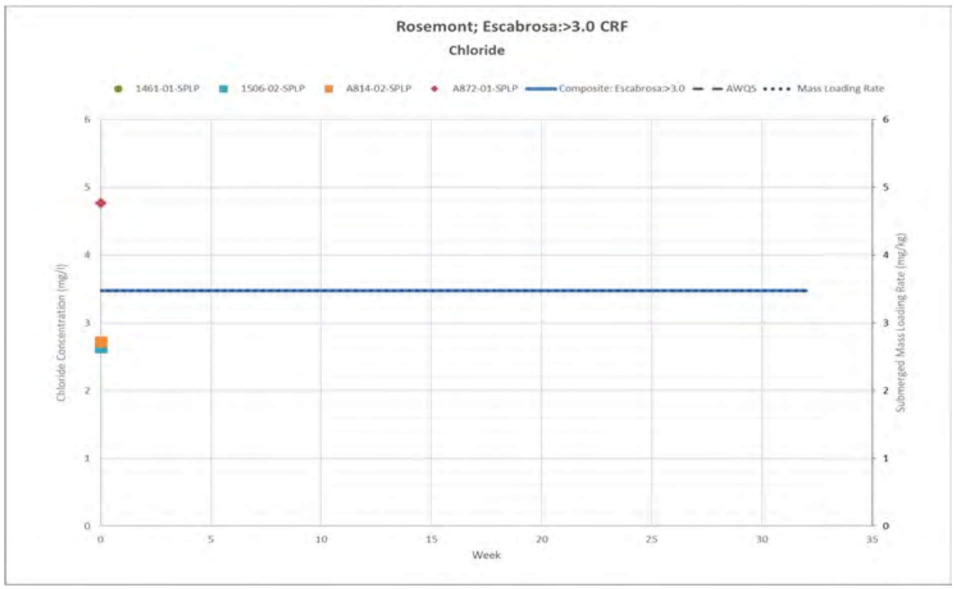

Rosemont; Escabrosa:>3.0 CRF
Alkalinity_Total
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

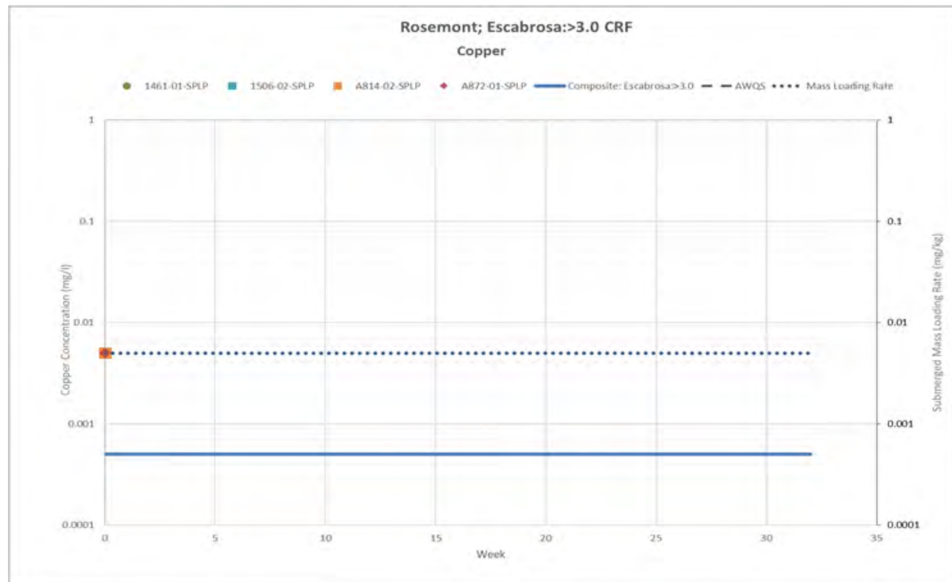

Rosemont; Escabrosa:>3.0 CRF
Aluminum
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

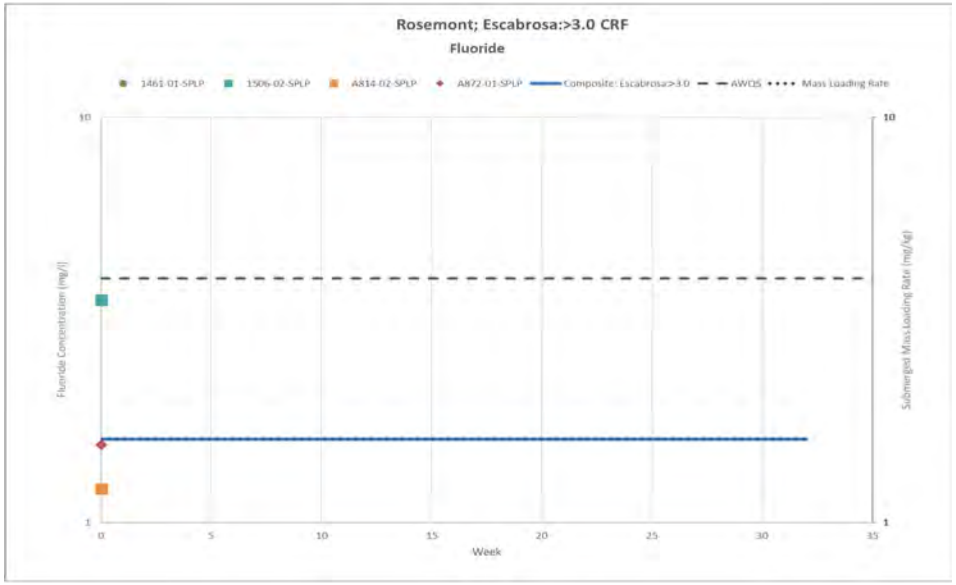

Rosemont; Escabrosa:>3.0 CRF
Arsenic
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

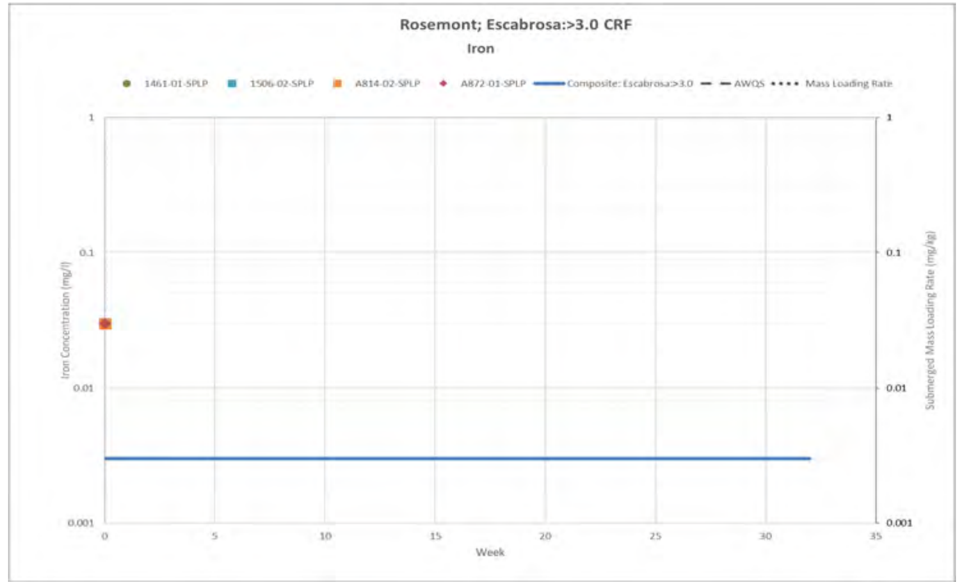

Rosemont; Escabrosa:>3.0 CRF
Cadmium
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

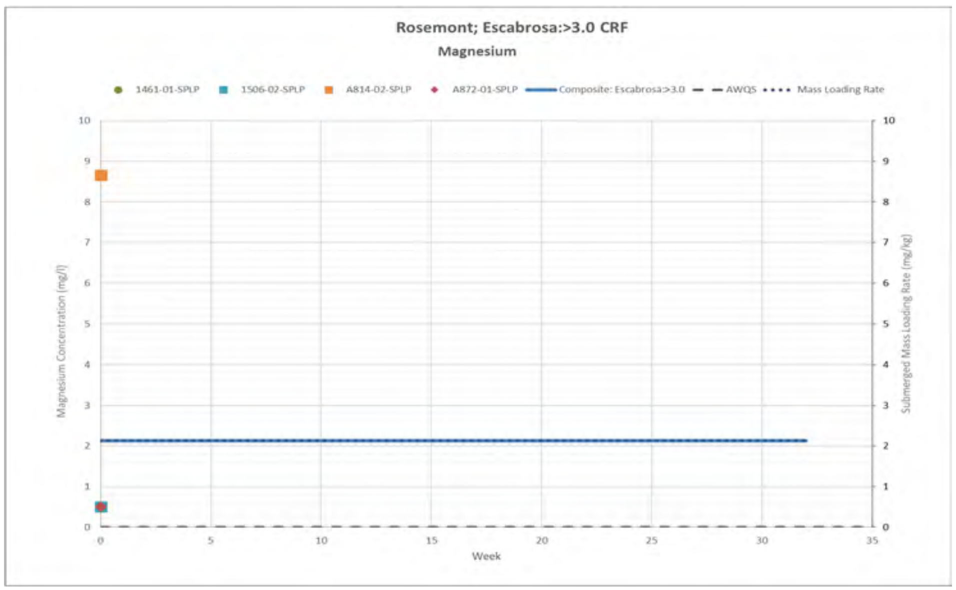

Rosemont; Escabrosa:>3.0 CRF
Calcium
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

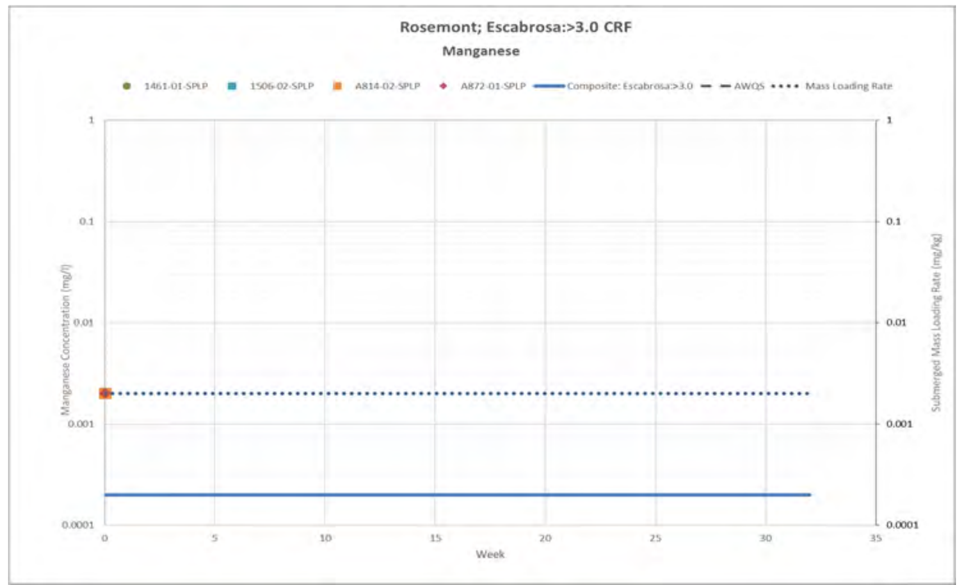

Rosemont; Escabrosa:>3.0 CRF
Chloride
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

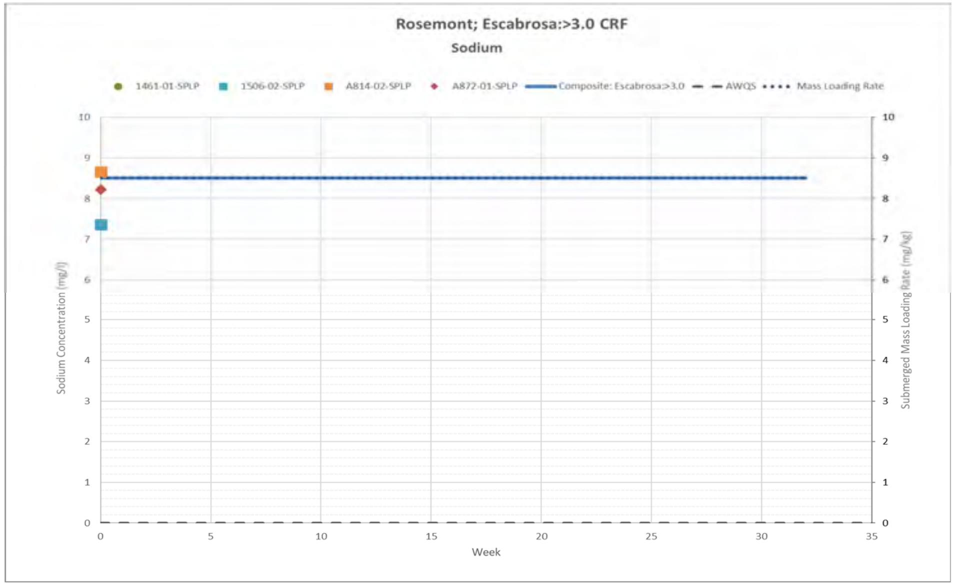

Rosemont; Escabrosa:>3.0 CRF
Copper
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

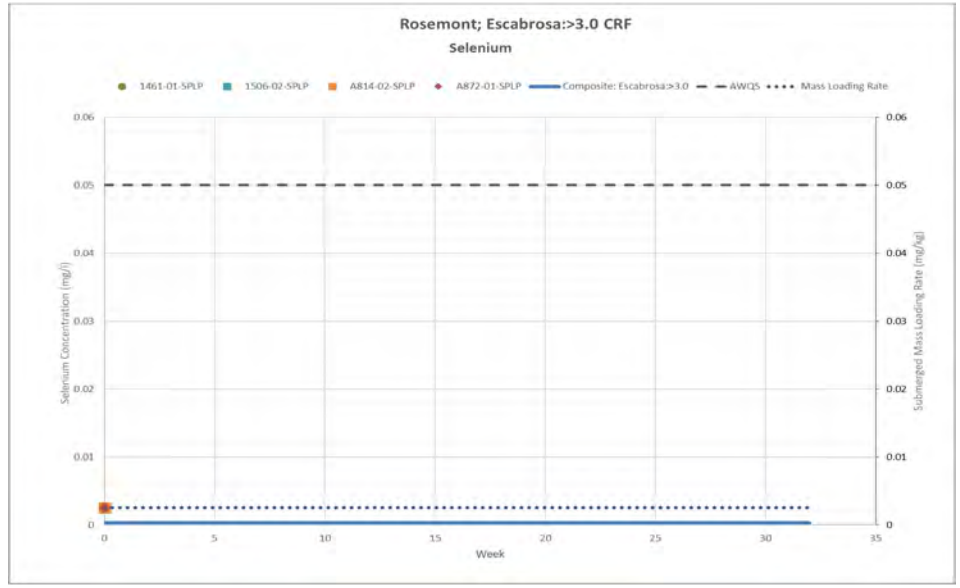

Rosemont; Escabrosa:>3.0 CRF
Fluoride
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

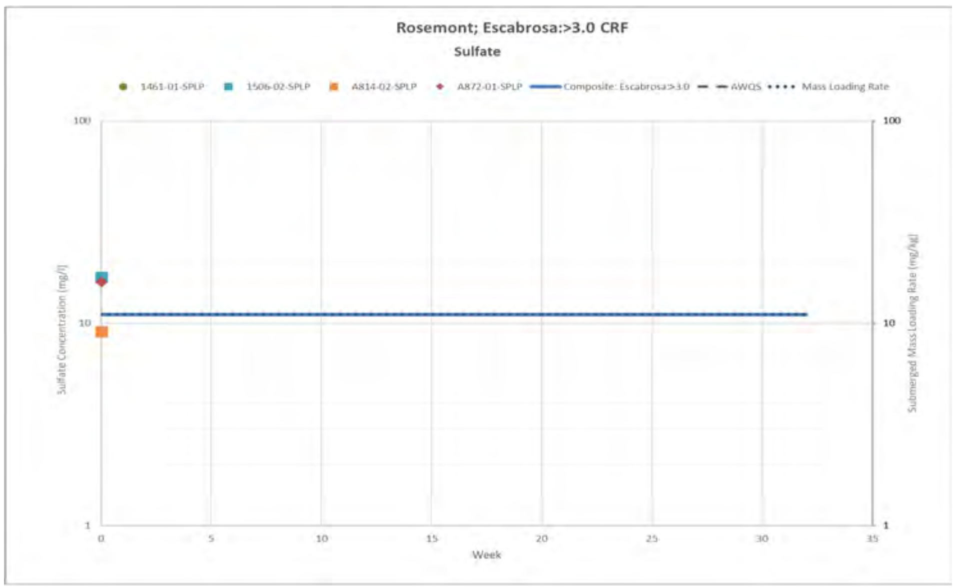

Rosemont; Escabrosa:>3.0 CRF
Iron
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

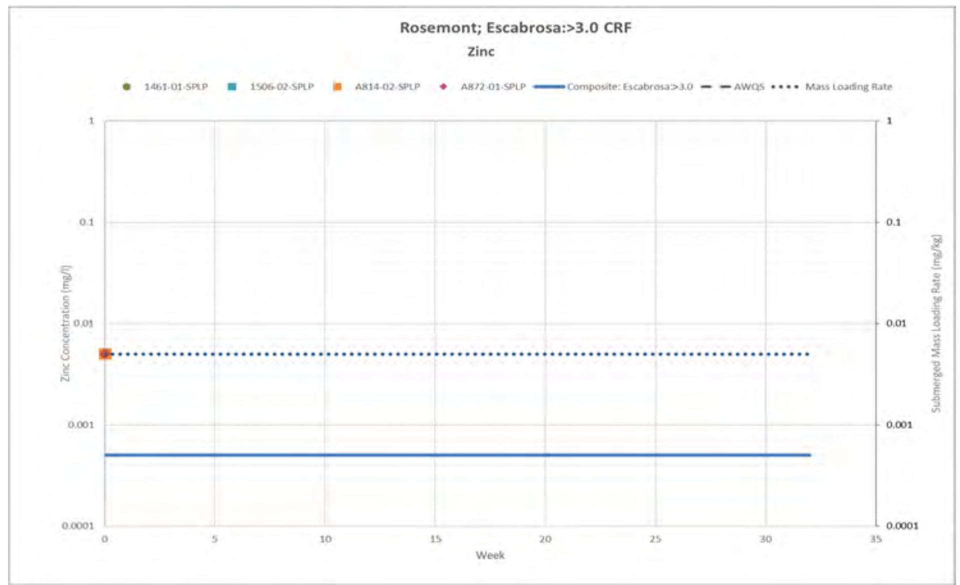

Rosemont; Escabrosa:>3.0 CRF
Magnesium
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Escabrosa:>3.0 CRF
Manganese
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

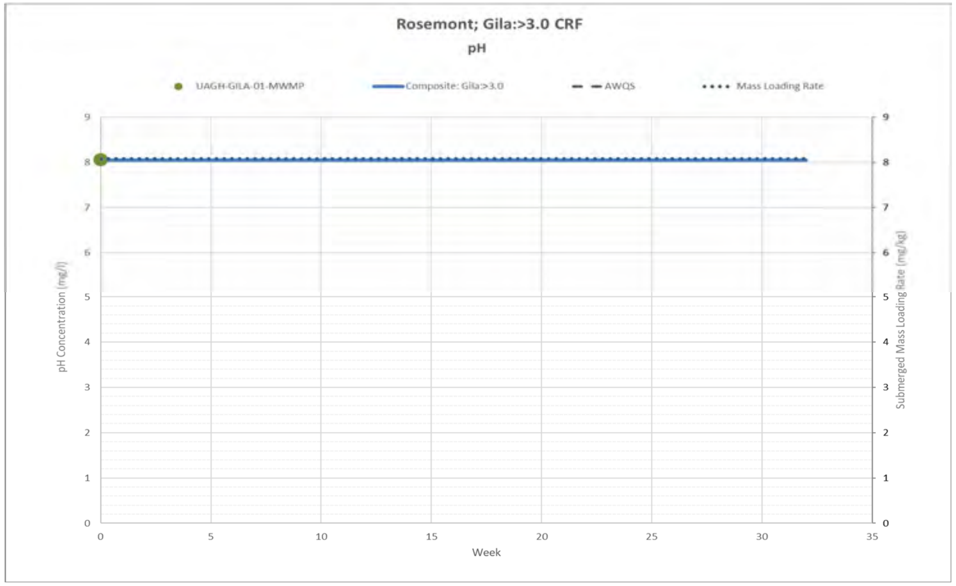

Rosemont; Escabrosa:>3.0 CRF
Sodium
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

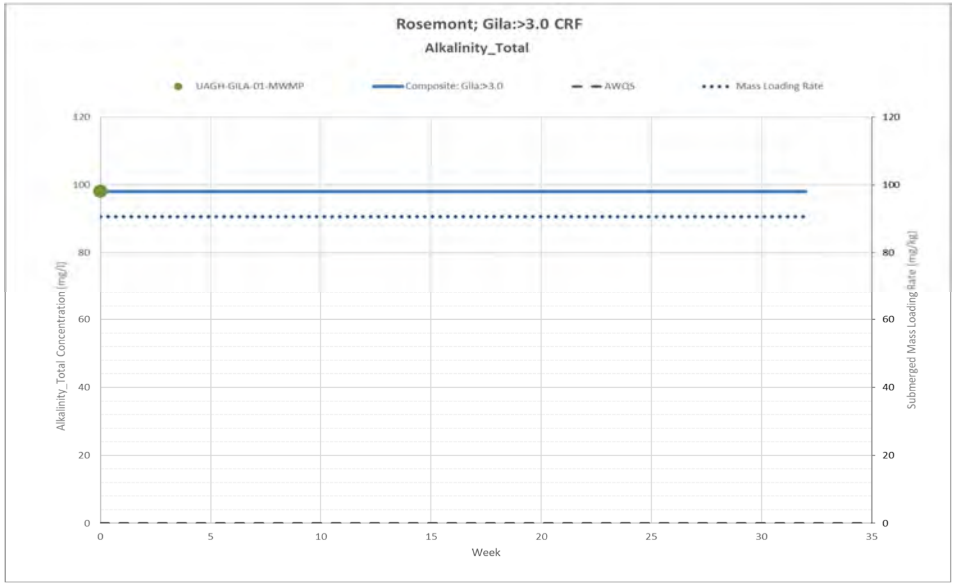

Rosemont; Escabrosa:>3.0 CRF
Selenium
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

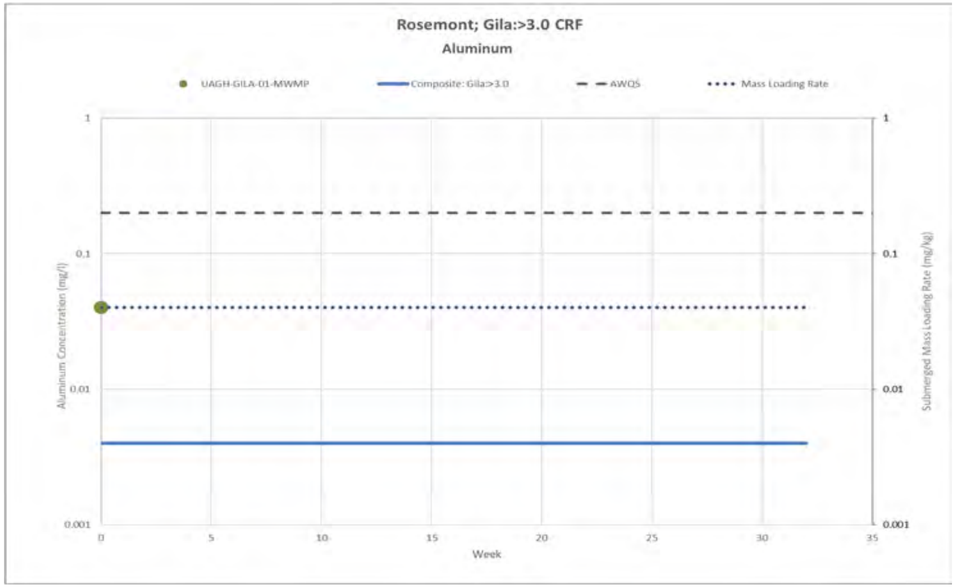

Rosemont; Escabrosa:>3.0 CRF
Sulfate
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

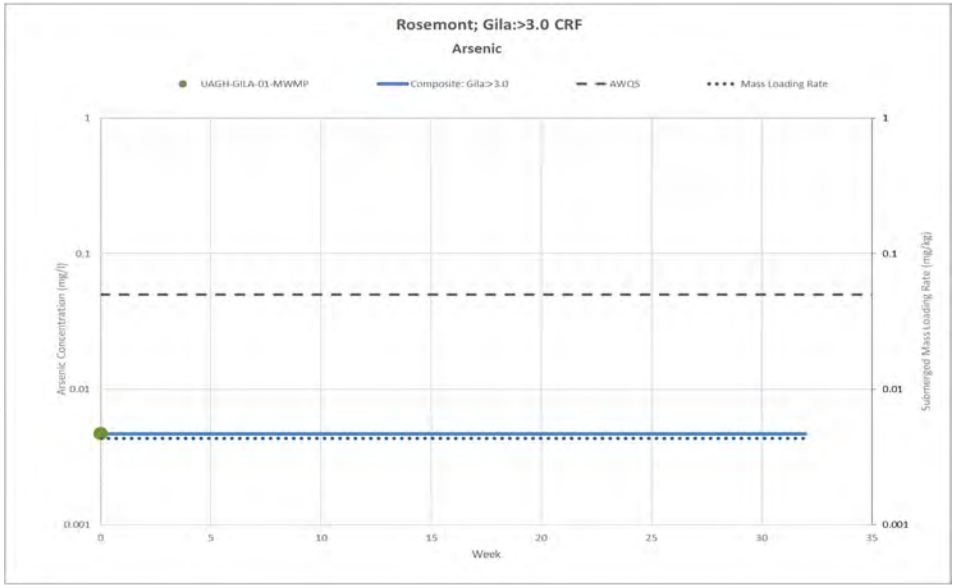

Rosemont; Escabrosa:>3.0 CRF
Zinc
1461-01-SPLP
1506-02-SPLP
A814-02-SPLP
A872-01-SPLP
Composite: Escabrosa>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

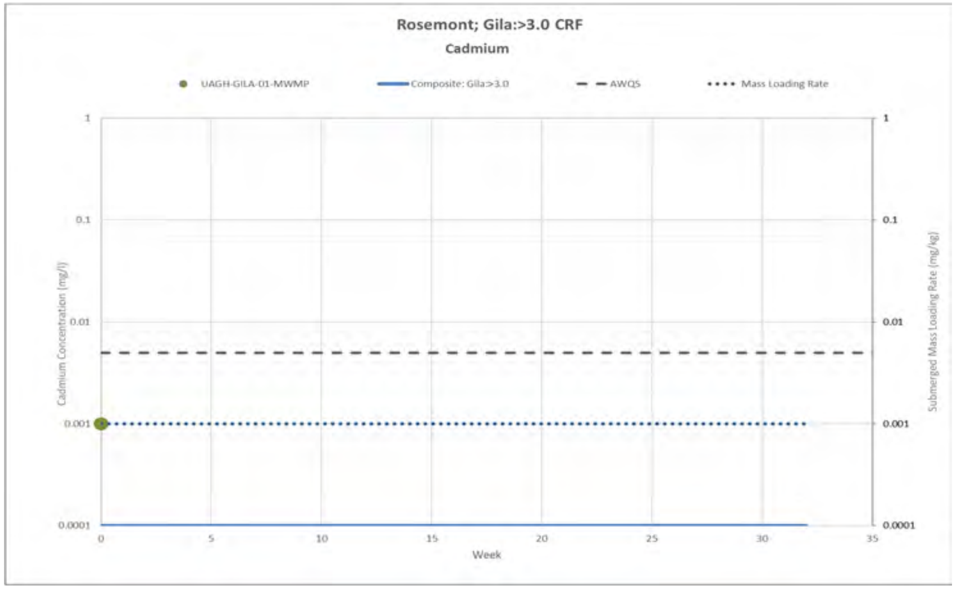
Appendix - H
Composite CRF Charts

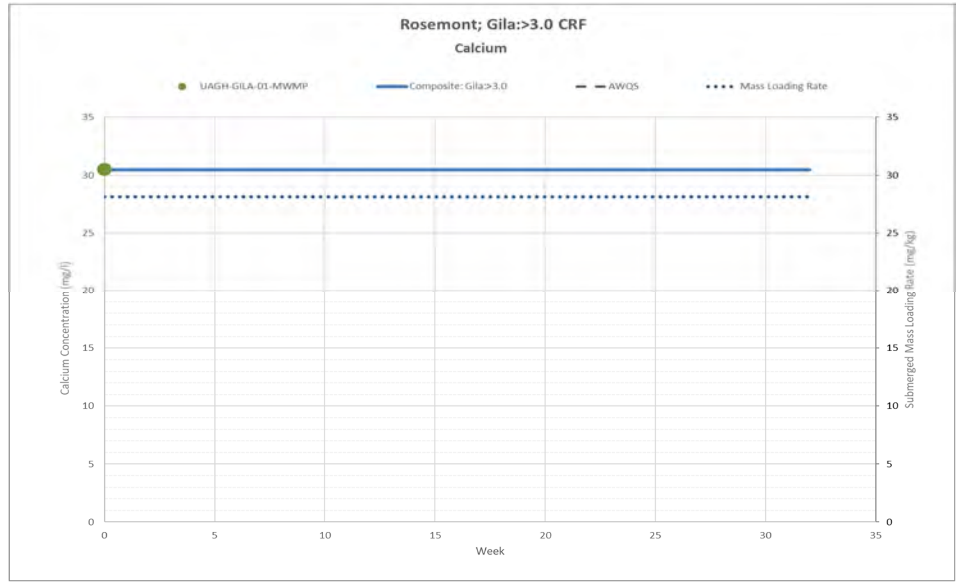


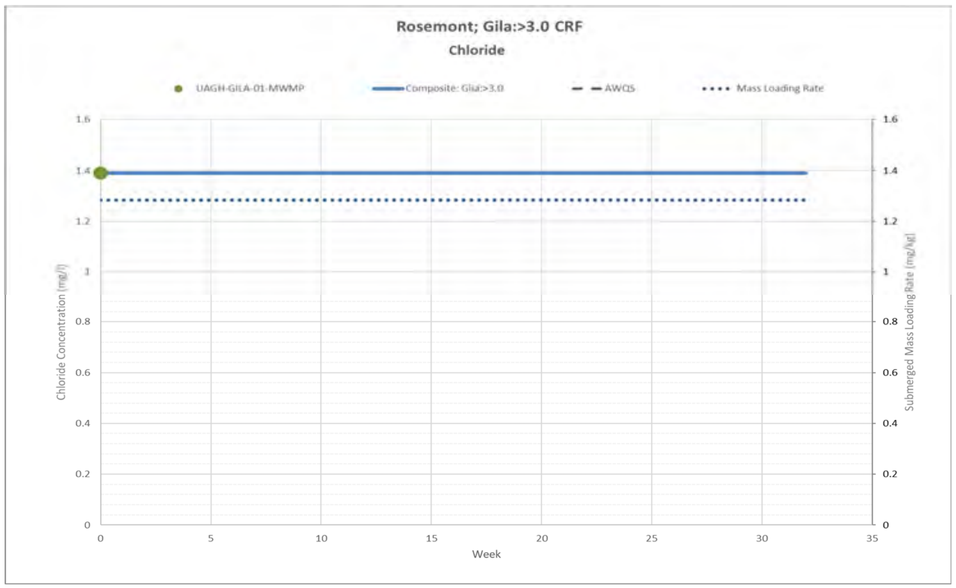


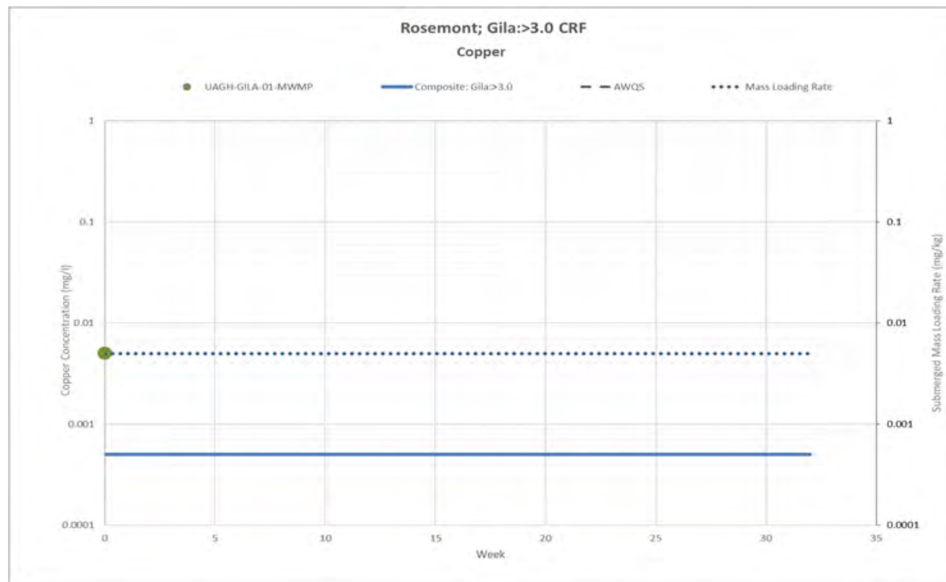


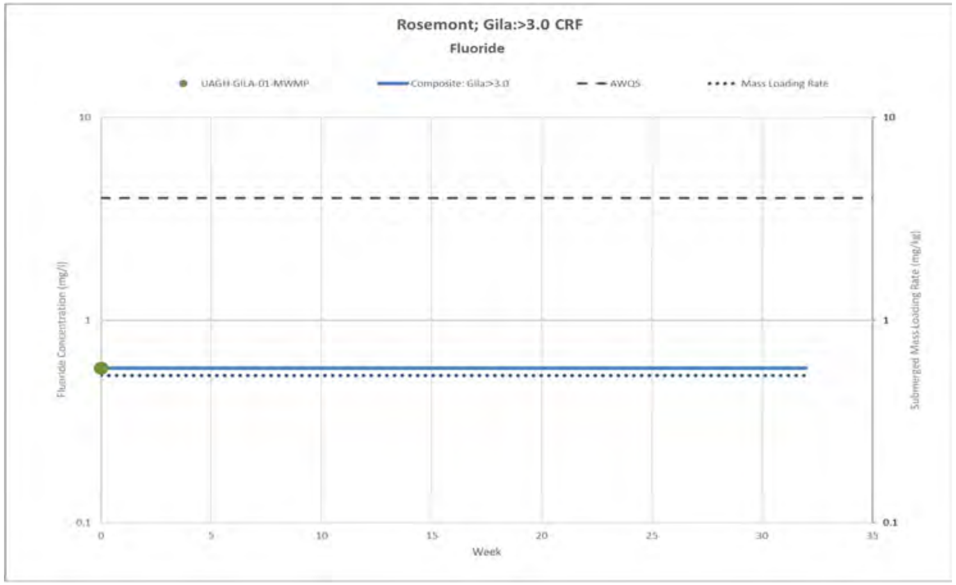


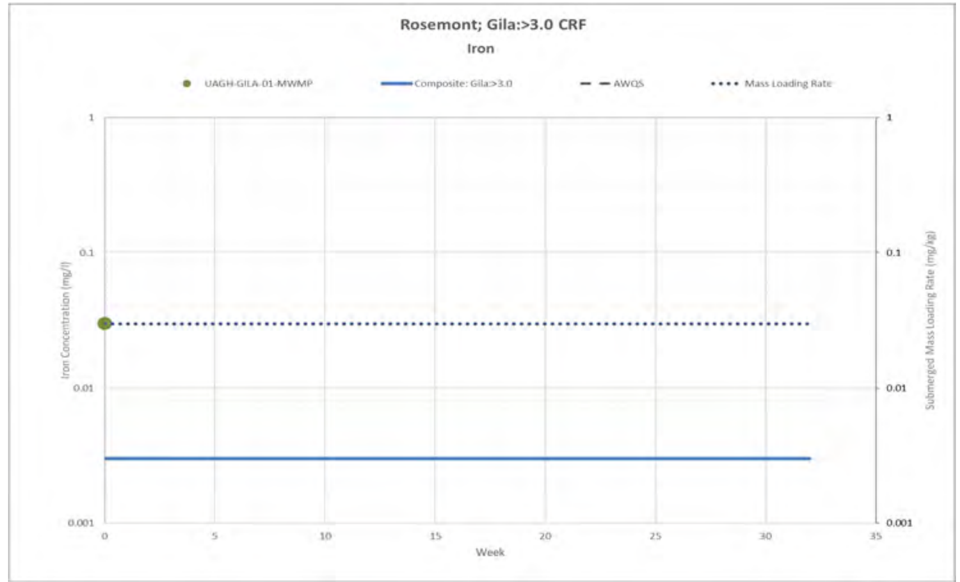

Rosemont; Gila:>3.0 CRF
Cadmium
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

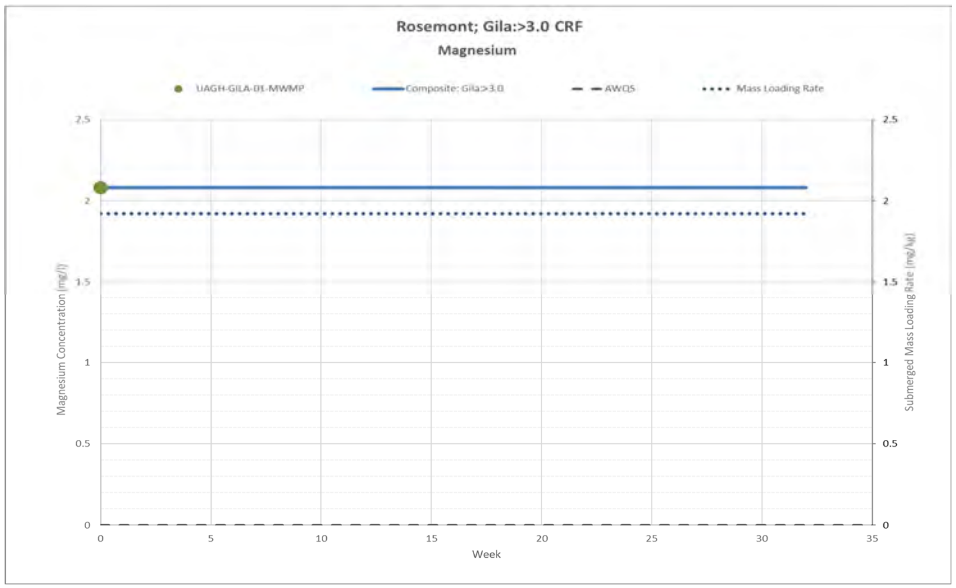

Rosemont; Gila:>3.0 CRF
Calcium
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

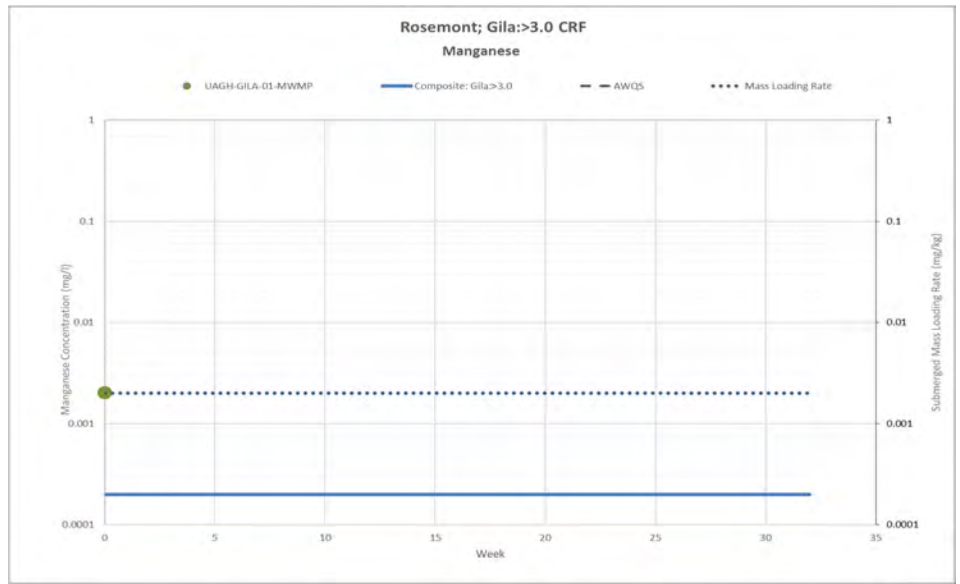

Rosemont; Gila:>3.0 CRF
Chloride
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

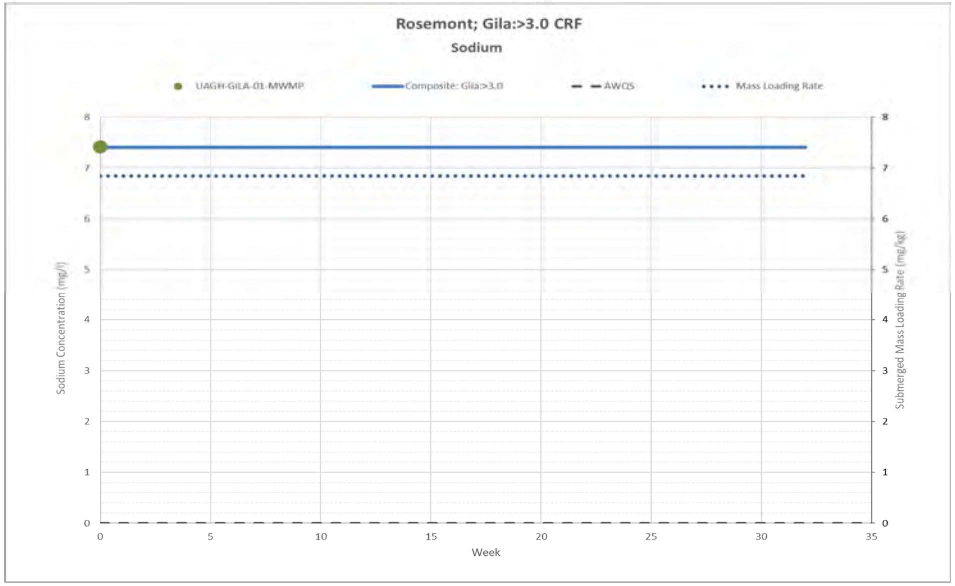

Rosemont; Gila:>3.0 CRF
Copper
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

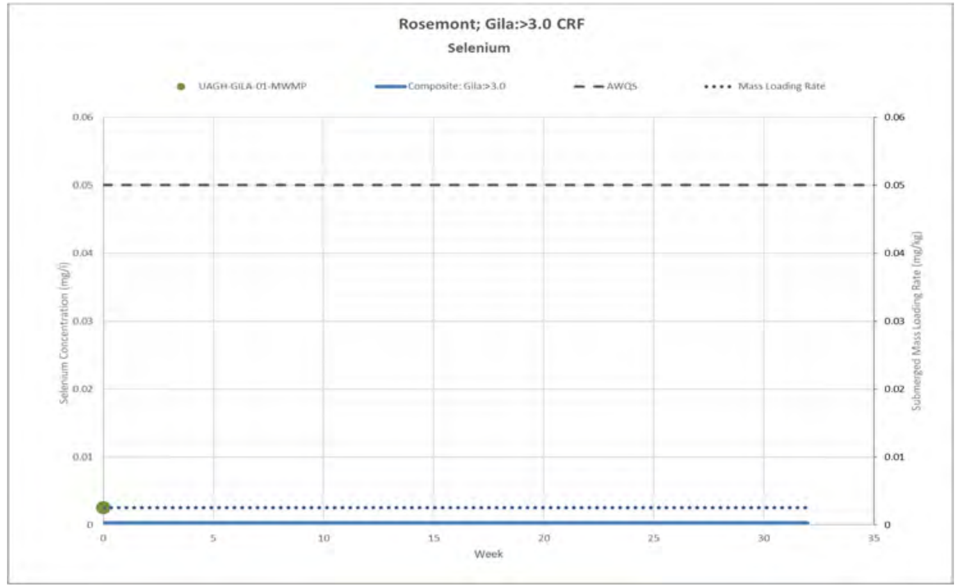

Rosemont; Gila:>3.0 CRF
Fluoride
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

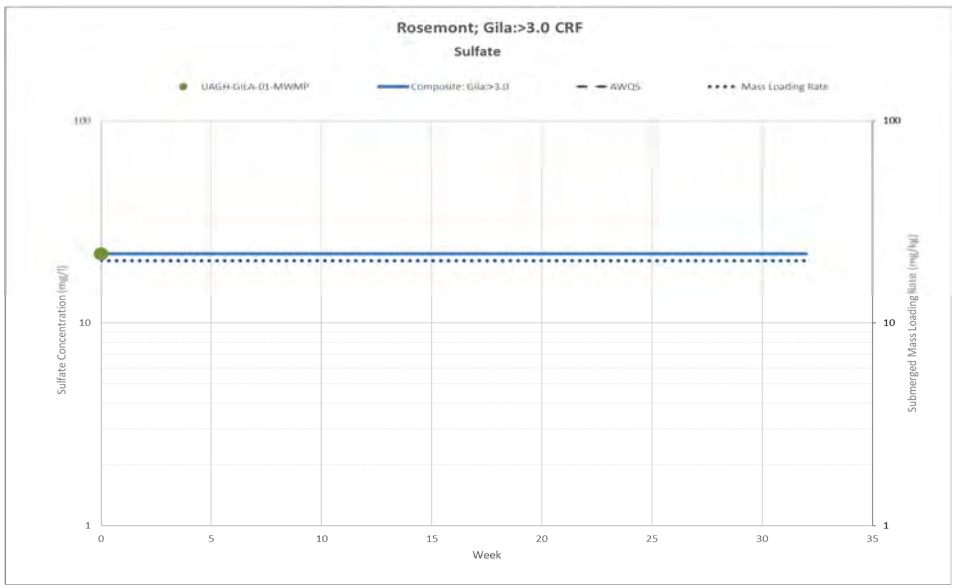

Rosemont; Gila:>3.0 CRF
Iron
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

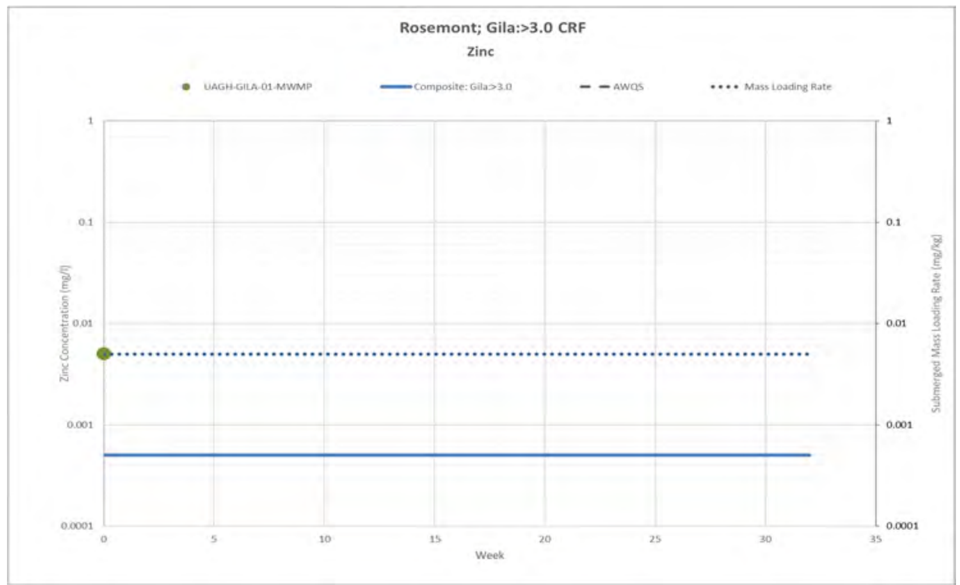

Rosemont; Gila:>3.0 CRF
Magnesium
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Gila:>3.0 CRF
Manganese
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

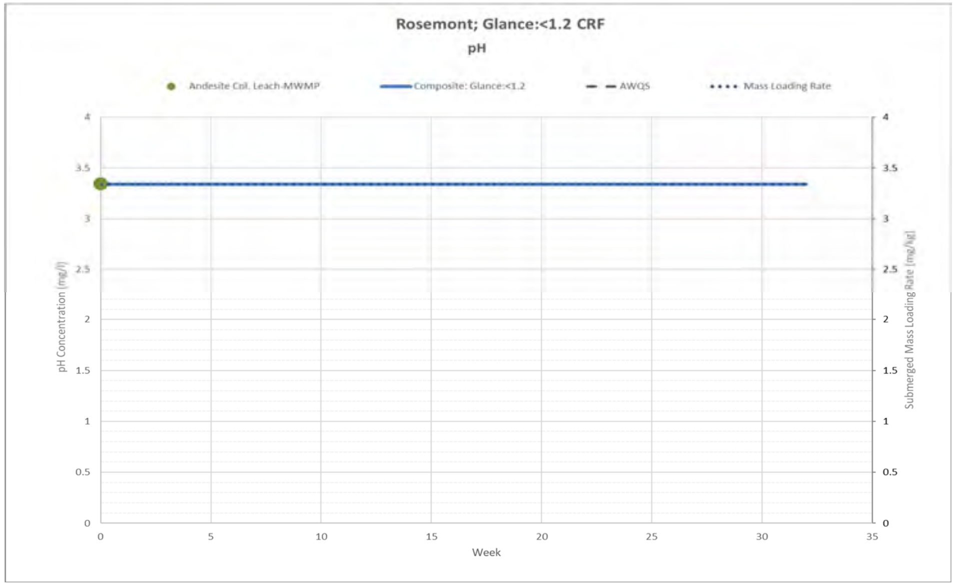

Rosemont; Gila:>3.0 CRF
Sodium
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

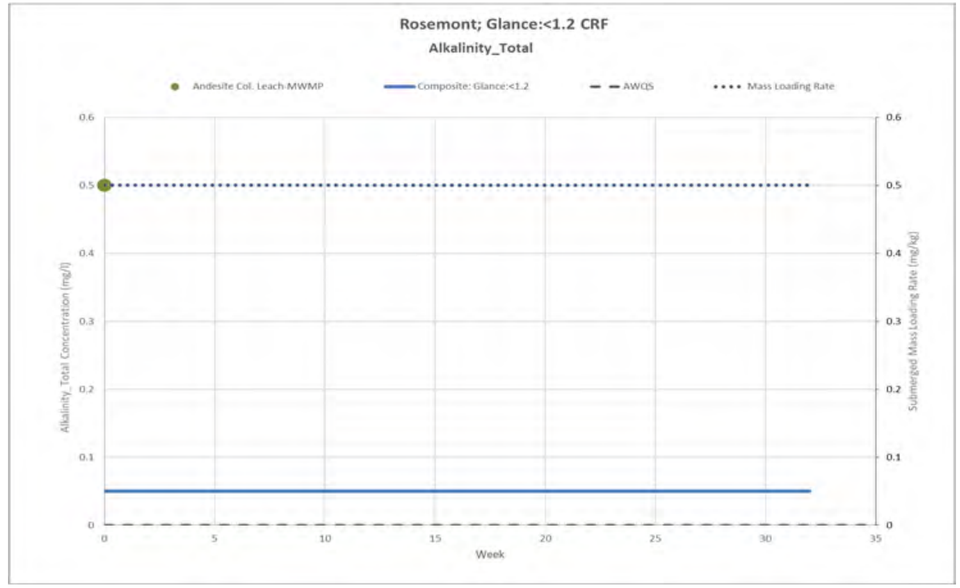

Rosemont; Gila:>3.0 CRF
Selenium
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

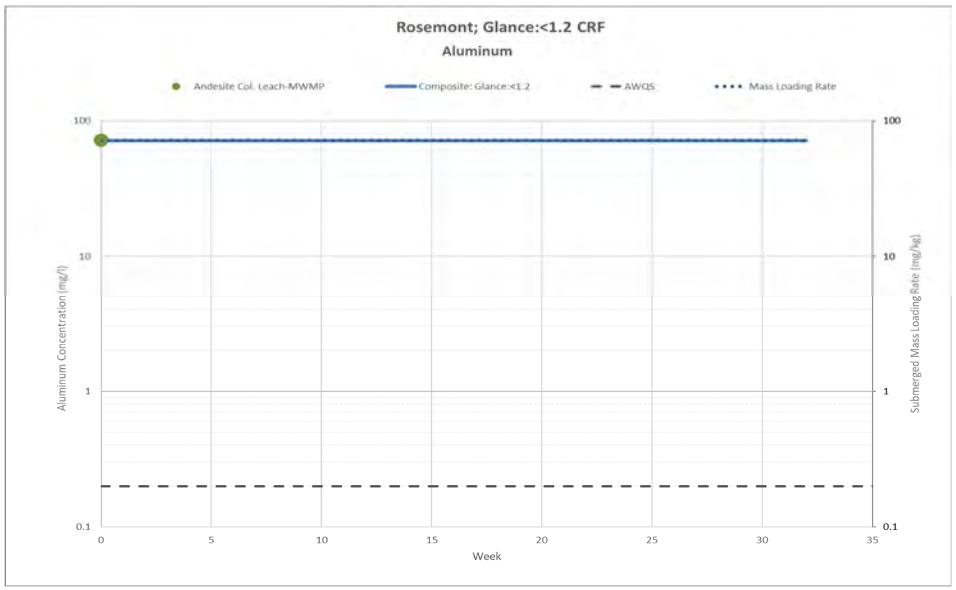

Rosemont; Gila:>3.0 CRF
Sulfate
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

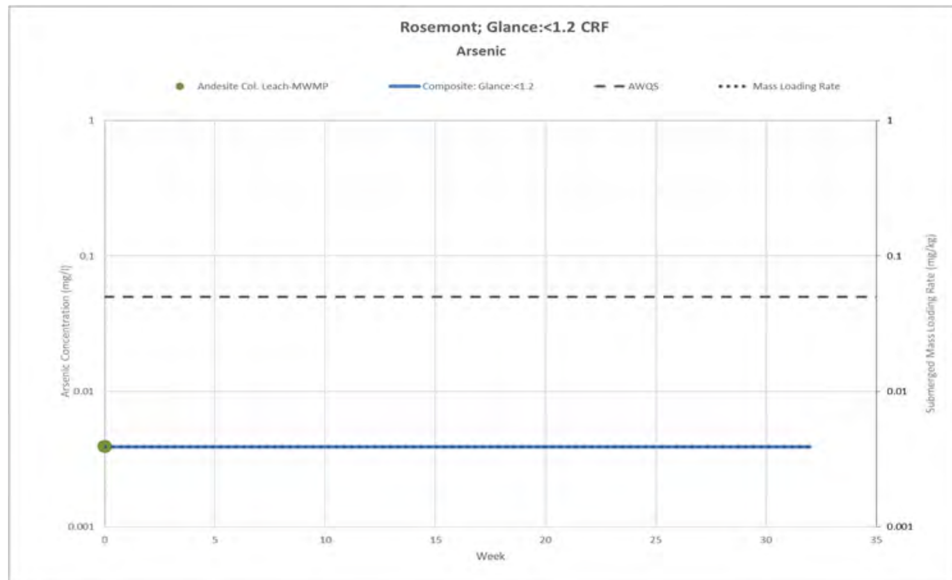

Rosemont; Gila:>3.0 CRF
Zinc
UAGH-GILA-01-MWMP
Composite: Gila>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

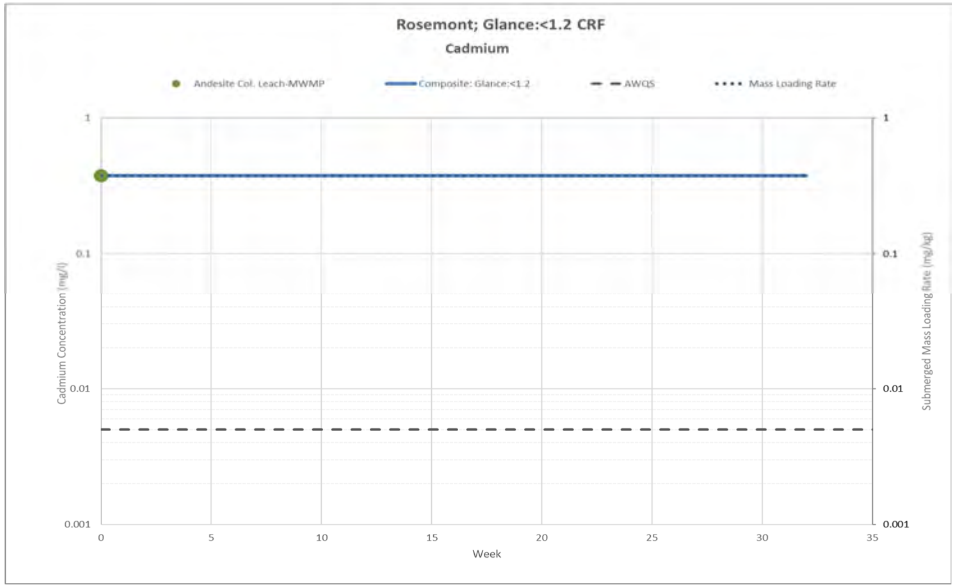


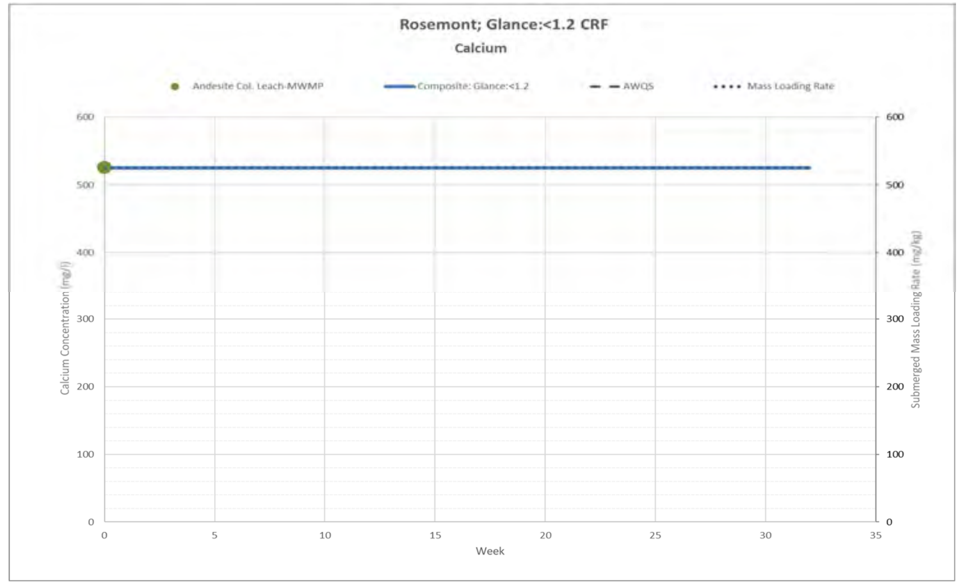


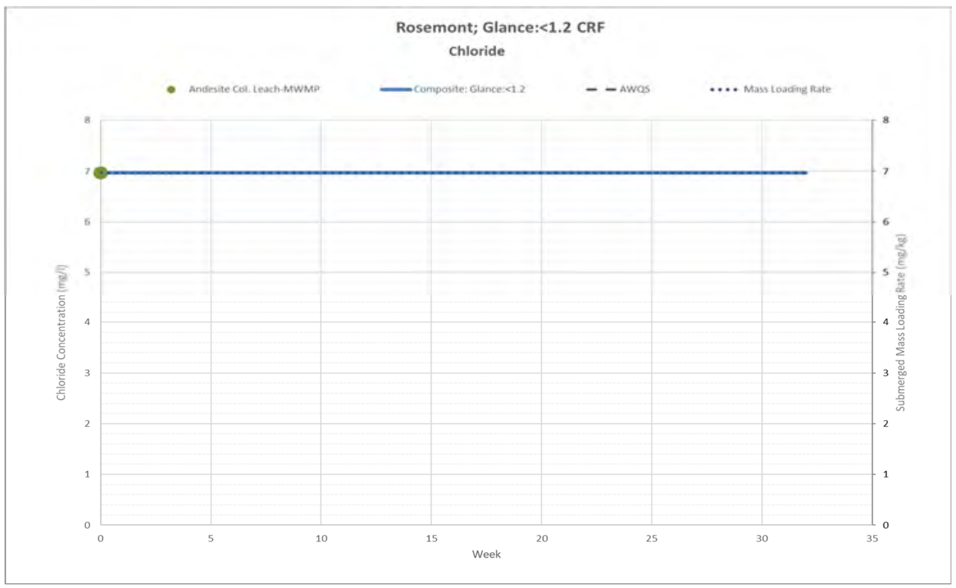


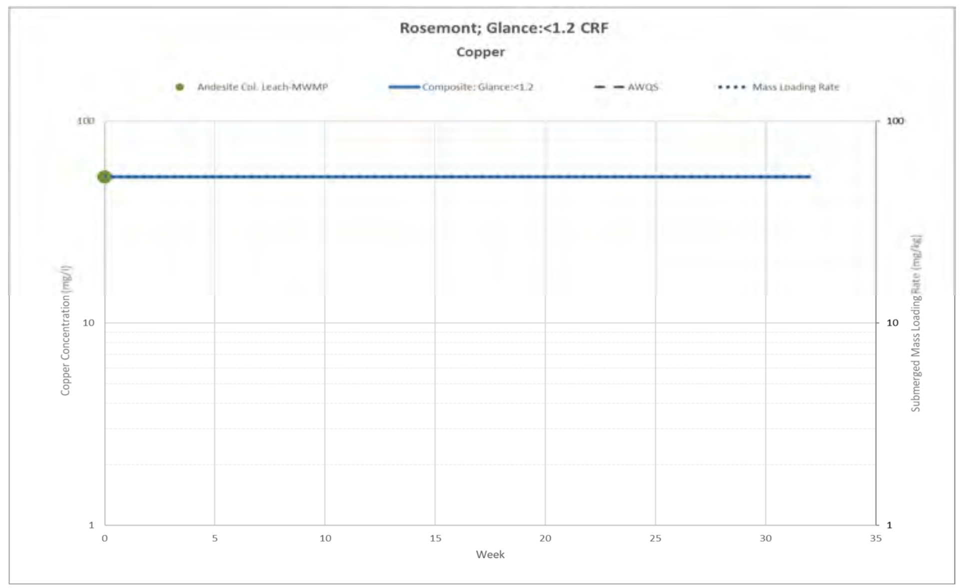


Appendix - H
Composite CRF Charts



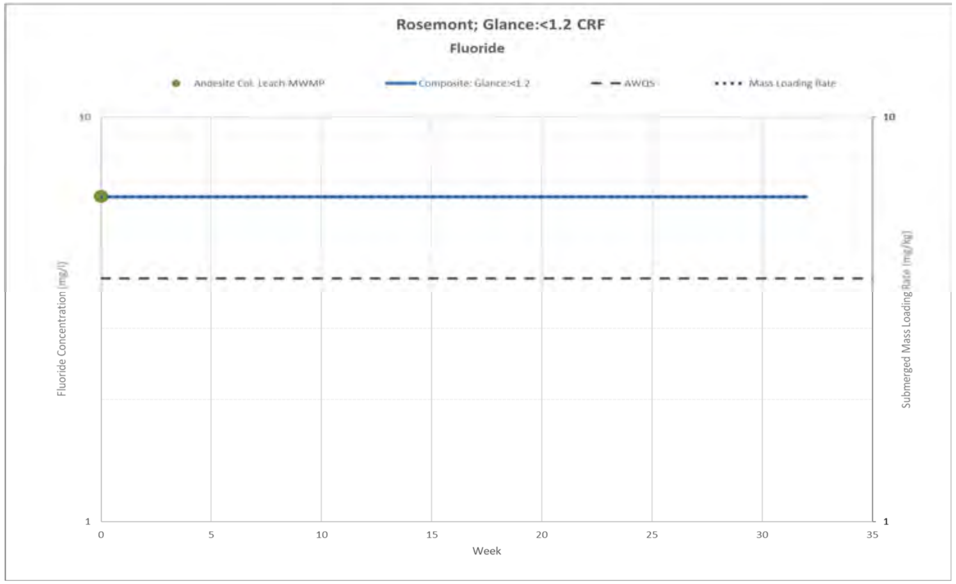


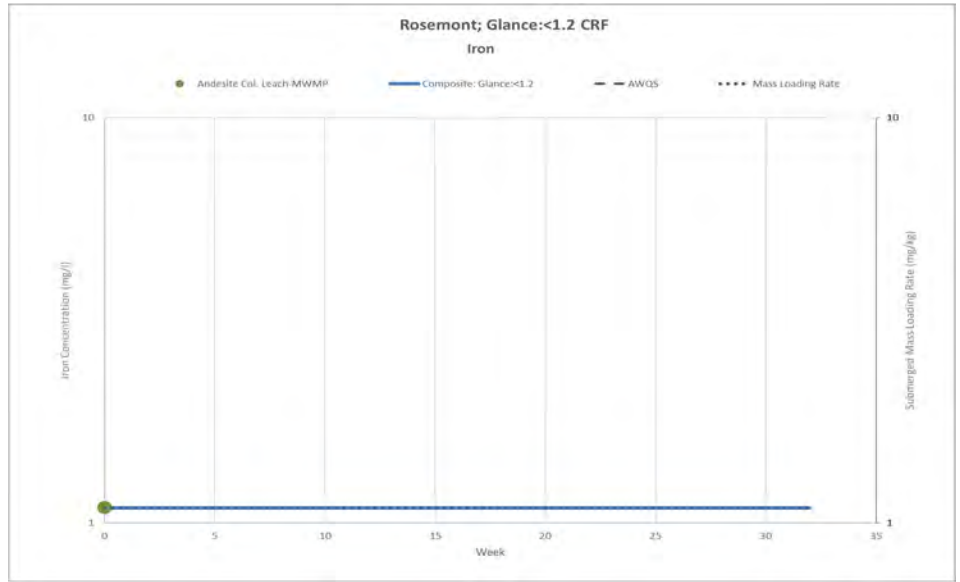


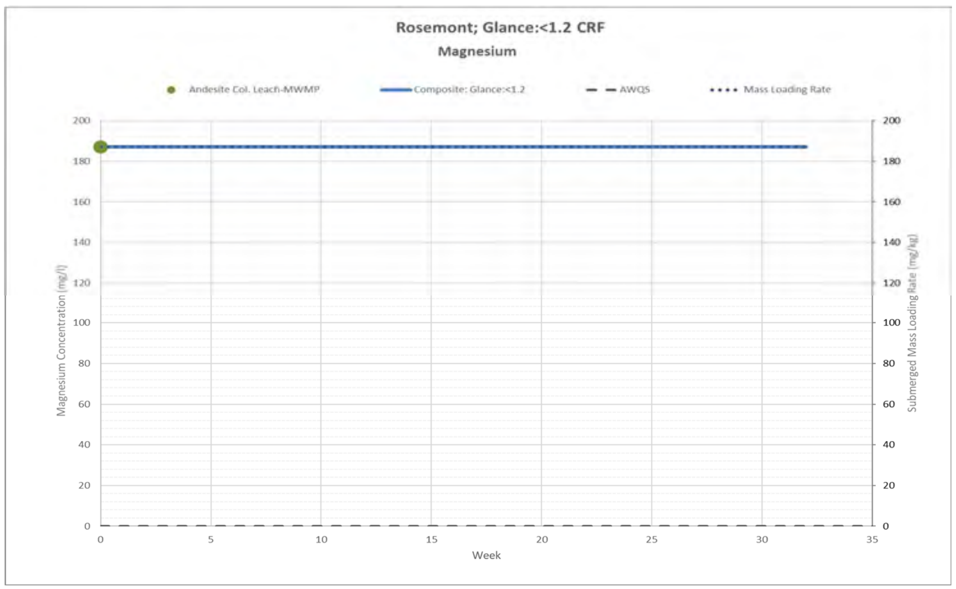


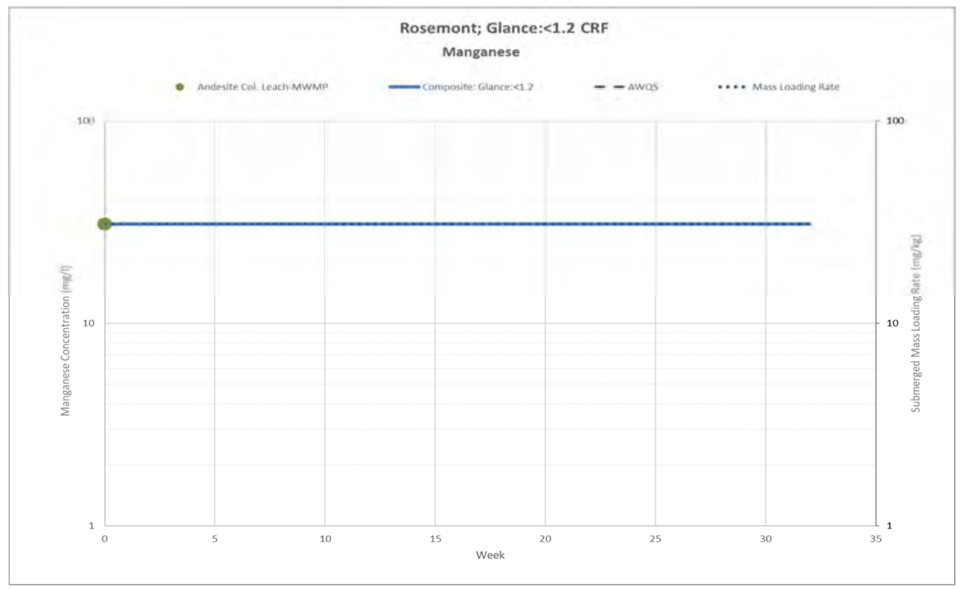
Rosemont Copper Company
Rosemont Copper World Project

Appendix - H
Composite CRF Charts

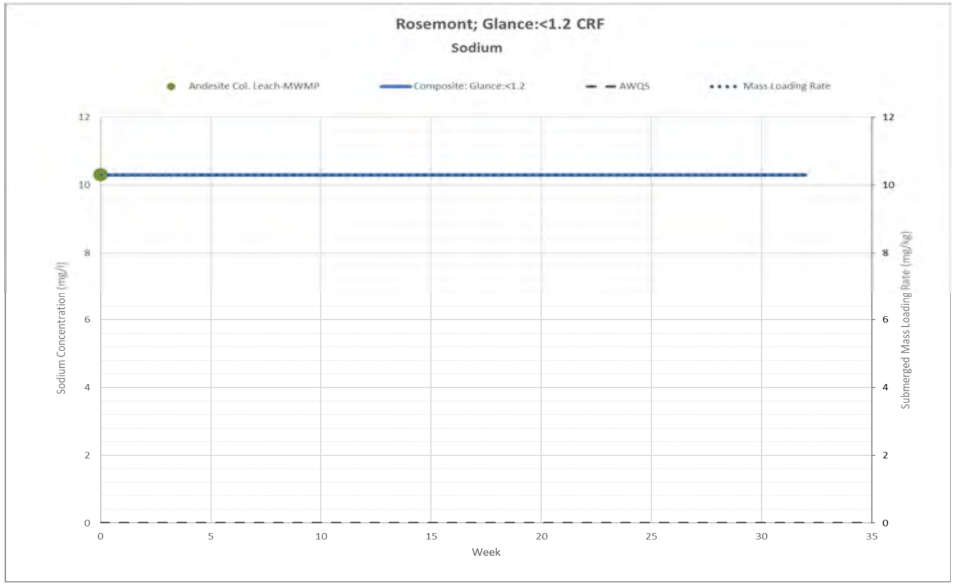


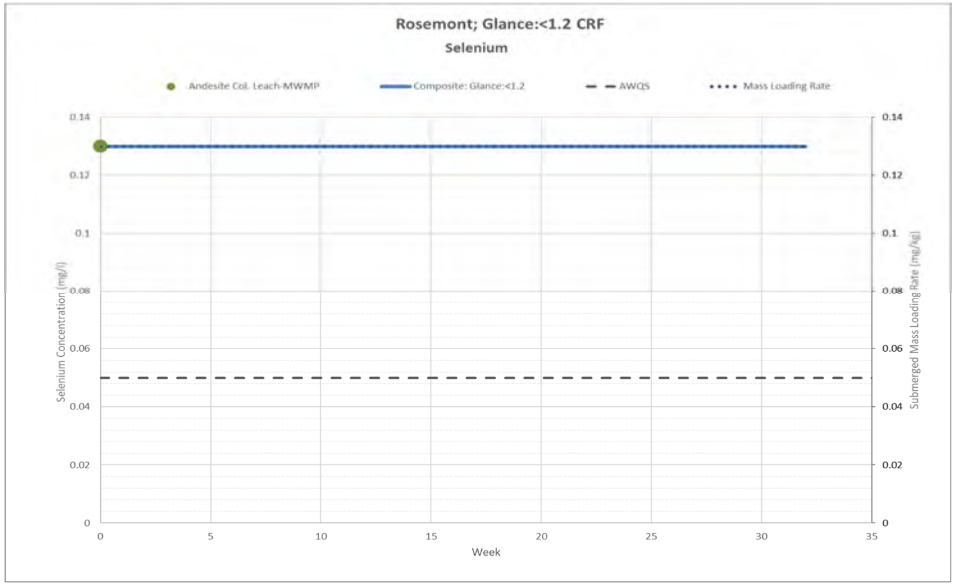


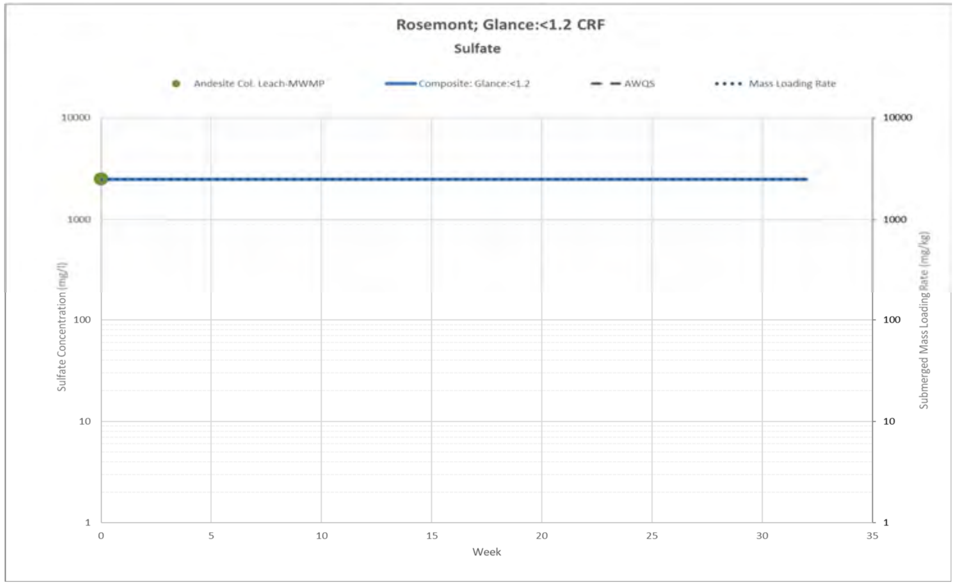


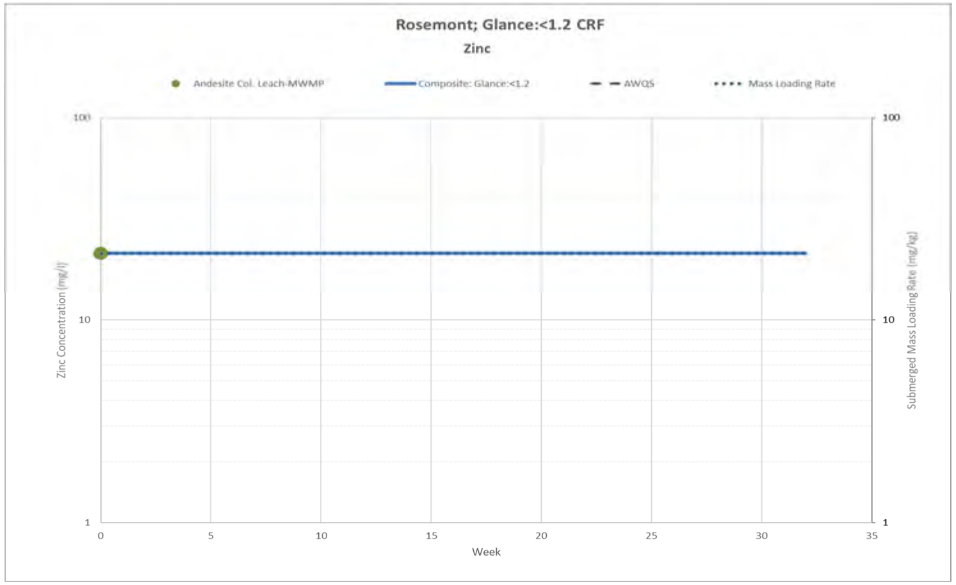


Appendix - H
Composite CRF Charts

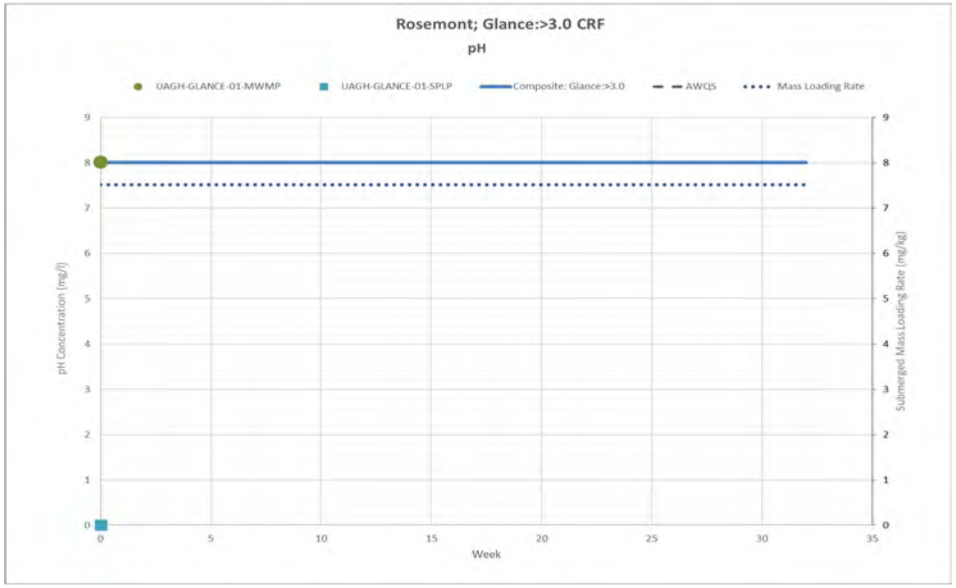


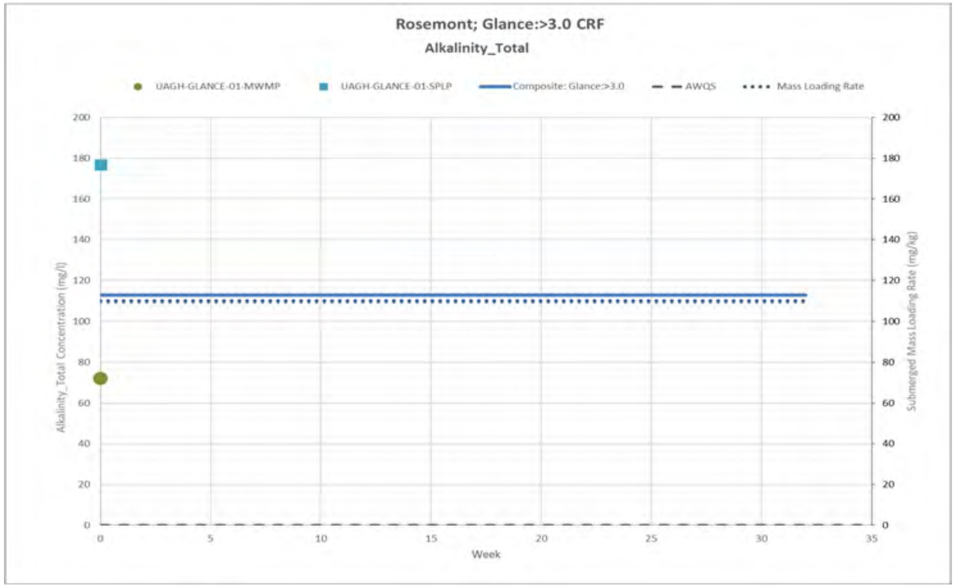


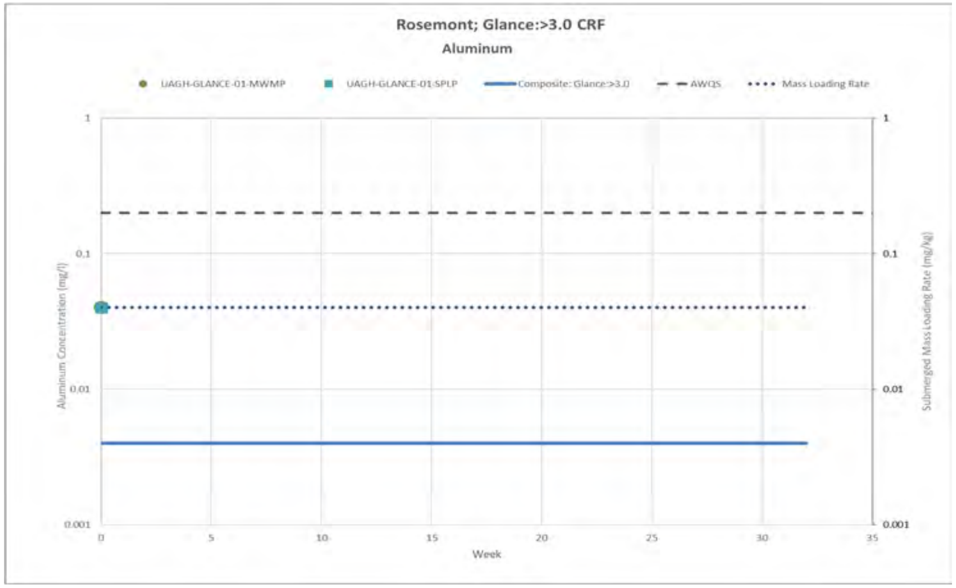


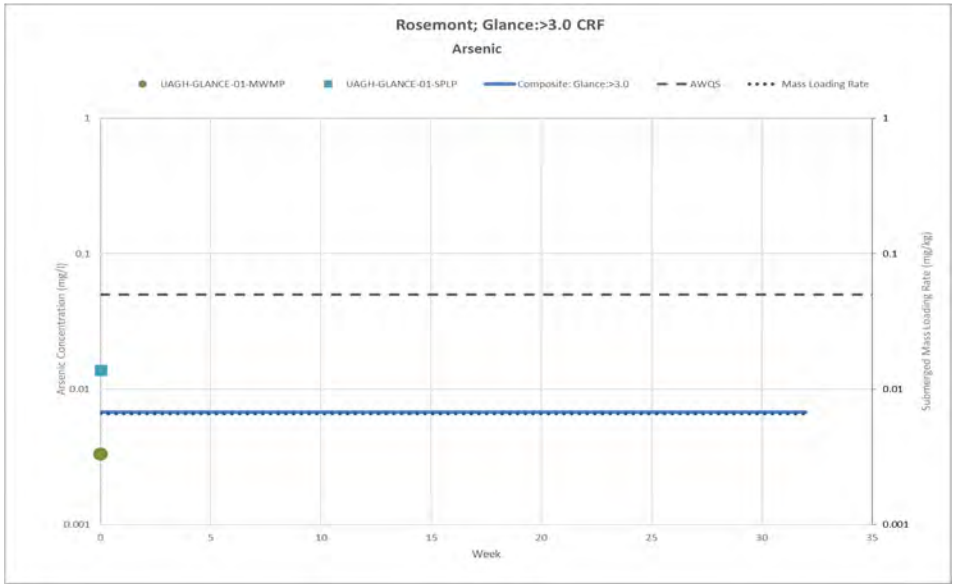


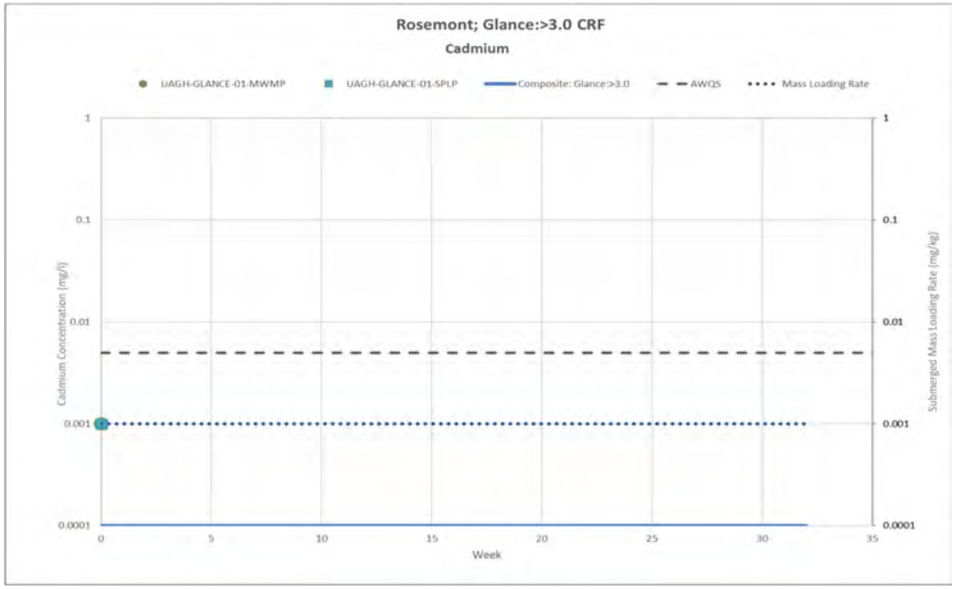
Appendix - H
Composite CRF Charts

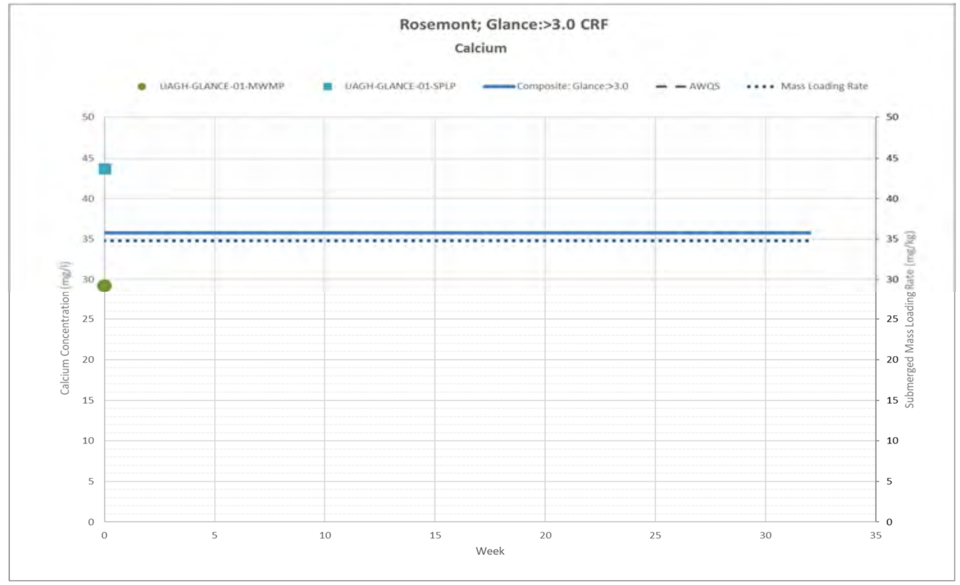


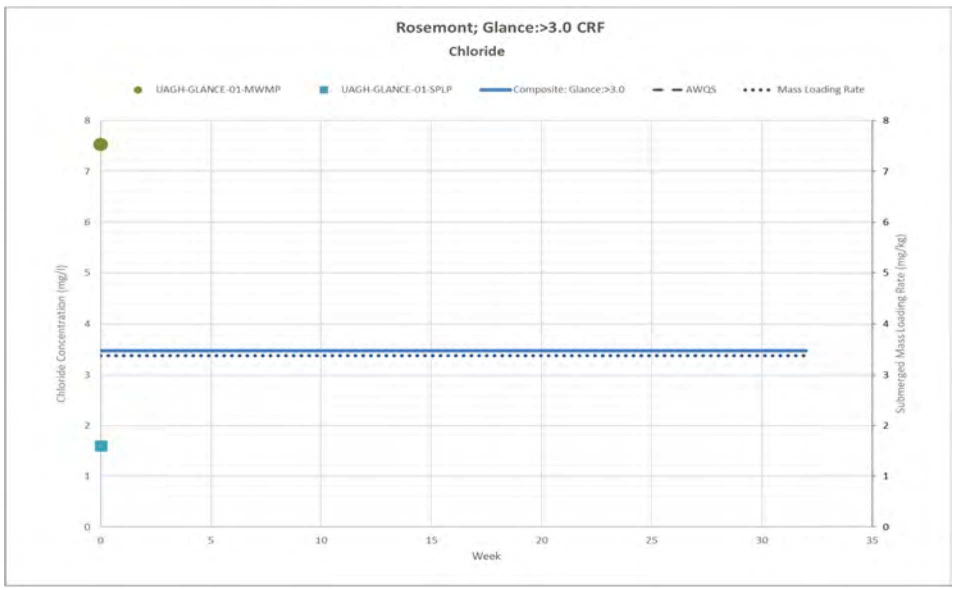


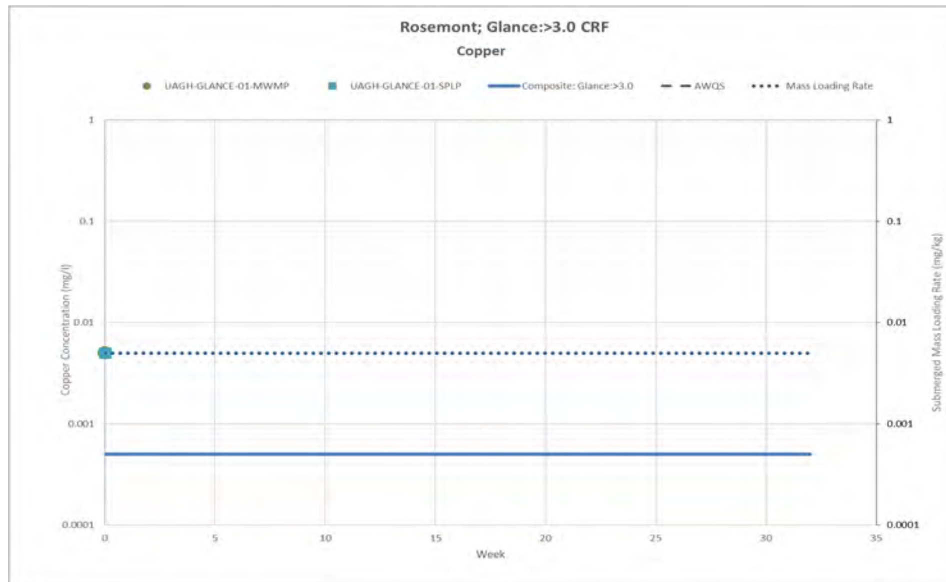


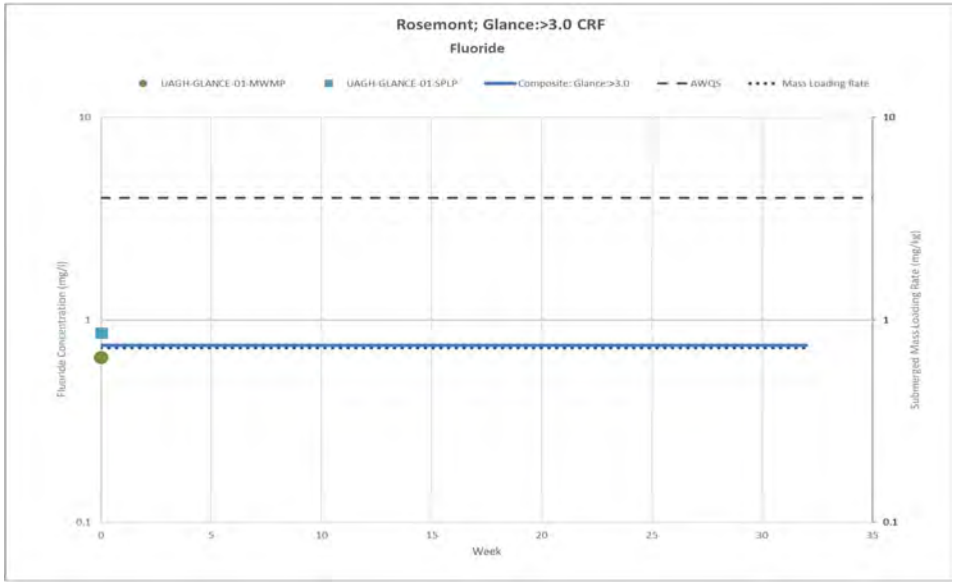


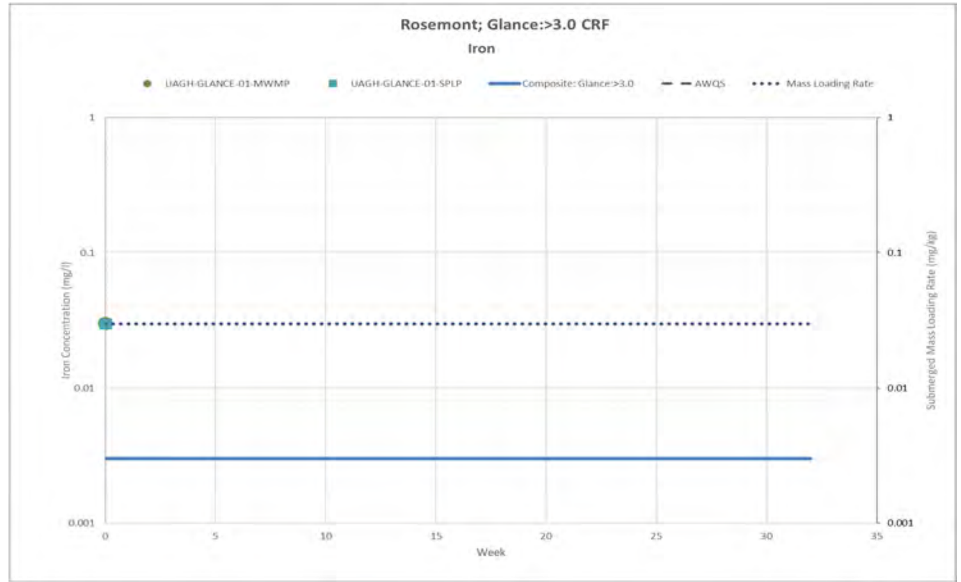

Rosemont; Glance:>3.0 CRF
Cadmium
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

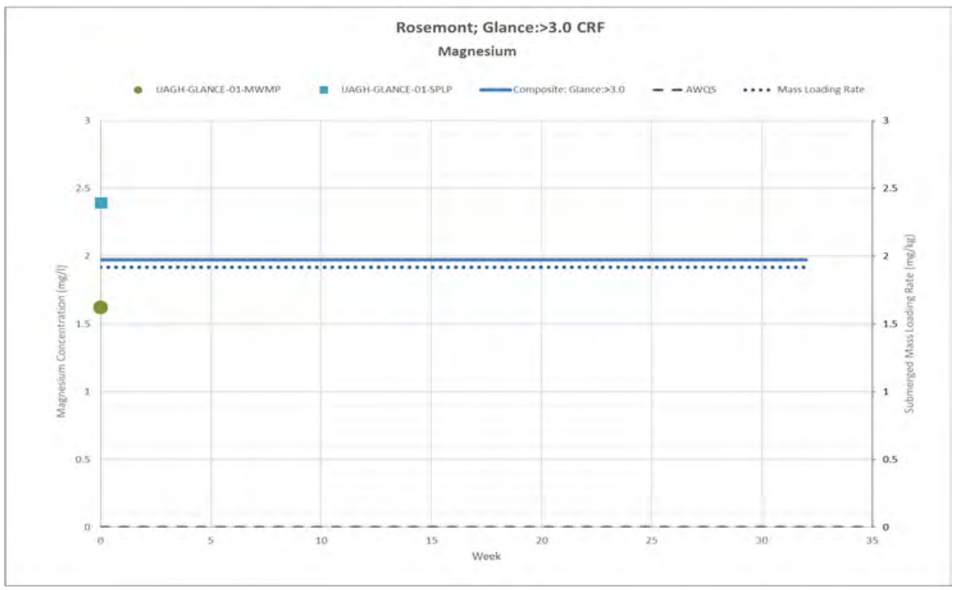

Rosemont; Glance:>3.0 CRF
Calcium
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

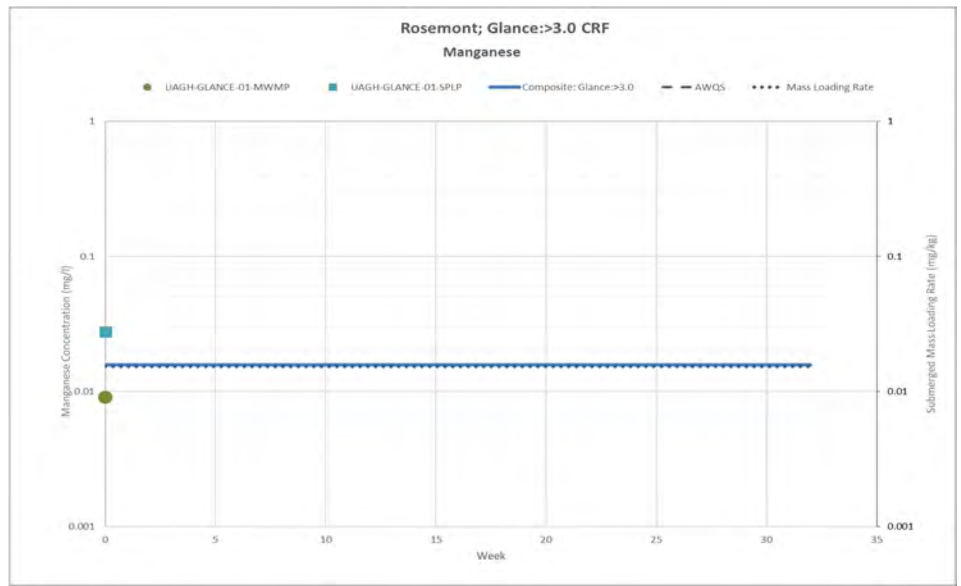

Rosemont; Glance:>3.0 CRF
Chloride
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

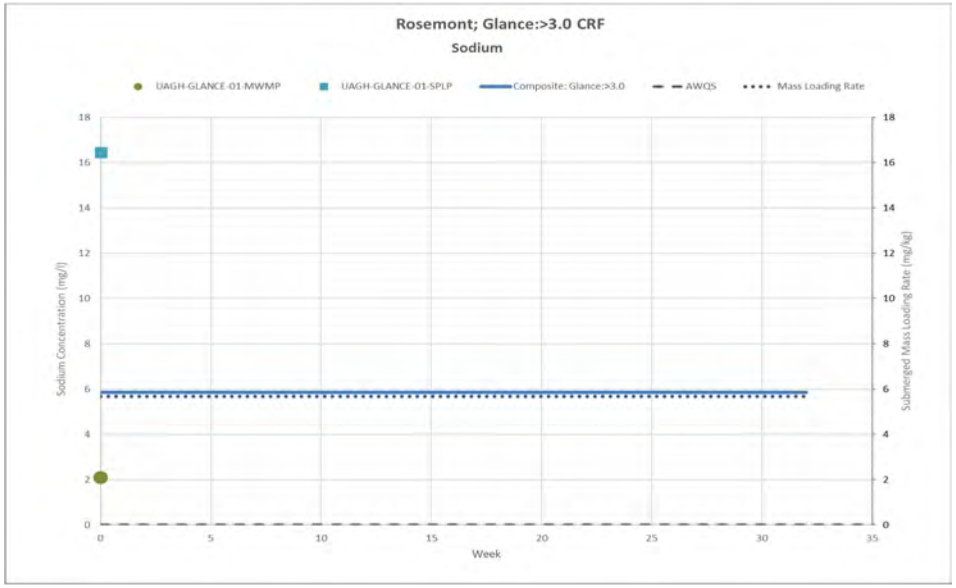

Rosemont; Glance:>3.0 CRF
Copper
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

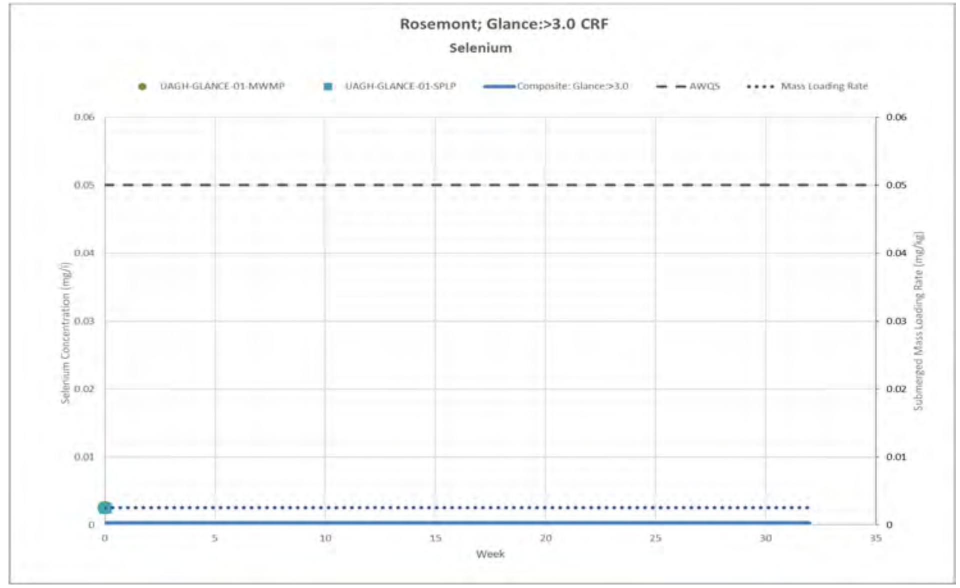

Rosemont; Glance:>3.0 CRF
Fluoride
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance>3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

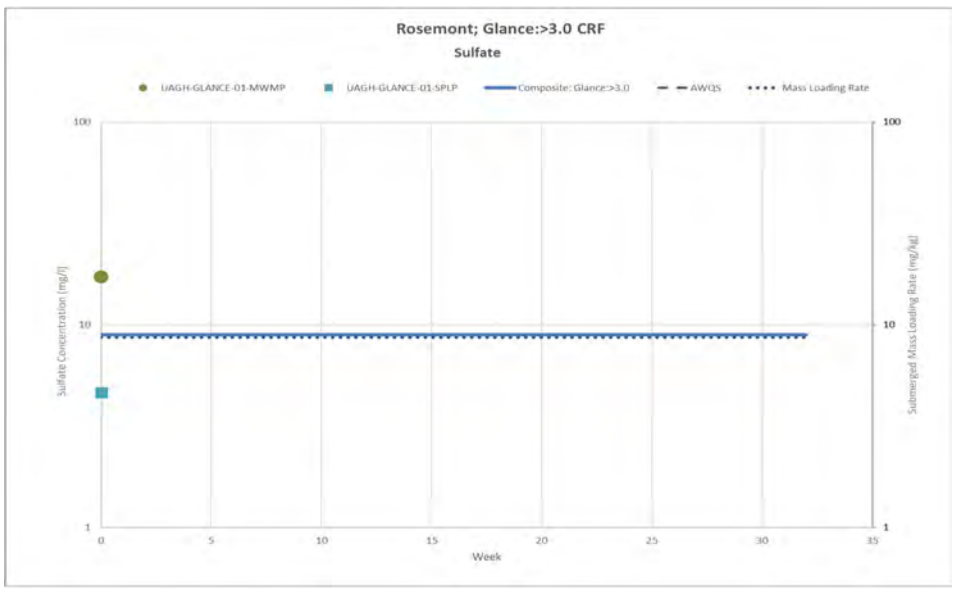

Rosemont; Glance:>3.0 CRF
Iron
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance>3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

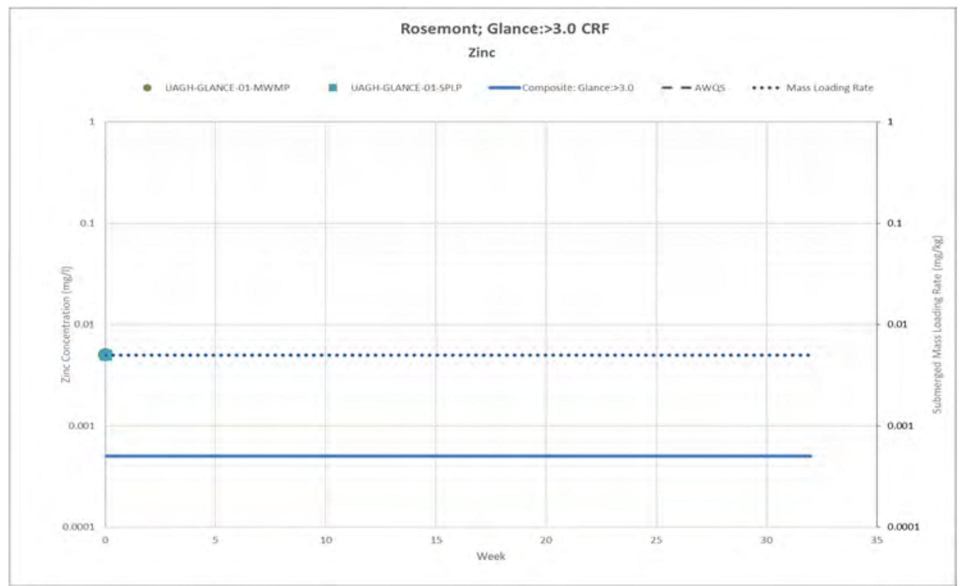

Rosemont; Glance:>3.0 CRF
Magnesium
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance>3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Glance:>3.0 CRF
Manganese
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance>3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

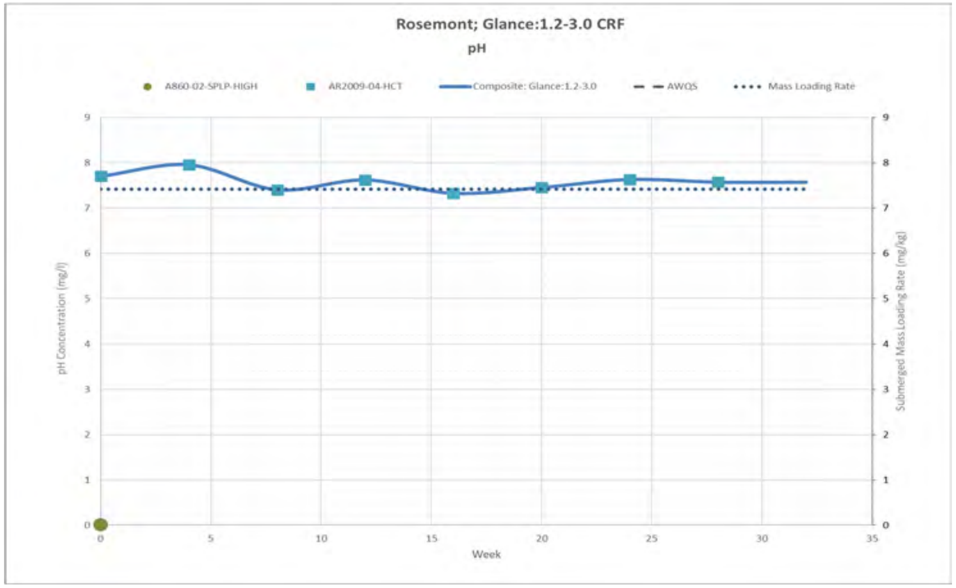

Rosemont; Glance:>3.0 CRF
Sodium
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance:>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

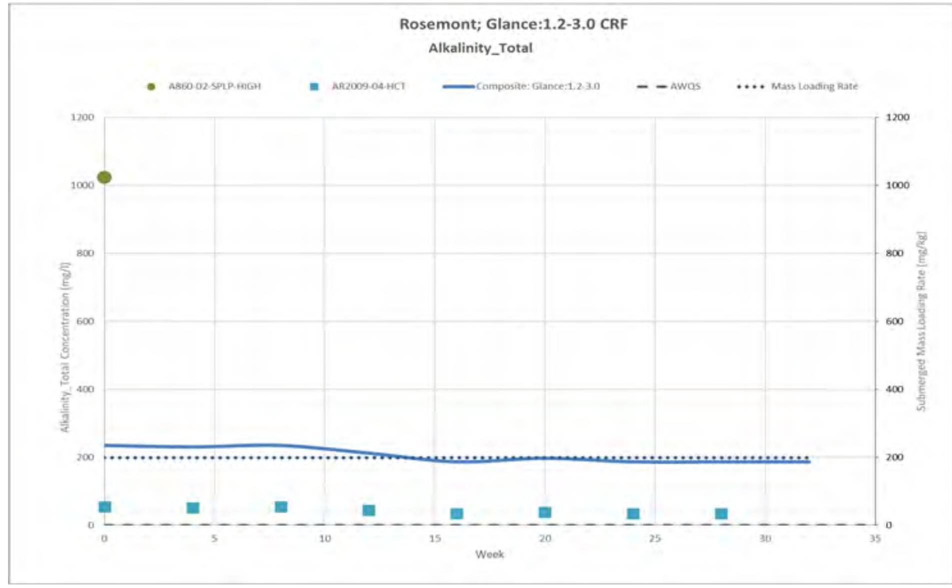

Rosemont; Glance:>3.0 CRF
Selenium
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance:>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

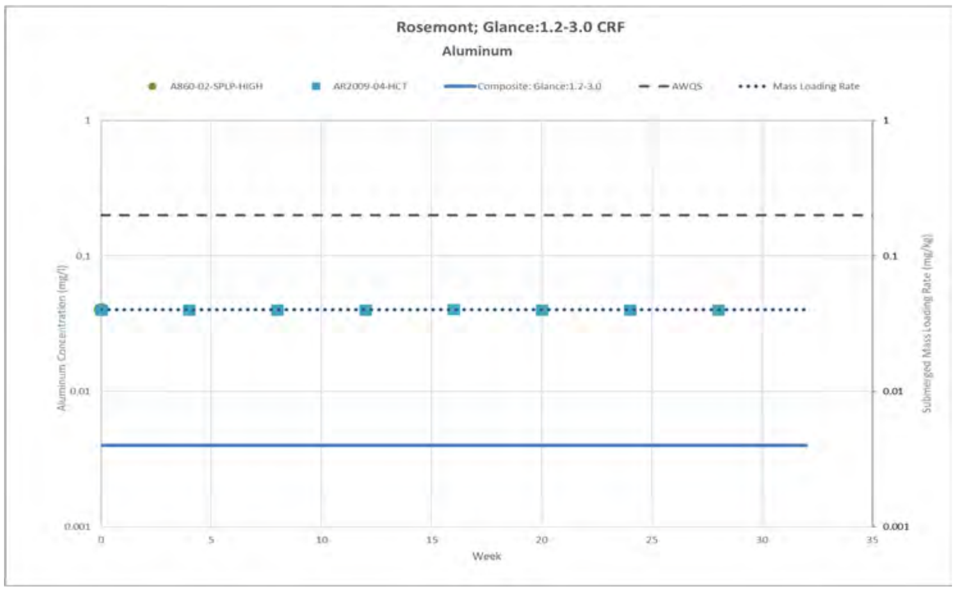

Rosemont; Glance:>3.0 CRF
Sulfate
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance:>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

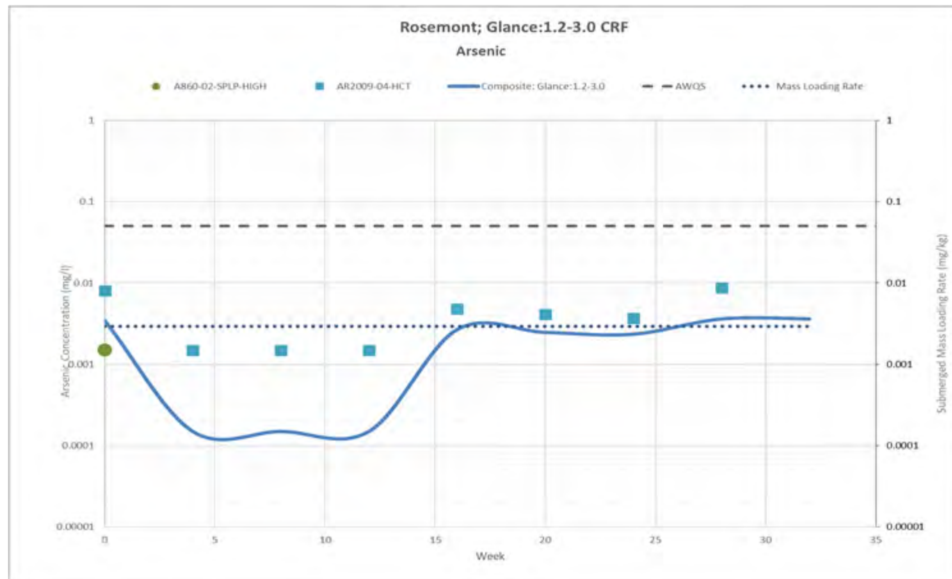

Rosemont; Glance:>3.0 CRF
Zinc
UAGH-GLANCE-01-MWMP
UAGH-GLANCE-01-SPLP
Composite: Glance:>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

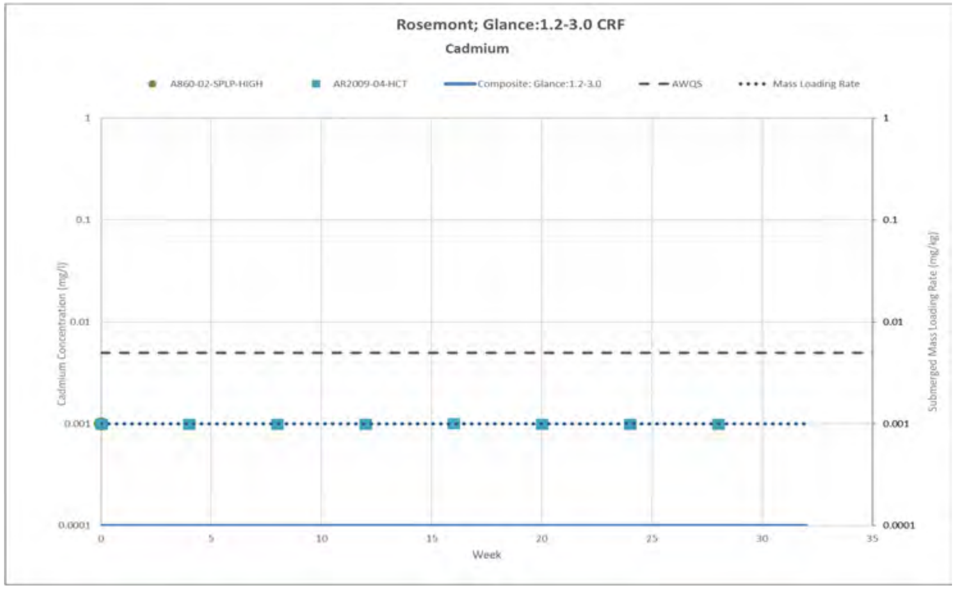


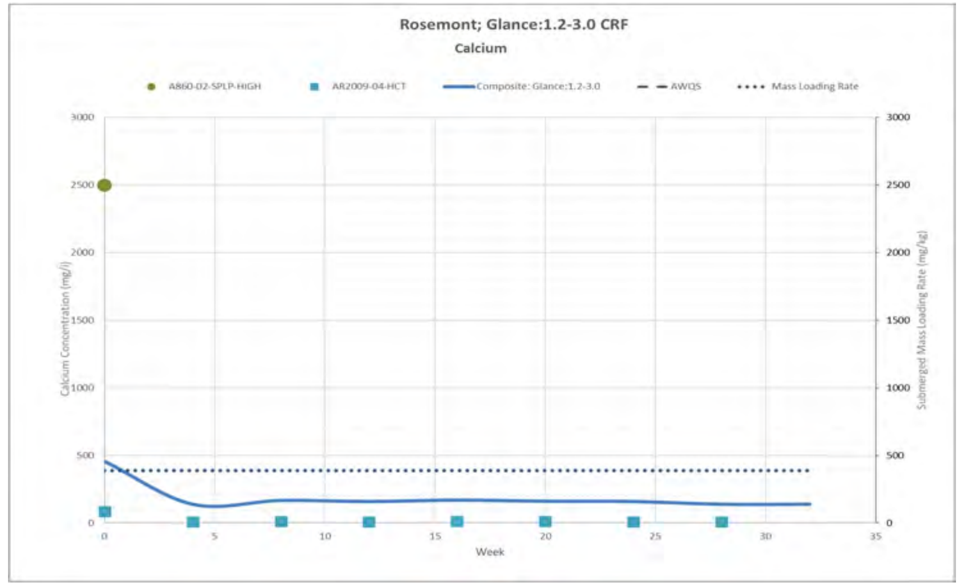


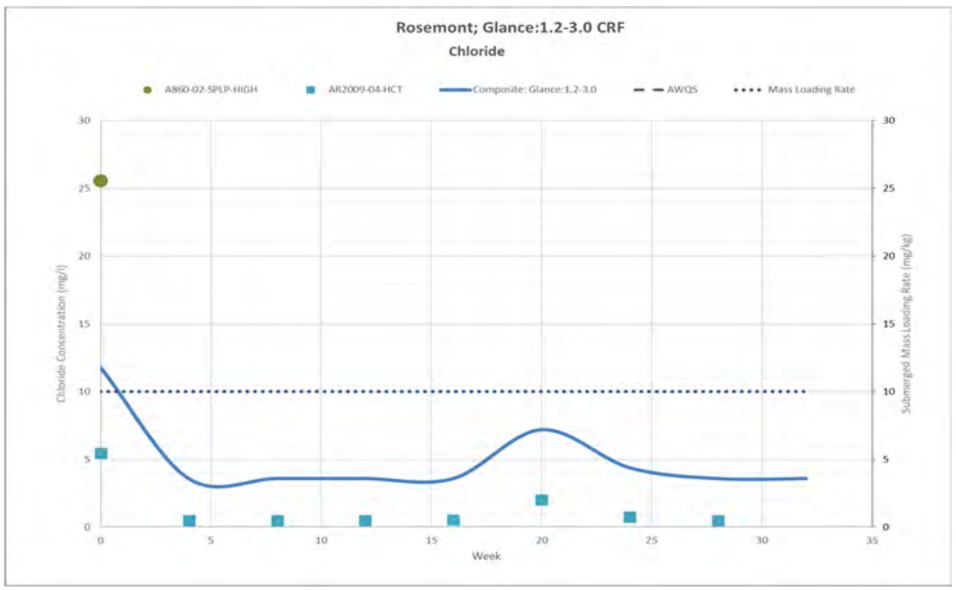


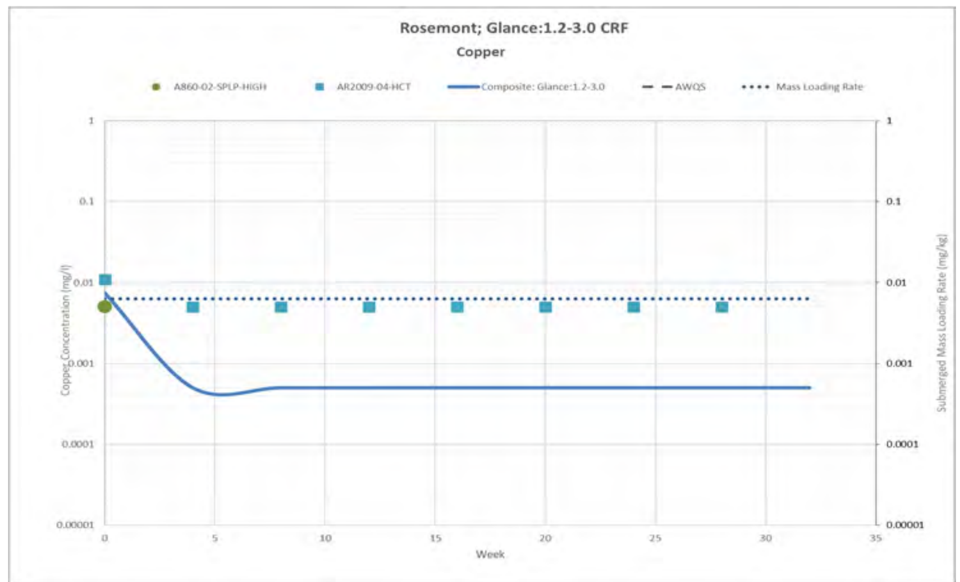


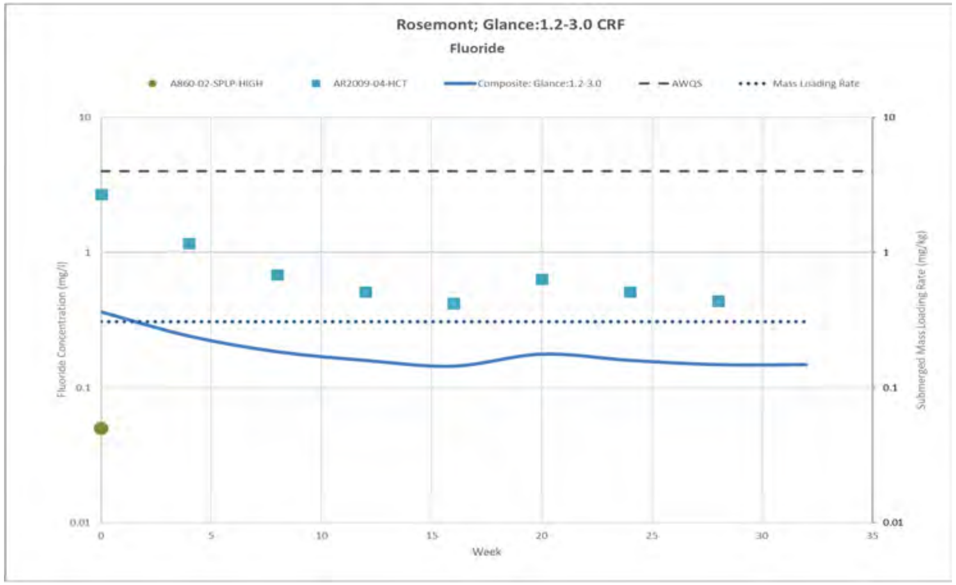
Appendix - H
Composite CRF Charts

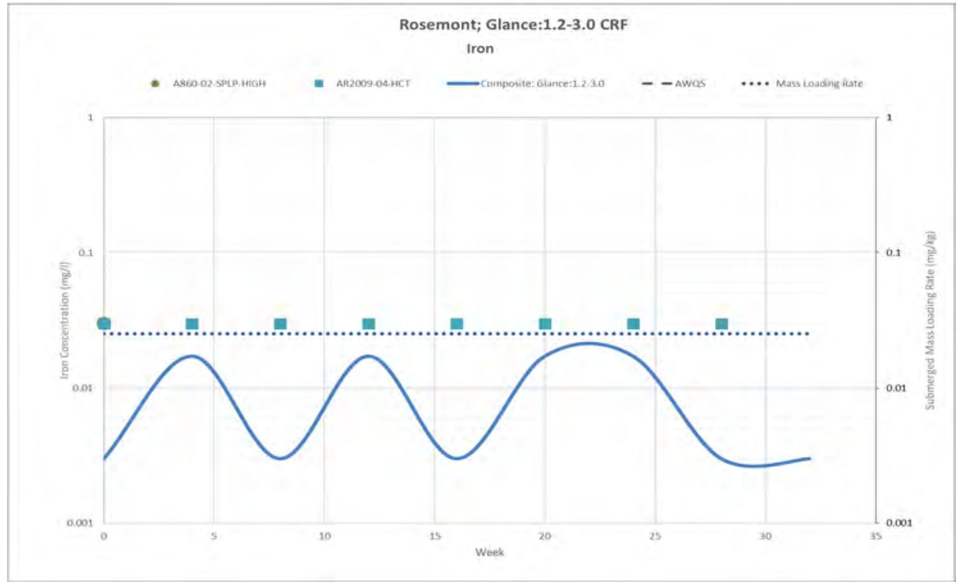


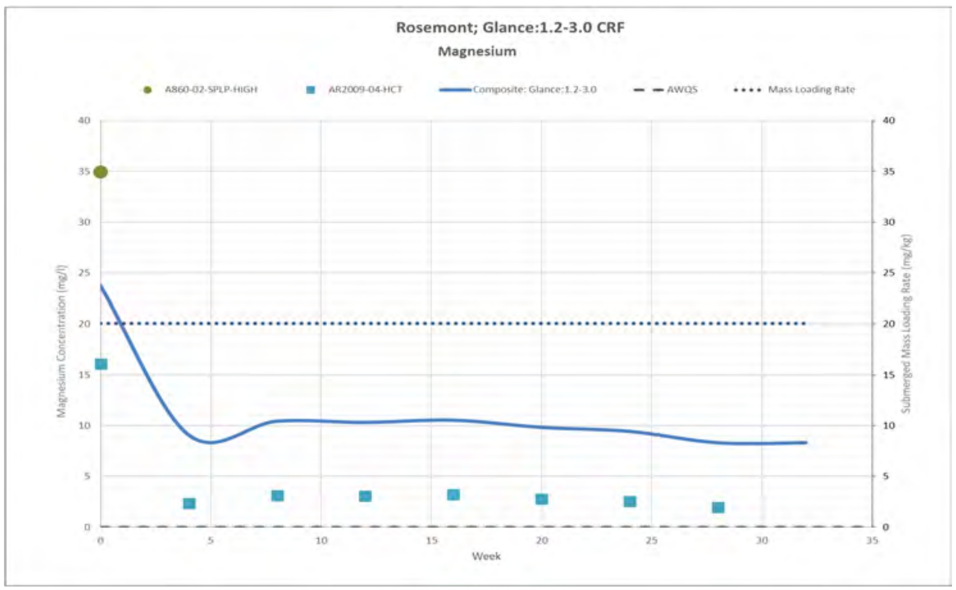


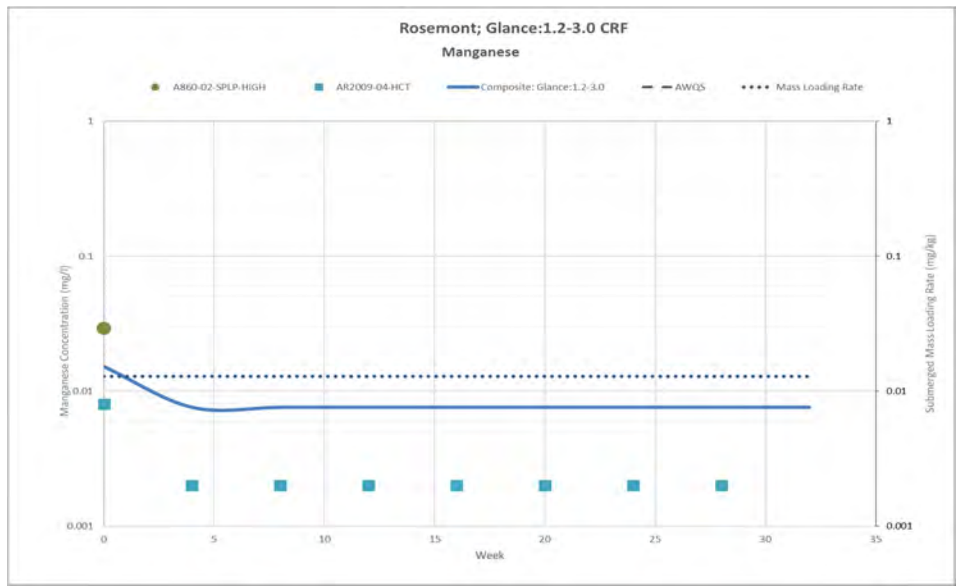




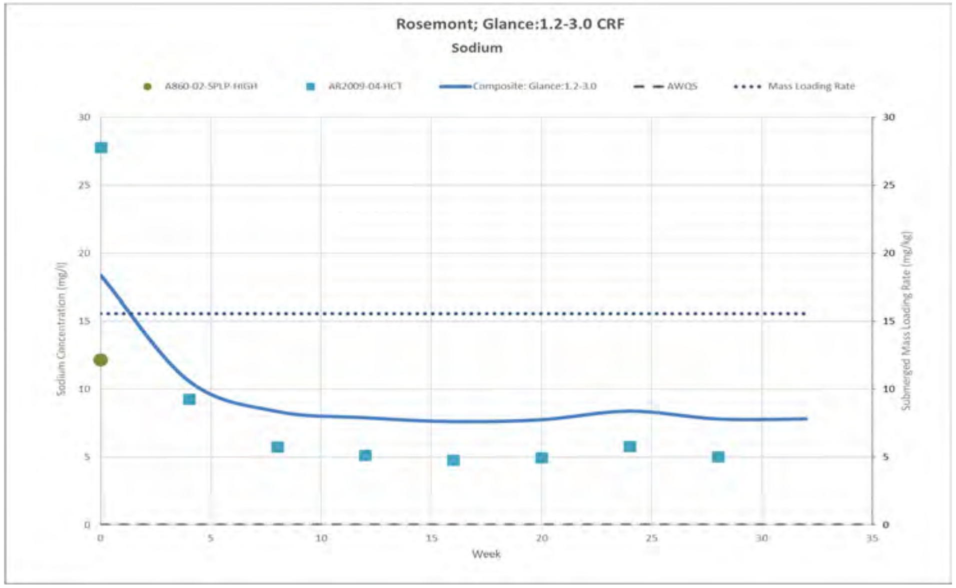

Rosemont; Glance:1.2-3.0 CRF
Fluoride
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Glance:1.2-3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

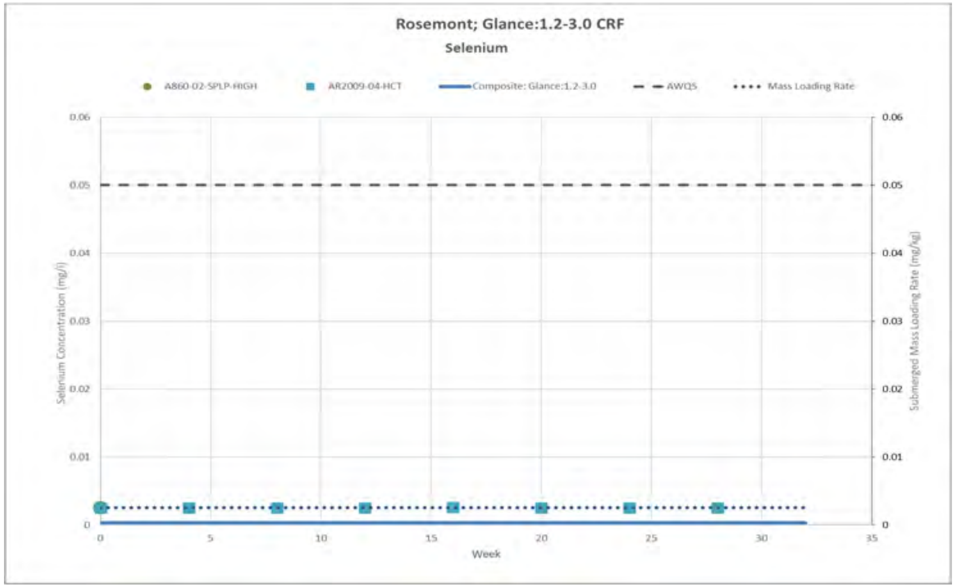

Rosemont; Glance:1.2-3.0 CRF
Iron
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Glance:1.2-3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

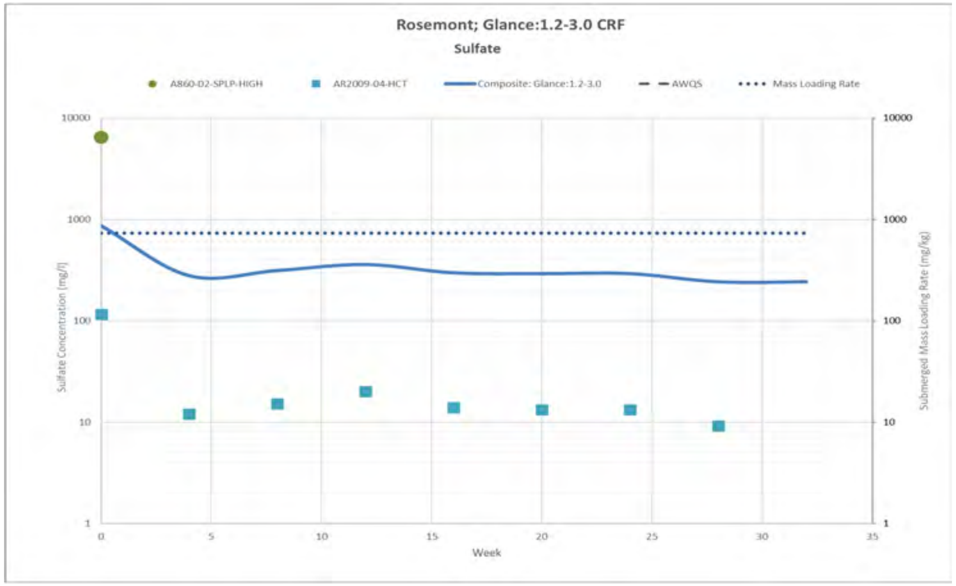

Rosemont; Glance:1.2-3.0 CRF
Magnesium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Glance:1.2-3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

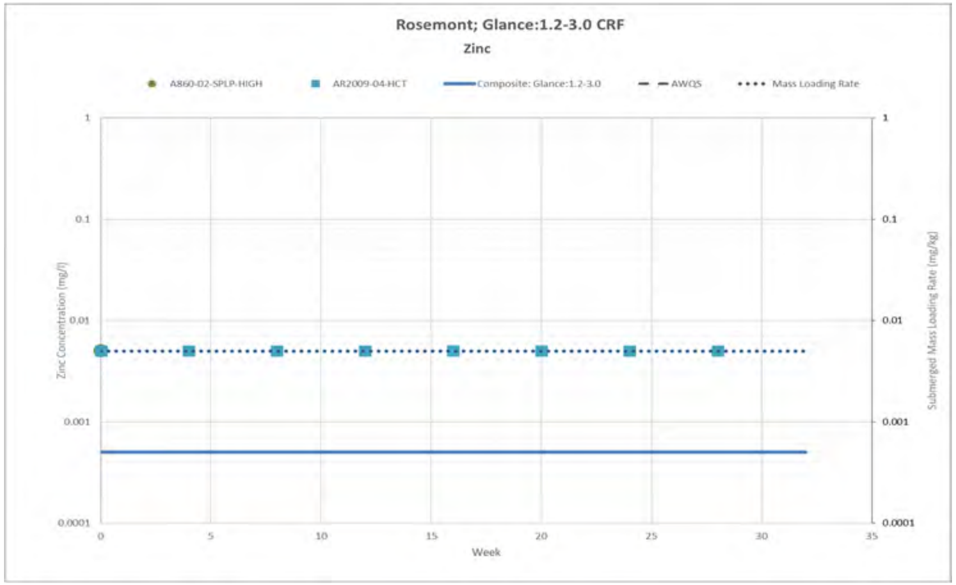

Rosemont; Glance:1.2-3.0 CRF
Manganese
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Glance:1.2-3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

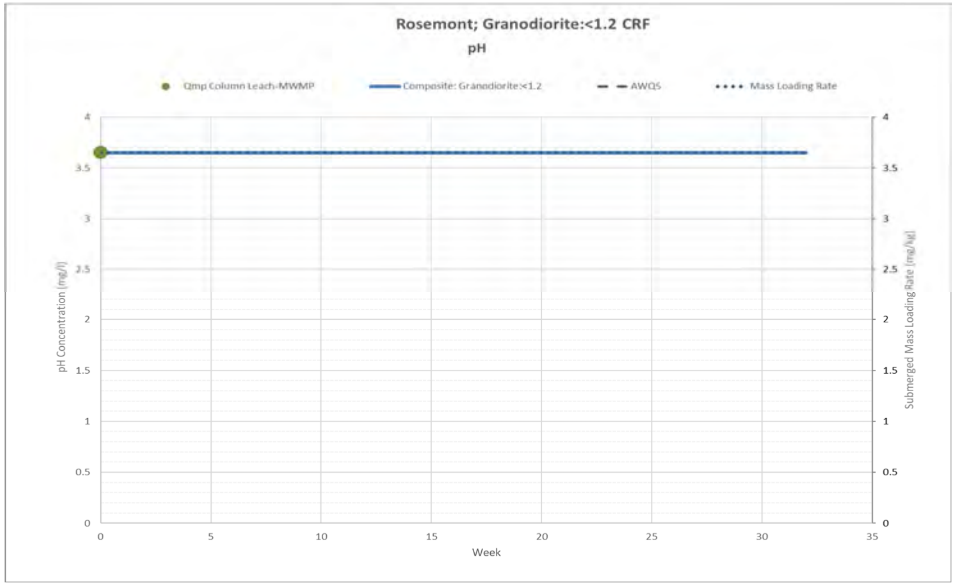


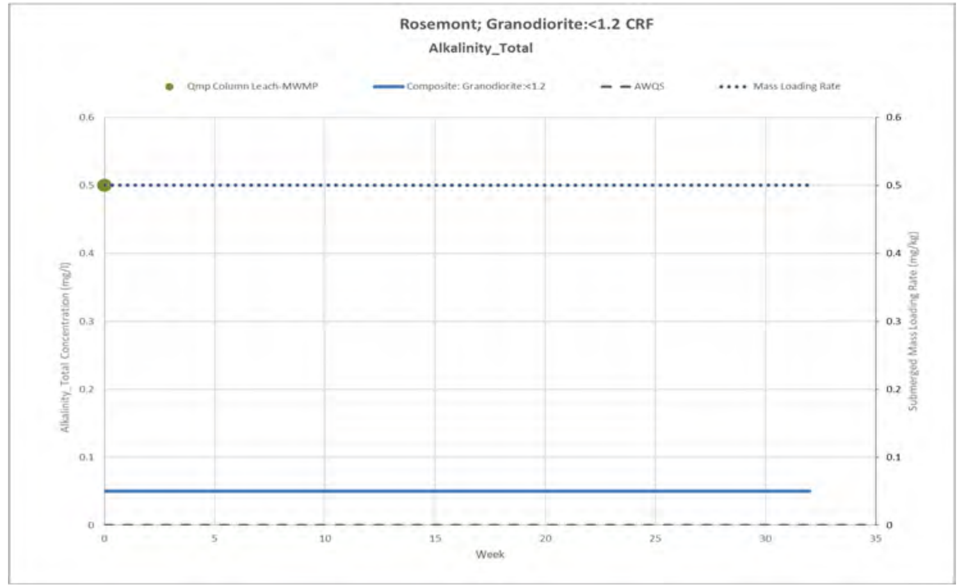


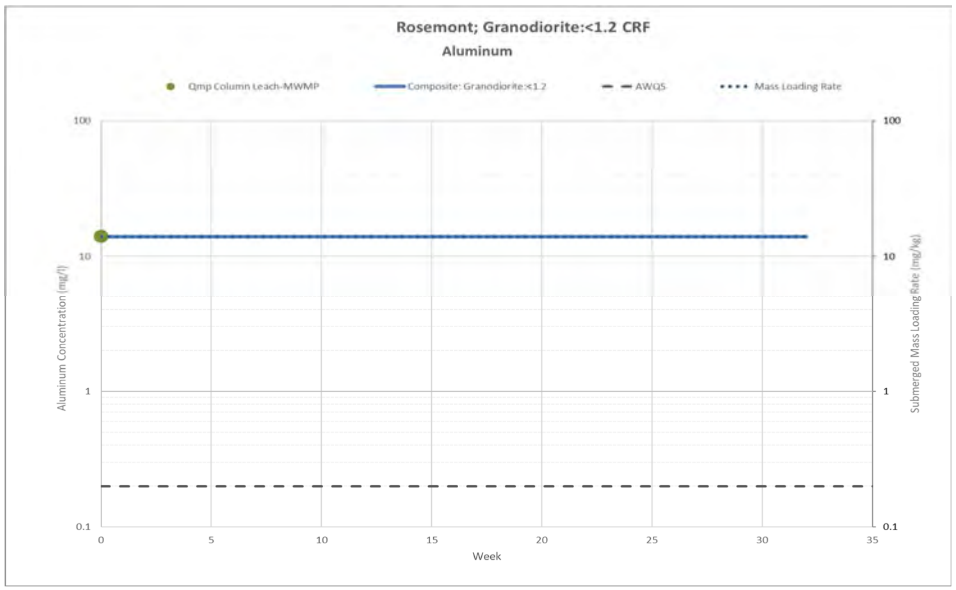


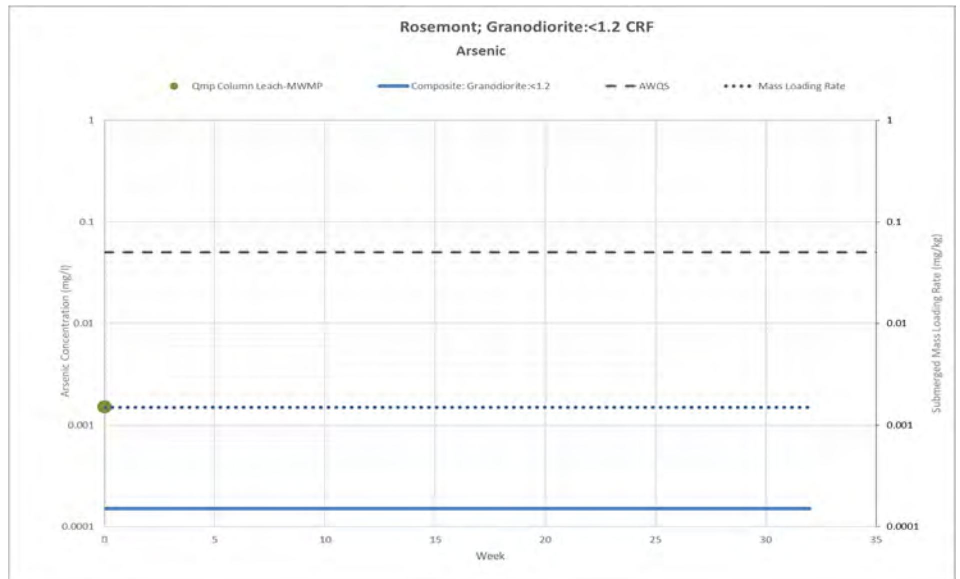


Appendix - H
Composite CRF Charts

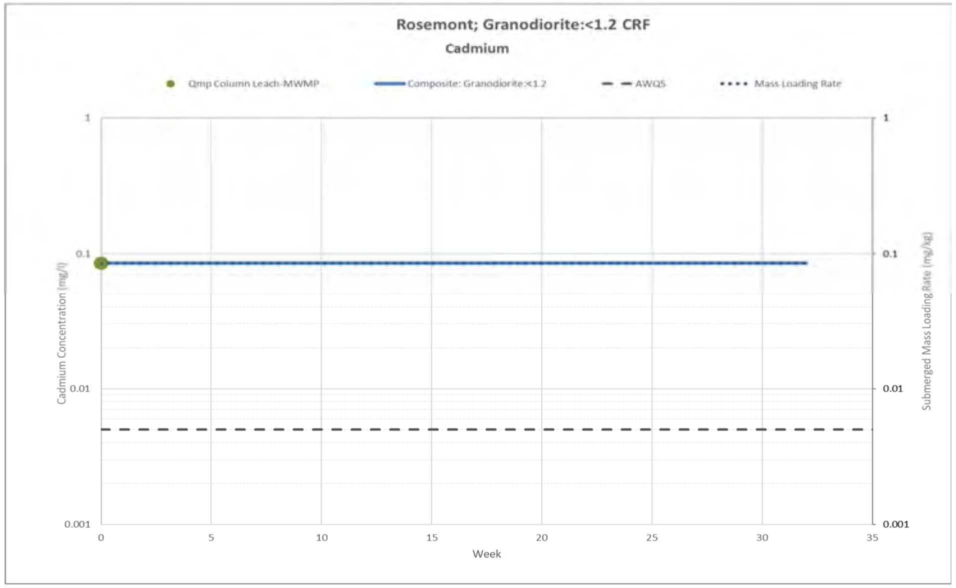


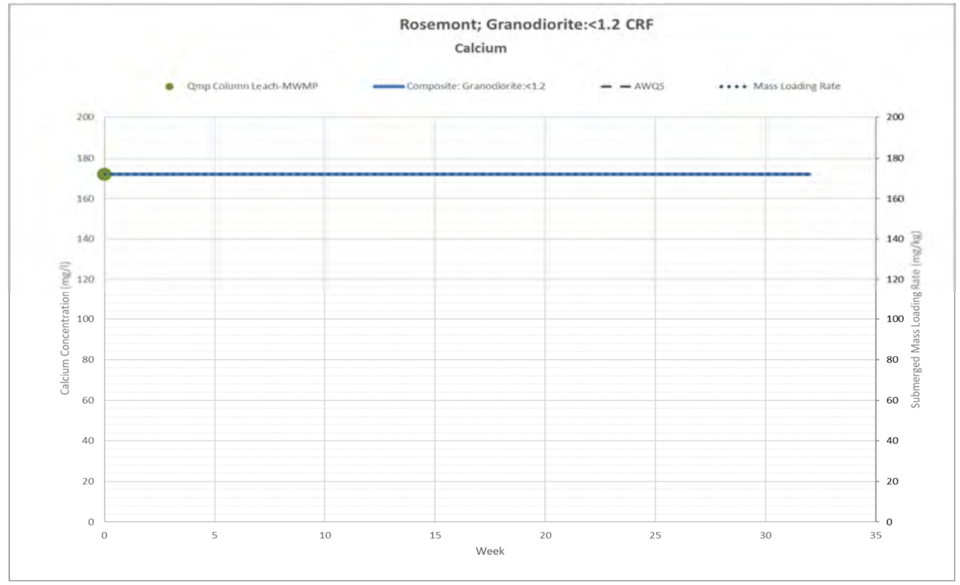


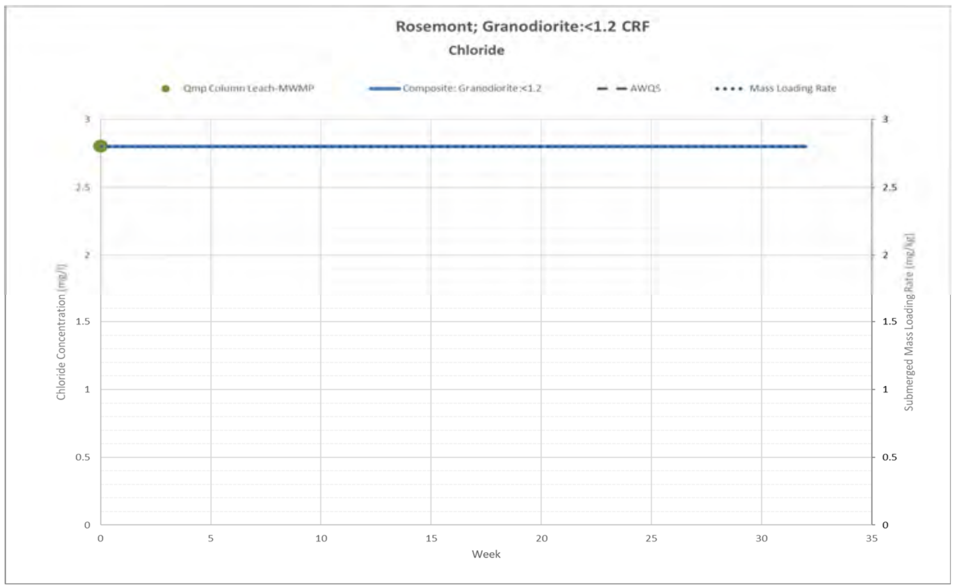


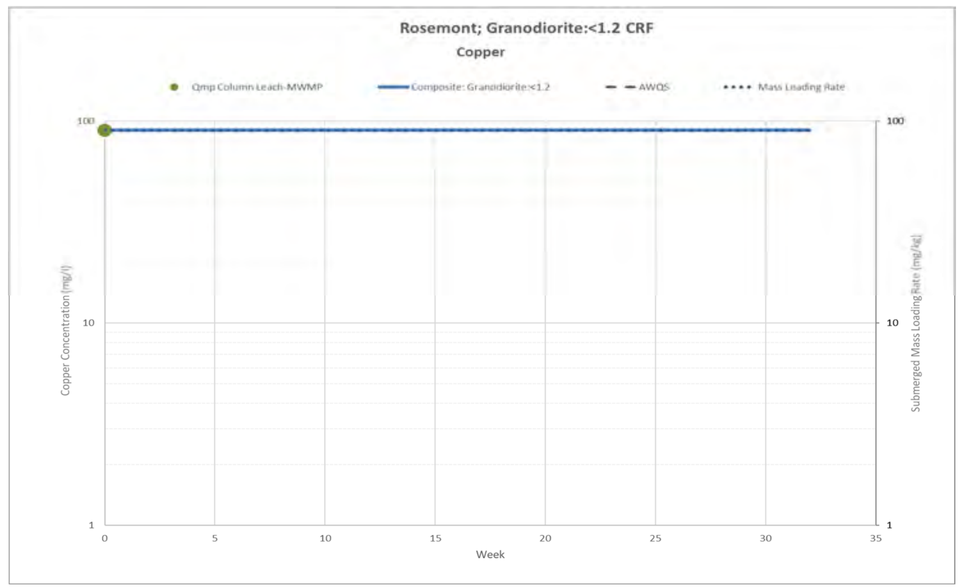


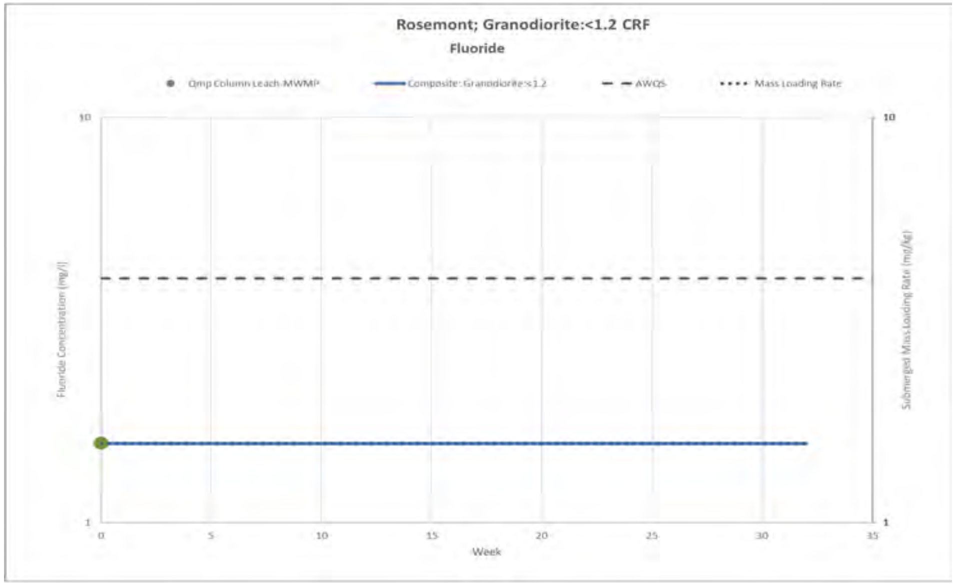
Appendix - H
Composite CRF Charts

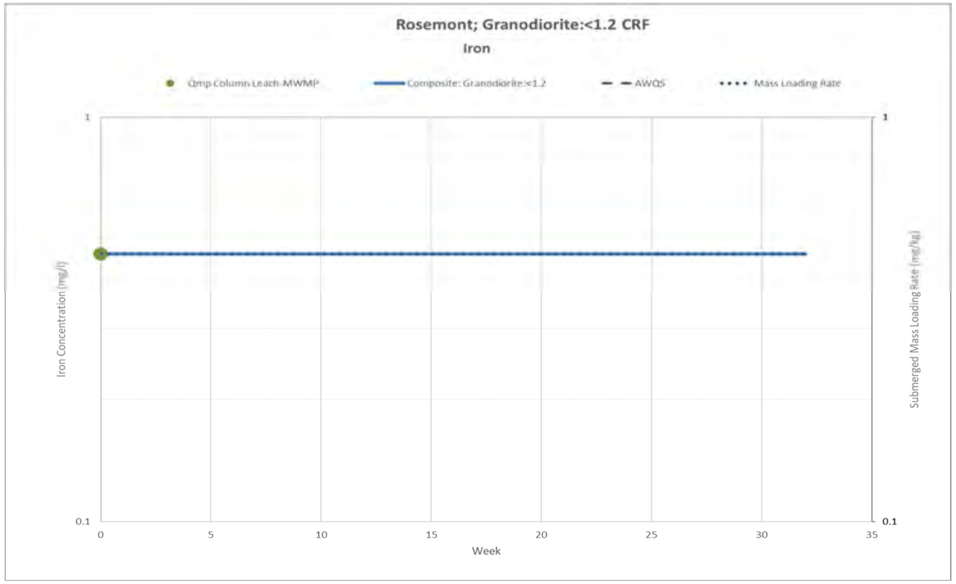


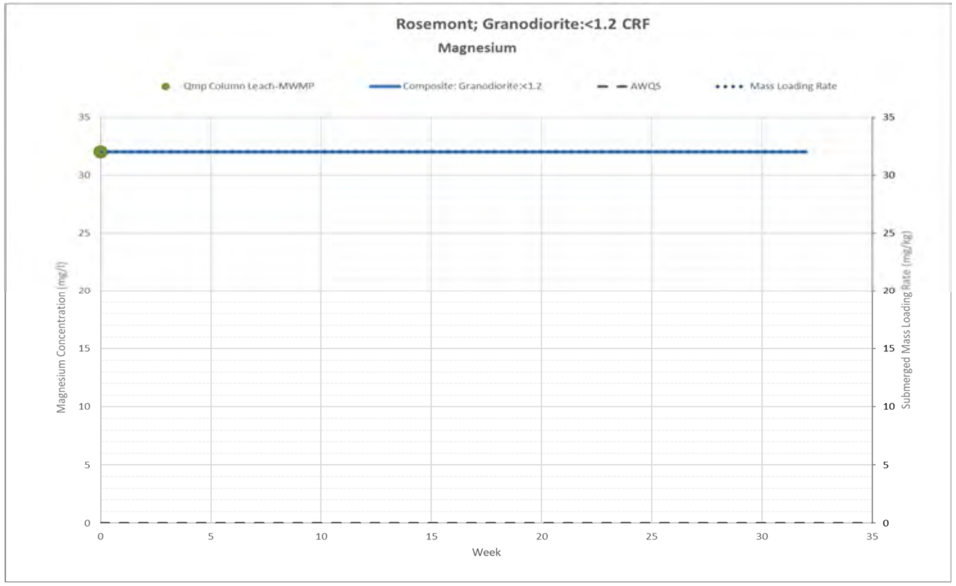


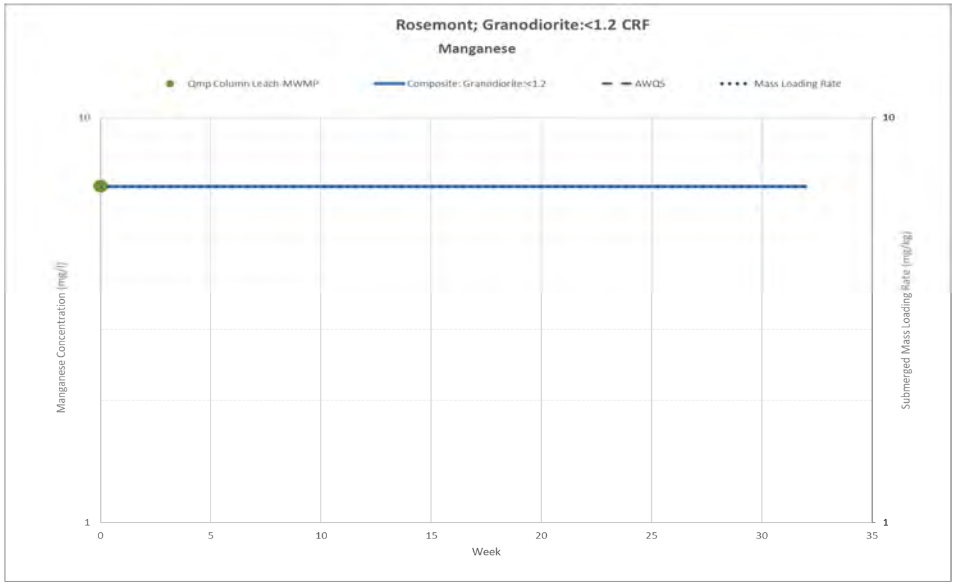




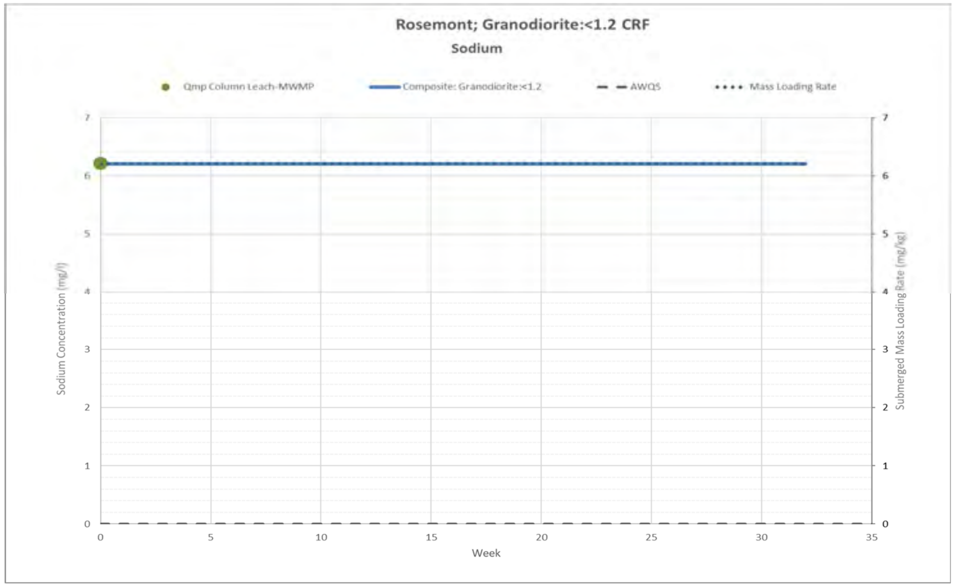

Rosemont; Granodiorite:<1.2 CRF
Fluoride
Qmp Column Leach-MWMP
Composite: Granodiorite:<1.2
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

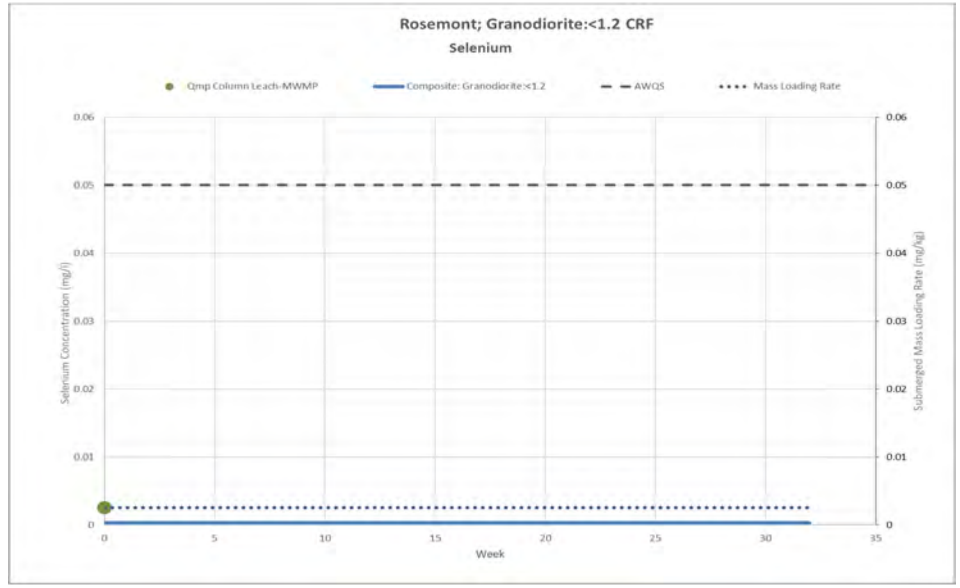

Rosemont; Granodiorite:<1.2 CRF
Iron
Qmp Column Leach-MWMP
Composite: Granodiorite:<1.2
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

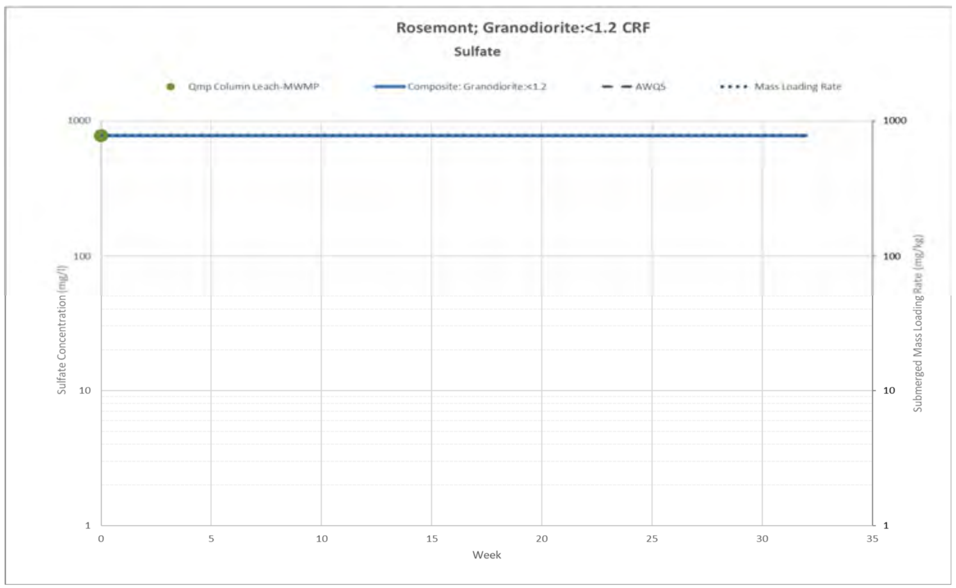

Rosemont; Granodiorite:<1.2 CRF
Magnesium
Qmp Column Leach-MWMP
Composite: Granodiorite:<1.2
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

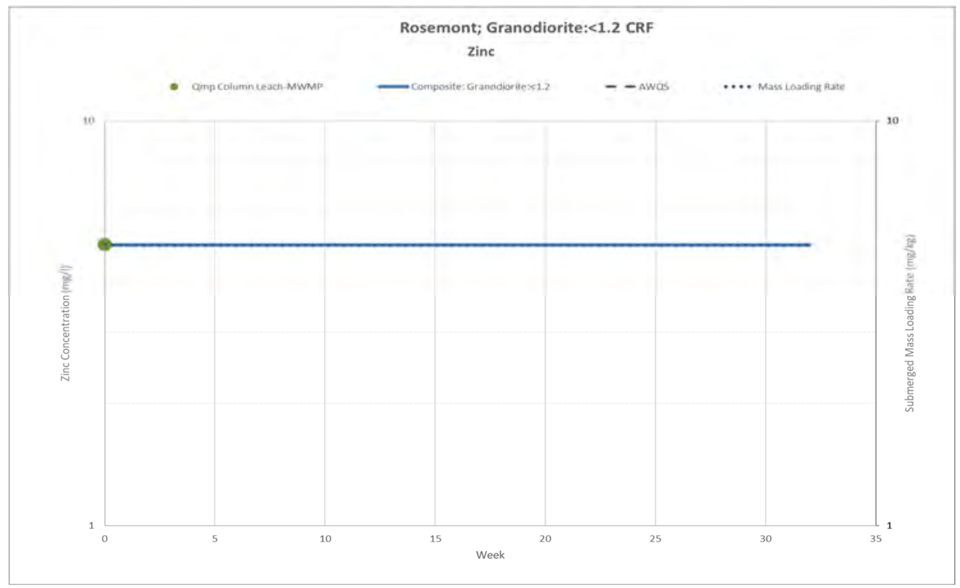

Rosemont; Granodiorite:<1.2 CRF
Manganese
Qmp Column Leach-MWMP
Composite: Granodiorite:<1.2
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

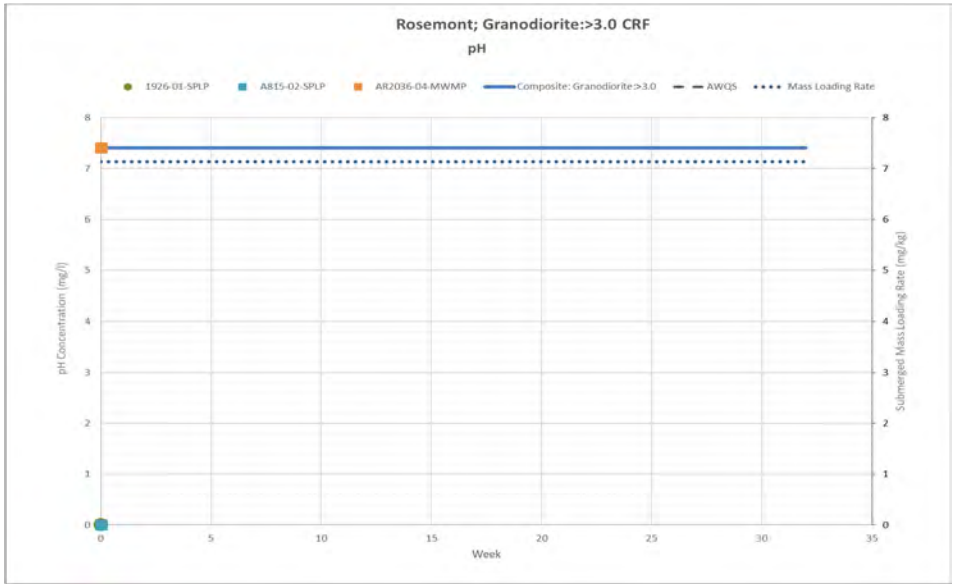
Appendix - H
Composite CRF Charts

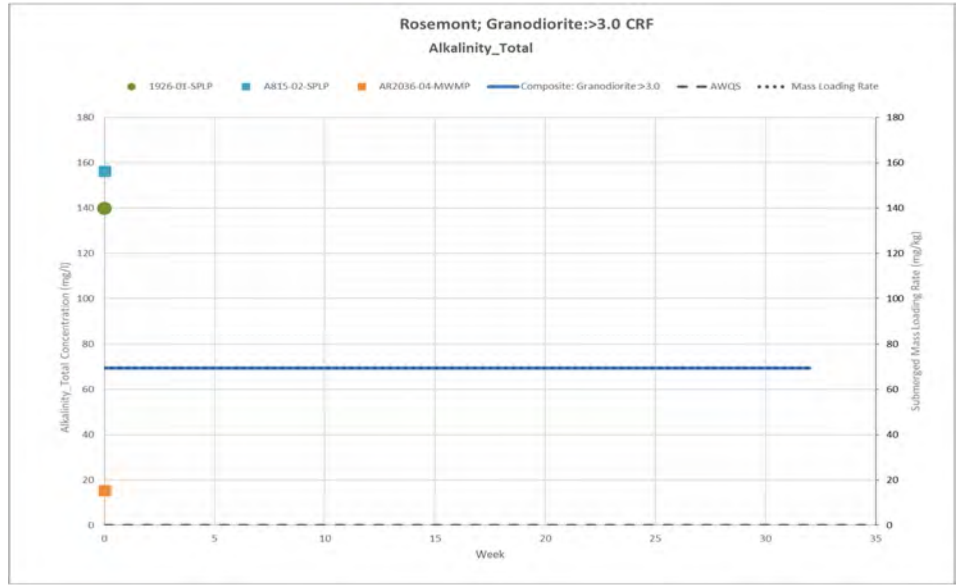


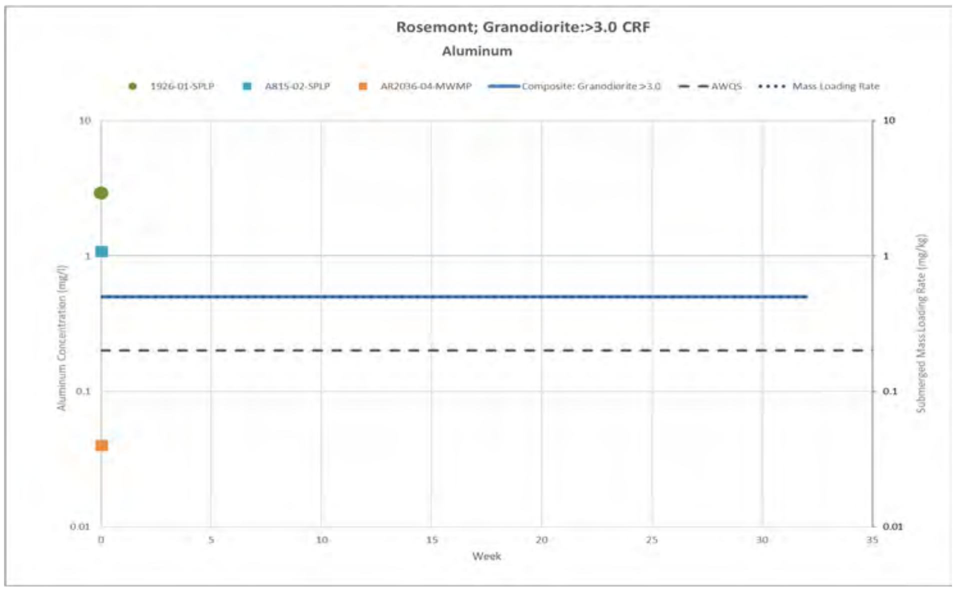


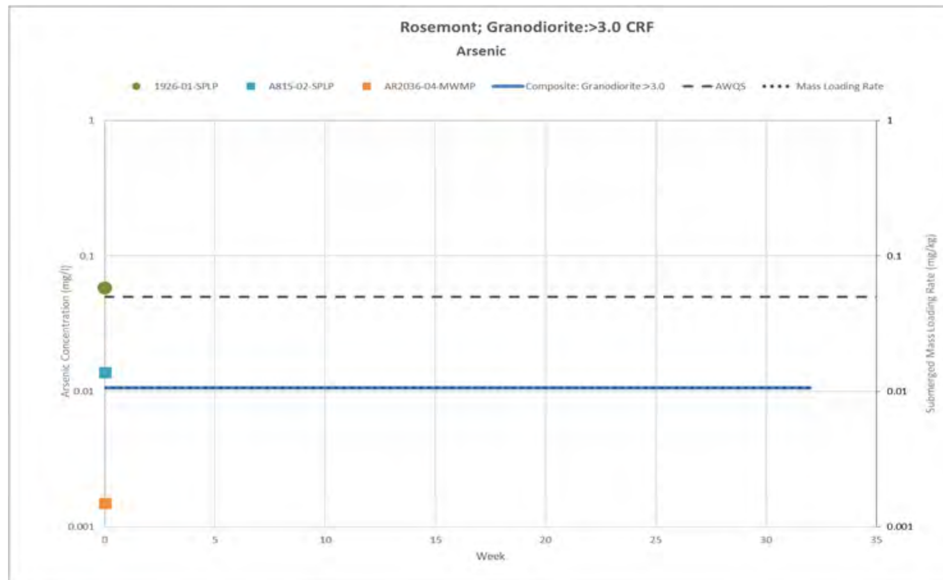


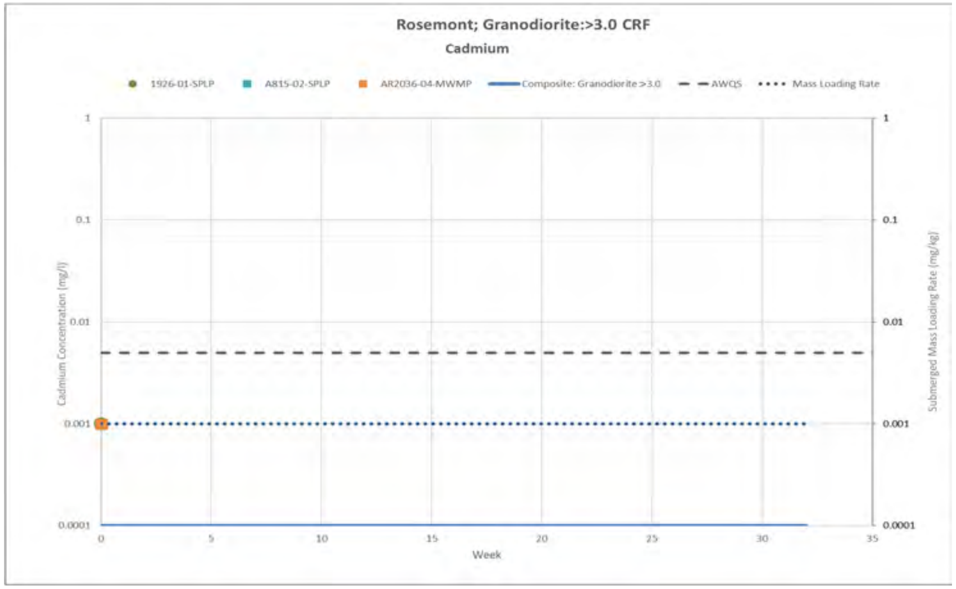


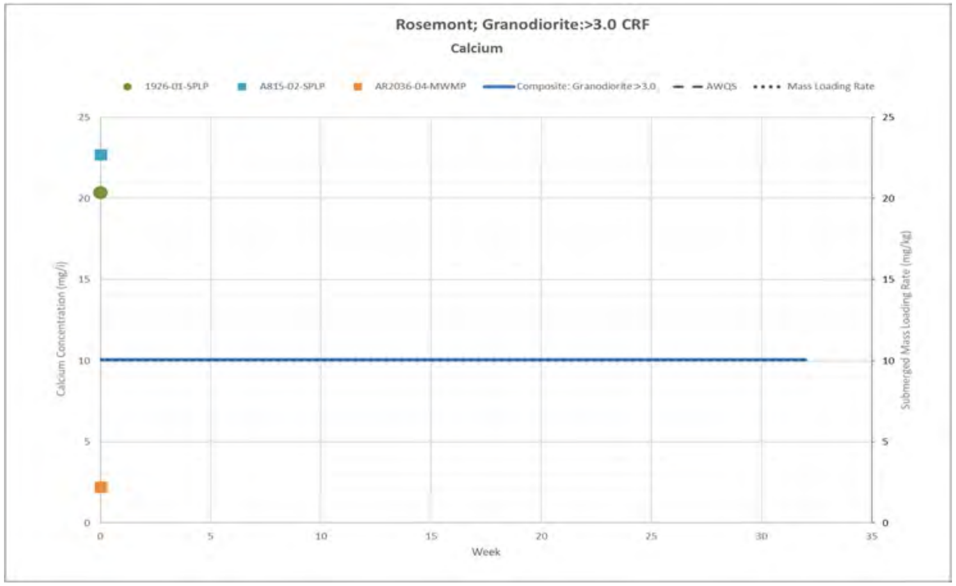

Rosemont; Granodiorite:>3.0 CRF
pH
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

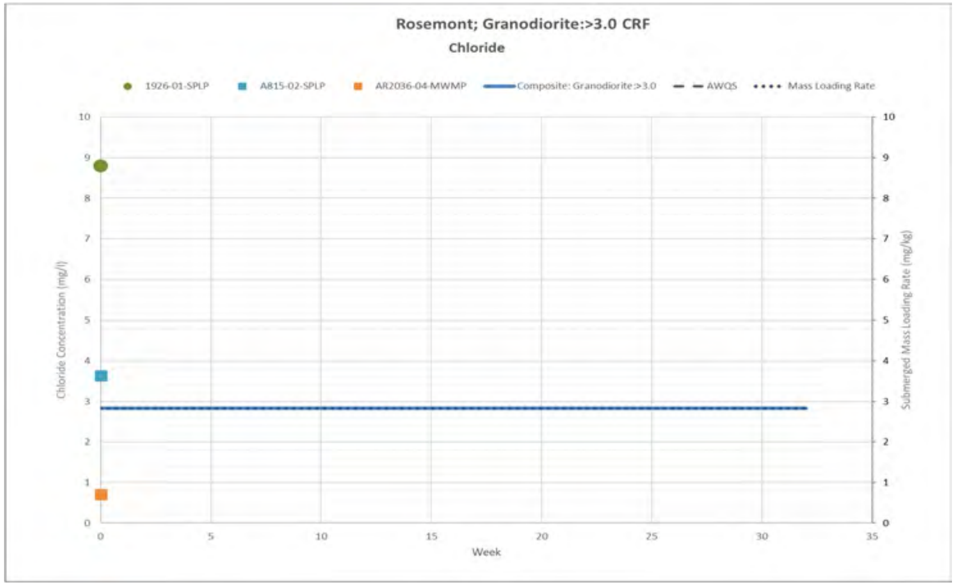

Rosemont; Granodiorite:>3.0 CRF
Alkalinity_Total
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

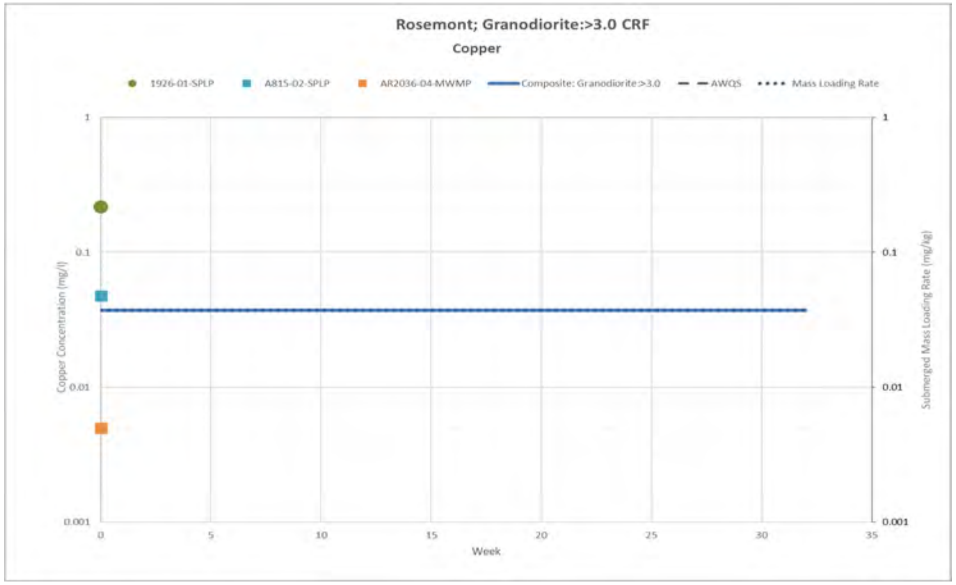

Rosemont; Granodiorite:>3.0 CRF
Aluminum
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

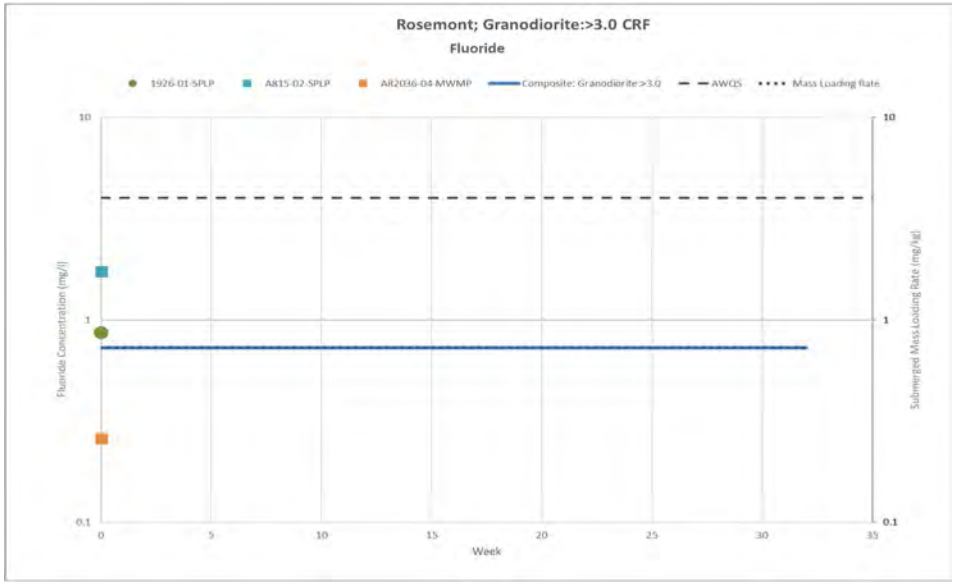

Rosemont; Granodiorite:>3.0 CRF
Arsenic
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

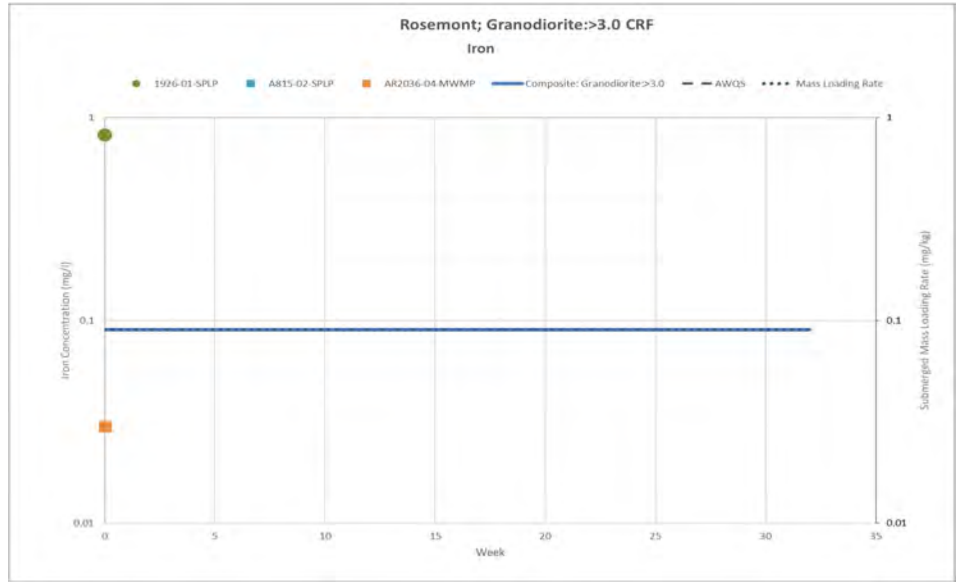

Rosemont; Granodiorite:>3.0 CRF
Cadmium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite >3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

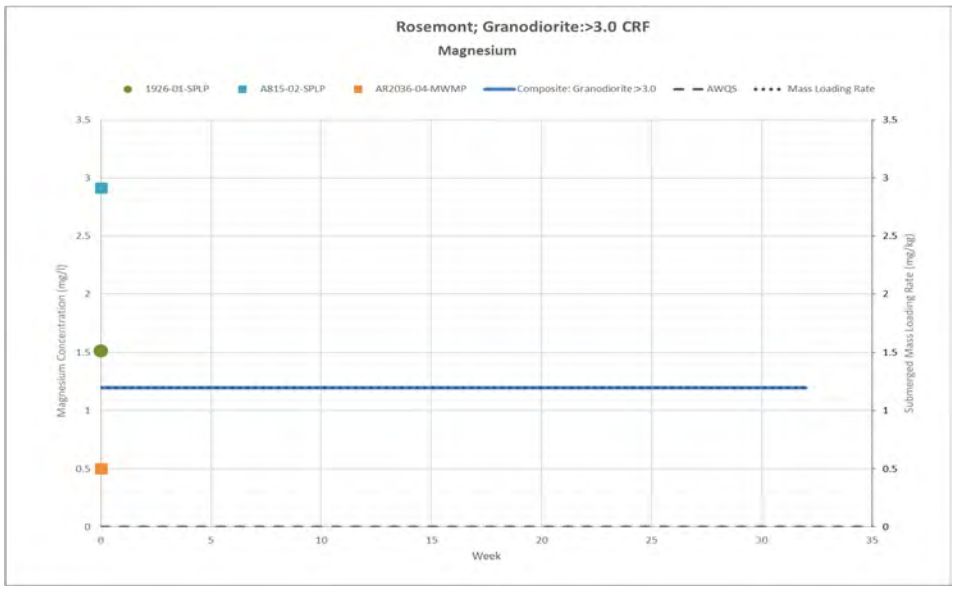

Rosemont; Granodiorite:>3.0 CRF
Calcium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite >3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

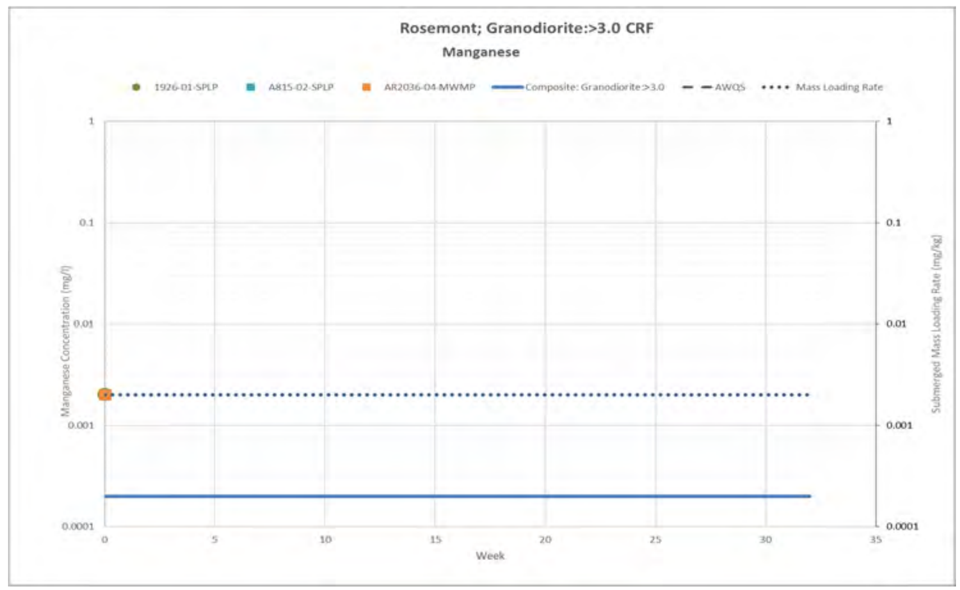

Rosemont; Granodiorite:>3.0 CRF
Chloride
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite >3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

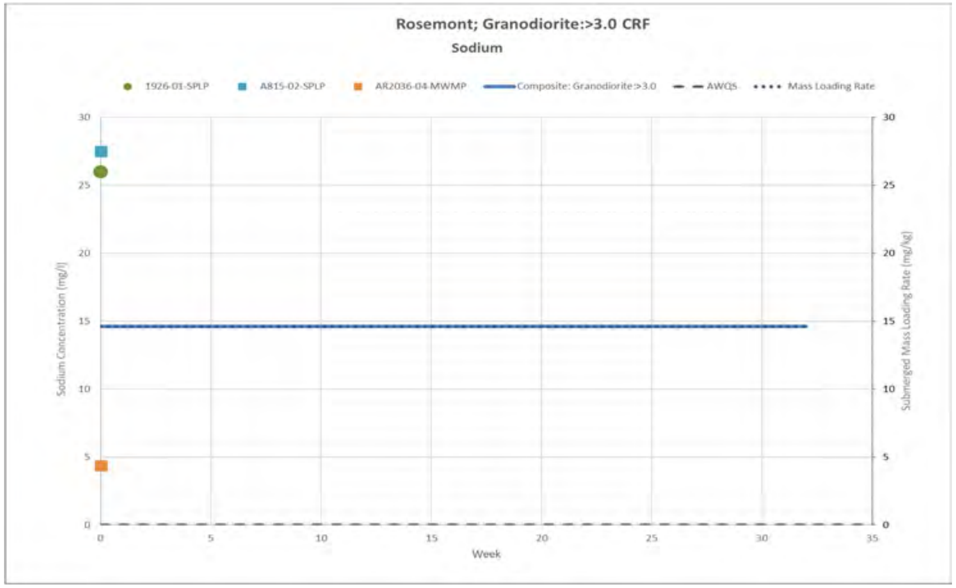

Rosemont; Granodiorite:>3.0 CRF
Copper
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite >3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

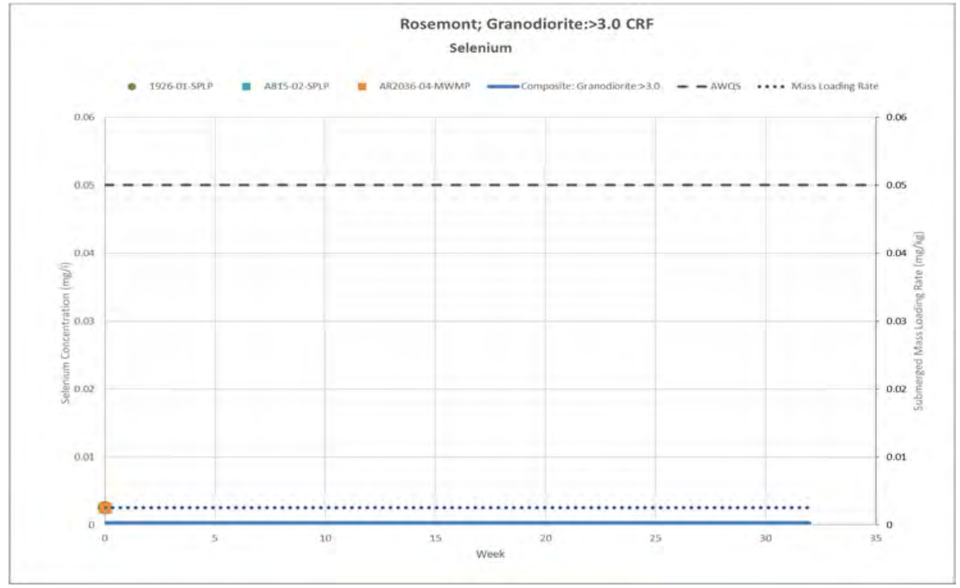

Rosemont; Granodiorite:>3.0 CRF
Fluoride
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

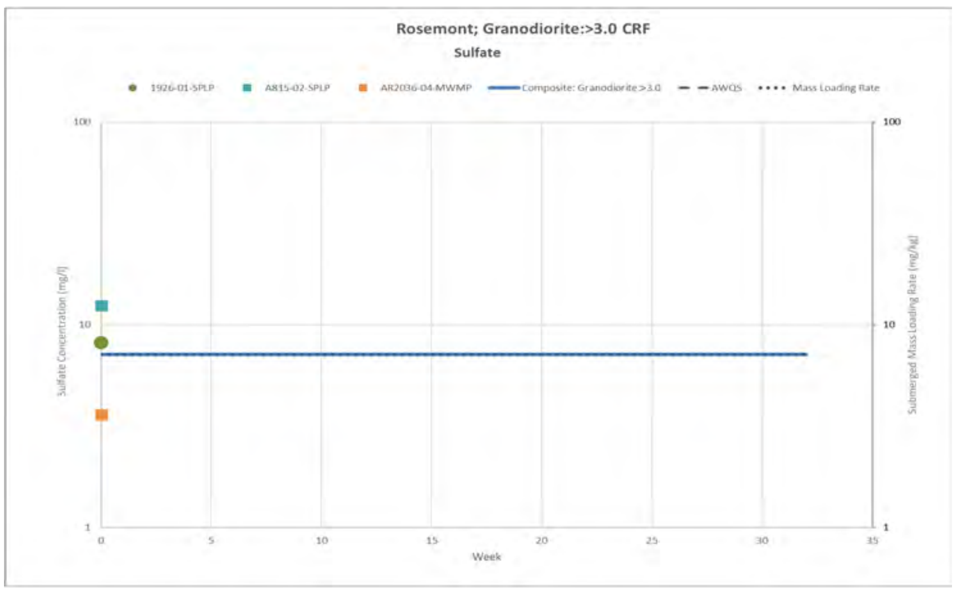

Rosemont; Granodiorite:>3.0 CRF
Iron
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

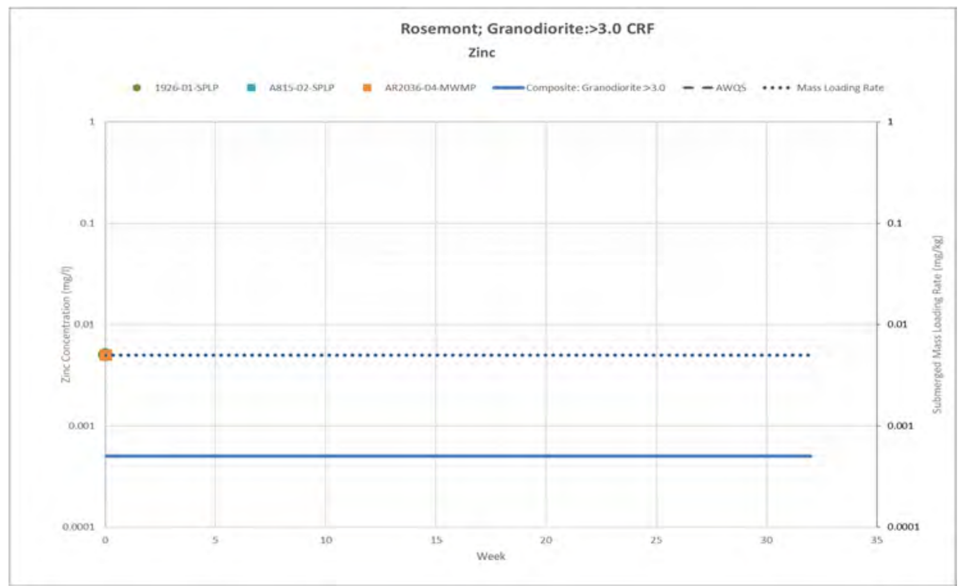

Rosemont; Granodiorite:>3.0 CRF
Magnesium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

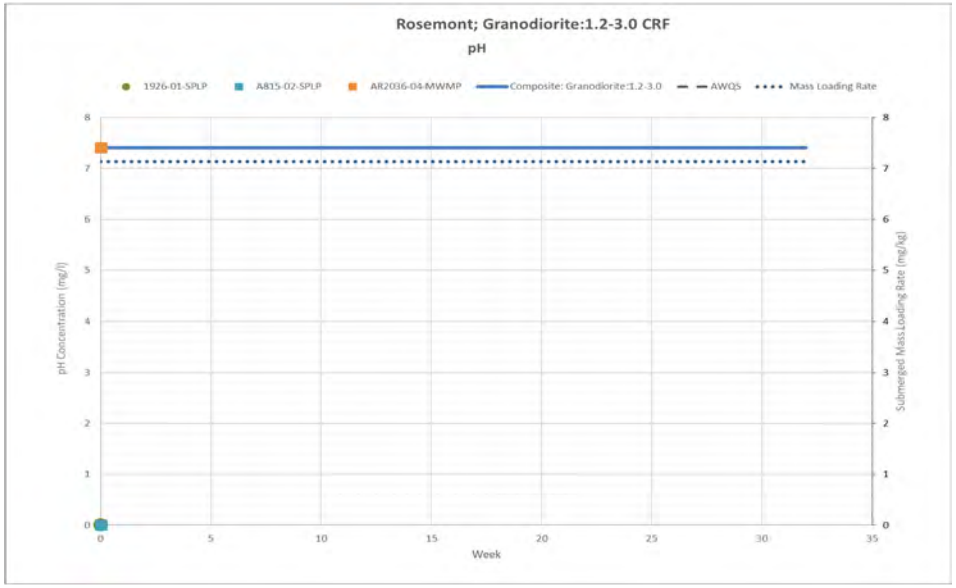

Rosemont; Granodiorite:>3.0 CRF
Manganese
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

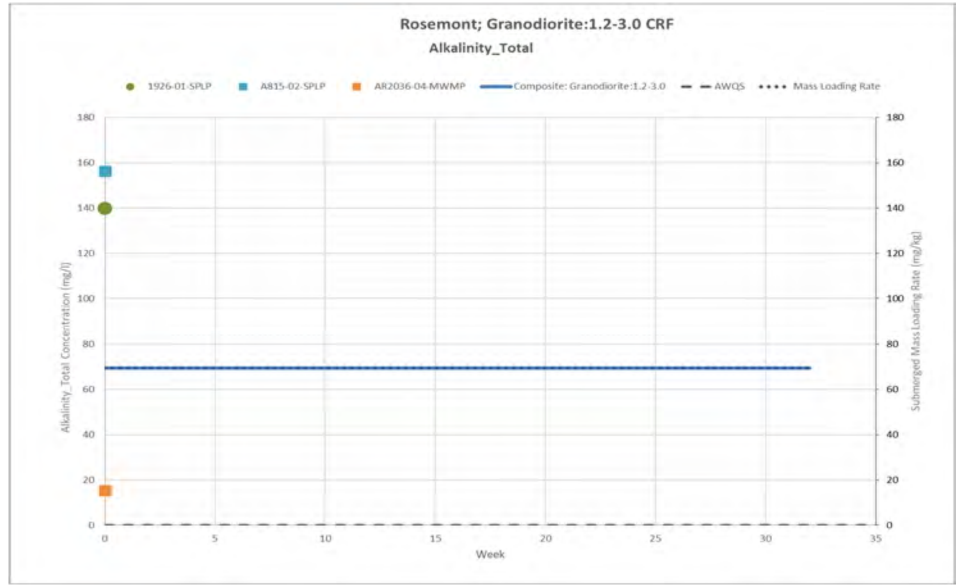

Rosemont; Granodiorite:>3.0 CRF
Sodium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

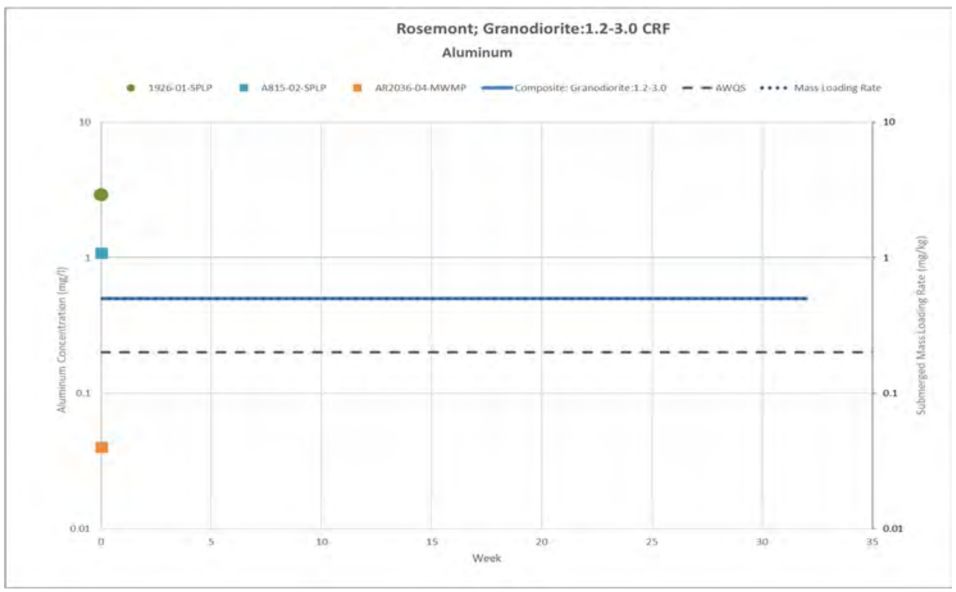

Rosemont; Granodiorite:>3.0 CRF
Selenium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

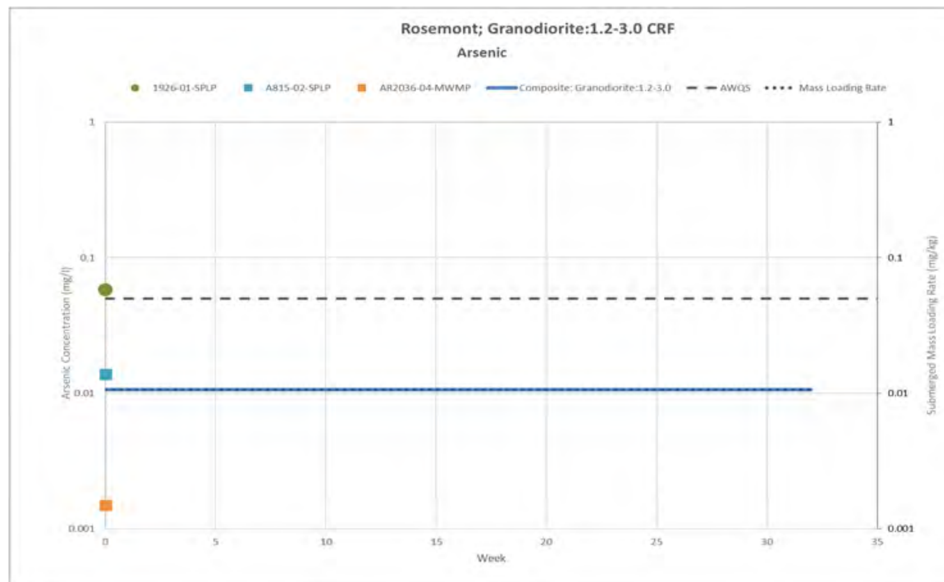

Rosemont; Granodiorite:>3.0 CRF
Sulfate
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

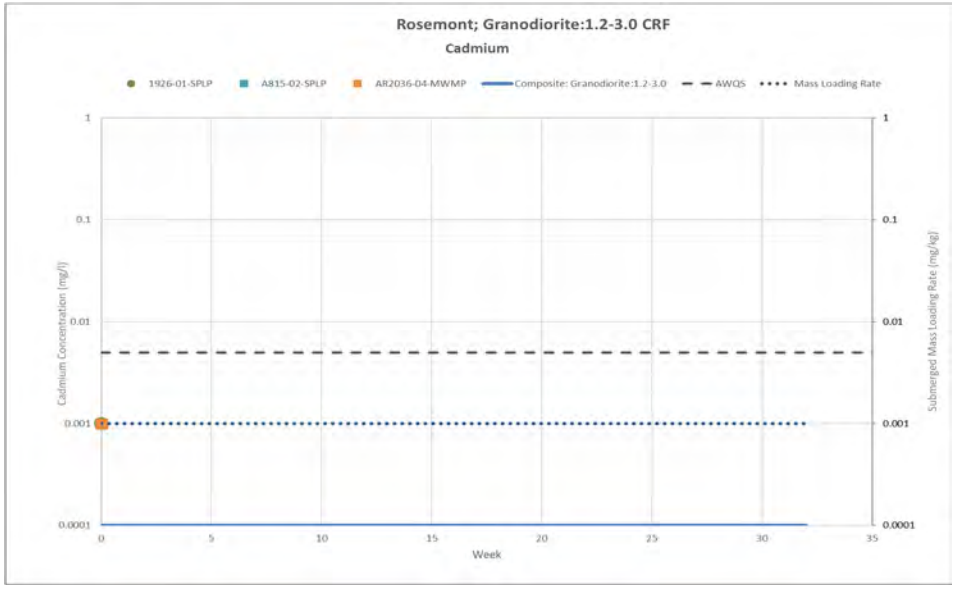

Rosemont; Granodiorite:>3.0 CRF
Zinc
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

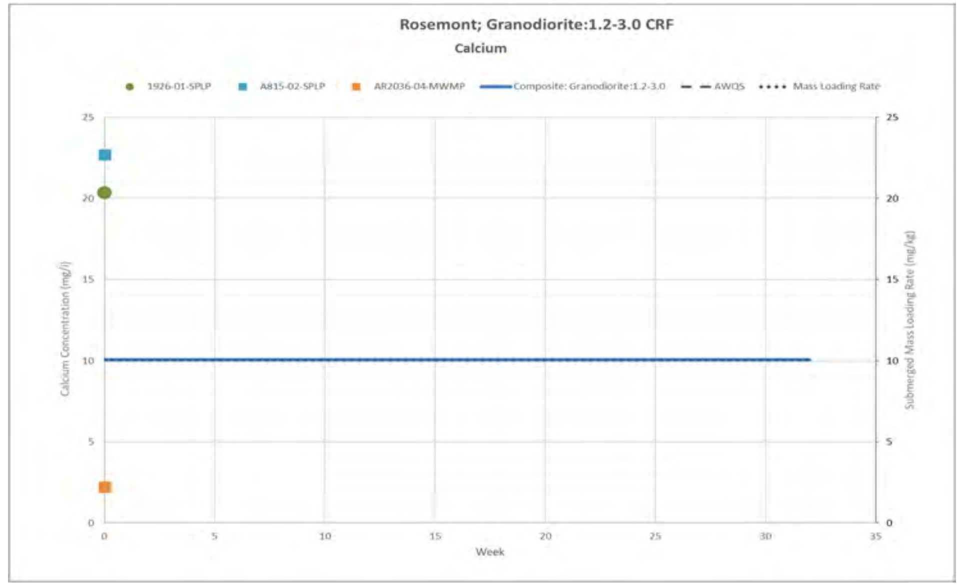

Rosemont; Granodiorite:1.2-3.0 CRF
pH
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

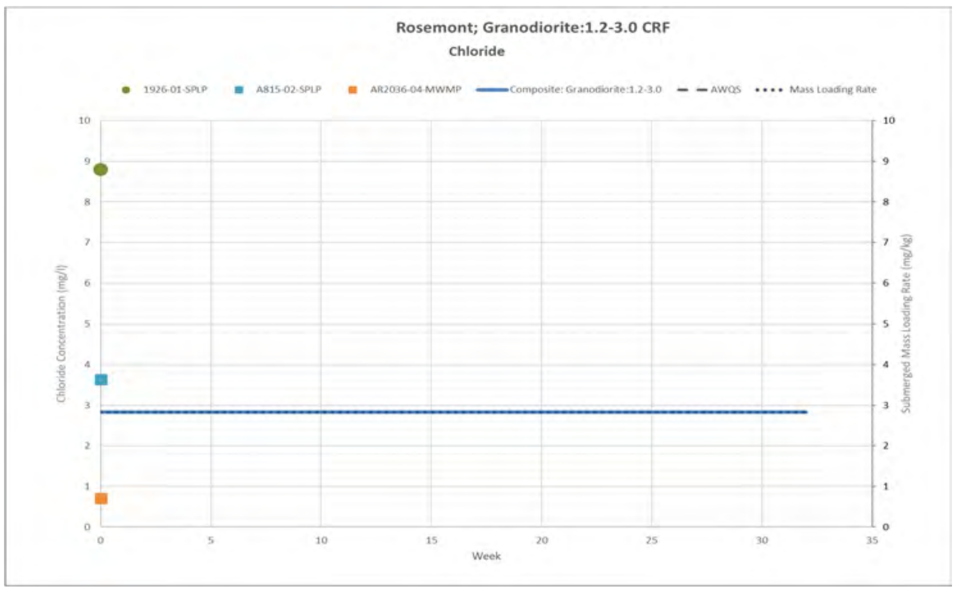

Rosemont; Granodiorite:1.2-3.0 CRF
Alkalinity_Total
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

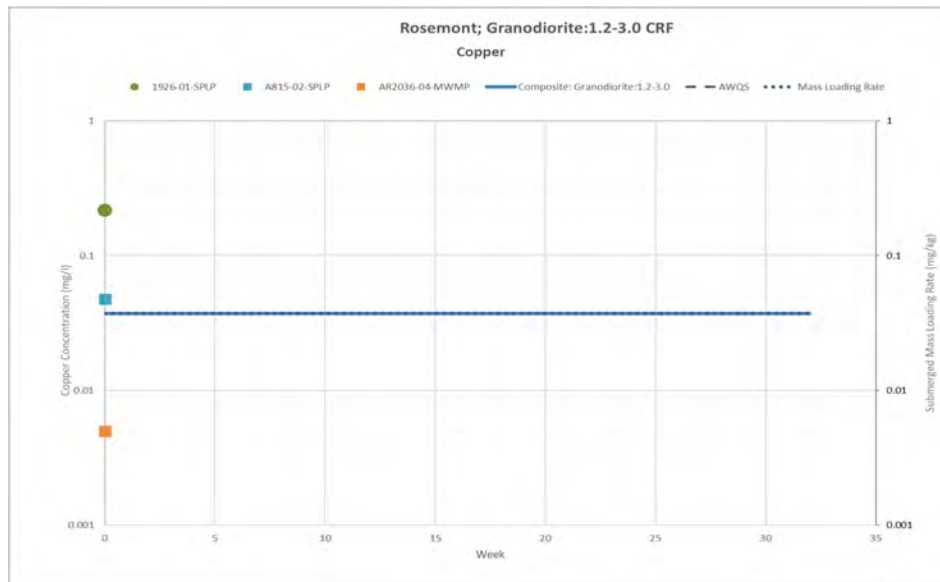

Rosemont; Granodiorite:1.2-3.0 CRF
Aluminum
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

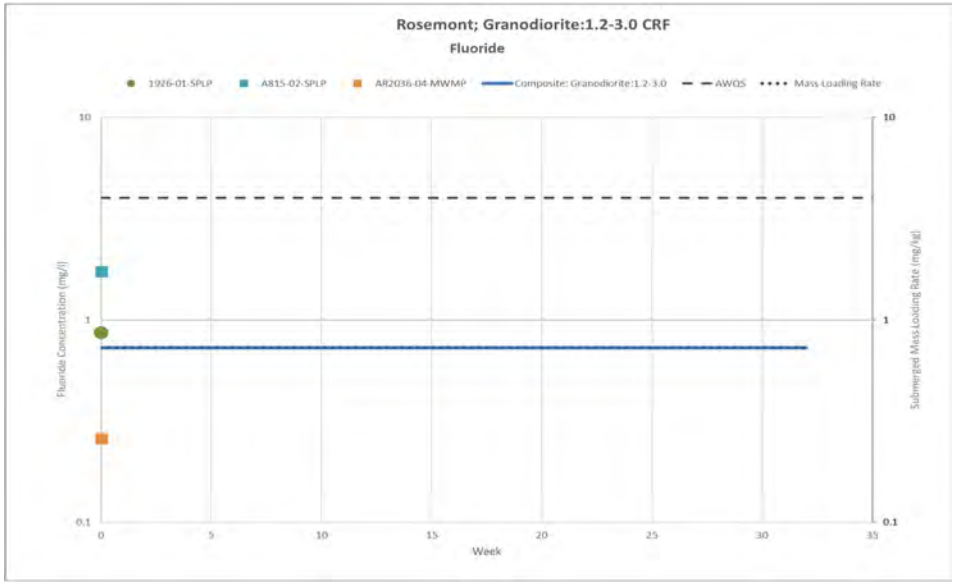

Rosemont; Granodiorite:1.2-3.0 CRF
Arsenic
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

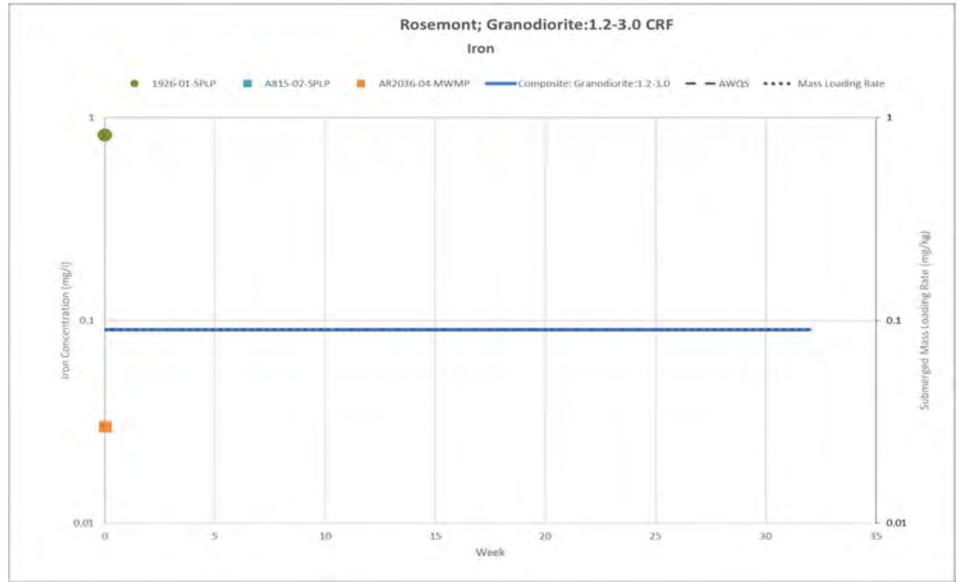

Rosemont; Granodiorite:1.2-3.0 CRF
Cadmium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

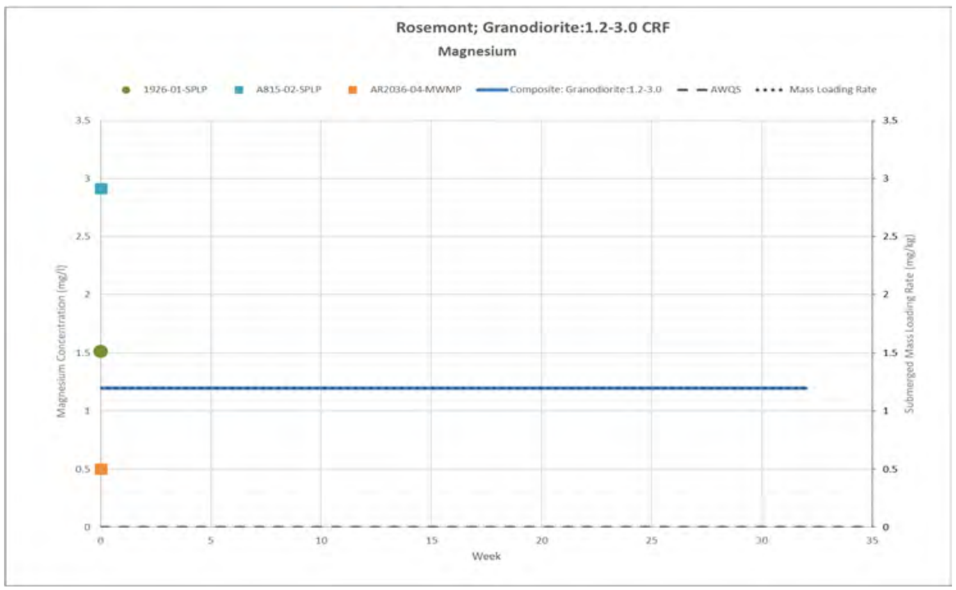

Rosemont; Granodiorite:1.2-3.0 CRF
Calcium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

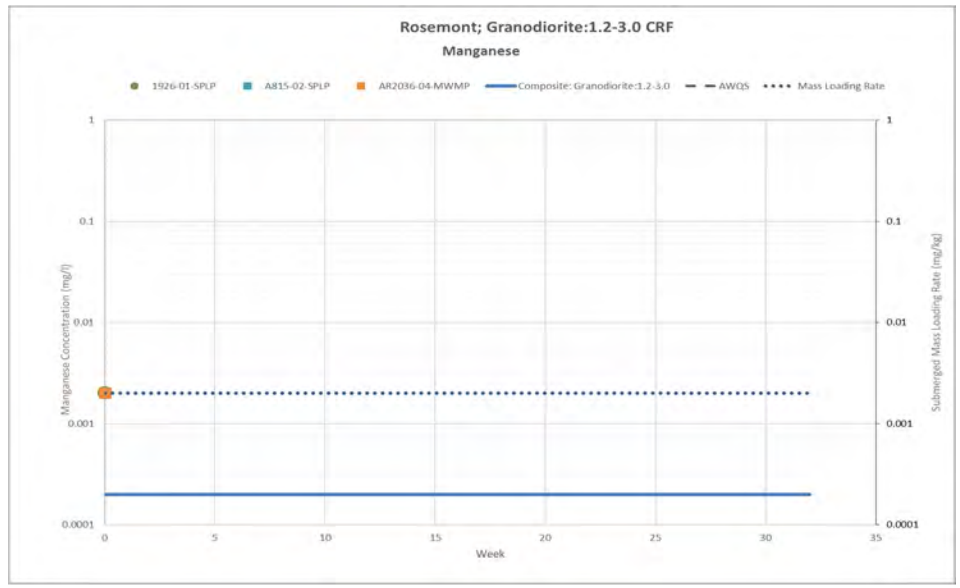

Rosemont; Granodiorite:1.2-3.0 CRF
Chloride
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Granodiorite:1.2-3.0 CRF
Copper
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

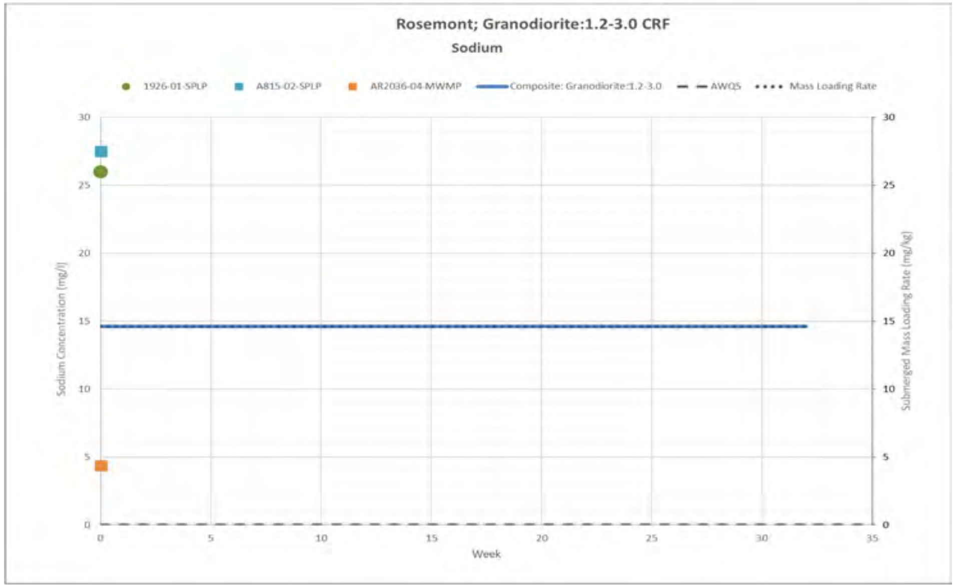

Rosemont; Granodiorite:1.2-3.0 CRF
Fluoride
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

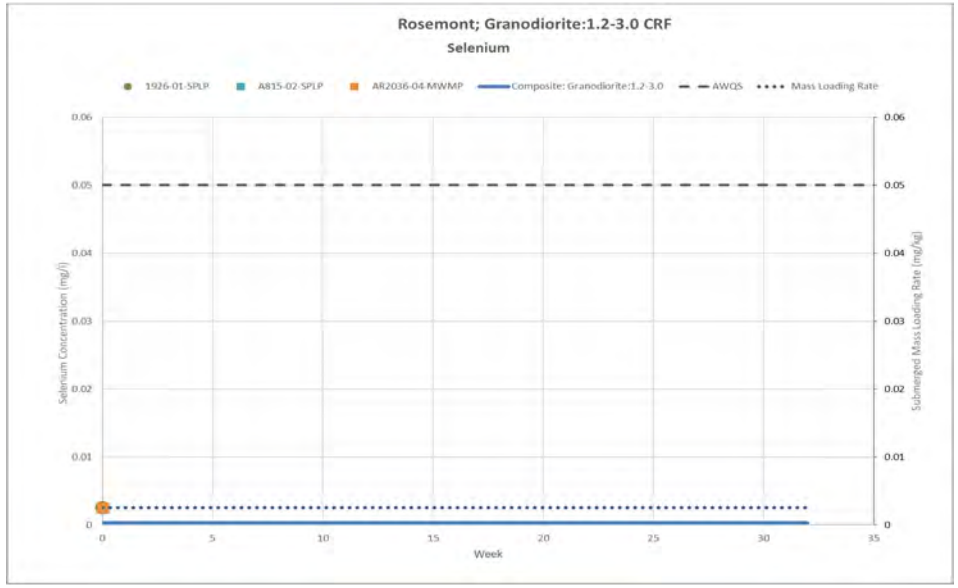

Rosemont; Granodiorite:1.2-3.0 CRF
Iron
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

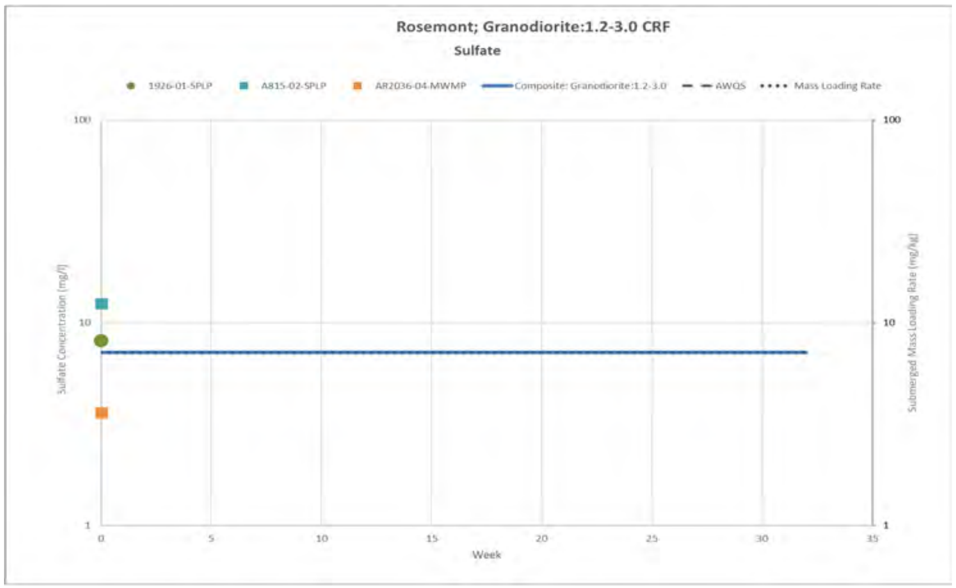

Rosemont; Granodiorite:1.2-3.0 CRF
Magnesium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

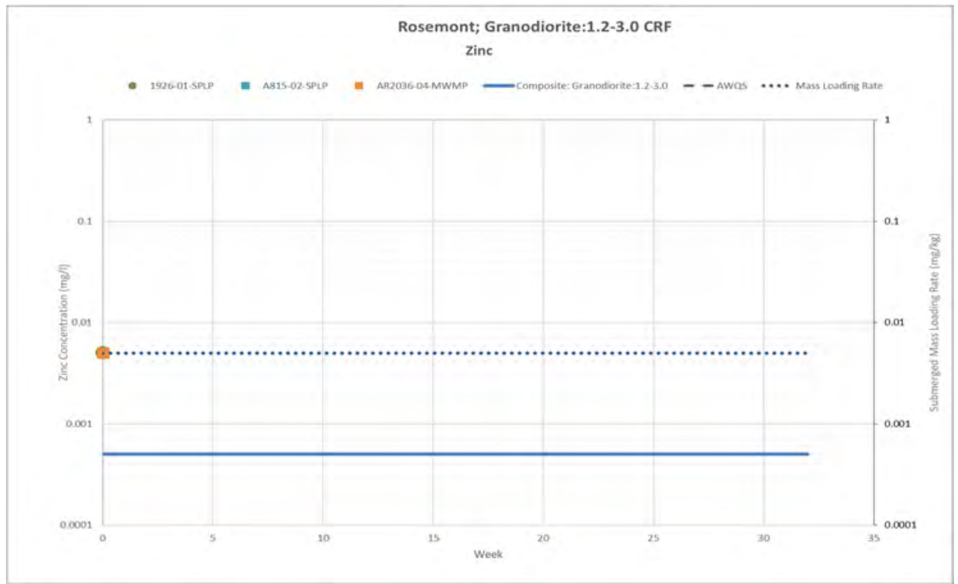

Rosemont; Granodiorite:1.2-3.0 CRF
Manganese
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Granodiorite:1.2-3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

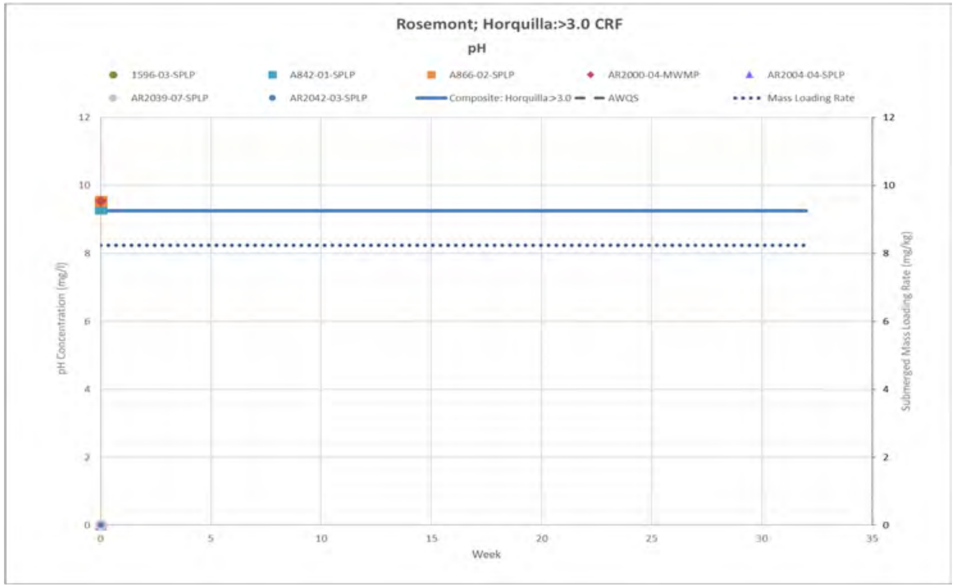


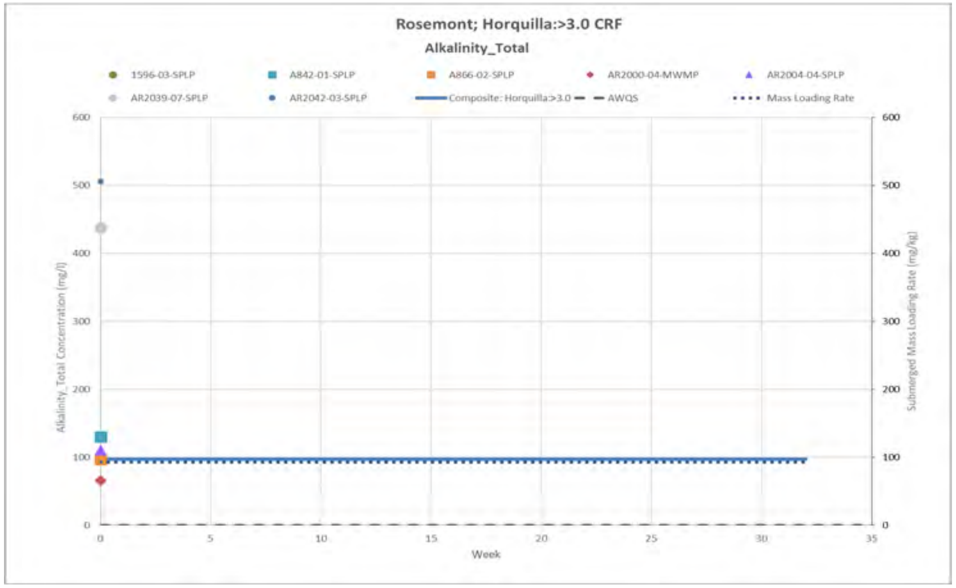


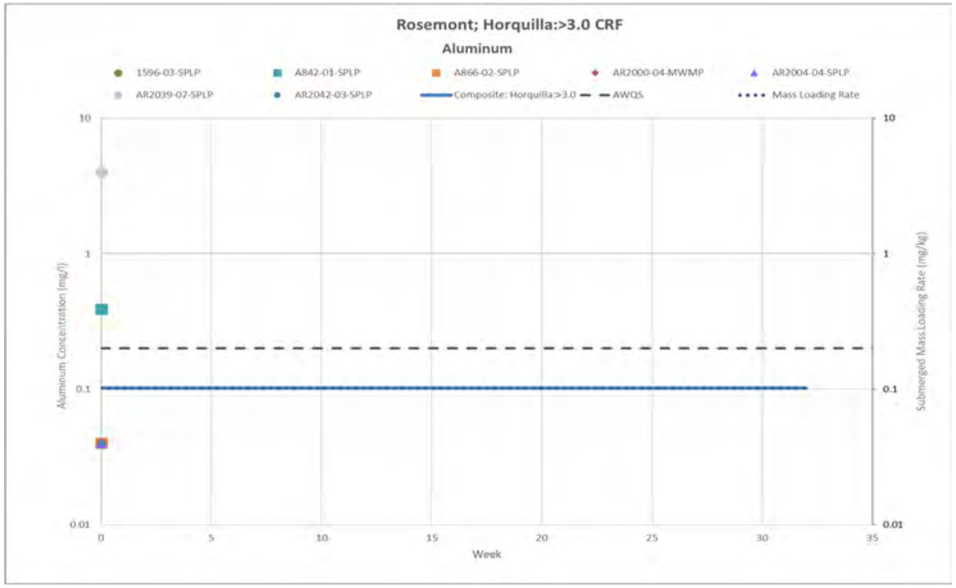


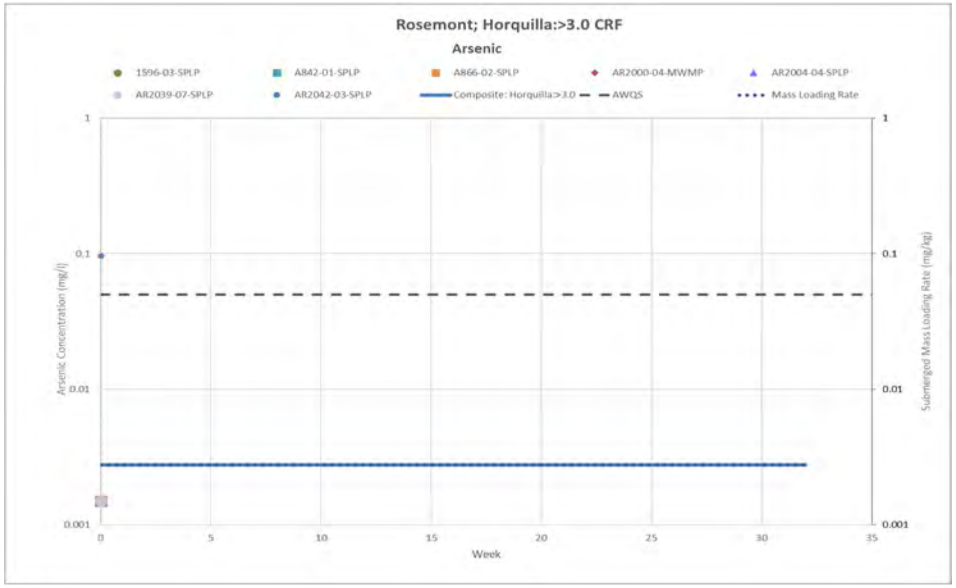


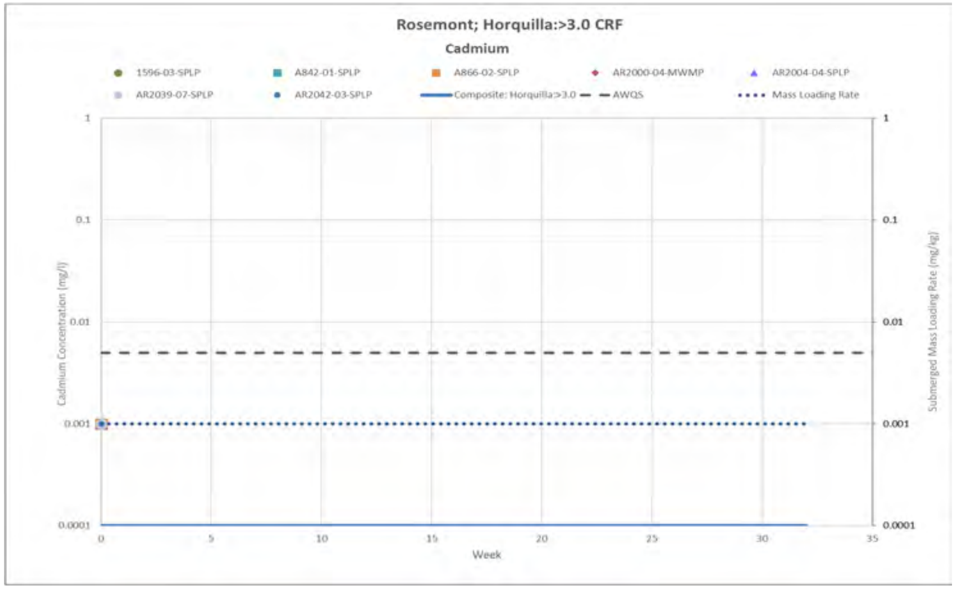
Appendix - H
Composite CRF Charts

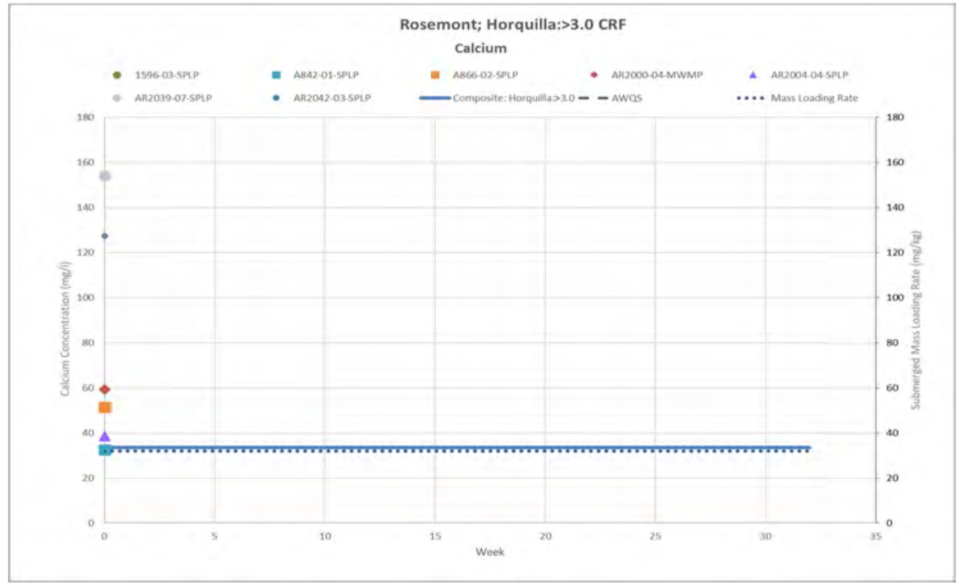


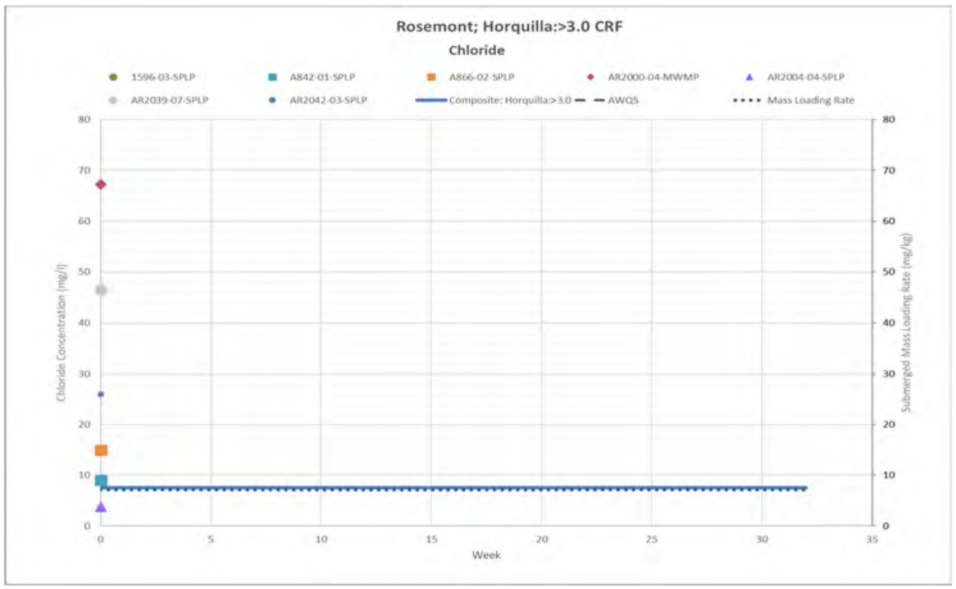


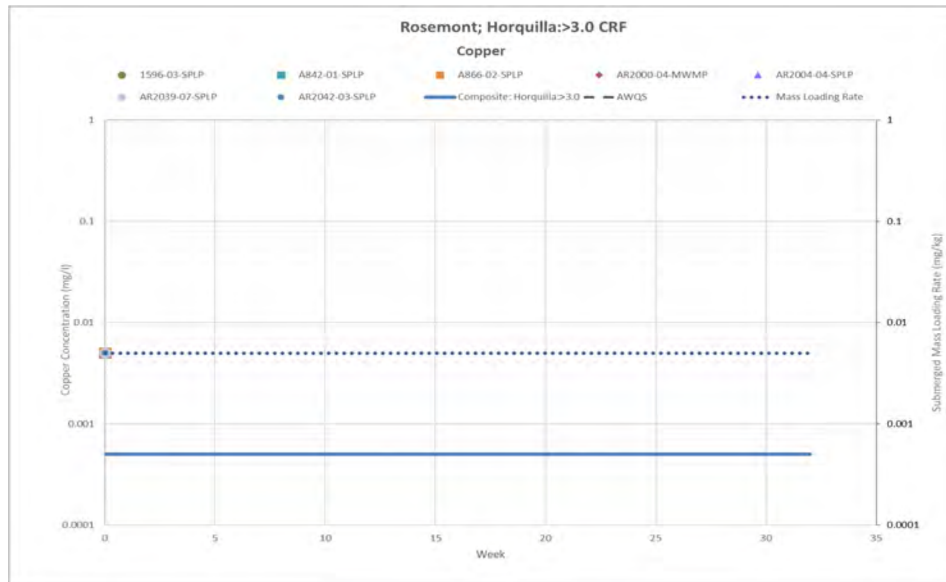


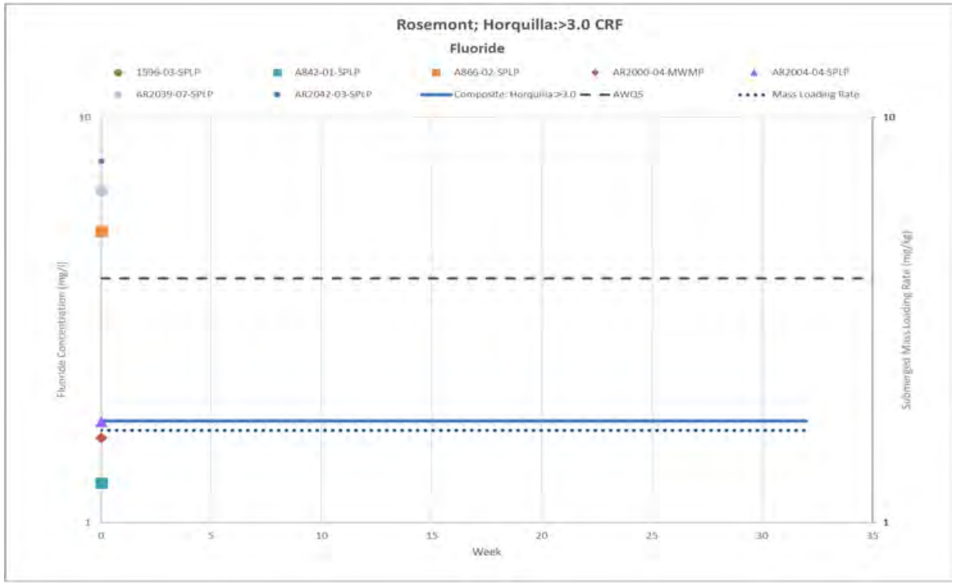


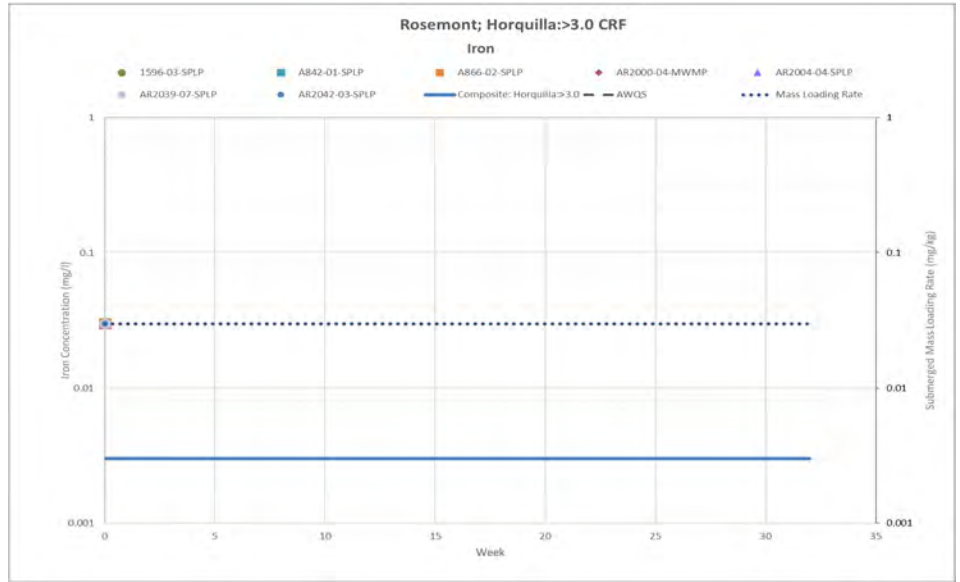

Rosemont; Horquilla:>3.0 CRF
Cadmium
1596-03-SPLP
A842-01-SPLP
A866-02-SPLP
AR2000-04-MWMP
AR2004-04-SPLP
AR2039-07-SPLP
AR2042-03-SPLP
Composite: Horquilla>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

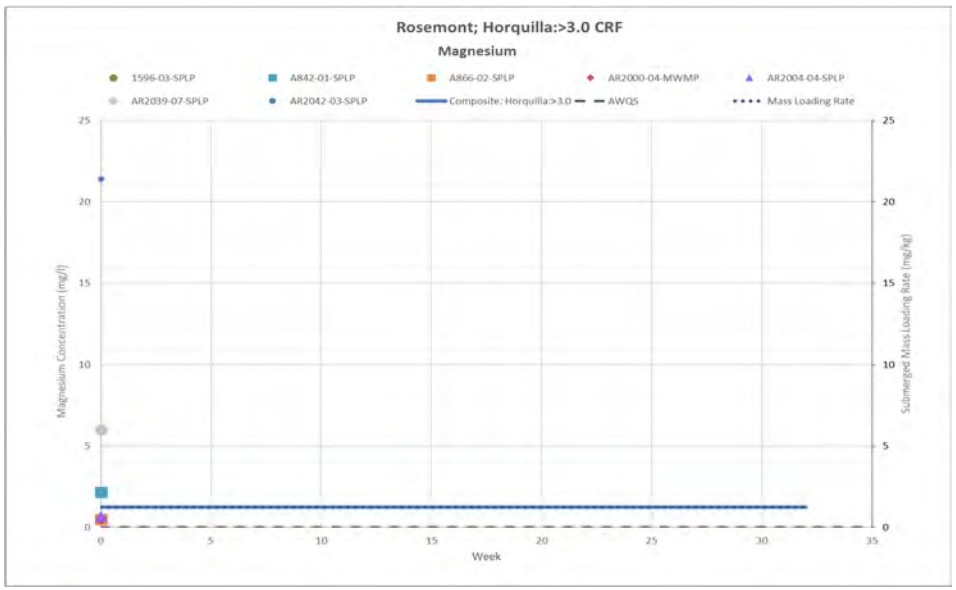

Rosemont; Horquilla:>3.0 CRF
Calcium
1596-03-SPLP
A842-01-SPLP
A866-02-SPLP
AR2000-04-MWMP
AR2004-04-SPLP
AR2039-07-SPLP
AR2042-03-SPLP
Composite: Horquilla>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

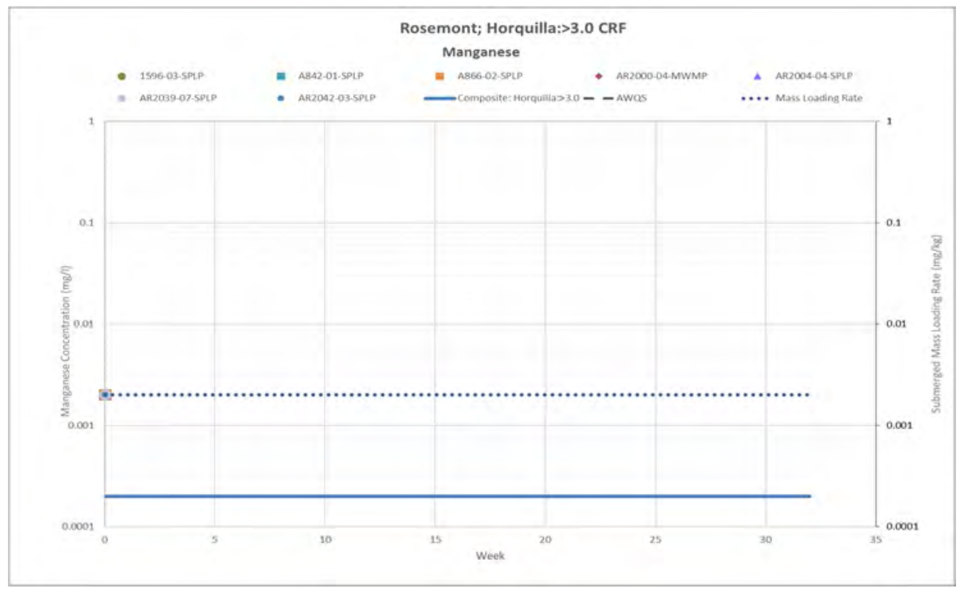

Rosemont; Horquilla:>3.0 CRF
Chloride
1596-03-SPLP
A842-01-SPLP
A866-02-SPLP
AR2000-04-MWMP
AR2004-04-SPLP
AR2039-07-SPLP
AR2042-03-SPLP
Composite: Horquilla>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Horquilla:>3.0 CRF
Copper
1596-03-SPLP
A842-01-SPLP
A866-02-SPLP
AR2000-04-MWMP
AR2004-04-SPLP
AR2039-07-SPLP
AR2042-03-SPLP
Composite: Horquilla>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

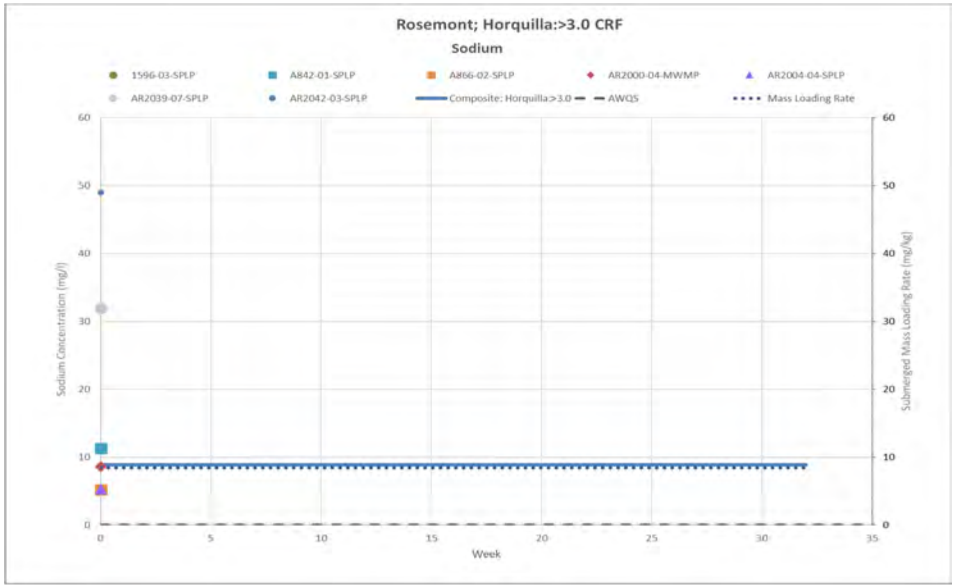

Rosemont; Horquilla:>3.0 CRF
Fluoride
1596-03-SPLP
A842-01-SPLP
A866-02-SPLP
AR2000-04-MWMP
AR2004-04-SPLP
AR2039-07-SPLP
AR2042-03-SPLP
Composite: Horquilla:>3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

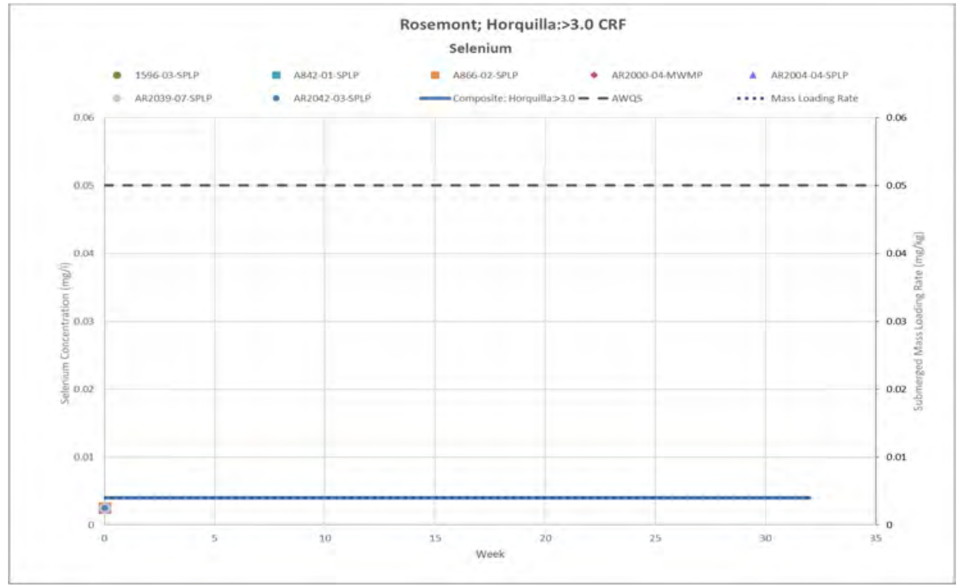

Rosemont; Horquilla:>3.0 CRF
Iron
1596-03-SPLP
A842-01-SPLP
A866-02-SPLP
AR2000-04-MWMP
AR2004-04-SPLP
AR2039-07-SPLP
AR2042-03-SPLP
Composite: Horquilla:>3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

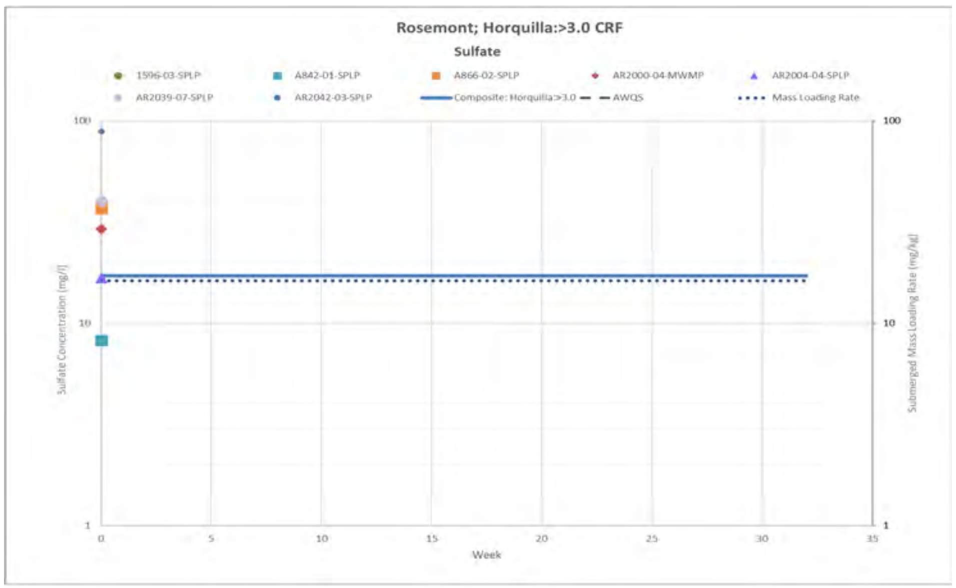

Rosemont; Horquilla:>3.0 CRF
Magnesium
1596-03-SPLP
A842-01-SPLP
A866-02-SPLP
AR2000-04-MWMP
AR2004-04-SPLP
AR2039-07-SPLP
AR2042-03-SPLP
Composite: Horquilla:>3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

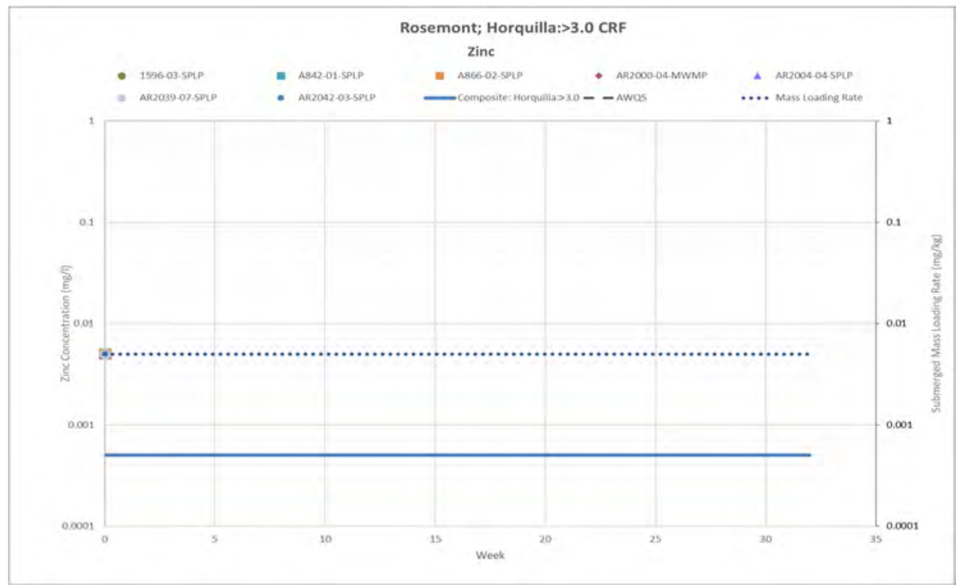

Rosemont; Horquilla:>3.0 CRF
Manganese
1596-03-SPLP
A842-01-SPLP
A866-02-SPLP
AR2000-04-MWMP
AR2004-04-SPLP
AR2039-07-SPLP
AR2042-03-SPLP
Composite: Horquilla:>3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

Appendix - H
Composite CRF Charts

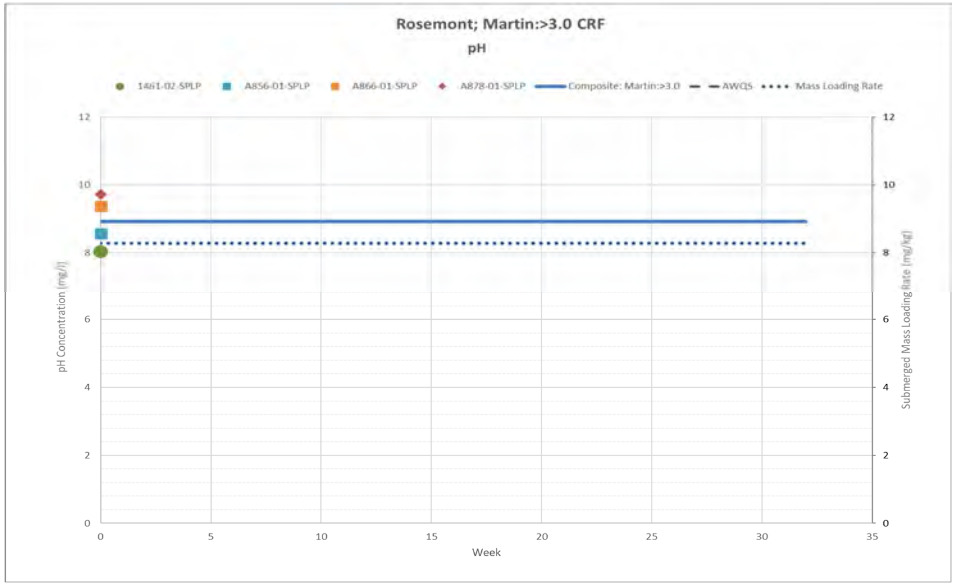


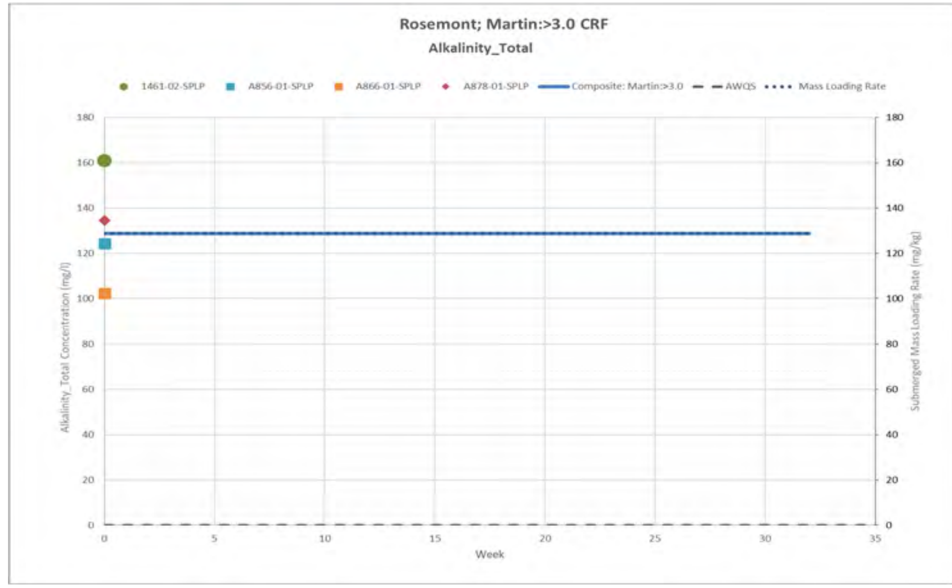


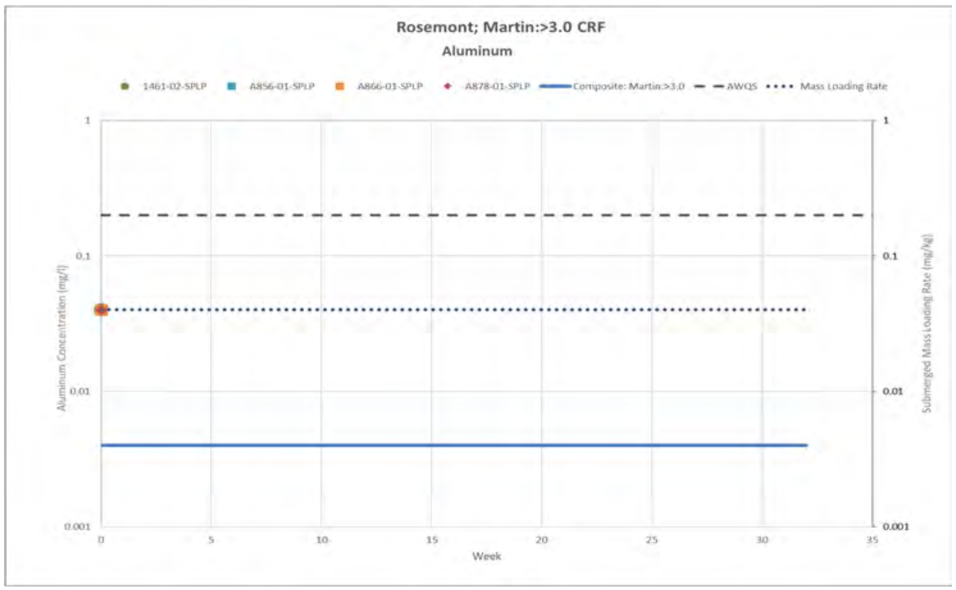


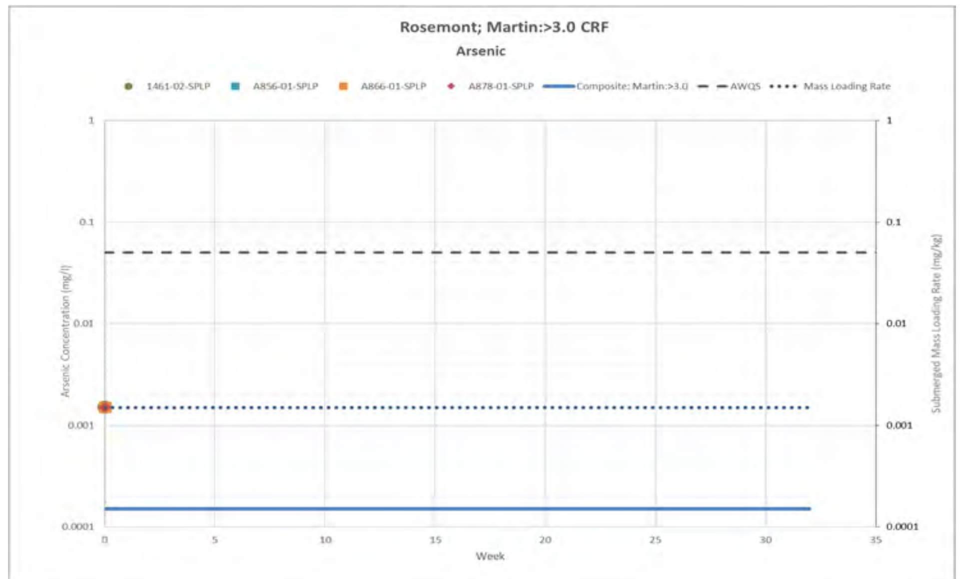


Appendix - H
Composite CRF Charts

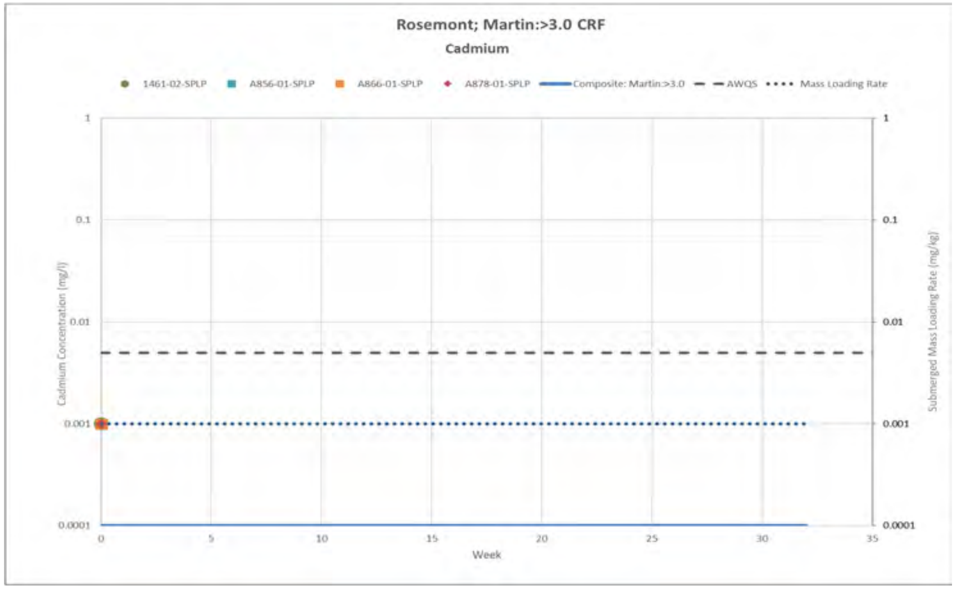


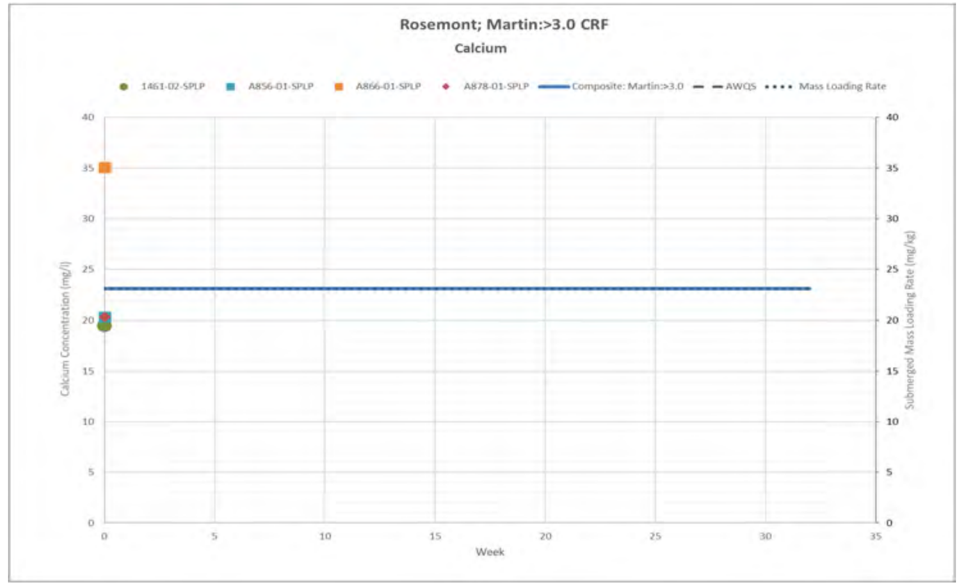


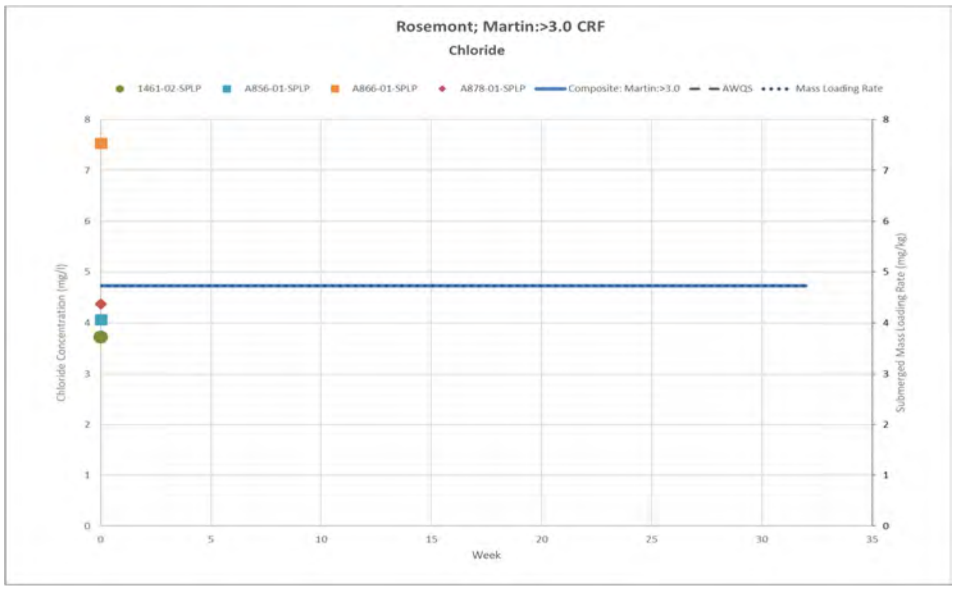


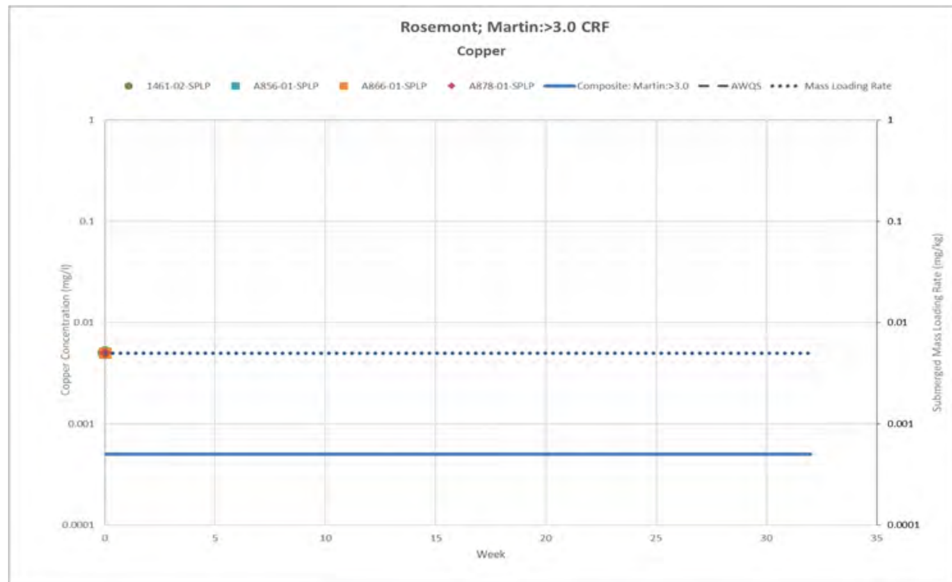


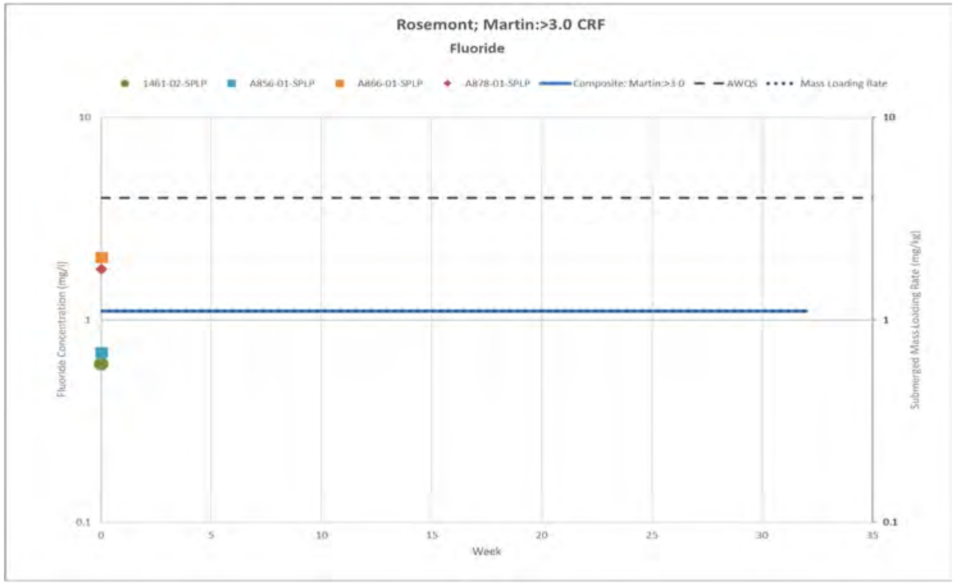
Appendix - H
Composite CRF Charts

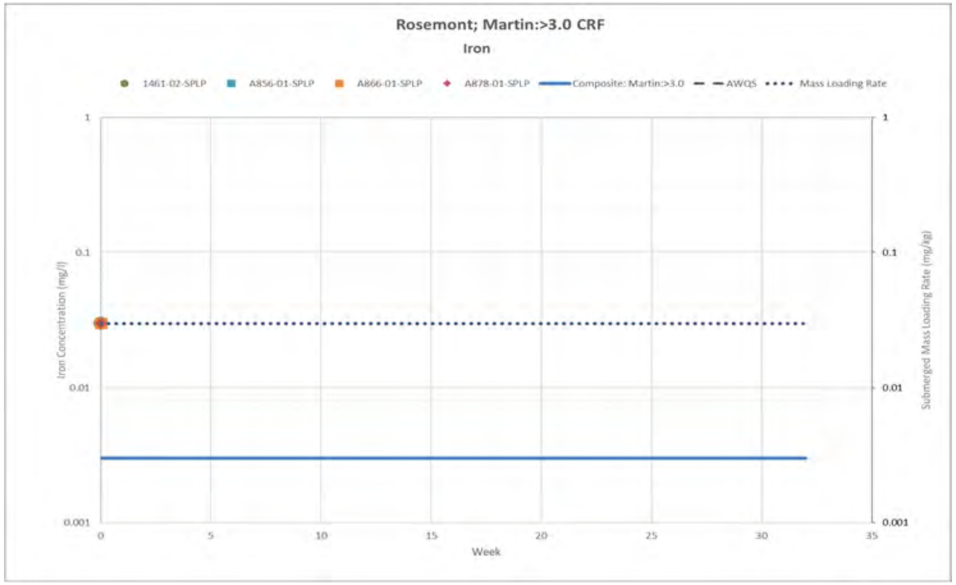


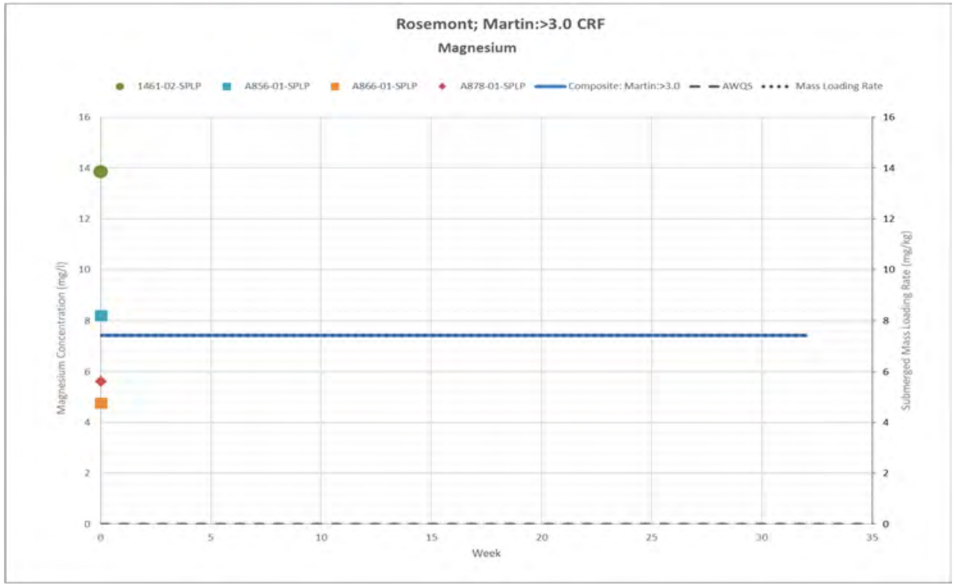


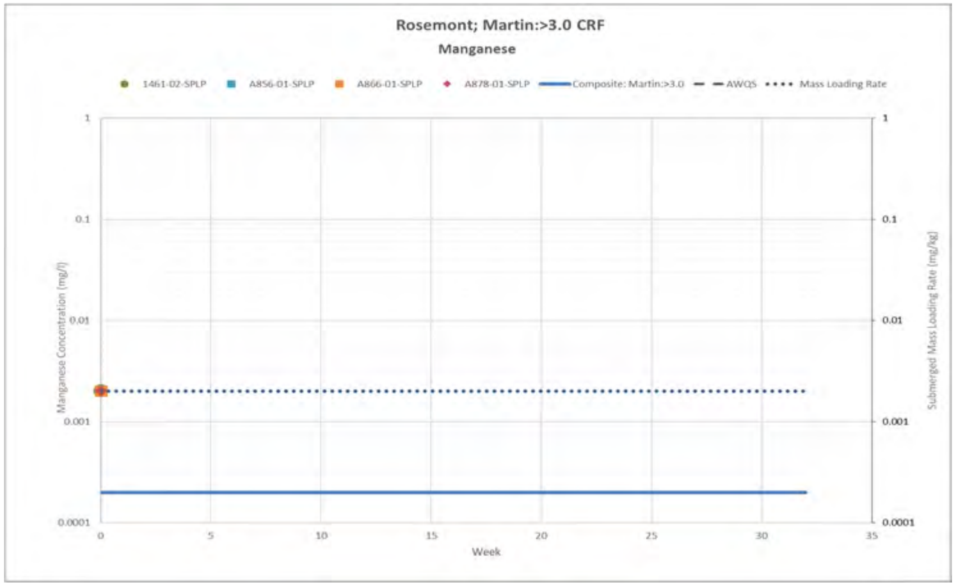


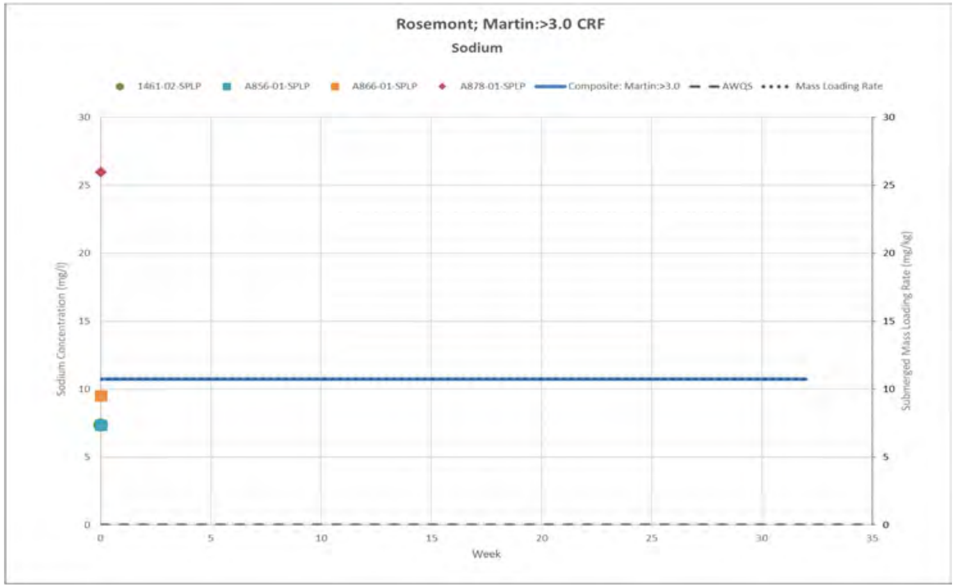


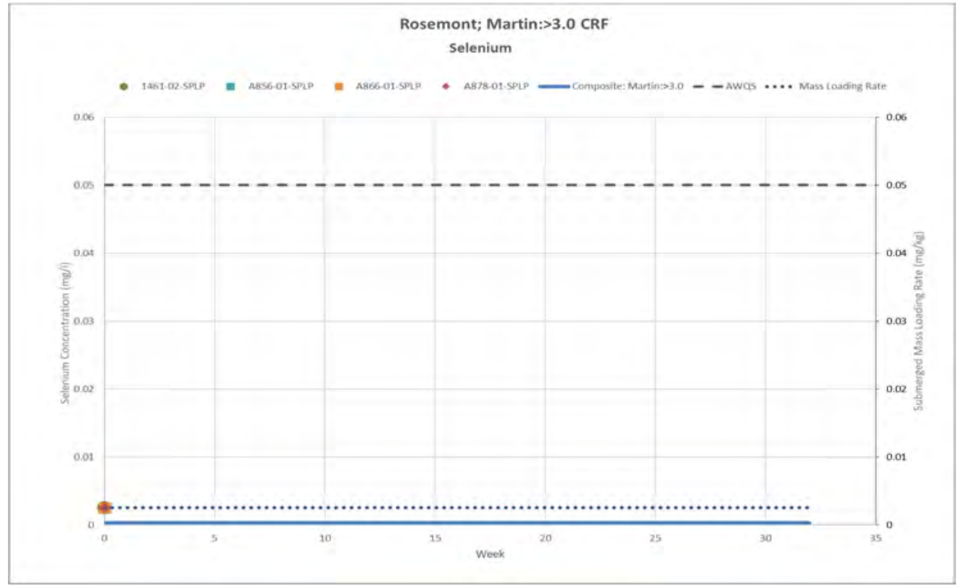

Rosemont; Martin:>3.0 CRF
Fluoride
Week

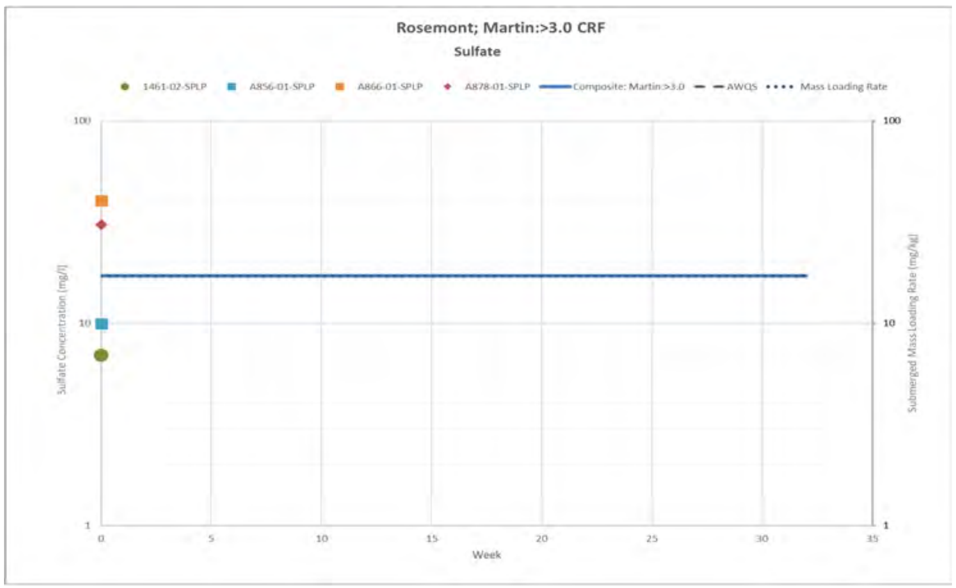

Rosemont; Martin:>3.0 CRF
Iron
Week

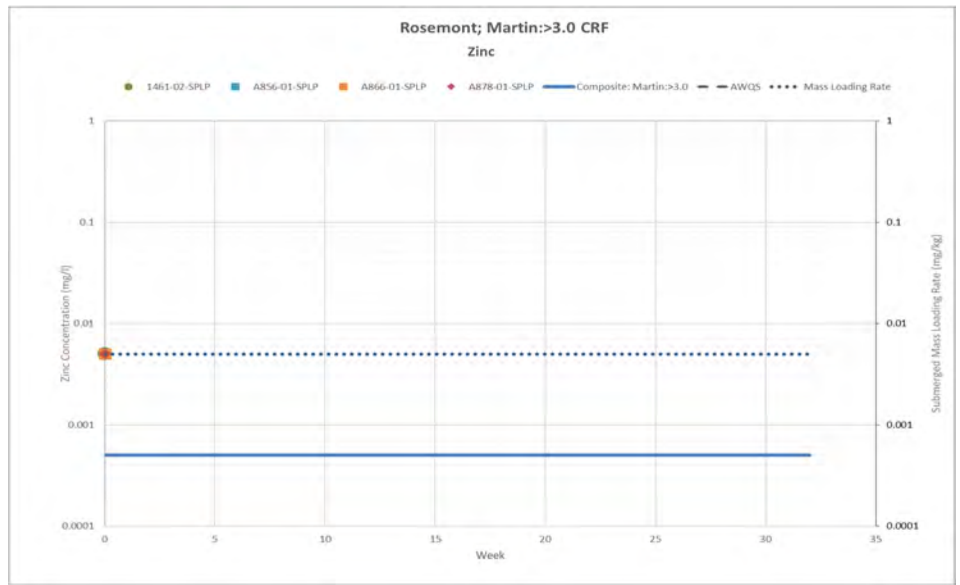

Rosemont; Martin:>3.0 CRF
Magnesium
Week


Rosemont; Martin:>3.0 CRF
Manganese
Week

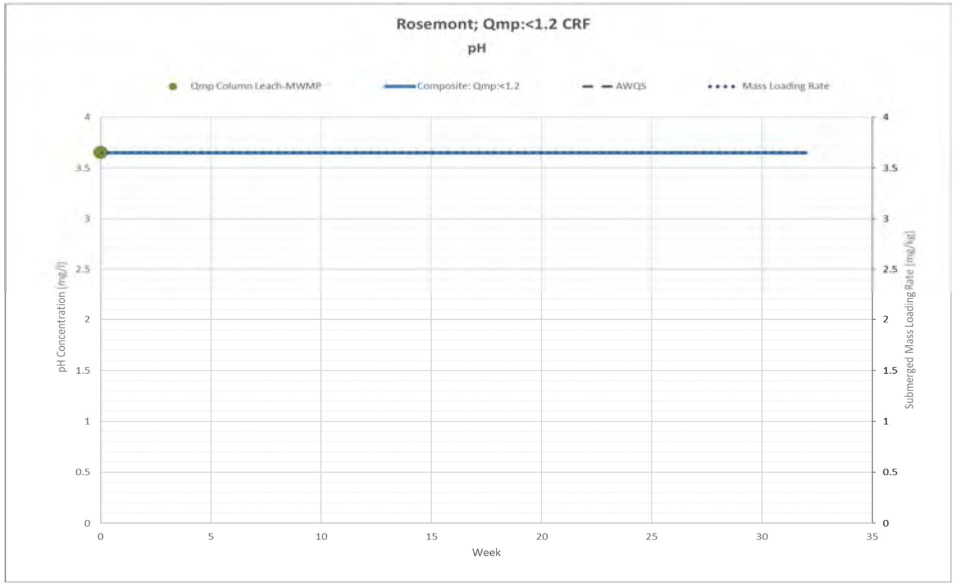

Rosemont; Martin:>3.0 CRF
Sodium
1461-02-SPLP
A856-01-SPLP
A866-01-SPLP
A878-01-SPLP
Composite: Martin:>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

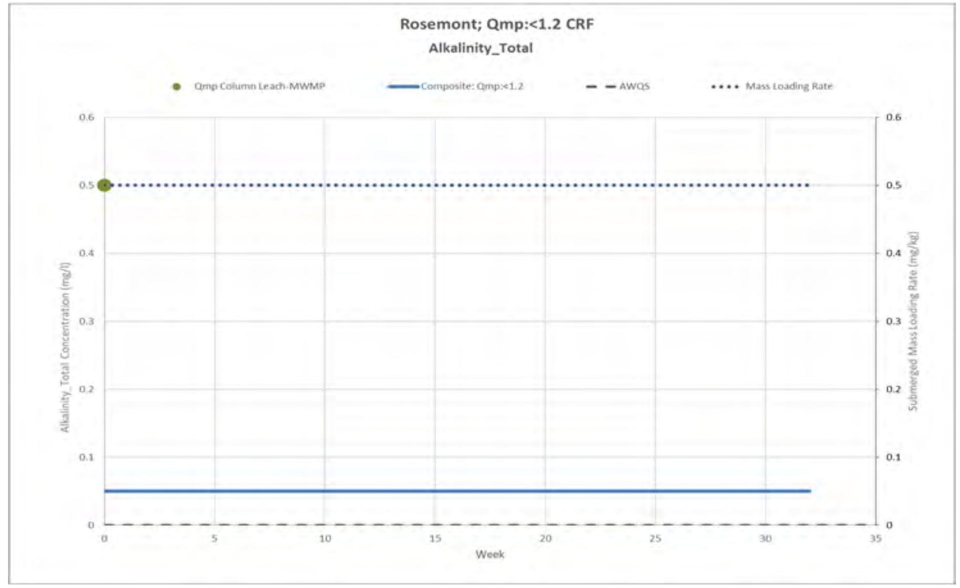

Rosemont; Martin:>3.0 CRF
Selenium
1461-02-SPLP
A856-01-SPLP
A866-01-SPLP
A878-01-SPLP
Composite: Martin:>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

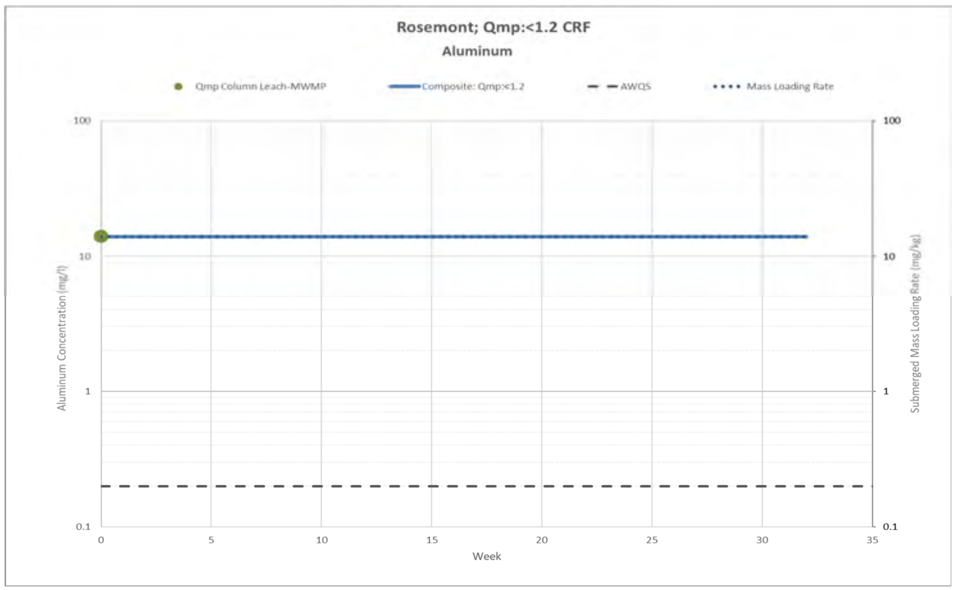

Rosemont; Martin:>3.0 CRF
Sulfate
1461-02-SPLP
A856-01-SPLP
A866-01-SPLP
A878-01-SPLP
Composite: Martin:>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

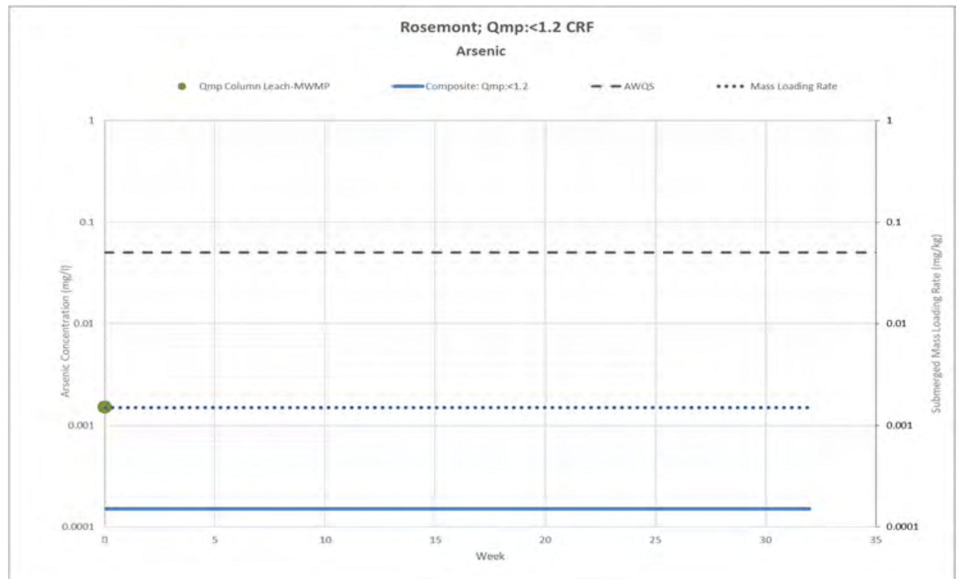

Rosemont; Martin:>3.0 CRF
Zinc
1461-02-SPLP
A856-01-SPLP
A866-01-SPLP
A878-01-SPLP
Composite: Martin:>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

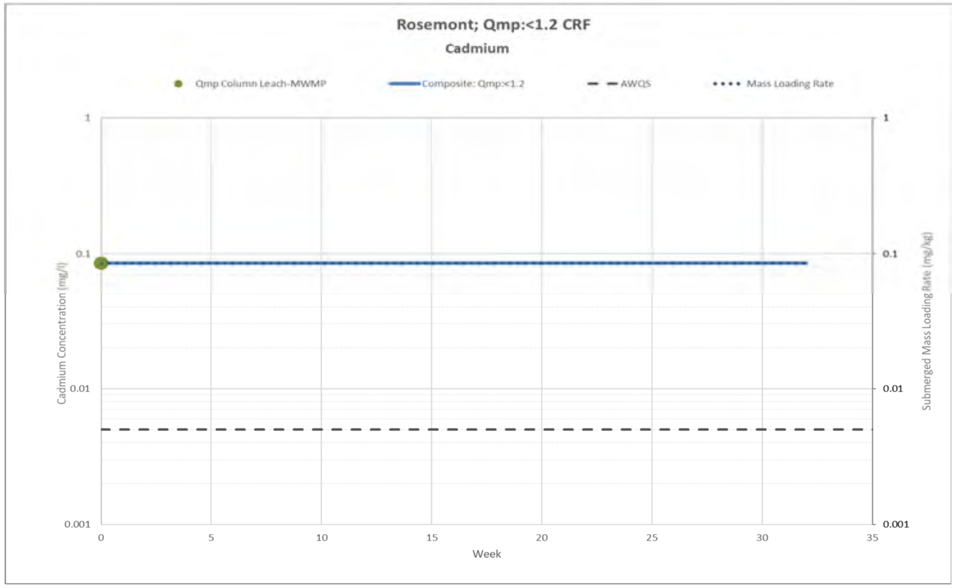
Appendix - H
Composite CRF Charts

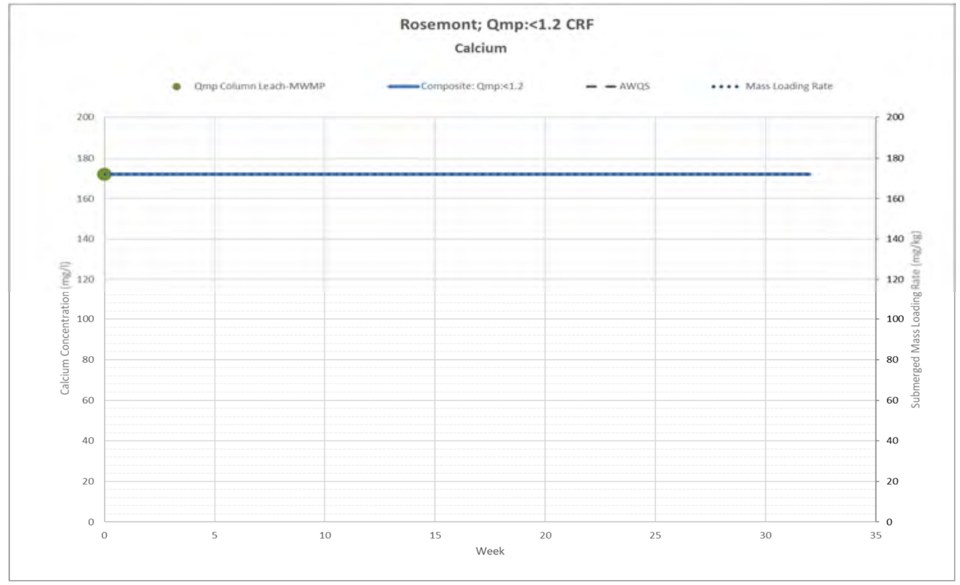


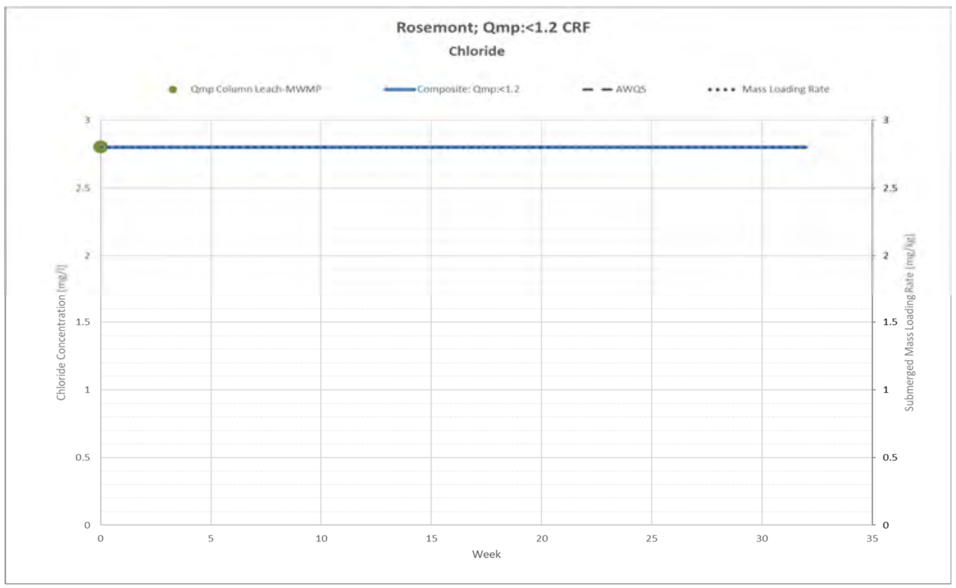


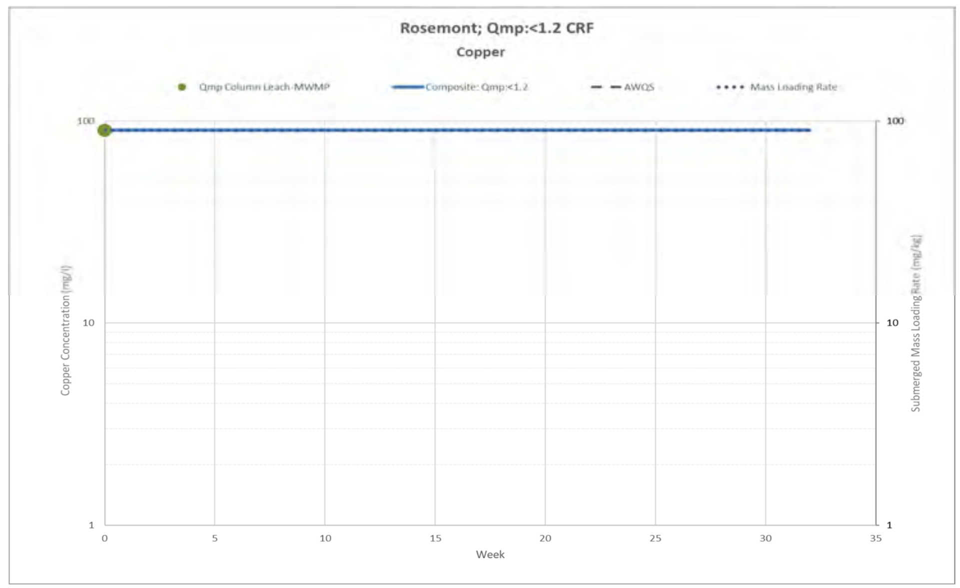




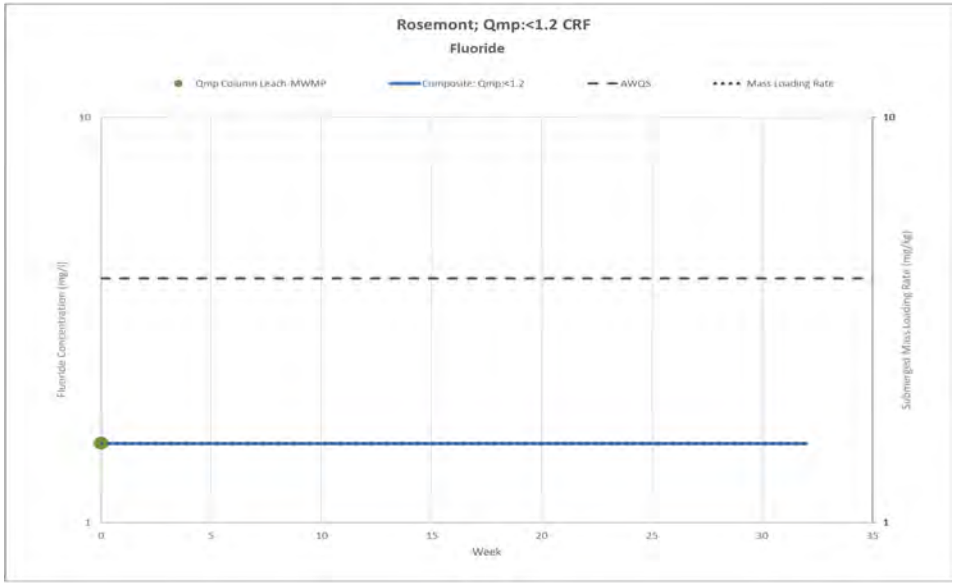

Rosemont; Qmp:<1.2 CRF
Cadmium
Qmp Column Leach-MWMP
Composite: Qmp:<1.2
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

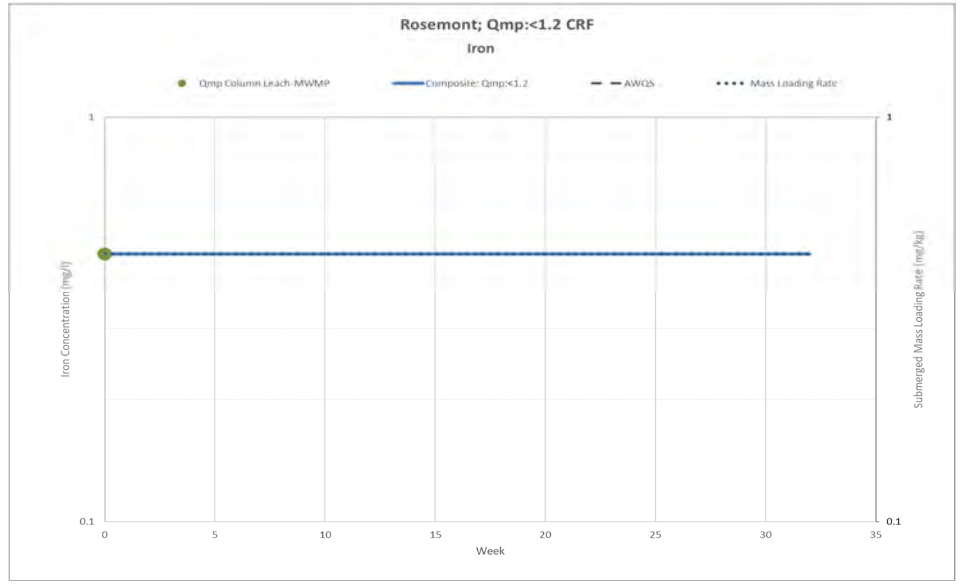

Rosemont; Qmp:<1.2 CRF
Calcium
Qmp Column Leach-MWMP
Composite: Qmp:<1.2
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

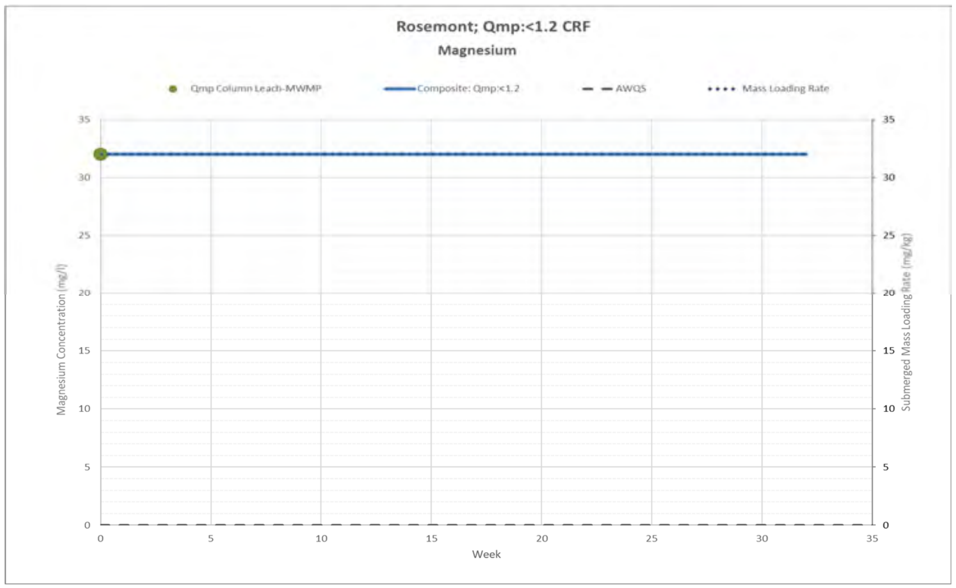

Rosemont; Qmp:<1.2 CRF
Chloride
Qmp Column Leach-MWMP
Composite: Qmp:<1.2
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

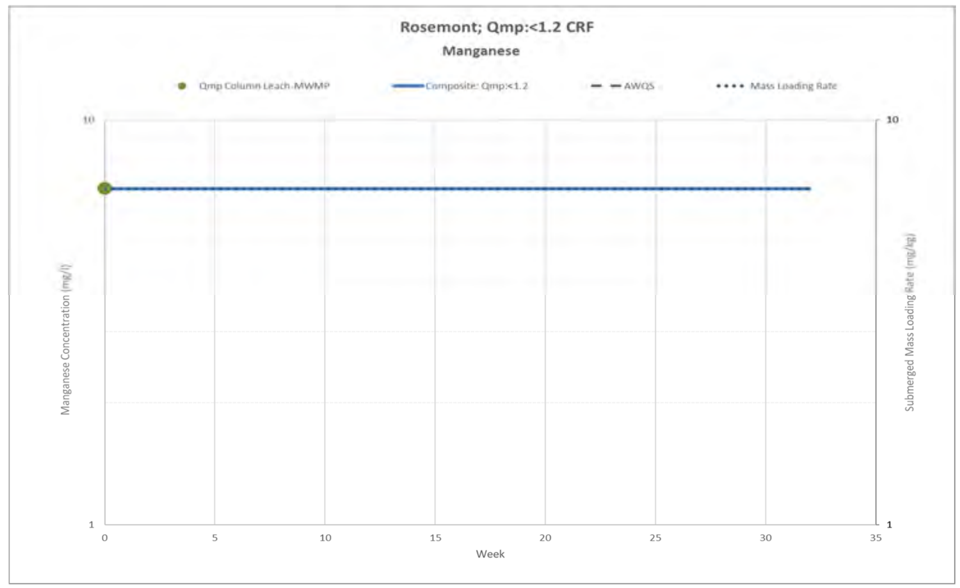

Rosemont; Qmp:<1.2 CRF
Copper
Qmp Column Leach-MWMP
Composite: Qmp:<1.2
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

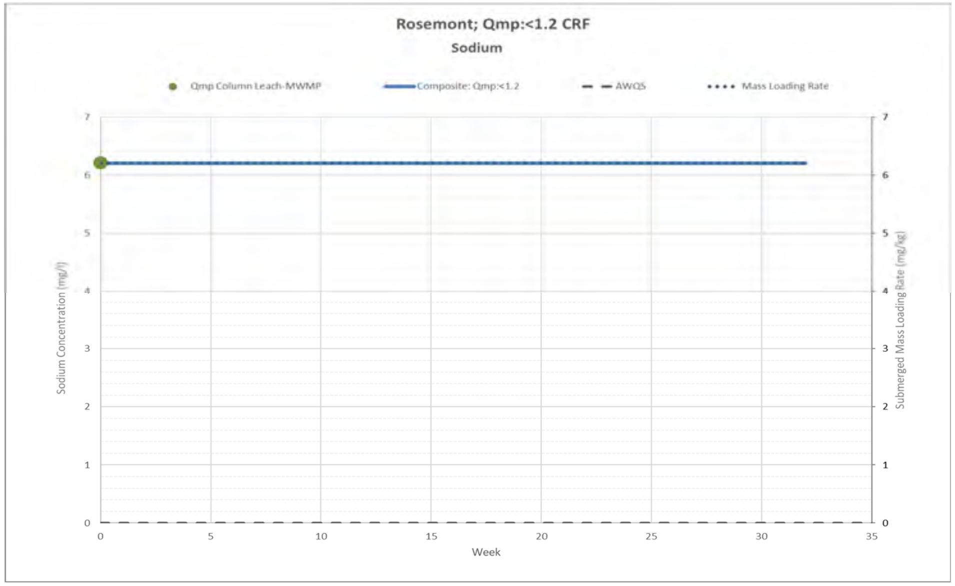
Appendix - H
Composite CRF Charts

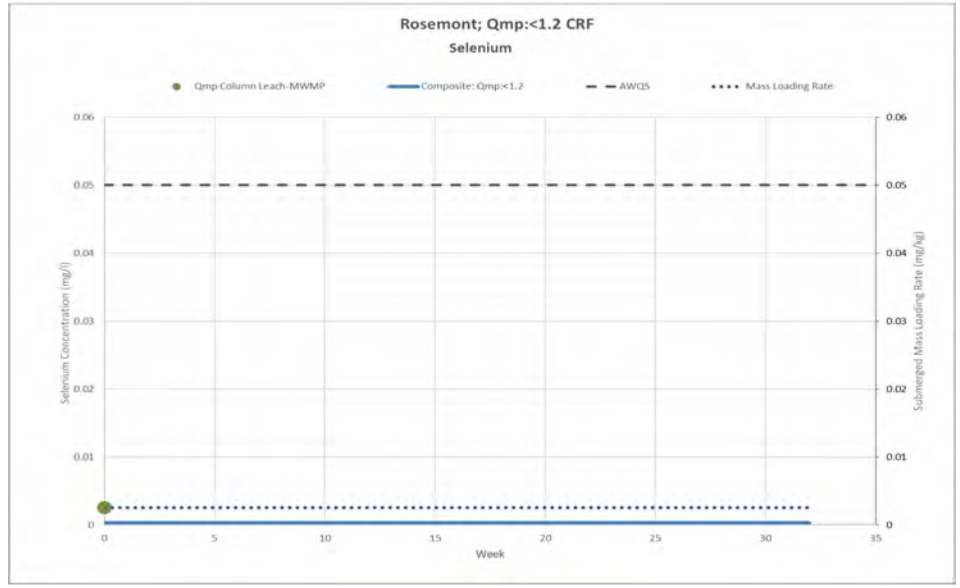


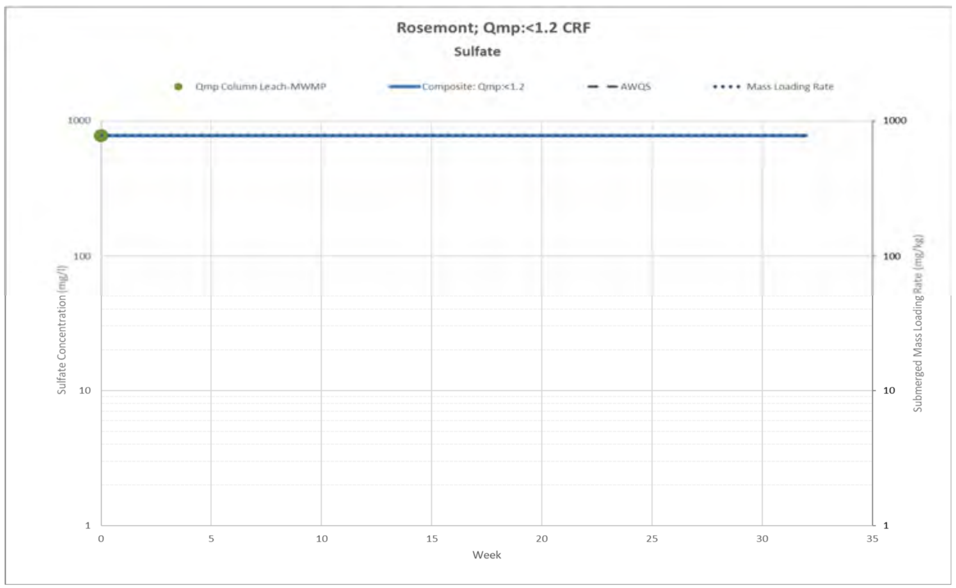


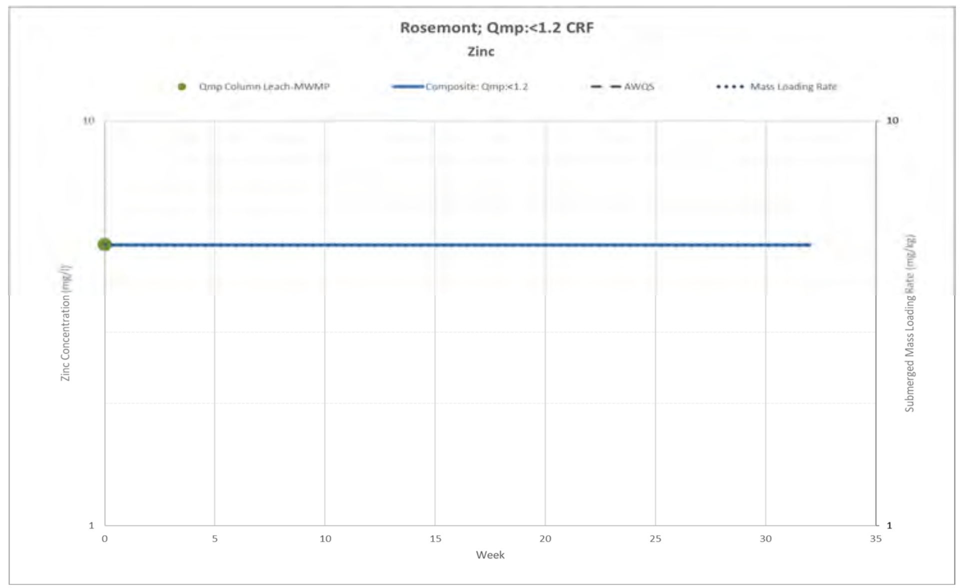




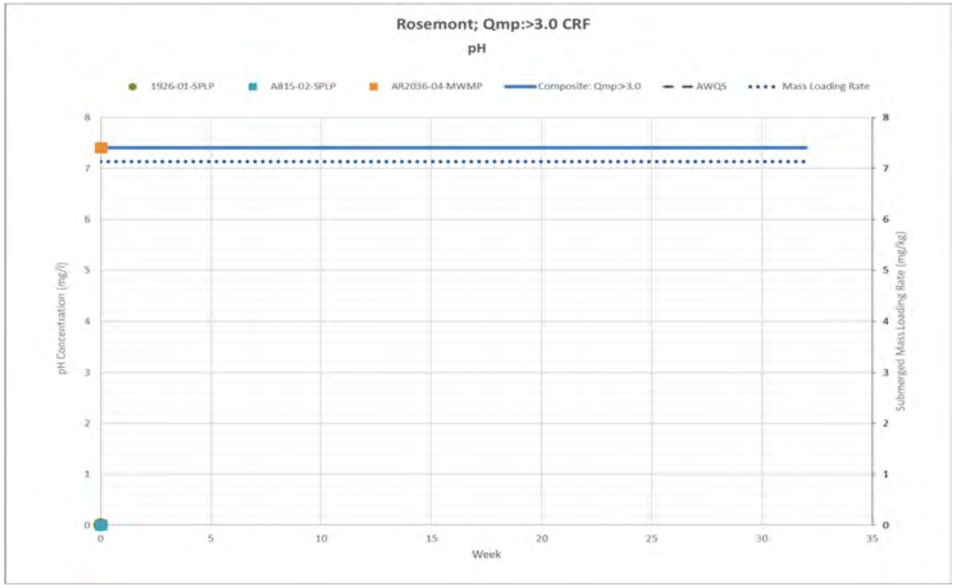

Rosemont; Qmp:<1.2 CRF
Sodium
Qmp Column Leach-MWMP
Composite: Qmp:<1.2
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

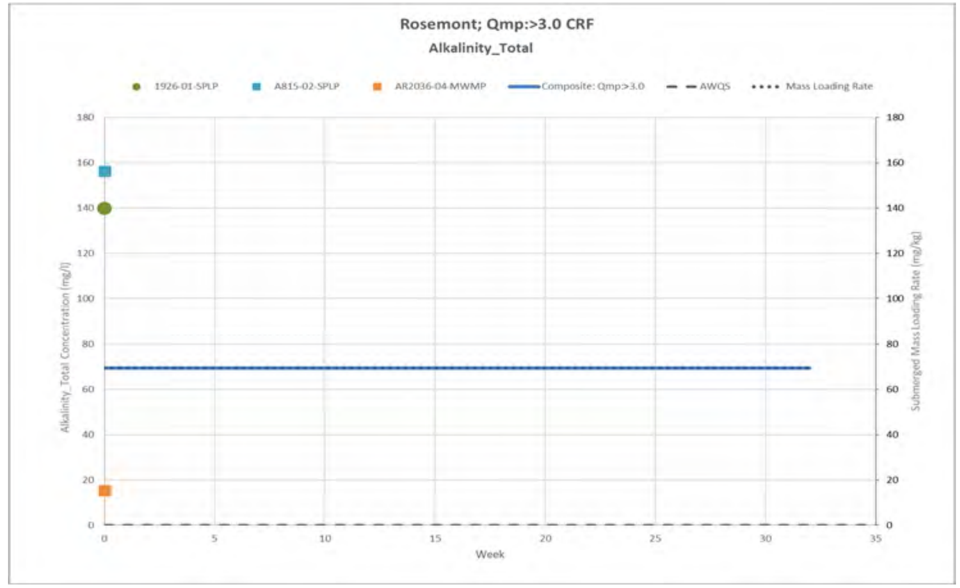

Rosemont; Qmp:<1.2 CRF
Selenium
Qmp Column Leach-MWMP
Composite: Qmp:<1.2
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

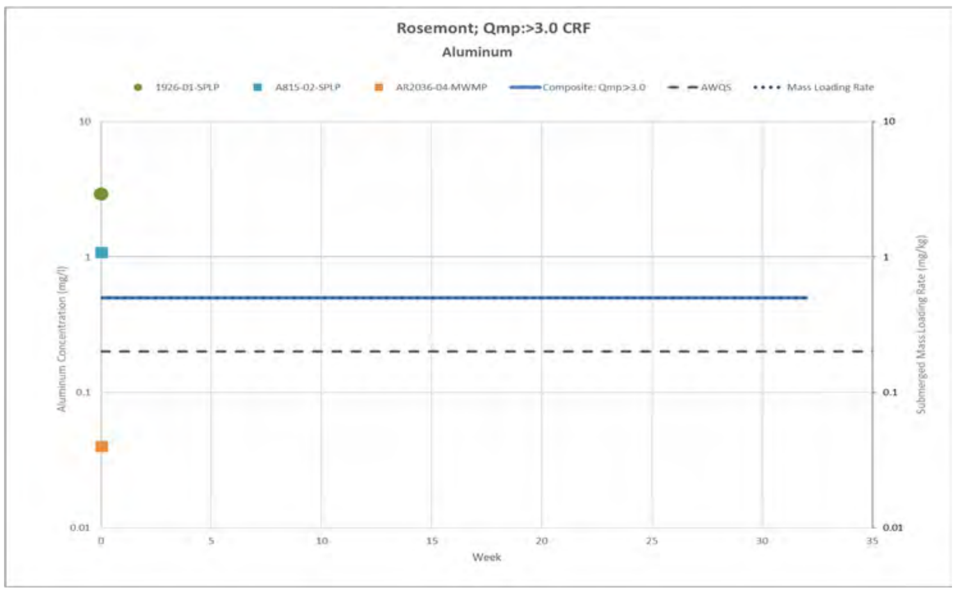

Rosemont; Qmp:<1.2 CRF
Sulfate
Qmp Column Leach-MWMP
Composite: Qmp:<1.2
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

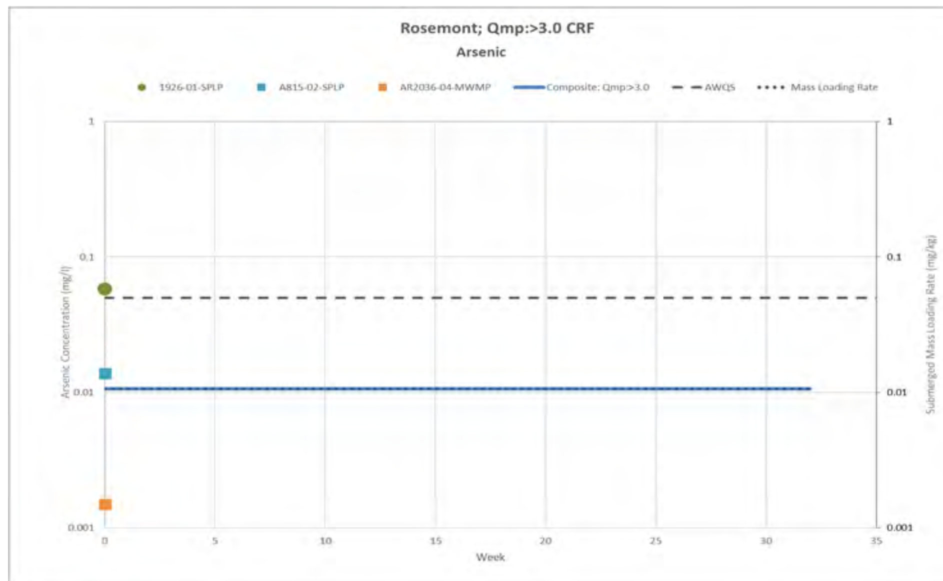

Rosemont; Qmp:<1.2 CRF
Zinc
Qmp Column Leach-MWMP
Composite: Qmp:<1.2
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

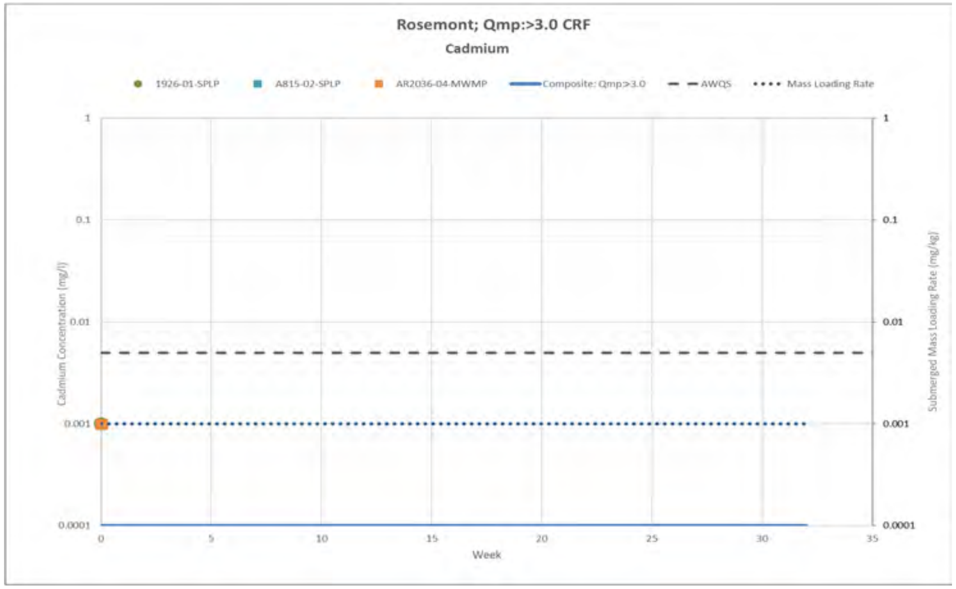
Appendix - H
Composite CRF Charts

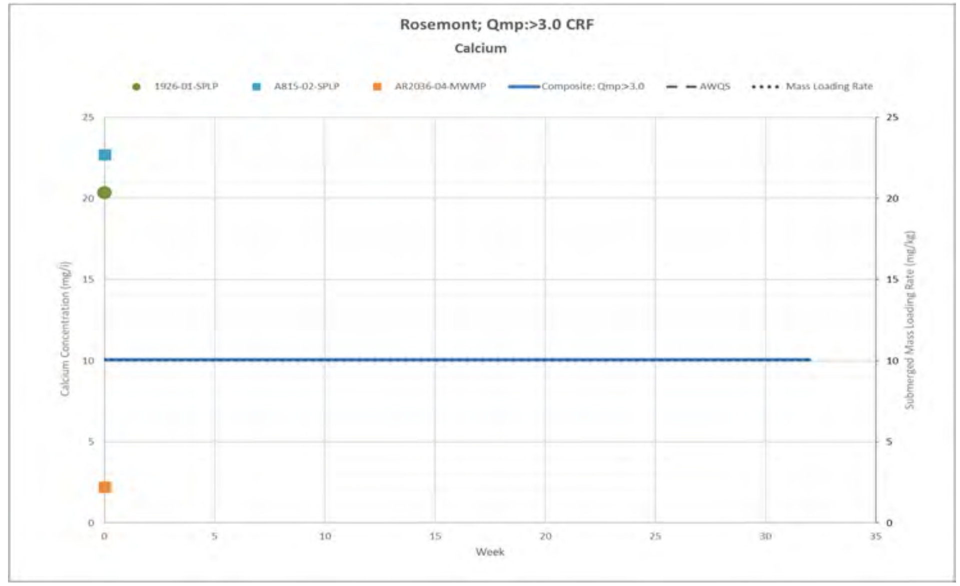


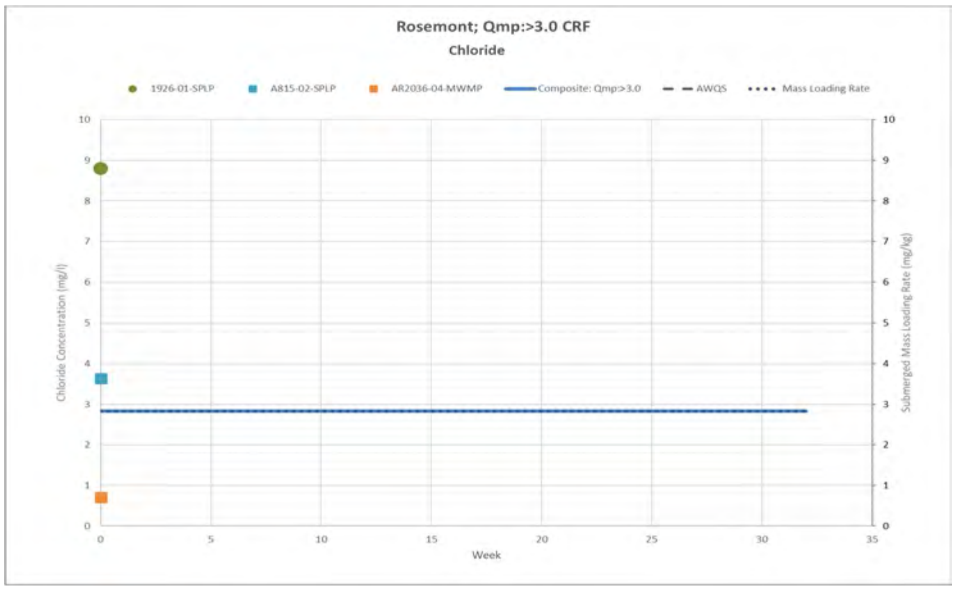


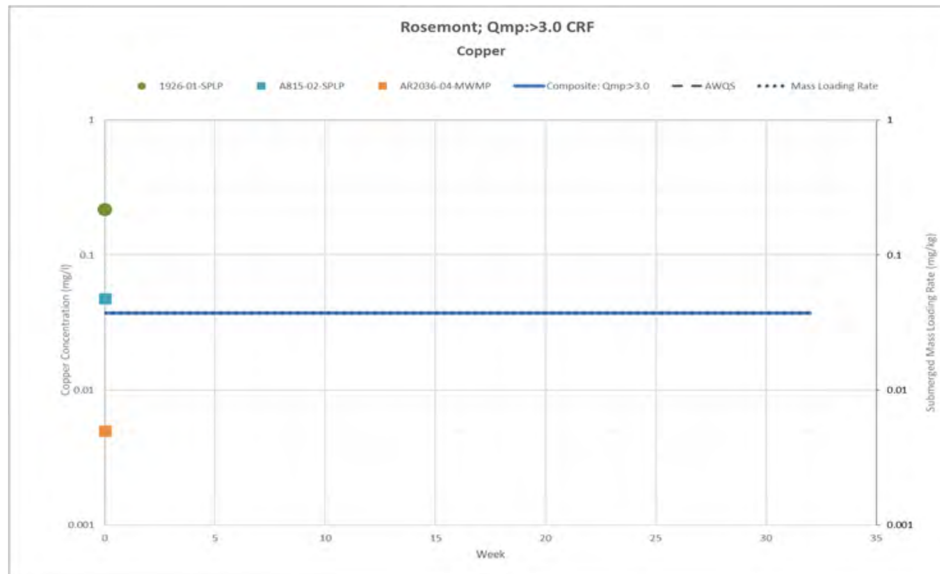




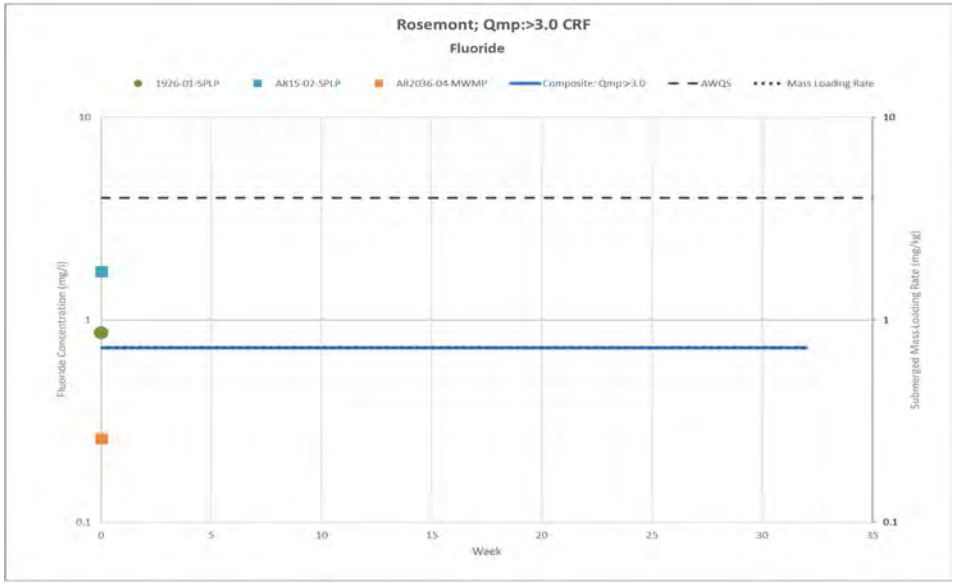

Rosemont; Qmp:>3.0 CRF
Cadmium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

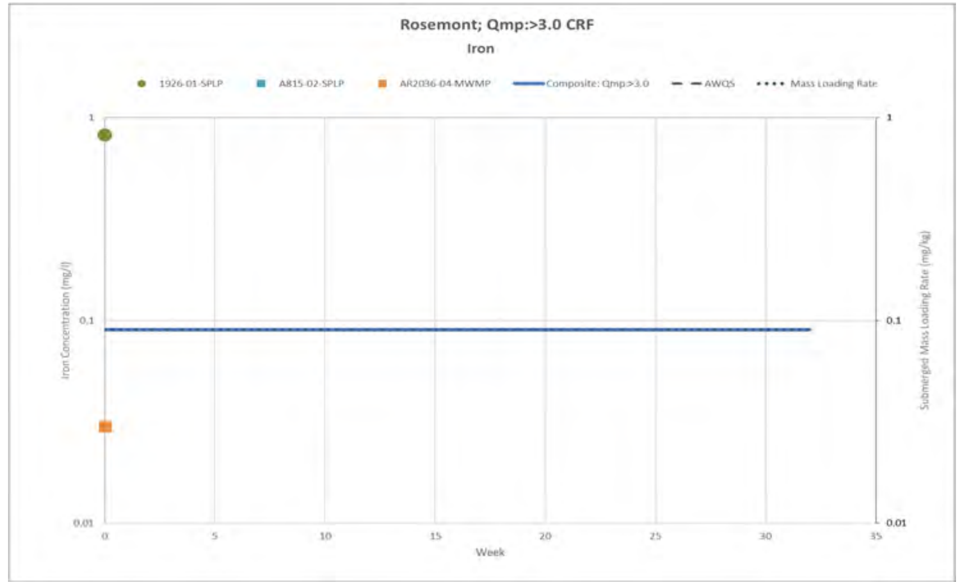

Rosemont; Qmp:>3.0 CRF
Calcium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

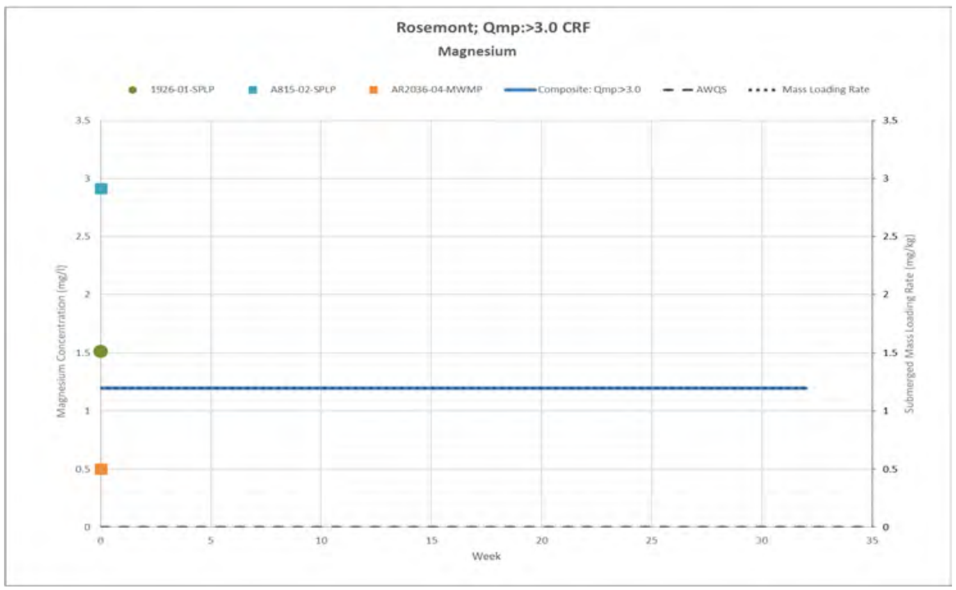

Rosemont; Qmp:>3.0 CRF
Chloride
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

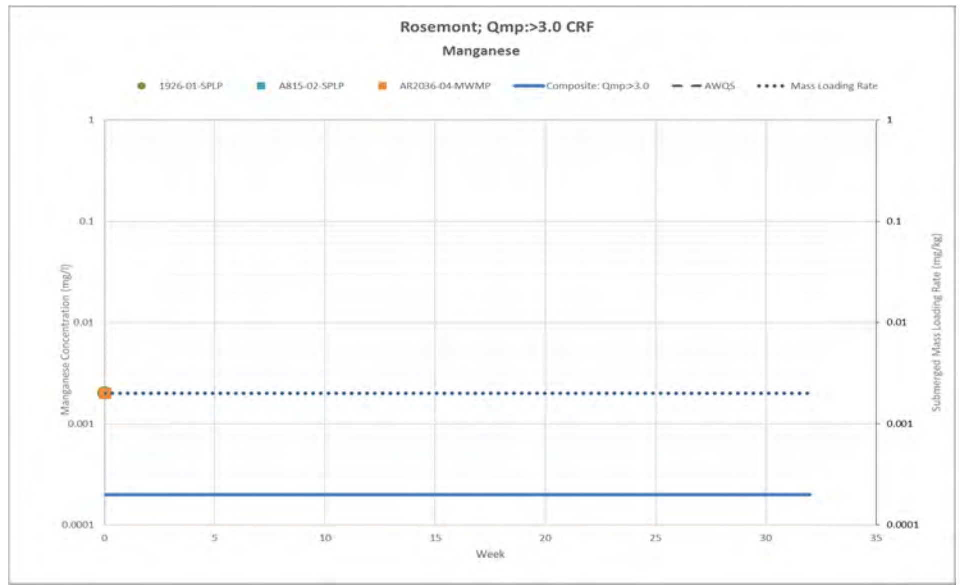

Rosemont; Qmp:>3.0 CRF
Copper
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

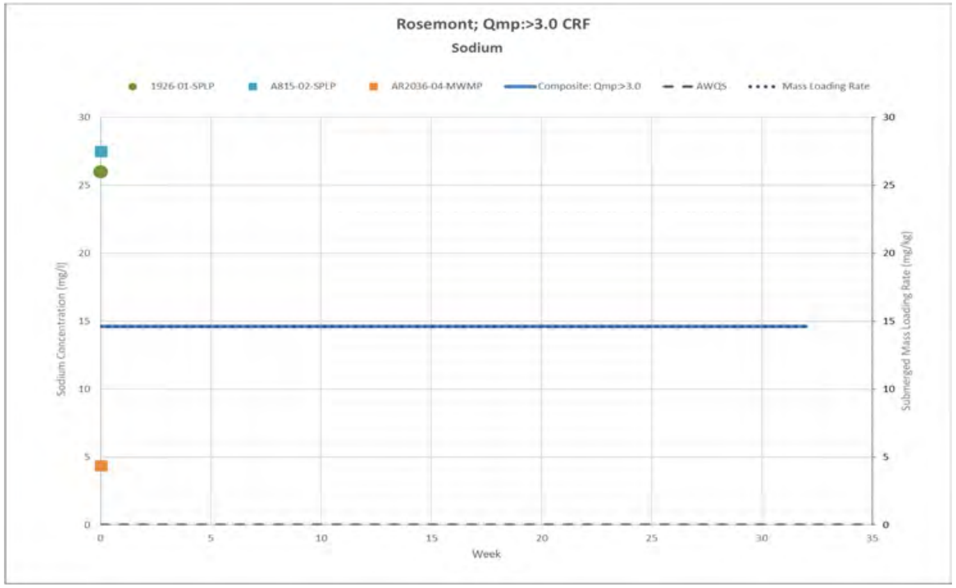
Appendix - H
Composite CRF Charts

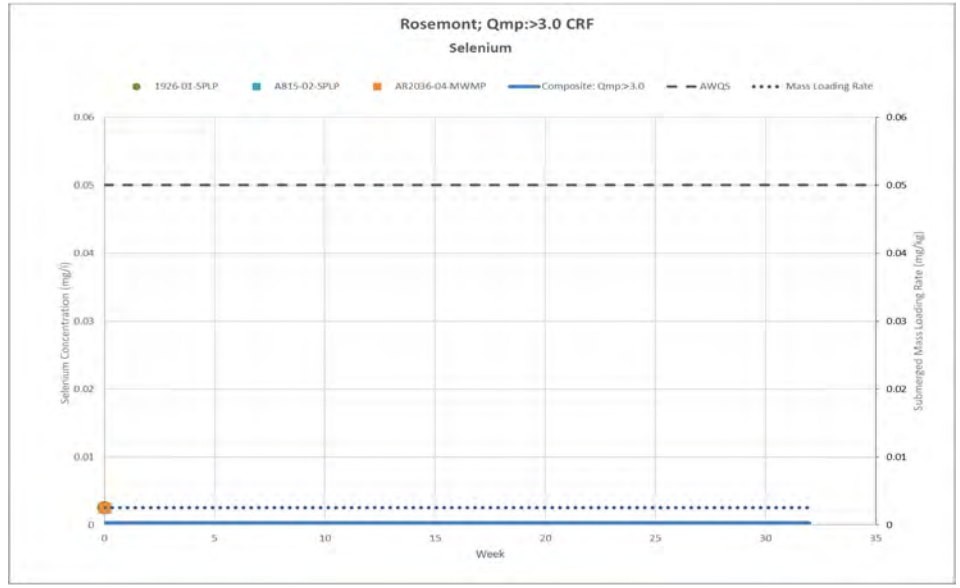


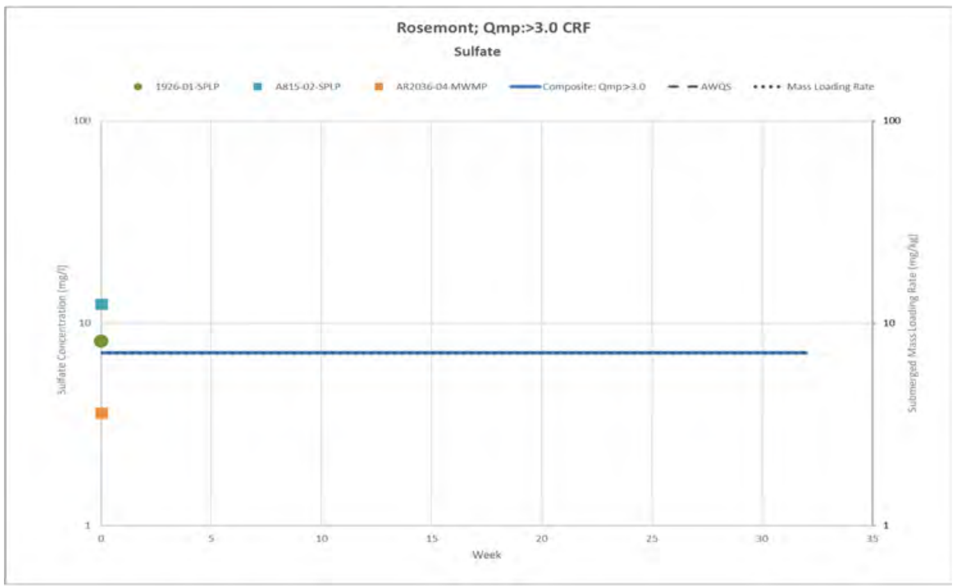


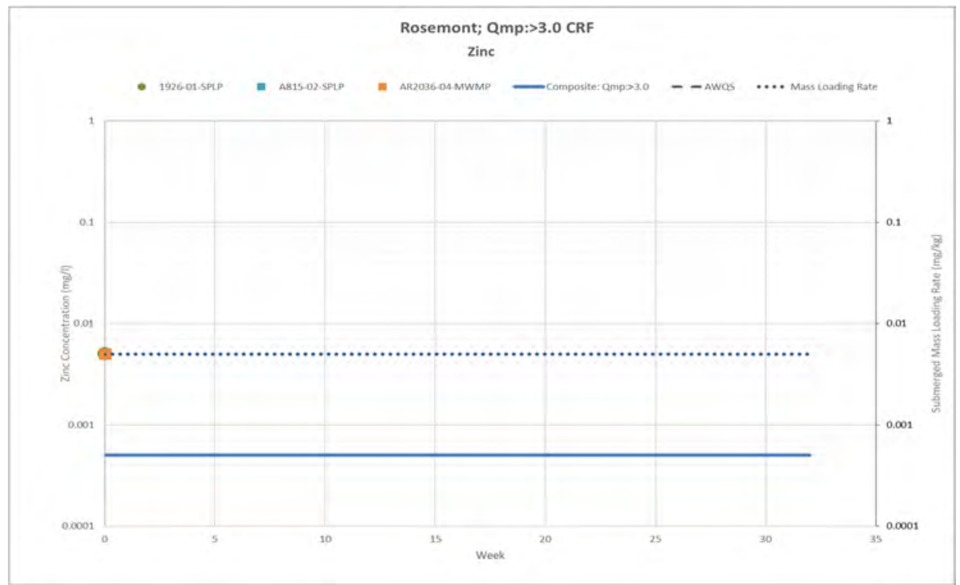


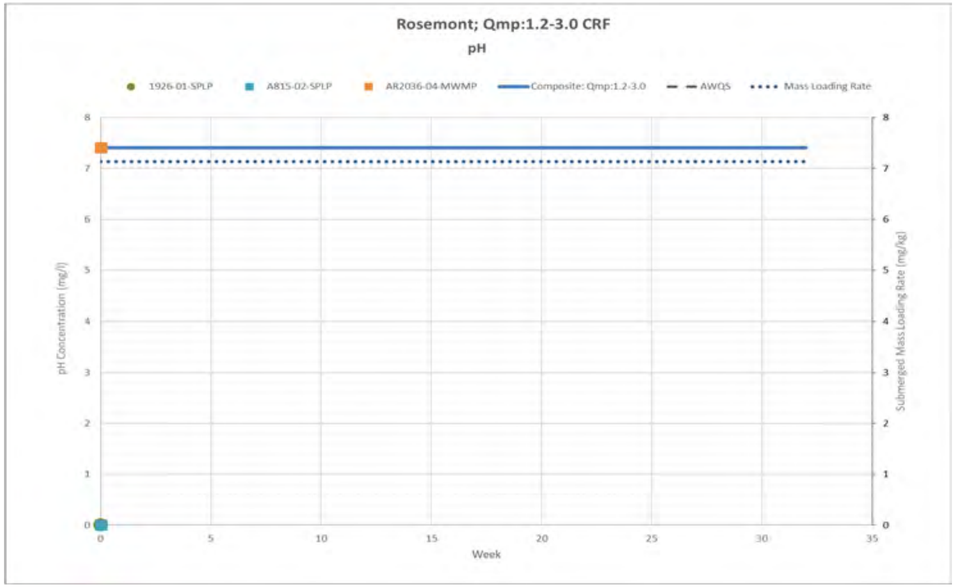


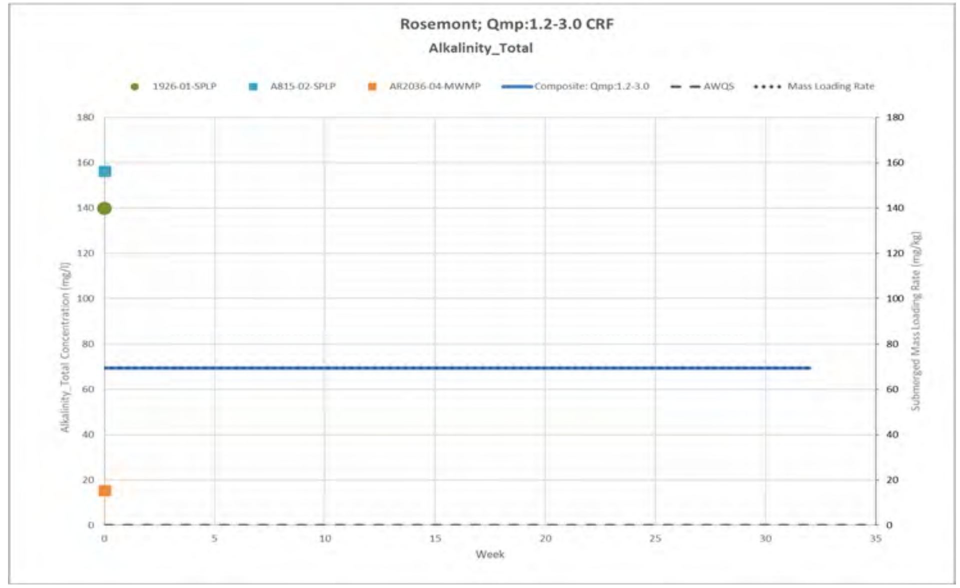

Rosemont; Qmp:>3.0 CRF
Sodium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

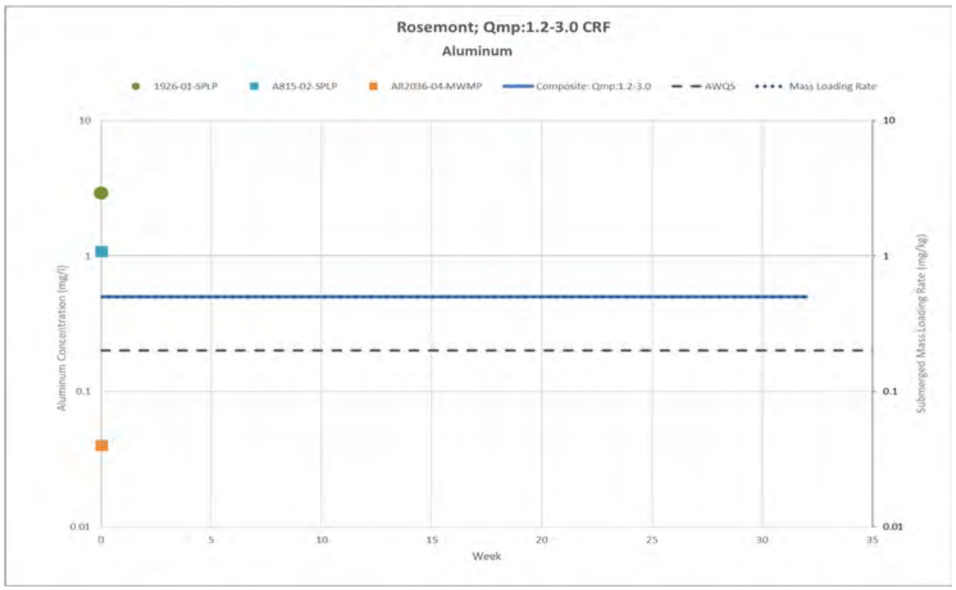

Rosemont; Qmp:>3.0 CRF
Selenium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

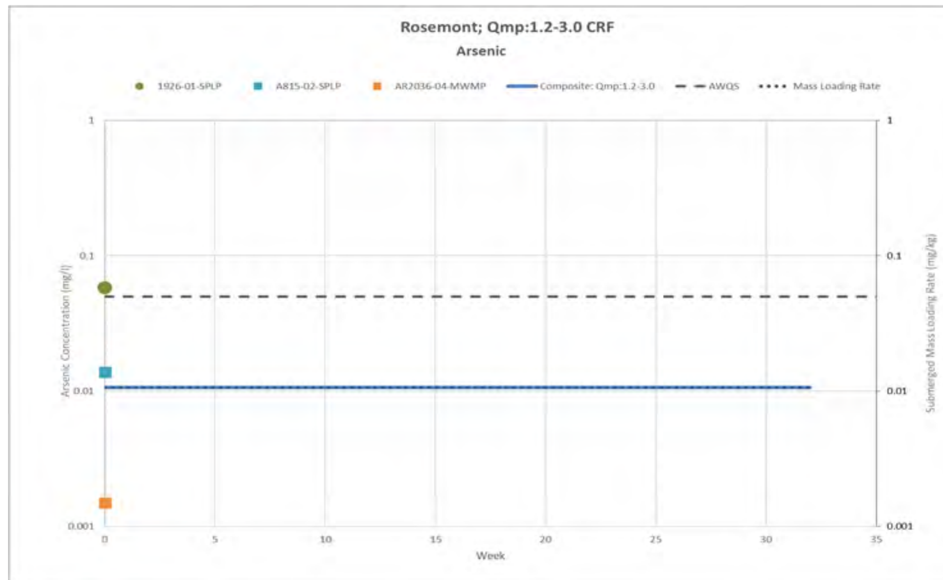

Rosemont; Qmp:>3.0 CRF
Sulfate
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

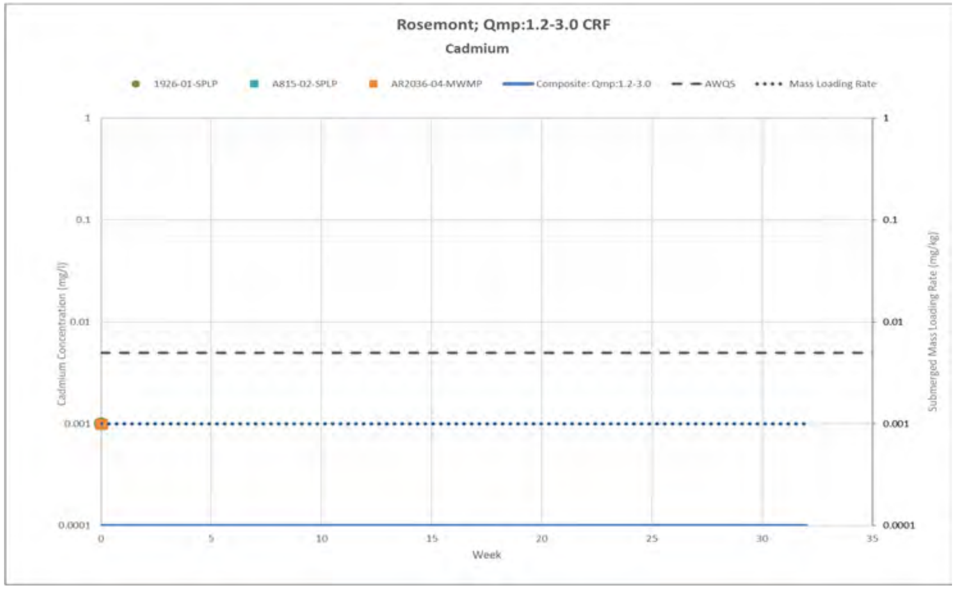

Rosemont; Qmp:>3.0 CRF
Zinc
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

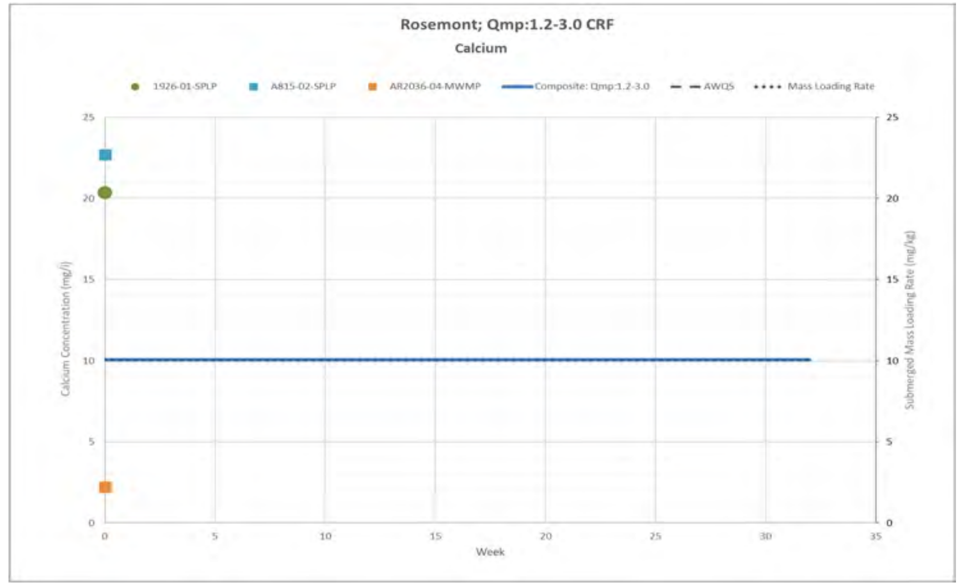

Rosemont; Qmp:1.2-3.0 CRF
pH
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

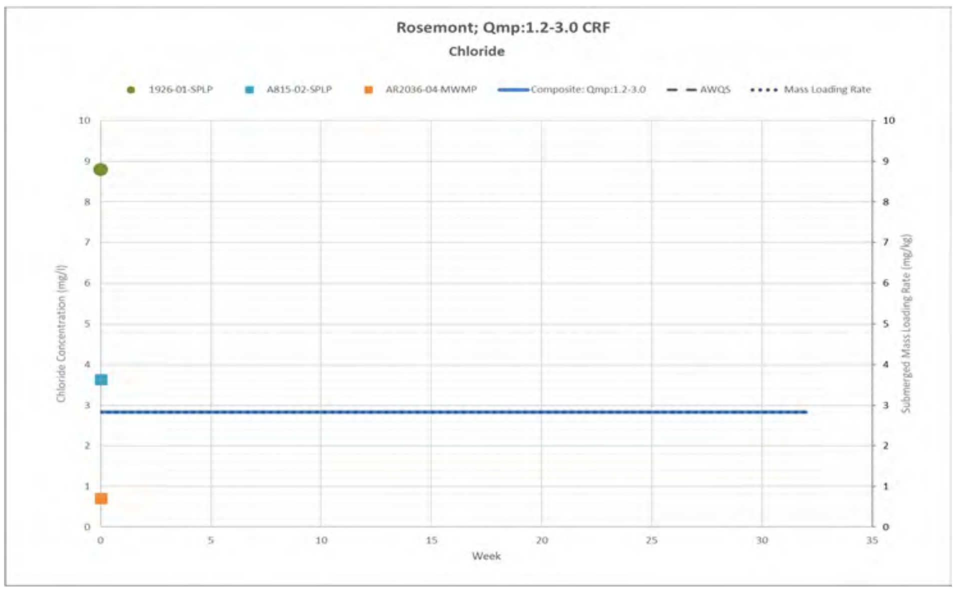

Rosemont; Qmp:1.2-3.0 CRF
Alkalinity_Total
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

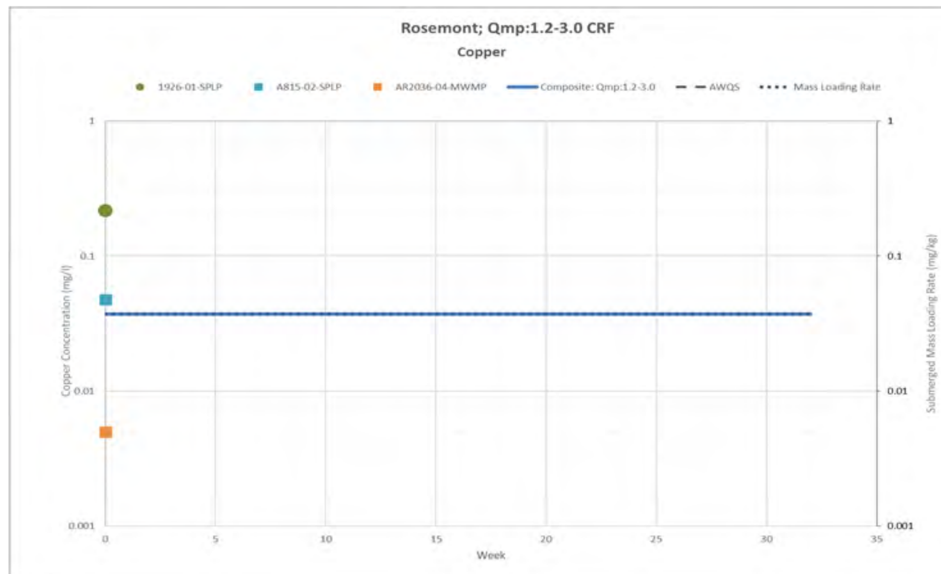

Rosemont; Qmp:1.2-3.0 CRF
Aluminum
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Qmp:1.2-3.0 CRF
Arsenic
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Qmp:1.2-3.0 CRF
Cadmium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Qmp:1.2-3.0 CRF
Calcium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Qmp:1.2-3.0 CRF
Chloride
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week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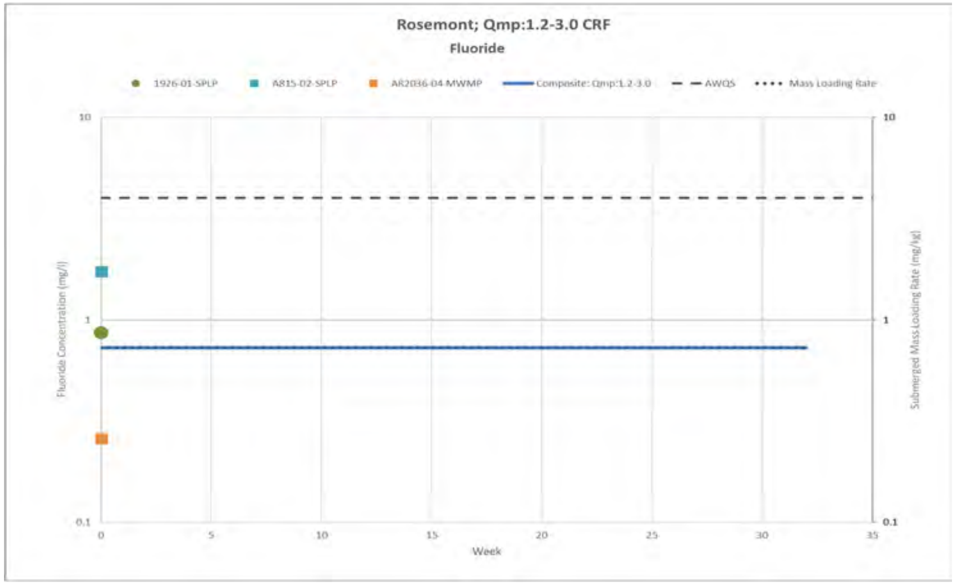
Copper
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week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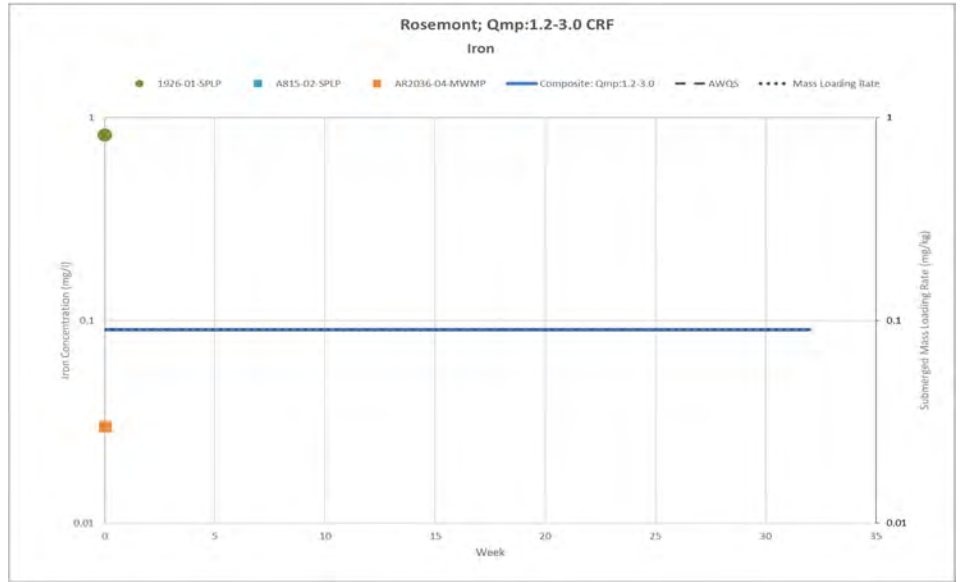
Fluoride
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week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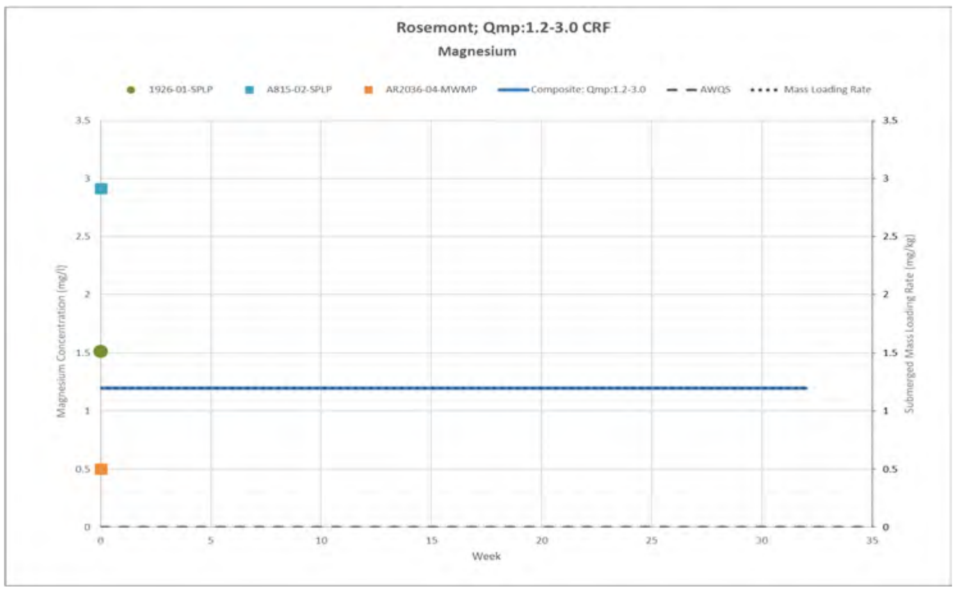
Iron
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week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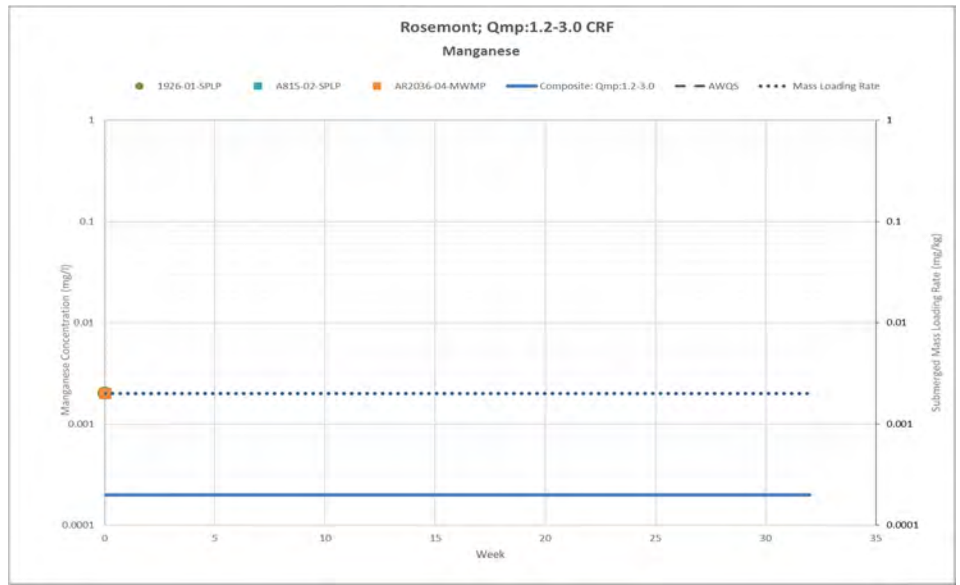
Magnesium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week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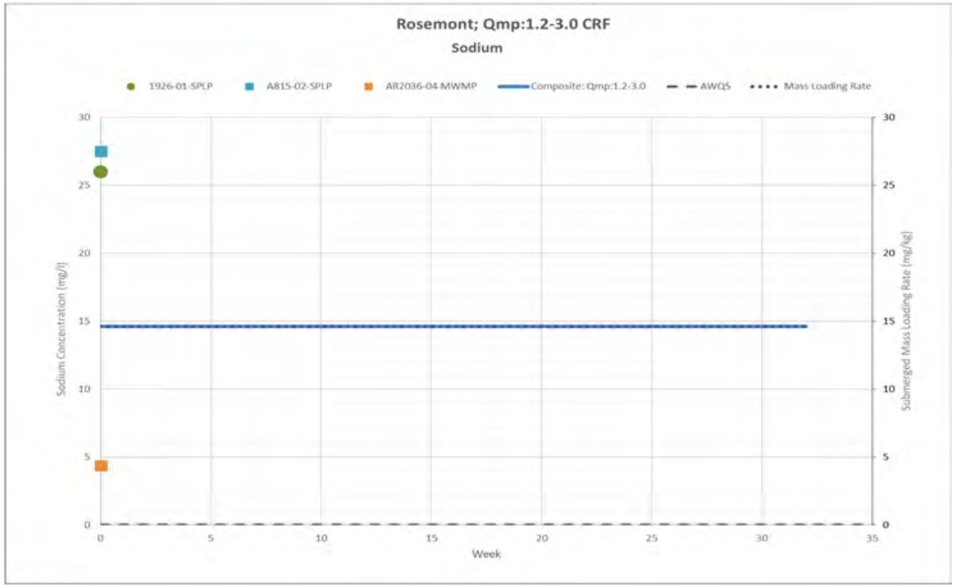
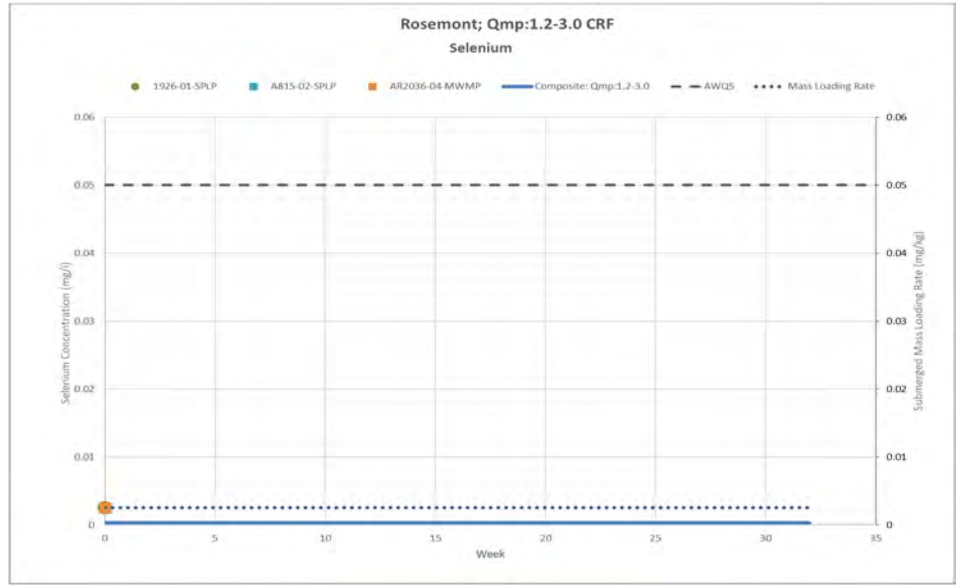
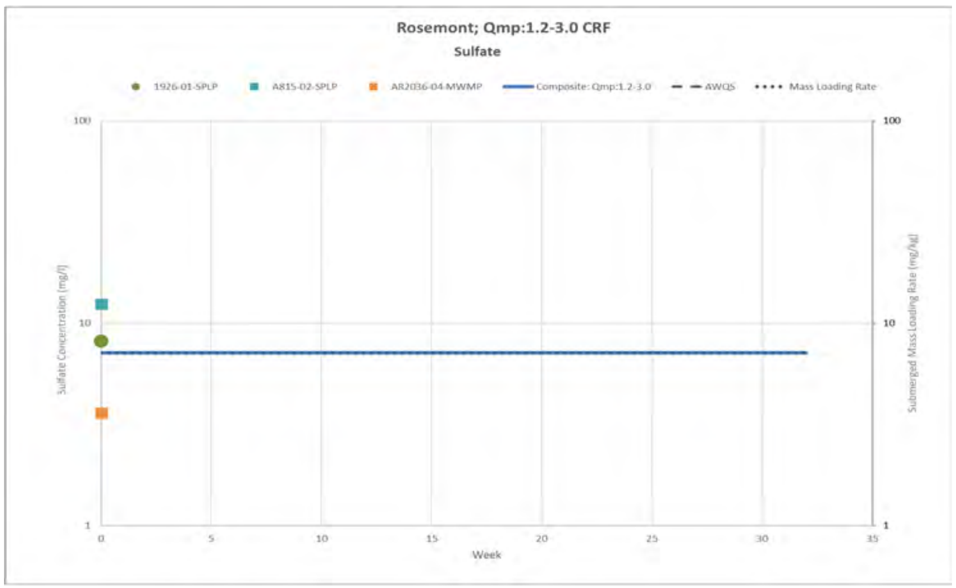
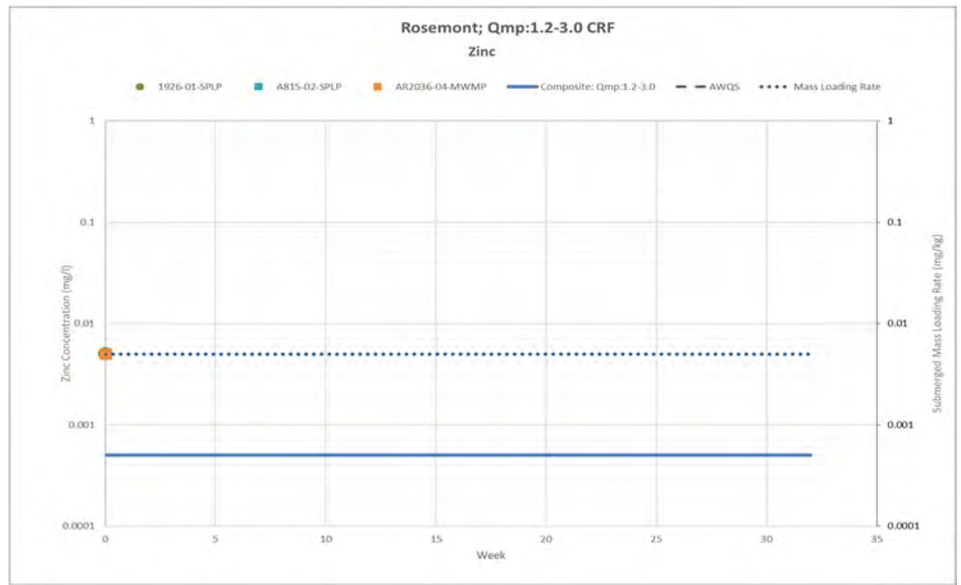
Manganese
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

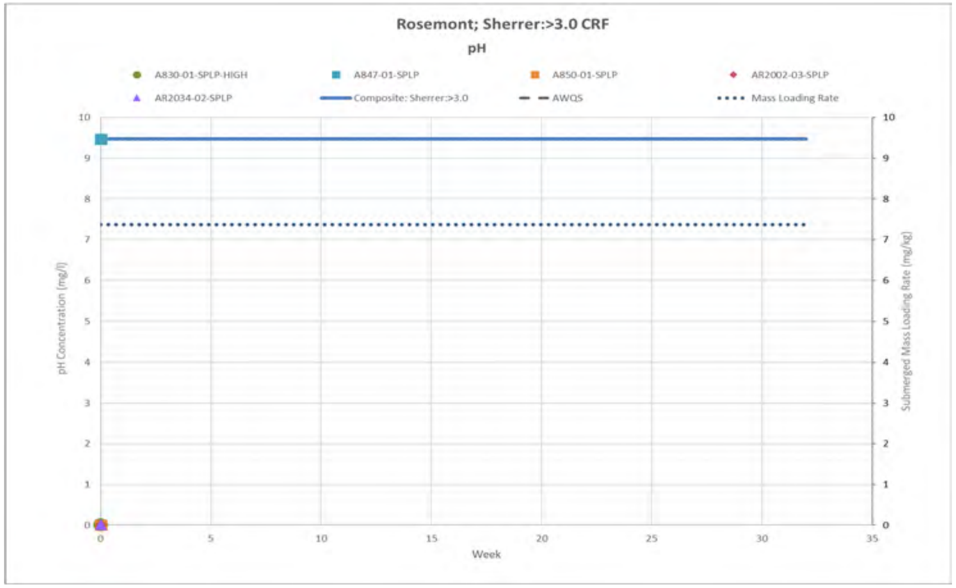

Rosemont; Qmp:1.2-3.0 CRF
Sodium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

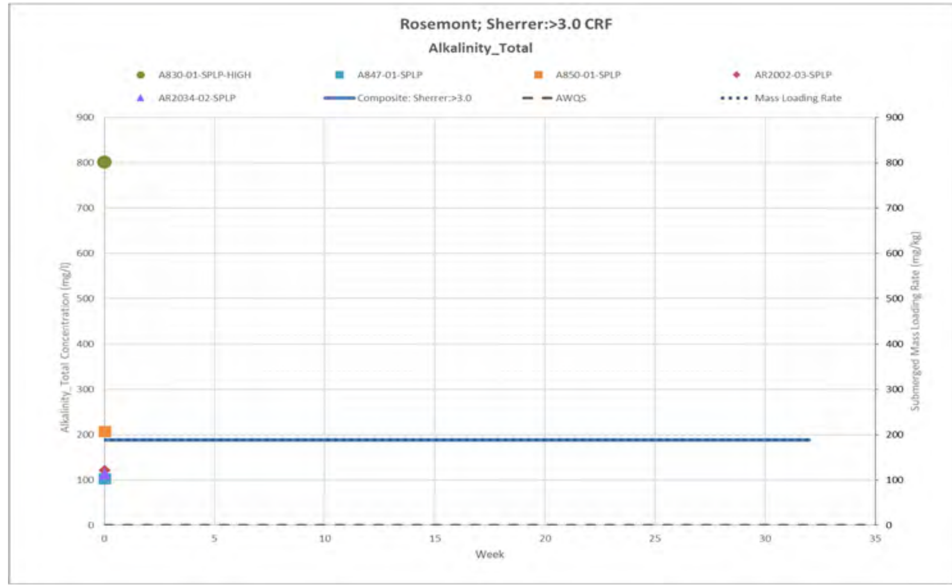

Rosemont; Qmp:1.2-3.0 CRF
Selenium
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

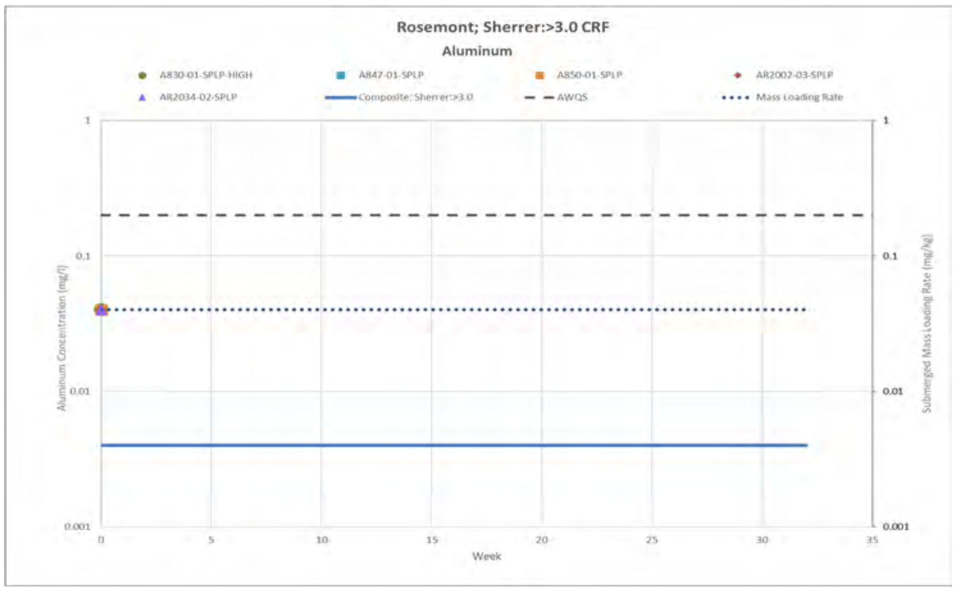

Rosemont; Qmp:1.2-3.0 CRF
Sulfate
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

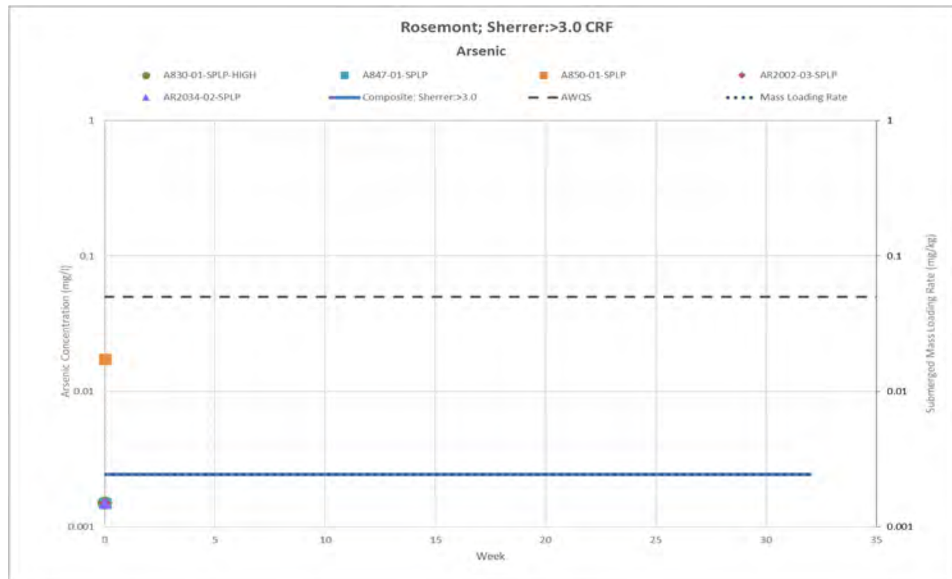

Rosemont; Qmp:1.2-3.0 CRF
Zinc
1926-01-SPLP
A815-02-SPLP
AR2036-04-MWMP
Composite: Qmp:1.2-3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

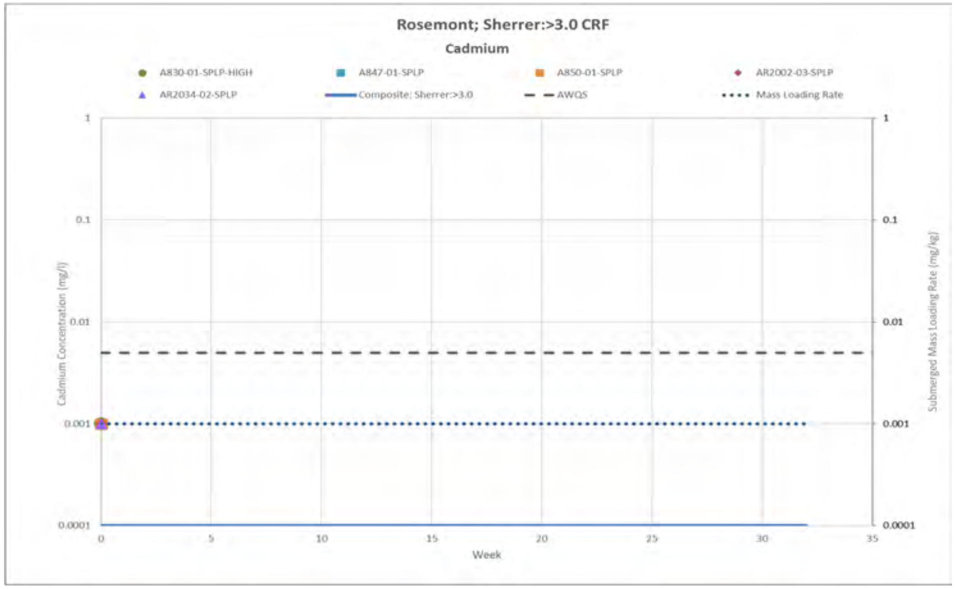
Appendix - H
Composite CRF Charts

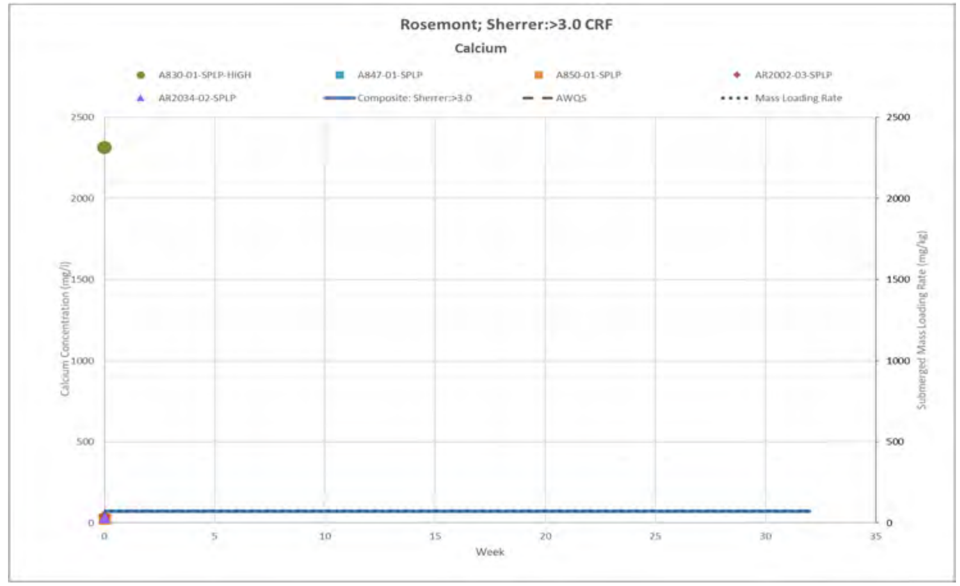


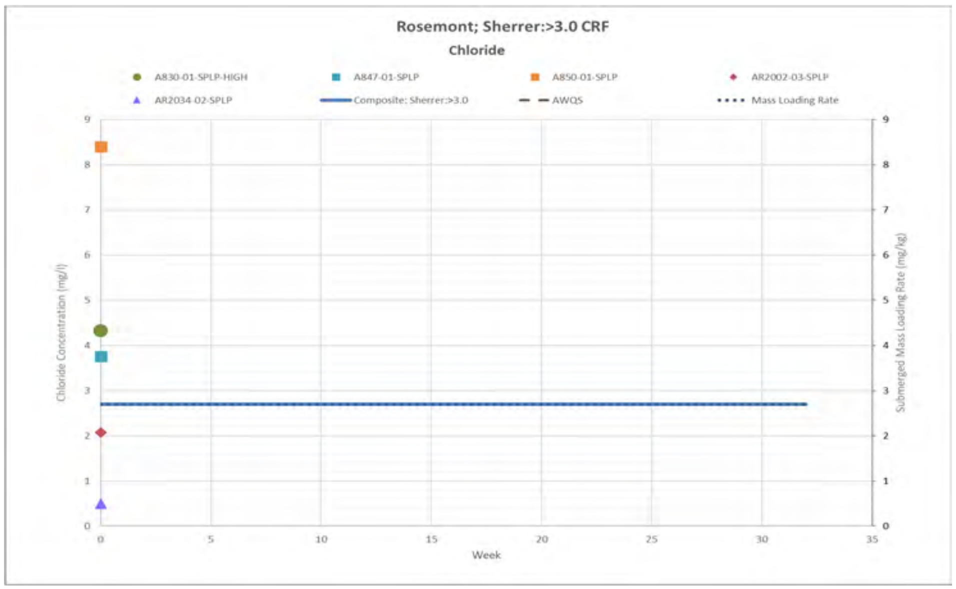


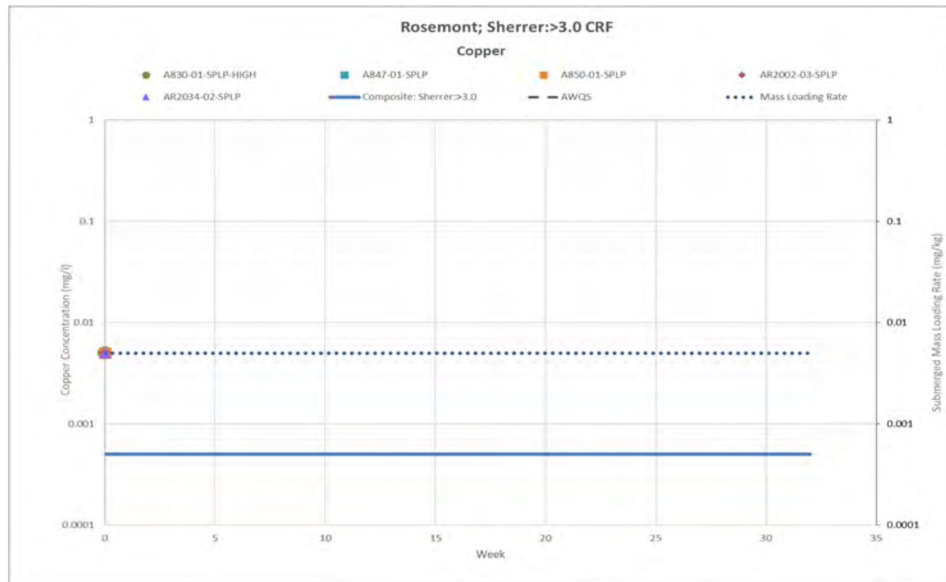


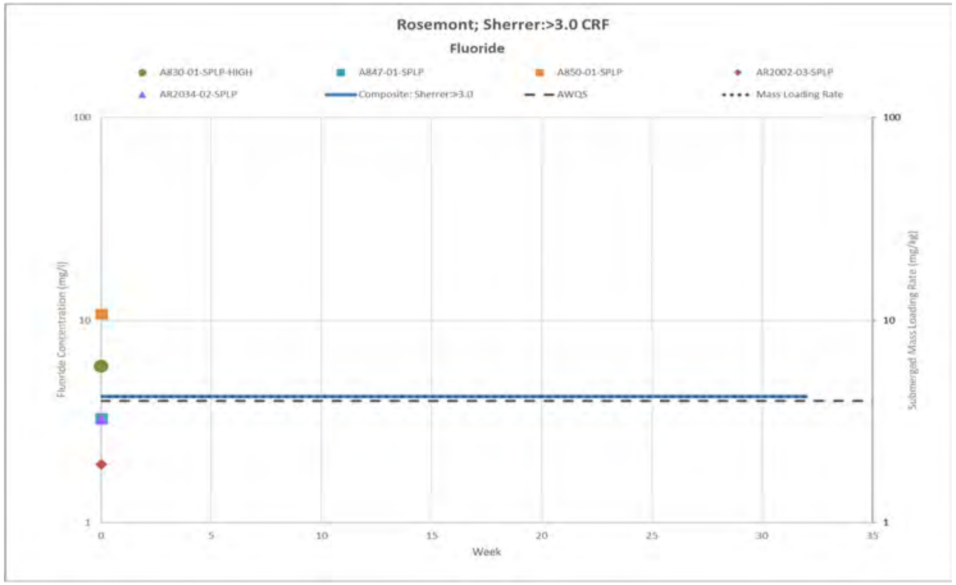


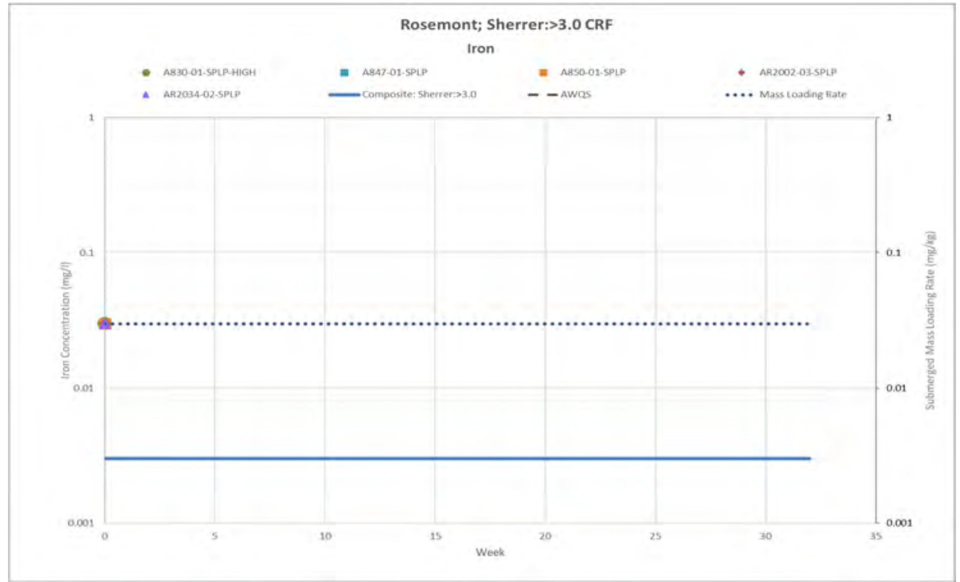

Rosemont; Sherrer:>3.0 CRF
Cadmium
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer>3.0
AWQS
Mass Loading Rate
Cadmium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

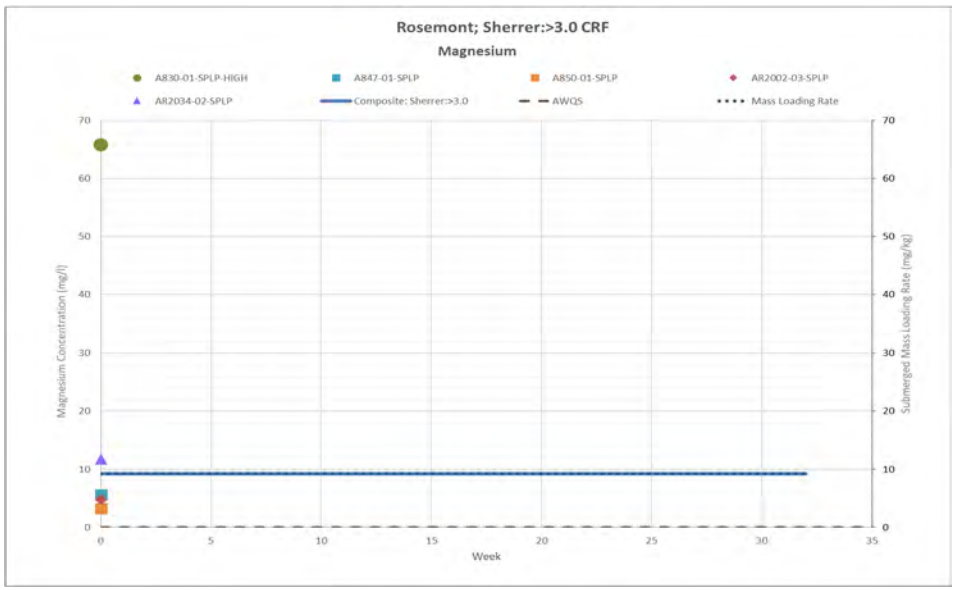

Rosemont; Sherrer:>3.0 CRF
Calcium
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer>3.0
AWQS
Mass Loading Rate
Calcium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

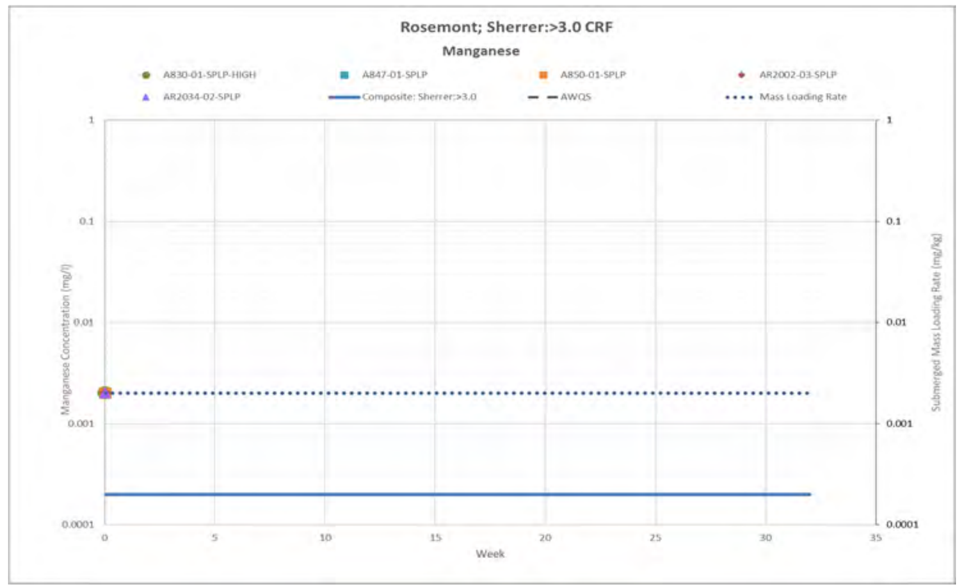

Rosemont; Sherrer:>3.0 CRF
Chloride
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer>3.0
AWQS
Mass Loading Rate
Chloride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

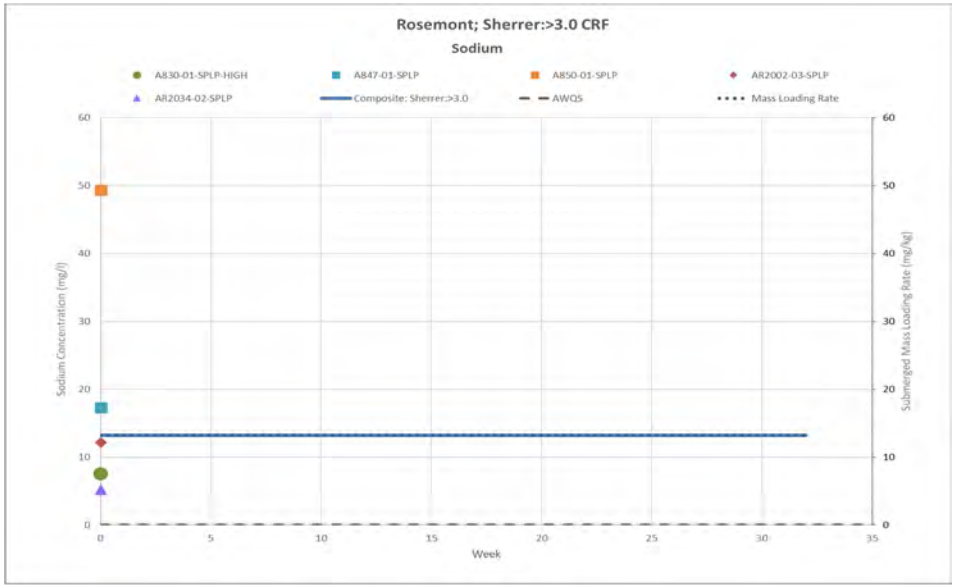

Rosemont; Sherrer:>3.0 CRF
Copper
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer>3.0
AWQS
Mass Loading Rate
Copper Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

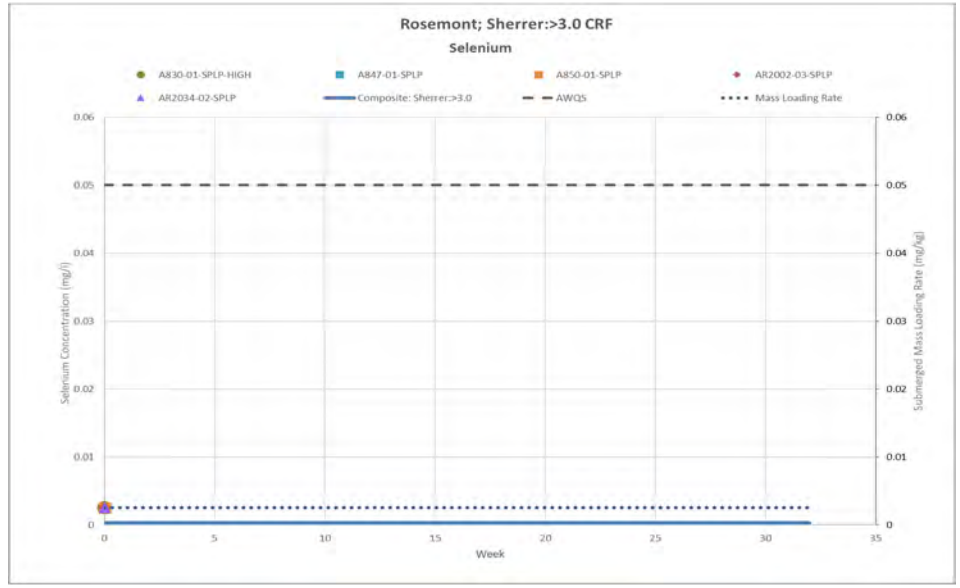

Rosemont; Sherrer:>3.0 CRF
Fluoride
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer>3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

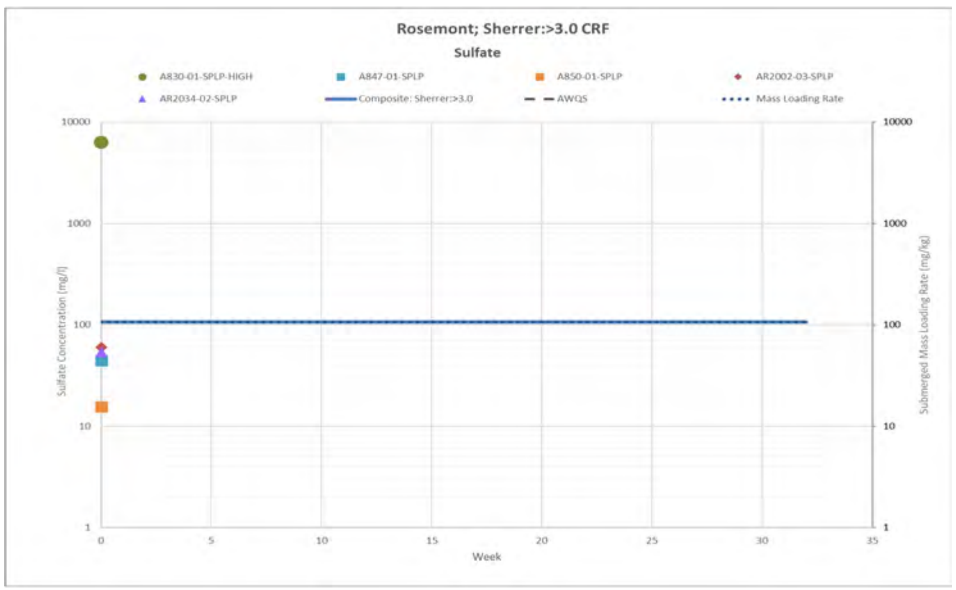

Rosemont; Sherrer:>3.0 CRF
Iron
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer>3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

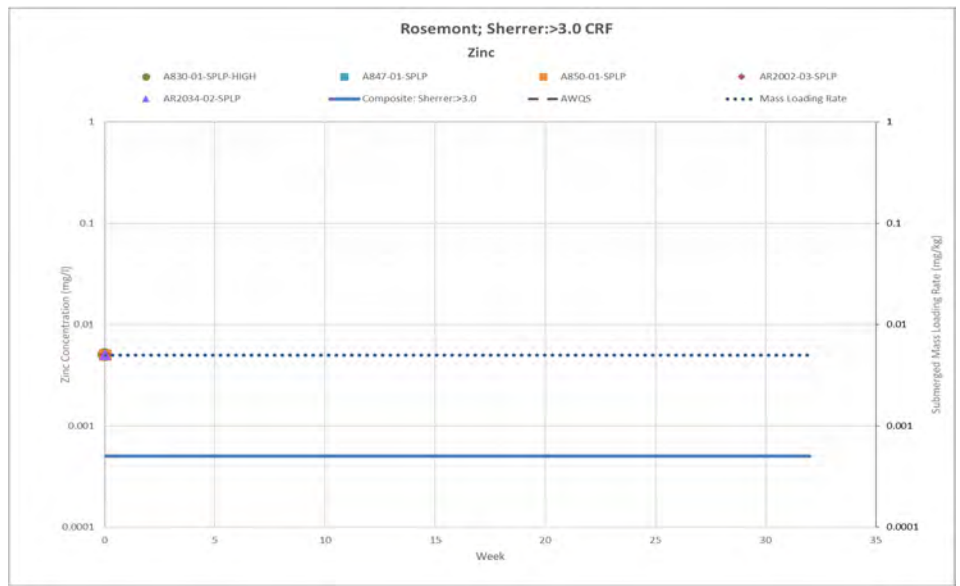

Rosemont; Sherrer:>3.0 CRF
Magnesium
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer>3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

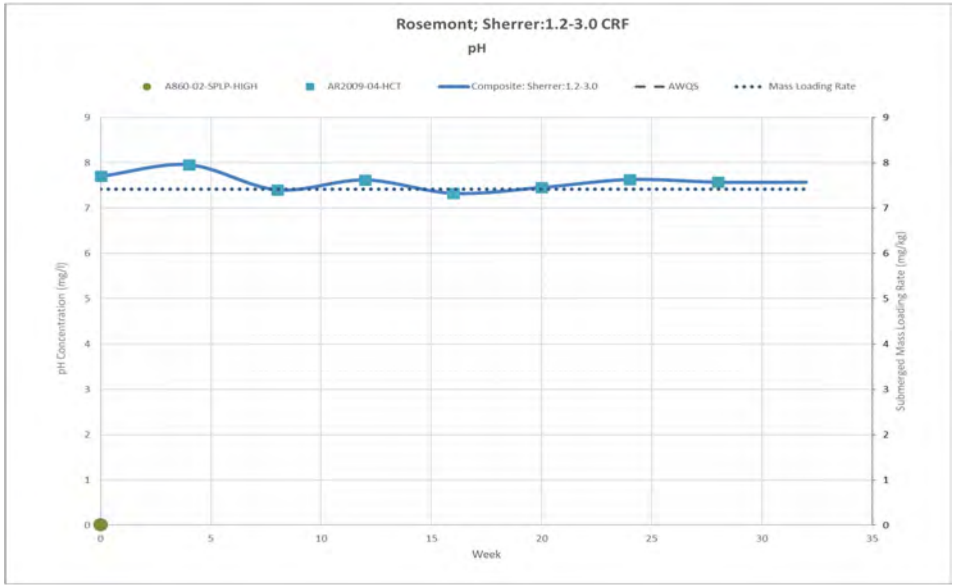

Rosemont; Sherrer:>3.0 CRF
Manganese
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer>3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

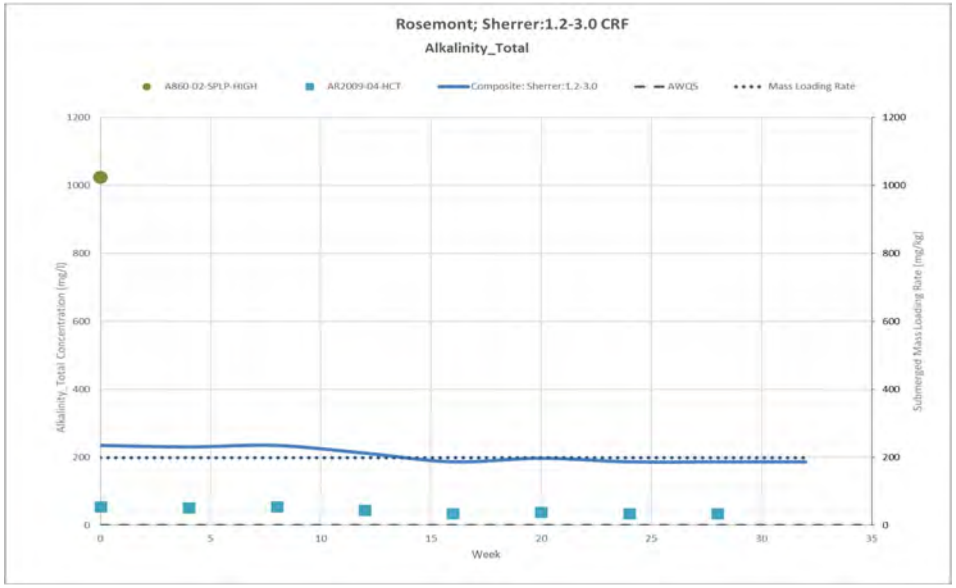

Rosemont; Sherrer:>3.0 CRF
Sodium
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer:>3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

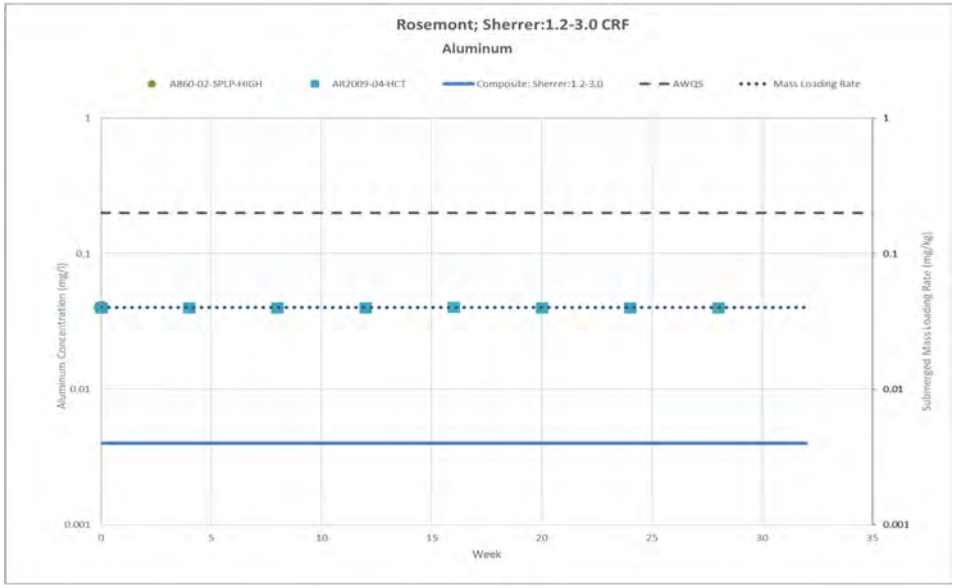

Rosemont; Sherrer:>3.0 CRF
Selenium
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer:>3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

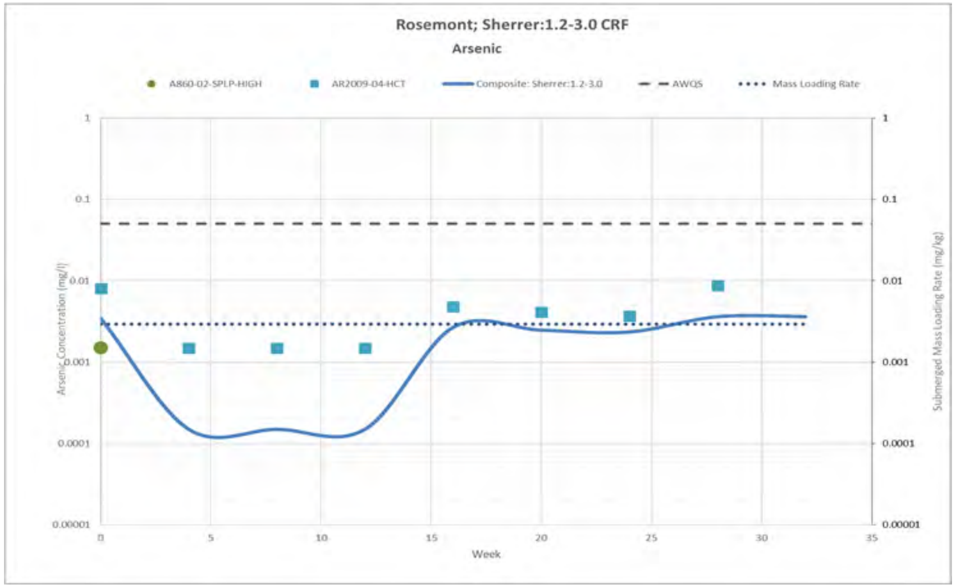

Rosemont; Sherrer:>3.0 CRF
Sulfate
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer:>3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Sherrer:>3.0 CRF
Zinc
A830-01-SPLP-HIGH
A847-01-SPLP
A850-01-SPLP
AR2002-03-SPLP
AR2034-02-SPLP
Composite: Sherrer:>3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

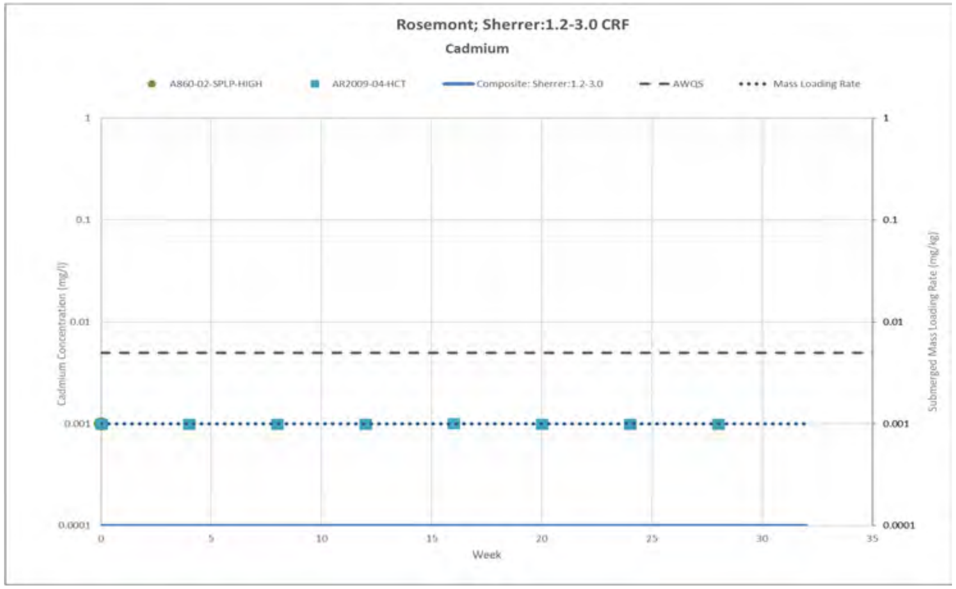

Rosemont; Sherrer:1.2-3.0 CRF
pH
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
pH Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

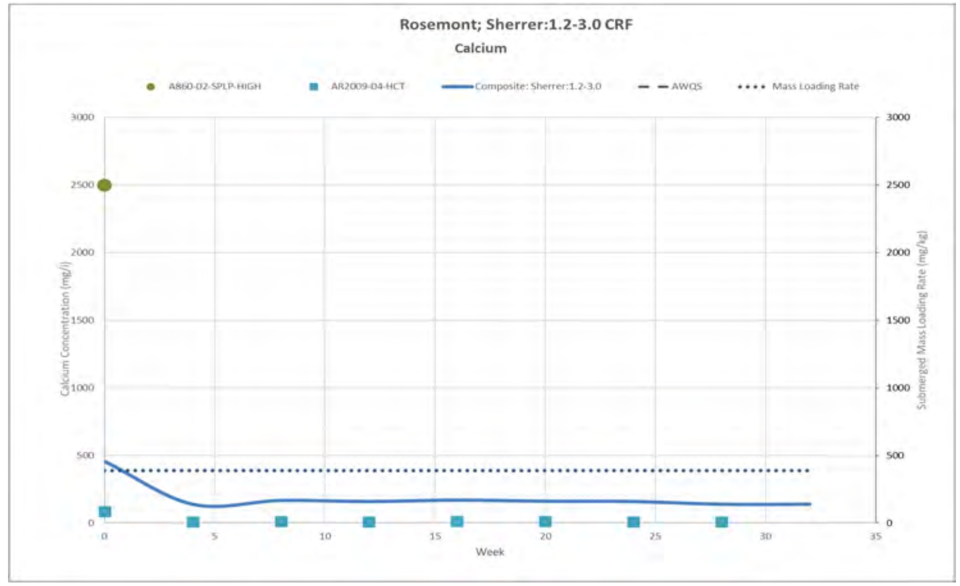

Rosemont; Sherrer:1.2-3.0 CRF
Alkalinity_Total
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Alkalinity_Total Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

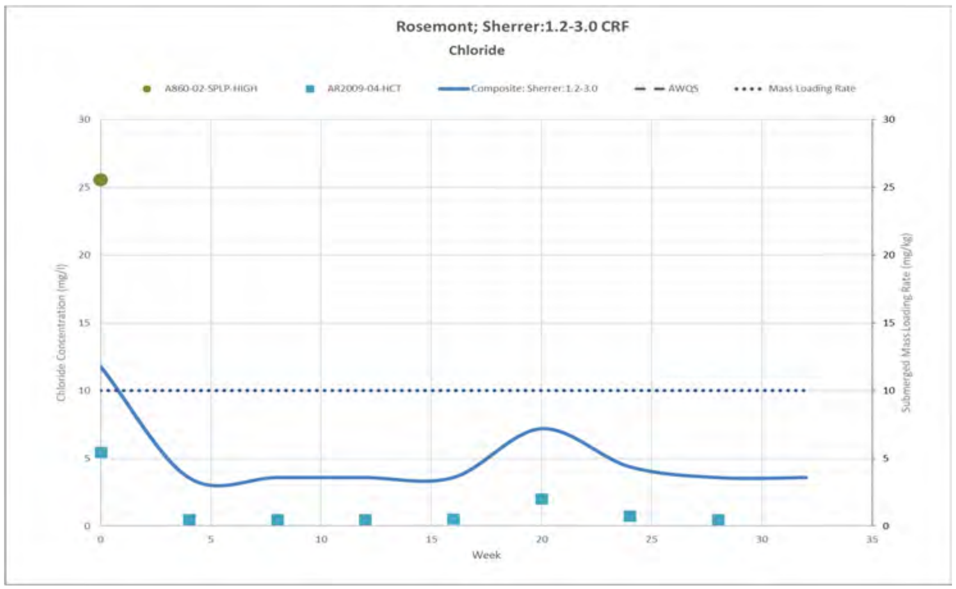

Rosemont; Sherrer:1.2-3.0 CRF
Aluminum
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Aluminum Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

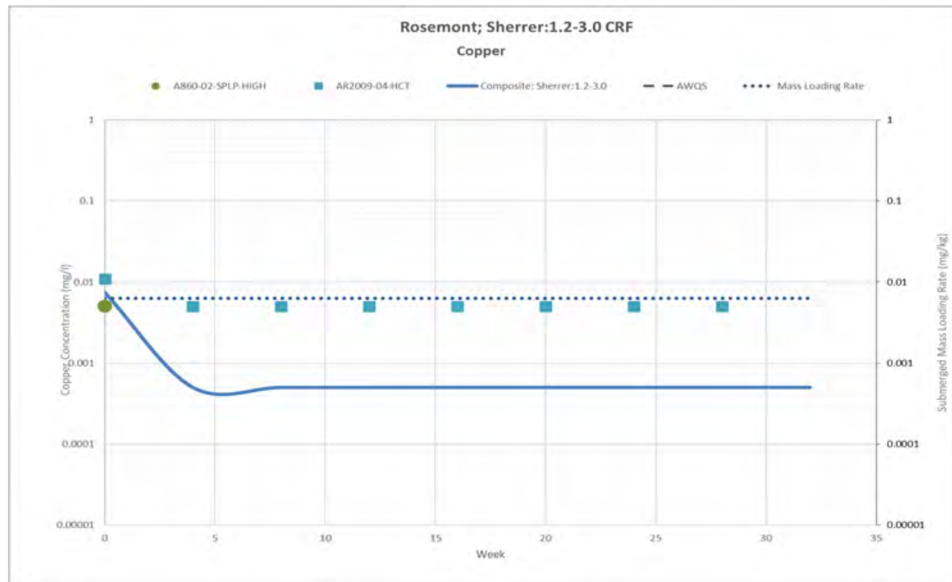

Rosemont; Sherrer:1.2-3.0 CRF
Arsenic
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Arsenic Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

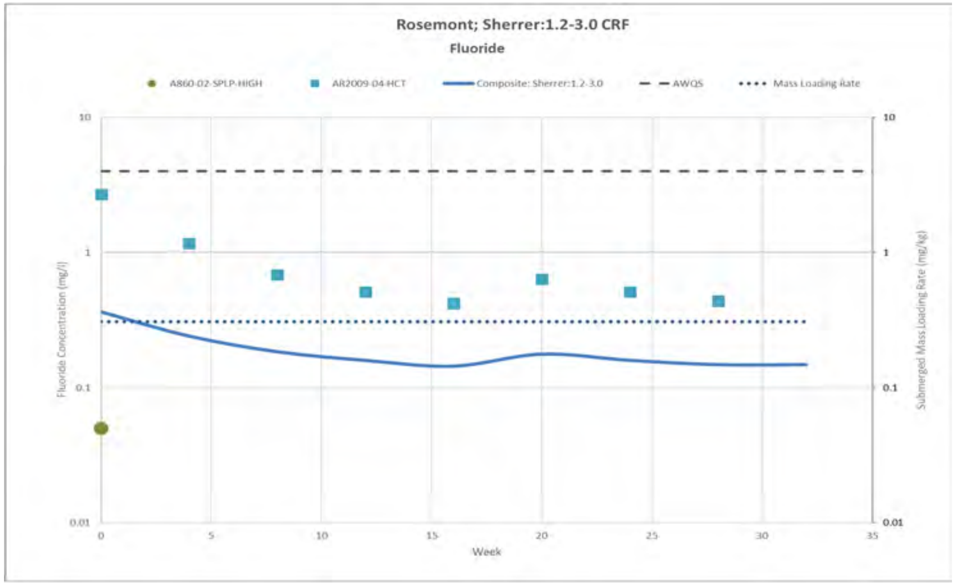
Appendix - H
Composite CRF Charts

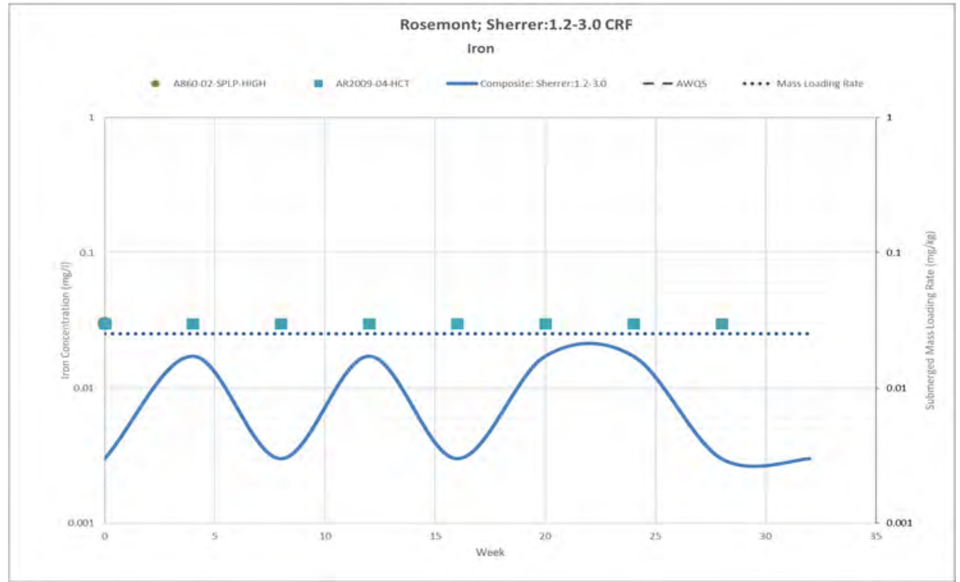


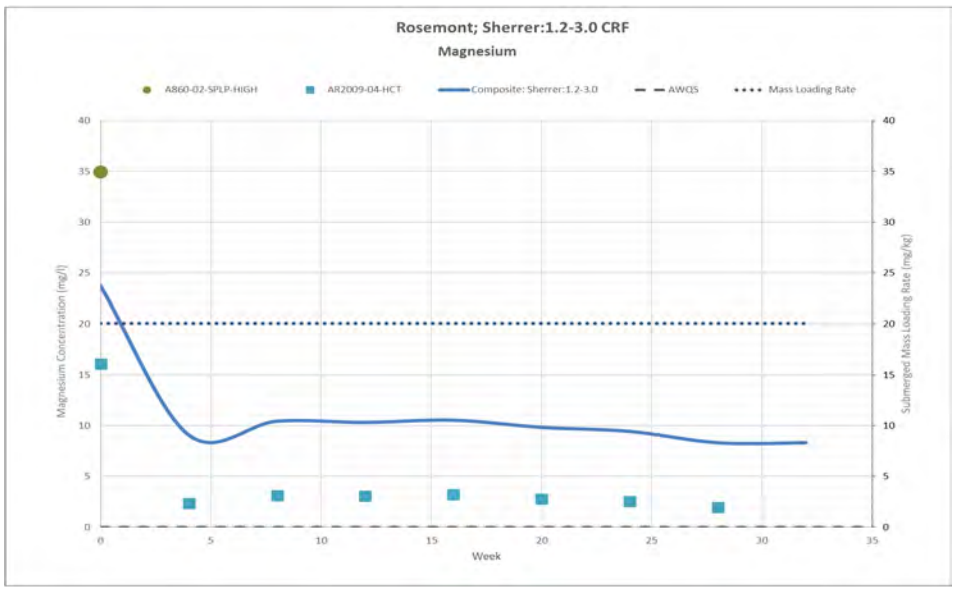


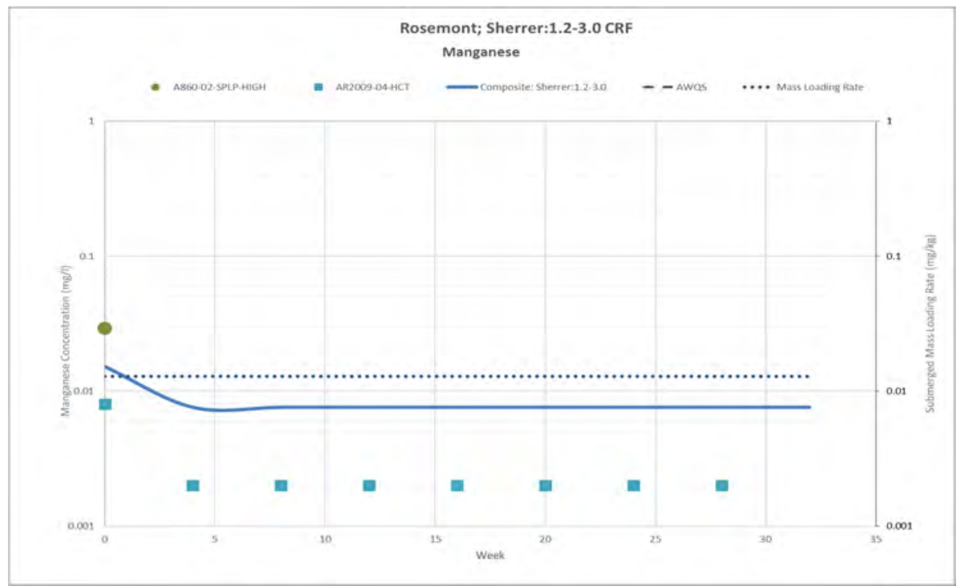


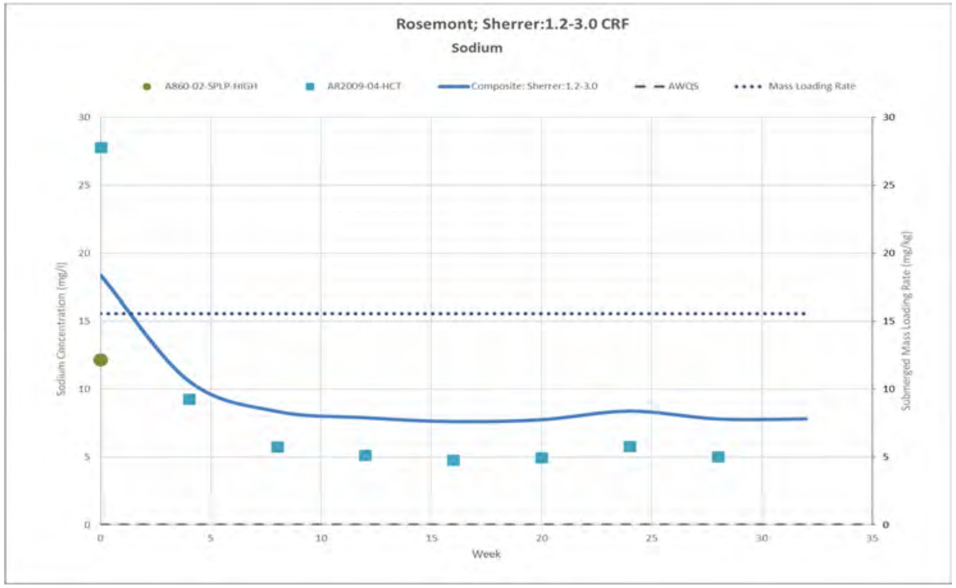


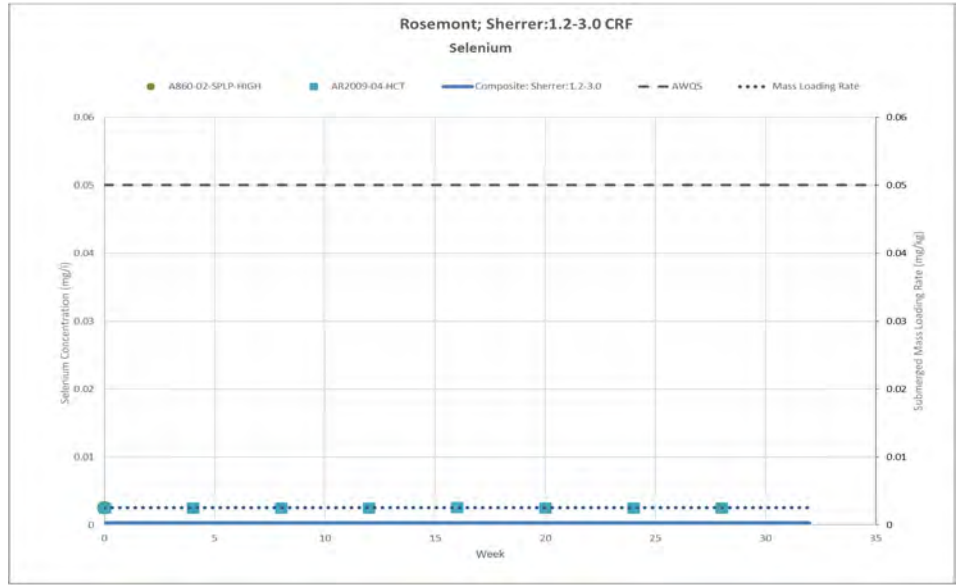

Rosemont; Sherrer:1.2-3.0 CRF
Fluoride
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Fluoride Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

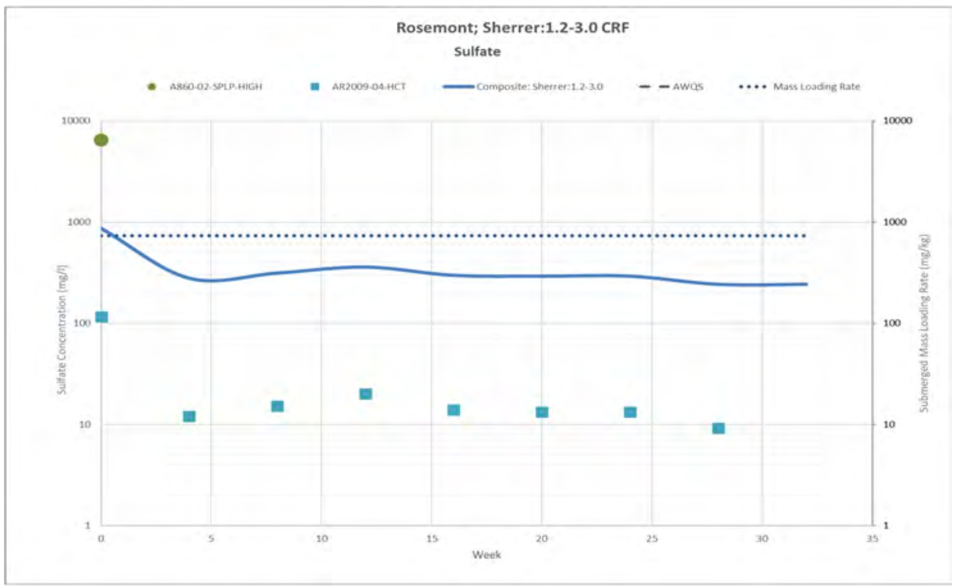

Rosemont; Sherrer:1.2-3.0 CRF
Iron
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Iron Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

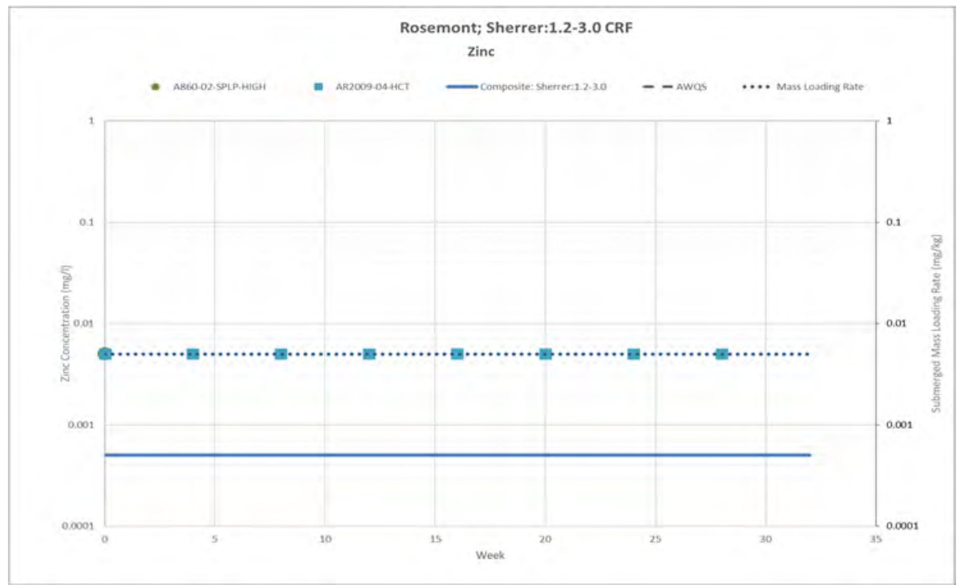

Rosemont; Sherrer:1.2-3.0 CRF
Magnesium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Magnesium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Sherrer:1.2-3.0 CRF
Manganese
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Manganese Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Sherrer:1.2-3.0 CRF
Sodium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Sodium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Sherrer:1.2-3.0 CRF
Selenium
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Selenium Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Sherrer:1.2-3.0 CRF
Sulfate
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Sulfate Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week


Rosemont; Sherrer:1.2-3.0 CRF
Zinc
A860-02-SPLP-HIGH
AR2009-04-HCT
Composite: Sherrer:1.2-3.0
AWQS
Mass Loading Rate
Zinc Concentration (mg/l)
Submerged Mass Loading Rate (mg/kg)
Week

APPENDIX I
Groundwater chemistry

Parameter	Units	EPA I/II	AWQS	GH2021-01	GH2021-01	GH2021-01	GH2021-07	GH2021-07	GH2021-07	GH2021-10	GH2021-10	GH2021-10	GH2021-11	GH2021-11	GH2021-11	GH2021-17	GH2021-22	GH2021-22	GH2021-22
Date				10/6/2021	11/2/2021	12/3/2021	10/7/2021	11/2/2021	12/3/2021	10/12/2021	11/2/2021	12/3/2021	10/7/2021	11/2/2021	12/3/2021	12/15/2021	10/7/2021	11/2/2021	12/2/2021
Alkalinity, Bicarbonate	mg/L	-	-	210	190	190	180	170	170	2600	250	270	210	200	200	170	140	130	140
Alkalinity, Carbonate	mg/L	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Alkalinity, Total	mg/L	-	-	210	190	190	180	170	170	2600	250	270	210	200	200	170	140	130	140
Aluminum, Dissolved	mg/L	-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Antimony, Dissolved	mg/L	0.006	0.006	0.0011	<0.0005	<0.0005	0.001	0.001	0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic, Dissolved	mg/L	0.01	0.05	0.0071	0.0032	0.0041	0.012	0.013	0.014	0.0016	0.00085	0.00062	0.00055	0.00063	0.00061	0.0013	0.0008	0.00069	0.0006
Barium, Dissolved	mg/L	2	2	0.04	0.042	0.037	0.011	0.011	0.01	0.74	0.081	0.088	0.1	0.1	0.1	0.17	0.07	0.066	0.075
Beryllium, Dissolved	mg/L	0.004	0.004	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Boron, Dissolved	mg/L	-	-	0.6	0.58	0.62	0.53	0.56	0.58	0.19	0.088	0.091	0.051	0.055	0.058	0.12	0.087	0.091	0.095
Cadmium, Dissolved	mg/L	0.005	0.005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Calcium, Dissolved	mg/L	-	-	190	170	190	110	100	100	78	83	83	54	52	52	54	55	48	51
Chloride	mg/L	250	-	39	29	30	42	31	28	26	27	25	19	17	17	14	12	13	14
Chromium, Dissolved	mg/L	0.1	0.1	<0.03	<0.0005	0.00096	<0.03	<0.0005	<0.0005	<0.03	<0.0005	<0.0005	<0.03	<0.0005	<0.0005	<0.0005	<0.03	<0.0005	<0.0005
Cobalt, Dissolved	mg/L	-	-	0.00046	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	0.00056	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025
Copper, Dissolved	mg/L	1.3	-	0.00055	<0.0005	0.0075	<0.0005	0.00074	0.0027	0.00069	0.0012	0.0019	<0.0005	0.0005	0.00064	0.0085	<0.0005	<0.0005	0.016
Fluoride	mg/L	4	4	1.8	1.8	1.9	1.2	1.3	1.3	1.4	1.6	1.7	2.6	2.6	2.8	1.7	1.2	1.5	1.8
Iron, Dissolved	mg/L	0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Lead, Dissolved	mg/L	0.015	0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Magnesium, Dissolved	mg/L	-	-	58	54	59	19	19	20	21	21	21	9.8	9.5	9.9	9.6	9.6	8.3	7.9
Manganese, Dissolved	mg/L	0.05	-	0.64	0.98	0.81	0.0044	0.0028	0.0034	0.38	0.32	0.5	0.25	0.25	0.24	0.5	0.08	0.074	0.12
Mercury, Dissolved	mg/L	0.002	0.002	0.000057	0.000057	0.000063	0.000053	0.000053	0.00007	0.00011	<0.000041	0.000071	0.000041	0.000041	0.000058	0.000096	0.00009	0.00009	0.000053
Molybdenum, Dissolved	mg/L	-	-	0.24	0.21	0.21	0.15	0.14	0.13	0.098	0.038	0.01	0.21	0.2	0.2	0.19	0.17	0.14	0.14
Nickel, Dissolved	mg/L	-	0.1	0.002	0.0012	0.0015	0.00054	<0.0005	0.00067	0.0049	<0.0005	0.0015	0.00073	<0.0005	<0.0005	0.0046	0.00054	<0.0005	0.00059
Nitrate and Nitrite Sum	mg/L	10	10	<0.1	<0.1	<0.1	2.6	2.9	3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrogen, Nitrate (As N)	mg/L	10	10	<0.5	<0.5	<0.5	2.6	2.9	3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrogen, Nitrite (As N)	mg/L	1	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus, Dissolved	mg/L	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Potassium, Dissolved	mg/L	-	-	<5	<5	<5	<5	<5	<5	5.3	<5	<5	<5	<5	<5	<5	<5	<5	<5
Selenium, Dissolved	mg/L	0.05	0.05	0.0057	0.0017	0.0029	0.0059	0.0065	0.0069	0.001	0.00063	0.00089	<0.00025	0.00028	0.00038	0.0012	<0.00025	0.00034	0.00037
Silica, Dissolved	mg/L	-	-	69	63	60	63	60	58	25	29	29	23	23	22	21	16	16	18
Silver, Dissolved	mg/L	0.1	-	<0.000021	0.000029	0.00019	<0.000021	0.00006	0.0013	<0.000021	0.000074	0.000023	0.000042	0.00016	0.00026	<0.000021	<0.000021	0.00018	<0.000021
Sodium, Dissolved	mg/L	-	-	39	41	39	21	20	20	61	57	58	35	34	34	42	35	37	39
Sulfate	mg/L	250	-	570	540	540	220	170	170	110	110	150	38	33	30	85	120	110	110
Thallium, Dissolved	mg/L	0.002	0.002	<0.000023	<0.000023	<0.000023	0.000025	<0.000023	<0.000023	<0.000023	0.000026	<0.000023	<0.000023	<0.000023	<0.000023	<0.000023	<0.000023	<0.000023	<0.000023
Uranium, Dissolved	mg/L	0.03	-	0.015	0.0099	0.011	0.0042	0.0045	0.0045	0.0032	0.0021	0.0031	0.052	0.045	0.042	0.02	0.0037	0.0062	0.0081
Zinc, Dissolved	mg/L	5	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.08	<0.04	<0.04	<0.04
Anion	meq/L	-	-	19.1	17.6	18.1	11.3	9.67	9.64	55.8	9.73	10.2	6.3	5.91	5.88	6.21	6.12	5.76	5.82
Cation	meq/L	-	-	16	14.7	16.1	7.97	7.42	7.51	8.42	8.36	8.41	5.03	4.87	4.9	5.33	5.06	4.69	4.9
Error	%	-	-	8.85	8.86	6.07	17.2	13.1	12.5	73.8	7.57	9.41	11.1	9.69	9.14	7.57	9.49	10.2	8.58
pH (pH Units)	pH	6.5-8.5	-	7.5	7.5	7.3	7.7	7.7	7.6	7.1	7.7	7.5	7.5	7.5	7.4	8	8.1	7.9	7.9
TDS	mg/L	500	-	1100	1100	1100	550	540	560	510	590	590	300	290	290	360	330	320	320

Indicates AWQS Exceedance

Parameter	Units	EPA I/II	AWQS	GH2021-25	GH2021-25	GH2021-25	HC-1A	HC-1B	HC-1B	HC-1B	HC-1B	HC-1B	HC-2A	HC-2B	HC-3A	HC-3B	HC-3C	HC-4A	HC-4B
Date				10/10/2021	12/2/2021	11/4/2021	8/19/2008	8/15/2008	11/29/2008	12/8/2008	12/15/2008	12/18/2008	7/3/2008	7/8/2008	9/11/2008	9/4/2008	9/2/2008	7/22/2008	7/17/2008
Alkalinity, Bicarbonate	mg/L	-	-	220	210	200	298	238	259	243	251	253	211	239	290	276	179	361	273
Alkalinity, Carbonate	mg/L	-	-	<2	<2	<2	<2	2.4	<2	3.6	<2	<2	6.6	7.2	<2	5.4	4.2	<2	6.6
Alkalinity, Total	mg/L	-	-	220	210	200	244	200	212	205	206	207	184	208	238	236	154	296	235
Aluminum, Dissolved	mg/L	-	-	<0.04	<0.04	<0.04	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Antimony, Dissolved	mg/L	0.006	0.006	<0.0005	0.00084	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Arsenic, Dissolved	mg/L	0.01	0.05	0.007	0.0025	0.0027	0.0013	0.0021	0.0023	0.0014	0.0021	0.0014	0.002	0.0013	0.0103	0.003	0.0065	0.003	0.0006
Barium, Dissolved	mg/L	2	2	0.024	0.021	0.022	0.067	0.009	<0.003	0.005	<0.003	0.004	0.074	0.045	0.037	0.03	0.029	0.008	0.024
Beryllium, Dissolved	mg/L	0.004	0.004	<0.00025	<0.00025	<0.00025	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron, Dissolved	mg/L	-	-	0.044	0.05	0.047	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	mg/L	0.005	0.005	<0.00025	<0.00025	<0.00025	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, Dissolved	mg/L	-	-	46	46	45	62.1	48.5	52.1	55	54.1	57.7	33.3	33.8	91.1	76.1	43.8	73.1	28.6
Chloride	mg/L	250	-	11	9.7	9.9	12.5	15	12	12	12.2	12.2	23.5	12.1	20.3	18.7	7.2	10.7	12
Chromium, Dissolved	mg/L	0.1	0.1	<0.03	<0.0005	<0.0005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Cobalt, Dissolved	mg/L	-	-	<0.00025	<0.00025	<0.00025	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper, Dissolved	mg/L	1.3	-	0.0011	0.0062	0.0013	<0.01	0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Fluoride	mg/L	4	4	3	3.2	2.7	1.4	1.8	2.1	2	1.9	1.9	0.5	0.4	0.4	0.4	0.5	0.3	<1
Iron, Dissolved	mg/L	0.3	-	<0.3	<0.3	<0.3	0.21	0.06	<0.02	0.04	<0.02	<0.02	0.04	0.32	0.03	0.18	0.16	0.26	1.94
Lead, Dissolved	mg/L	0.015	0.05	<0.0005	<0.0005	<0.0005	0.0001	0.0002	0.0013	0.0008	0.0008	0.0007	0.0001	<0.0001	0.0005	0.0001	<0.0001	0.0002	<0.0001
Magnesium, Dissolved	mg/L	-	-	11	11	11	16	14.7	15.4	16.5	16.3	17.3	7.8	7	17.6	18.8	5.5	17	7.7
Manganese, Dissolved	mg/L	0.05	-	0.37	0.31	0.31	0.021	0.033	0.006	0.037	<0.005	0.006	0.061	0.08	0.006	0.287	0.032	0.03	0.097
Mercury, Dissolved	mg/L	0.002	0.002	<0.000041	0.000084	<0.000041	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum, Dissolved	mg/L	-	-	0.23	0.21	0.21	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.03	0.03	0.05	0.1	<0.01	0.02
Nickel, Dissolved	mg/L	-	0.1	<0.0005	<0.0005	<0.0005	0.02	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.03	<0.01	0.01	0.01	<0.01	<0.01
Nitrate and Nitrite Sum	mg/L	10	10	<0.1	<0.1	<0.1	0.67	0.31	0.31	0.36	0.41	0.44	0.77	0.38	0.16	0.11	0.11	0.7	<0.02
Nitrogen, Nitrate (As N)	mg/L	10	10	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrite (As N)	mg/L	1	1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus, Dissolved	mg/L	-	-	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium, Dissolved	mg/L	-	-	<5	<5	<5	1.7	1.6	1.8	1.6	1.5	1.7	1.3	2.3	2	2.5	2.4	1.5	2.9
Selenium, Dissolved	mg/L	0.05	0.05	0.00088	<0.00025	0.00031	0.0002	0.0003	0.0002	0.0003	<0.0001	0.0003	0.0003	0.0003	0.0015	0.0009	0.0009	0.0006	<0.0001
Silica, Dissolved	mg/L	-	-	29	31	30	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver, Dissolved	mg/L	0.1	-	<0.000021	<0.000021	<0.000021	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	mg/L	-	-	47	43	41	27.3	35.6	24.4	25.2	24.3	27	73.2	81.9	18.5	34.1	67.9	41.3	82.7
Sulfate	mg/L	250	-	50	43	43	6.4	16.4	6.4	6	7.1	7.7	43.2	47.5	51.3	55.8	90.1	8.3	16
Thallium, Dissolved	mg/L	0.002	0.002	<0.000023	<0.000023	<0.000023	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Uranium, Dissolved	mg/L	0.03	-	0.0045	0.0057	0.0043	0.005	0.0055	0.0045	0.0042	0.0044	0.0047	0.0031	0.0189	0.0041	0.0318	0.0349	0.0029	0.0015
Zinc, Dissolved	mg/L	5	-	<0.04	<0.04	<0.04	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	0.03	<0.01	0.01	0.03	<0.01
Anion	meq/L	-	-	6.7	6.35	6.11	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation	meq/L	-	-	5.26	5.08	4.95	-	-	-	-	-	-	-	-	-	-	-	-	-
Error	%	-	-	12	11.1	10.5	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (pH Units)	pH	6.5-8.5	-	7.6	7.4	7.5	7.54	7.76	7.22	7.3	7.29	7.3	7.66	7.57	7.12	7.4	7.65	7.22	8.08
TDS	mg/L	500	-	330	310	310	290	280	260	270	260	240	320	320	360	360	330	340	300

Indicates AWQS Exceedance

Parameter	Units	EPA I/II	AWQS	HC-5A	HC-5A	HC-5A	HC-5A	HC-5A	HC-5B	PC-1	PC-2	PC-2	PC-2	PC-3	PC-4	PC-5	PC-5	PC-5	PC-5
Date				6/18/2008	11/29/2008	12/8/2008	12/15/2008	12/18/2008	6/24/2008	5/25/2007	5/16/2007	4/21/2008	7/25/2008	6/1/2007	5/18/2007	10/21/2008	10/23/2008	12/8/2008	12/15/2008
Alkalinity, Bicarbonate	mg/L	-	-	257	267	251	250	250	98.8	212	194	168	165	123	264	214	40.3	204	209
Alkalinity, Carbonate	mg/L	-	-	<2	<2	<2	<2	<2	4.2	<2	<2	<2	6	<2	<2	<2	<2	3	<2
Alkalinity, Total	mg/L	-	-	211	219	207	205	205	88	175	159	138	144	101	216	175	33	172	171
Aluminum, Dissolved	mg/L	-	-	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	-	-	<0.03	0.04	<0.03	<0.03	<0.03	<0.03
Antimony, Dissolved	mg/L	0.006	0.006	0.0004	<0.0004	<0.0004	<0.0004	0.0004	<0.0004	<0.0004	0.0009	-	-	<0.0004	0.0005	<0.0004	0.001	<0.0004	<0.0004
Arsenic, Dissolved	mg/L	0.01	0.05	0.0151	0.0184	0.0145	0.0171	0.016	<0.0005	0.0028	0.0154	-	-	0.0038	0.0023	0.004	0.0017	0.0051	0.0062
Barium, Dissolved	mg/L	2	2	0.013	0.009	0.01	0.006	0.014	0.021	0.015	0.01	-	-	0.058	0.183	0.01	0.03	0.008	0.003
Beryllium, Dissolved	mg/L	0.004	0.004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron, Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	mg/L	0.005	0.005	0.0008	0.0009	0.001	0.001	0.001	<0.0001	0.0002	0.0002	-	-	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Calcium, Dissolved	mg/L	-	-	124	119	127	124	131	85.2	82.2	87	72.5	68.2	192	59.6	72	162	75.5	72.7
Chloride	mg/L	250	-	16.8	13	12.4	12.6	12.6	60	8	11	22	6.9	5	12	7.5	17	7.4	7.6
Chromium, Dissolved	mg/L	0.1	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, Dissolved	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper, Dissolved	mg/L	1.3	-	<0.01	<0.01	0.01	0.03	0.02	<0.01	<0.01	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	0.02	0.04
Fluoride	mg/L	4	4	1.4	1.6	1.5	1.4	1.2	3	0.8	1.2	1.5	<2	1.2	0.4	0.7	1	0.8	0.8
Iron, Dissolved	mg/L	0.3	-	0.04	<0.02	<0.02	<0.02	<0.02	2.43	<0.02	<0.02	-	-	0.43	0.96	0.15	0.21	<0.02	<0.02
Lead, Dissolved	mg/L	0.015	0.05	0.0009	0.0022	0.0007	0.0008	0.0008	0.0003	0.0002	0.0001	-	-	0.0001	0.0002	<0.0001	<0.0001	0.0009	0.0012
Magnesium, Dissolved	mg/L	-	-	31.4	30.3	32.8	32.4	34.5	21.9	9.5	20.6	20.3	19.1	33.4	17.9	10.7	15.9	11.1	10.5
Manganese, Dissolved	mg/L	0.05	-	0.013	<0.005	0.006	<0.005	<0.005	0.211	0.046	0.053	-	-	0.671	0.565	0.007	0.114	0.007	<0.005
Mercury, Dissolved	mg/L	0.002	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum, Dissolved	mg/L	-	-	0.07	0.08	0.08	0.09	0.08	0.02	0.03	0.13	-	-	0.13	0.03	0.07	0.63	0.05	0.08
Nickel, Dissolved	mg/L	-	0.1	0.02	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01	<0.01	0.01	<0.01	<0.01	0.01
Nitrate and Nitrite Sum	mg/L	10	10	0.48	0.48	0.38	0.39	0.41	<0.02	0.69	0.38	0.38	<0.02	0.09	0.63	0.48	0.03	0.54	0.55
Nitrogen, Nitrate (As N)	mg/L	10	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrite (As N)	mg/L	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus, Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium, Dissolved	mg/L	-	-	2.3	2.4	2.3	2.4	2.7	2.7	1.9	2.6	2.2	2.2	5	4.1	1.6	3.8	1.6	1.6
Selenium, Dissolved	mg/L	0.05	0.05	0.0015	0.0013	0.0016	0.001	0.0016	0.0001	0.0018	0.0044	-	-	0.0006	0.0006	0.0014	0.0019	0.0018	0.0011
Silica, Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver, Dissolved	mg/L	0.1	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	mg/L	-	-	18	16	16.9	16.1	17.8	360	10.7	20.3	12	12.1	56.3	32.9	6.4	186	7.6	6.5
Sulfate	mg/L	250	-	190	223	195	208	206	850	30	170	110	109	610	50	42.2	824	37	38.1
Thallium, Dissolved	mg/L	0.002	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Uranium, Dissolved	mg/L	0.03	-	0.0029	0.0023	0.0022	0.0024	0.0027	<0.0001	0.0016	0.004	-	-	0.0159	0.0064	0.0016	0.0092	0.0012	0.0013
Zinc, Dissolved	mg/L	5	-	0.02	<0.01	0.02	0.02	<0.01	0.01	0.35	0.39	-	0.01	0.56	0.61	<0.01	<0.01	<0.01	<0.01
Anion	meq/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation	meq/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Error	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (pH Units)	pH	6.5-8.5	-	7.17	7.1	7.06	7.04	7.04	8.3	7.75	7.72	8.96	8.28	7.66	7.76	7.32	8.33	7.24	7.26
TDS	mg/L	500	-	610	560	600	580	580	1480	300	410	350	350	1040	320	260	1240	270	270

Indicates AWQS Exceedance

Parameter	Units	EPA I/II	AWQS	PC-5	PC-5	PC-6	PC-6	PC-6	PC-6	PC-7	PC-7	PC-7	PC-7	PC-8	PC-8	PC-8	Pit2021-08	RNW-HB-091	RNW-HB-091
Date				12/18/2008	10/21/2008	10/12/2008	10/13/2008	10/14/2008	10/16/2008	10/2/2008	10/3/2008	10/4/2008	10/7/2008	9/23/2008	9/25/2008	9/27/2008	12/1/2021	10/4/2021	12/2/2021
Alkalinity, Bicarbonate	mg/L	-	-	214	215	206	201	201	212	155	150	122	99	229	233	233	190	200	200
Alkalinity, Carbonate	mg/L	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Alkalinity, Total	mg/L	-	-	175	176	169	165	165	174	127	123	100	81	188	191	191	190	200	200
Aluminum, Dissolved	mg/L	-	-	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.15	<0.04	<0.04
Antimony, Dissolved	mg/L	0.006	0.006	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.001	<0.0005	0.00051
Arsenic, Dissolved	mg/L	0.01	0.05	0.0054	0.0032	0.0014	0.0009	0.0008	0.0008	0.0011	0.0014	0.0014	0.0011	0.0022	0.0018	0.0023	0.0073	<0.0005	<0.0005
Barium, Dissolved	mg/L	2	2	0.014	0.01	0.028	0.028	0.026	0.026	0.019	0.021	0.017	0.012	0.024	0.019	0.02	0.032	0.047	0.041
Beryllium, Dissolved	mg/L	0.004	0.004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00025	<0.00025	<0.00025
Boron, Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.029	0.094	0.11
Cadmium, Dissolved	mg/L	0.005	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00025	<0.00025	<0.00025
Calcium, Dissolved	mg/L	-	-	77.9	72.3	204	194	209	203	184	195	245	359	61.8	60.4	59.4	61	180	130
Chloride	mg/L	250	-	7.6	7.3	8.6	8.4	8	8.3	7	6.9	5.8	4.6	7.7	7.7	7.7	13	13	13
Chromium, Dissolved	mg/L	0.1	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0005	<0.03	<0.0005
Cobalt, Dissolved	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.00034	0.00053	<0.00025
Copper, Dissolved	mg/L	1.3	-	0.02	<0.01	<0.01	<0.01	0.02	<0.02	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.16	0.00098	0.0084
Fluoride	mg/L	4	4	0.8	0.8	0.7	0.7	<1	0.7	<1	0.9	0.9	0.9	0.6	0.6	0.6	1.3	1.9	2.3
Iron, Dissolved	mg/L	0.3	-	<0.02	0.33	0.84	0.5	1.12	1.37	0.52	0.4	0.51	1.2	0.06	0.11	0.03	<0.3	<0.3	2.2
Lead, Dissolved	mg/L	0.015	0.05	0.0006	<0.0001	0.0004	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0007	<0.0001	<0.0001	<0.0001	0.00062	<0.0005	<0.0005
Magnesium, Dissolved	mg/L	-	-	11.3	10.8	21.9	21.1	22.4	20.7	33	32.8	42.5	61.5	11.5	11.4	11.3	8.1	43	28
Manganese, Dissolved	mg/L	0.05	-	0.006	0.009	0.101	0.099	0.116	0.172	0.109	0.095	0.094	0.116	0.019	0.019	<0.005	0.038	0.59	0.32
Mercury, Dissolved	mg/L	0.002	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.000082	0.000047	0.000081
Molybdenum, Dissolved	mg/L	-	-	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.09	0.11	0.09	0.01	<0.01	<0.01	0.31	0.099	0.098
Nickel, Dissolved	mg/L	-	0.1	<0.01	<0.01	0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.001	0.0037	0.00077
Nitrate and Nitrite Sum	mg/L	10	10	0.57	0.48	0.65	0.65	0.65	0.61	0.37	0.37	0.28	0.21	1.79	1.79	0.37	0.78	<0.1	<0.1
Nitrogen, Nitrate (As N)	mg/L	10	10	-	-	-	-	-	-	-	-	-	-	-	-	-	0.78	<0.5	<0.5
Nitrogen, Nitrite (As N)	mg/L	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1
Phosphorus, Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5
Potassium, Dissolved	mg/L	-	-	1.8	1.6	3.5	3.1	3.2	3.4	3.2	3.6	4	4.8	2.1	2.2	2.2	<5	7.2	7.1
Selenium, Dissolved	mg/L	0.05	0.05	0.0017	0.0017	0.0018	0.0017	0.0013	0.0015	0.0041	0.0034	0.0055	0.0039	0.0019	0.0018	0.0017	0.0022	0.013	0.0014
Silica, Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	10	11
Silver, Dissolved	mg/L	0.1	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.000058	<0.000021	<0.000021
Sodium, Dissolved	mg/L	-	-	7.6	6.5	30.5	30	33.5	34	24.3	22	23.2	28.5	8.9	9	7.9	26	140	130
Sulfate	mg/L	250	-	38.5	34.2	441	425	444	457	447	513	710	1090	7	7.1	3.7	46	680	510
Thallium, Dissolved	mg/L	0.002	0.002	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.000023	0.000035	0.000029
Uranium, Dissolved	mg/L	0.03	-	0.0014	0.0013	0.0049	0.0046	0.0056	0.0038	0.0032	0.0027	0.0031	0.0031	0.0029	0.003	0.003	0.0032	0.0079	0.0045
Zinc, Dissolved	mg/L	5	-	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	0.01	0.02	0.05	0.07	0.07	0.16	<0.04	<0.04	<0.04
Anion	meq/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.51	18.9	15.4
Cation	meq/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.87	18.8	14.7
Error	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.5	0.26	2.25
pH (pH Units)	pH	6.5-8.5	-	7.27	7.32	7.4	6.89	7.27	7.3	7.44	7.41	7.31	7.57	7.32	7.28	7.32	7.9	7.5	7.5
TDS	mg/L	500	-	250	270	900	850	870	900	790	900	1150	1700	220	230	230	320	1300	970

Indicates AWQS Exceedance

Parameter	Units	EPA I/II	AWQS	RNW-HB-091	RNW-HB-108	RNW-HB-108	RNW-HB-108	RNW-HB-168	RP-2A	RP-2B	RP-2C	RP-3A	RP-3B	RP-3B	RP-3B	RP-4A	RP-4B	RP-5	RP-6
Date				11/4/2021	10/5/2021	12/2/2021	11/4/2021	12/15/2021	8/28/2008	8/26/2008	8/22/2008	7/15/2008	7/12/2008	11/29/2008	12/8/2008	7/1/2008	6/26/2008	7/24/2008	7/29/2008
Alkalinity, Bicarbonate	mg/L	-	-	200	280	260	270	170	223	309	278	224	217	234	220	183	176	250	266
Alkalinity, Carbonate	mg/L	-	-	<2	<2	<2	<2	<2	6	7.2	14.4	7.2	7.8	<2	6	5.4	7.8	6.6	10.2
Alkalinity, Total	mg/L	-	-	200	280	260	270	170	193	265	252	197	191	192	190	159	157	215	234
Aluminum, Dissolved	mg/L	-	-	<0.04	<0.04	<0.04	<0.04	<0.04	0.11	0.05	<0.3	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Antimony, Dissolved	mg/L	0.006	0.006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0031	0.0008	0.0006	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Arsenic, Dissolved	mg/L	0.01	0.05	<0.0005	0.0057	0.005	0.0062	0.0022	0.0266	0.0137	0.0052	0.005	0.0006	0.0008	<0.0005	0.0026	0.0012	0.0013	0.0029
Barium, Dissolved	mg/L	2	2	0.038	0.028	0.0072	0.017	0.076	0.009	0.053	0.041	0.095	0.113	0.11	0.116	0.021	0.021	0.074	0.111
Beryllium, Dissolved	mg/L	0.004	0.004	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron, Dissolved	mg/L	-	-	0.1	0.053	0.032	0.054	0.12	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	mg/L	0.005	0.005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, Dissolved	mg/L	-	-	150	66	120	62	55	15.6	45.5	8.8	53.7	31.6	31.3	32.8	35.3	12.8	65.7	67.2
Chloride	mg/L	250	-	14	16	20	14	9.6	40	17.4	15.6	23	17.1	16.6	16.4	8.4	46.9	13.1	13.1
Chromium, Dissolved	mg/L	0.1	0.1	<0.0005	<0.03	<0.0005	<0.0005	<0.0005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, Dissolved	mg/L	-	-	<0.00025	<0.00025	<0.00025	<0.00025	<0.00025	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper, Dissolved	mg/L	1.3	-	0.0025	0.0008	0.0048	0.0024	0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	4	4	2	2.4	3.1	2.5	1.5	1.5	0.3	0.3	0.4	0.2	0.3	0.3	0.3	1.3	0.1	0.6
Iron, Dissolved	mg/L	0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3	0.1	<0.02	0.03	<0.02	0.1	0.03	<0.02	0.02	0.28	0.34	<0.02
Lead, Dissolved	mg/L	0.015	0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0001	0.0001	0.0005	0.0003	0.002	0.0007	<0.0001	<0.0001	0.0002	0.0004
Magnesium, Dissolved	mg/L	-	-	34	21	37	22	7.1	3.3	15.8	1.8	9.3	4.6	4.2	4.7	6.9	2.6	7.8	11.3
Manganese, Dissolved	mg/L	0.05	-	0.29	0.079	0.085	0.074	0.1	0.036	0.074	0.059	0.006	0.017	0.013	0.043	0.042	0.086	0.05	<0.005
Mercury, Dissolved	mg/L	0.002	0.002	0.000047	0.000049	0.00008	0.000049	0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002
Molybdenum, Dissolved	mg/L	-	-	0.091	0.089	0.04	0.078	0.13	0.03	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.01
Nickel, Dissolved	mg/L	-	0.1	0.0008	0.0012	<0.0005	0.0012	0.0015	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Nitrate and Nitrite Sum	mg/L	10	10	<0.1	<0.1	<0.1	<0.1	<0.1	0.37	0.03	0.07	0.77	0.35	0.35	0.31	0.78	0.05	0.36	1.13
Nitrogen, Nitrate (As N)	mg/L	10	10	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrite (As N)	mg/L	1	1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
Phosphorus, Dissolved	mg/L	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-
Potassium, Dissolved	mg/L	-	-	7.1	<5	<5	<5	<5	1.1	1.2	0.8	1.1	1.1	1.1	0.8	0.8	1.5	1	1.5
Selenium, Dissolved	mg/L	0.05	0.05	0.0011	0.0013	0.0021	0.00046	<0.00025	0.0011	<0.0001	0.0002	0.0003	0.0002	0.0002	0.0003	<0.0001	0.0003	0.0002	0.0006
Silica, Dissolved	mg/L	-	-	11	26	29	29	22	-	-	-	-	-	-	-	-	-	-	-
Silver, Dissolved	mg/L	0.1	-	0.000025	<0.000021	0.00027	0.000084	0.00007	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	mg/L	-	-	130	91	38	75	40	157	109	150	39.3	64.9	61.3	62	34	156	35.4	46.9
Sulfate	mg/L	250	-	510	150	140	140	84	217	96.5	67.4	9.8	5.9	6.2	6	6.1	141	10	40.1
Thallium, Dissolved	mg/L	0.002	0.002	0.000035	<0.000023	<0.000023	0.00004	<0.000023	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Uranium, Dissolved	mg/L	0.03	-	0.004	0.018	0.041	0.016	0.0056	0.0145	0.0034	0.0261	0.0022	0.0155	0.0134	0.0117	0.0022	0.0086	0.0011	0.0033
Zinc, Dissolved	mg/L	5	-	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.01	<0.01	0.04	0.02	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Anion	meq/L	-	-	15.4	10.1	11.7	9.6	6.08	-	-	-	-	-	-	-	-	-	-	-
Cation	meq/L	-	-	15.7	8.98	14.7	8.62	5.07	-	-	-	-	-	-	-	-	-	-	-
Error	%	-	-	0.99	5.67	11.5	5.41	9.01	-	-	-	-	-	-	-	-	-	-	-
pH (pH Units)	pH	6.5-8.5	-	7.5	7.9	7.2	7.7	8	8.23	7.67	8.54	7.46	7.63	7.53	7.5	7.8	8.41	7.3	7.26
TDS	mg/L	500	-	1100	580	680	550	350	510	450	430	280	250	240	250	190	450	280	340

Indicates AWQS Exceedance

Parameter	Units	EPA I/II	AWQS	RP-6	RP-6	RP-6	RP-6	RP-7	RP-8	RP-9
Date				11/29/2008	12/8/2008	12/15/2008	12/18/2008	8/5/2008	8/7/2008	8/13/2008
Alkalinity, Bicarbonate	mg/L	-	-	289	266	271	271	379	322	189
Alkalinity, Carbonate	mg/L	-	-	<2	3.6	<2	<2	<2	<2	7.2
Alkalinity, Total	mg/L	-	-	237	224	222	222	311	264	167
Aluminum, Dissolved	mg/L	-	-	<0.03	<0.03	0.05	<0.03	<0.03	<0.03	<0.03
Antimony, Dissolved	mg/L	0.006	0.006	<0.0004	<0.0004	<0.0004	<0.0004	0.0016	<0.0004	<0.0004
Arsenic, Dissolved	mg/L	0.01	0.05	0.0026	0.0018	0.0023	0.0017	0.0063	0.0041	0.0104
Barium, Dissolved	mg/L	2	2	0.126	0.135	0.128	0.145	0.028	0.147	0.044
Beryllium, Dissolved	mg/L	0.004	0.004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron, Dissolved	mg/L	-	-	-	-	-	-	-	-	-
Cadmium, Dissolved	mg/L	0.005	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, Dissolved	mg/L	-	-	66.5	72.1	69.4	73.5	146	66.7	5.4
Chloride	mg/L	250	-	12.6	12.6	12.8	12.7	49	30.8	4.2
Chromium, Dissolved	mg/L	0.1	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, Dissolved	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Copper, Dissolved	mg/L	1.3	-	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	4	4	0.8	0.8	0.6	0.6	<1	0.6	0.3
Iron, Dissolved	mg/L	0.3	-	<0.02	0.03	<0.02	<0.02	0.12	<0.02	<0.02
Lead, Dissolved	mg/L	0.015	0.05	0.0023	0.0009	0.0011	0.0007	0.0005	0.0007	0.0003
Magnesium, Dissolved	mg/L	-	-	10.4	11.4	10.8	11.4	50	18.6	0.7
Manganese, Dissolved	mg/L	0.05	-	<0.005	0.021	<0.005	<0.005	0.152	<0.005	<0.005
Mercury, Dissolved	mg/L	0.002	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum, Dissolved	mg/L	-	-	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02
Nickel, Dissolved	mg/L	-	0.1	<0.01	<0.01	0.01	<0.01	0.01	<0.01	0.02
Nitrate and Nitrite Sum	mg/L	10	10	1.13	1.14	1.15	1.25	0.05	1.17	0.2
Nitrogen, Nitrate (As N)	mg/L	10	10	-	-	-	-	-	-	-
Nitrogen, Nitrite (As N)	mg/L	1	1	-	-	-	-	-	-	-
Phosphorus, Dissolved	mg/L	-	-	-	-	-	-	-	-	-
Potassium, Dissolved	mg/L	-	-	1.6	1.6	1.5	1.7	3.4	3.1	0.9
Selenium, Dissolved	mg/L	0.05	0.05	0.0006	0.0008	0.0002	0.0007	<0.0001	0.0006	0.0004
Silica, Dissolved	mg/L	-	-	-	-	-	-	-	-	-
Silver, Dissolved	mg/L	0.1	-	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	mg/L	-	-	38.9	41	39.9	44.2	165	53.2	90.2
Sulfate	mg/L	250	-	40	42	40	40	534	27.2	24.5
Thallium, Dissolved	mg/L	0.002	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Uranium, Dissolved	mg/L	0.03	-	0.0025	0.0023	0.0024	0.0027	0.007	0.0083	0.0211
Zinc, Dissolved	mg/L	5	-	<0.01	<0.01	<0.01	<0.01	0.06	0.01	<0.01
Anion	meq/L	-	-	-	-	-	-	-	-	-
Cation	meq/L	-	-	-	-	-	-	-	-	-
Error	%	-	-	-	-	-	-	-	-	-
pH (pH Units)	pH	6.5-8.5	-	7.05	7.29	7.29	7.29	7.29	7.12	8.83
TDS	mg/L	500	-	310	350	330	310	1140	370	250

Indicates AWQS Exceedance

APPENDIX J
Tabulated pit stage / lithology areas

Rosemont Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	ABRIGO:>3.0	ANDESITE:<1.2	ANDESITE:>3.0	ANDESITE:1.2-3.0	ARKOSE:<1.2	ARKOSE:>3.0
3650	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3700	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3750	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3800	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3850	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3900	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3950	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4050	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4100	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4150	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4200	0.00E+00	0.00E+00	6.73E+03	0.00E+00	0.00E+00	0.00E+00
4250	0.00E+00	0.00E+00	5.67E+04	0.00E+00	0.00E+00	0.00E+00
4300	0.00E+00	0.00E+00	1.45E+05	0.00E+00	0.00E+00	0.00E+00
4350	0.00E+00	0.00E+00	2.91E+05	0.00E+00	0.00E+00	0.00E+00
4400	0.00E+00	0.00E+00	4.14E+05	0.00E+00	0.00E+00	0.00E+00
4450	0.00E+00	4.86E+02	5.57E+05	6.38E+03	0.00E+00	0.00E+00
4500	0.00E+00	1.02E+04	7.86E+05	3.47E+04	0.00E+00	0.00E+00
4550	0.00E+00	1.15E+04	1.13E+06	6.85E+04	0.00E+00	0.00E+00
4600	0.00E+00	1.15E+04	1.50E+06	1.06E+05	0.00E+00	3.69E+03
4650	4.84E+03	1.15E+04	1.83E+06	1.46E+05	0.00E+00	4.25E+04
4700	2.16E+04	1.15E+04	2.19E+06	1.89E+05	0.00E+00	1.17E+05
4750	1.06E+05	2.03E+04	2.56E+06	2.36E+05	0.00E+00	2.27E+05
4800	1.14E+05	2.07E+04	2.91E+06	2.39E+05	0.00E+00	4.30E+05
4850	1.35E+05	2.07E+04	3.26E+06	2.40E+05	5.80E+01	6.57E+05
4900	1.46E+05	2.07E+04	3.60E+06	2.48E+05	3.59E+03	8.89E+05
4950	1.72E+05	2.07E+04	3.94E+06	2.67E+05	3.70E+03	1.16E+06
5000	2.08E+05	2.07E+04	4.28E+06	2.90E+05	3.70E+03	1.43E+06
5050	3.12E+05	2.07E+04	4.65E+06	2.96E+05	3.70E+03	1.71E+06
5100	3.77E+05	2.07E+04	4.98E+06	2.97E+05	3.70E+03	1.98E+06
5150	4.97E+05	2.07E+04	5.22E+06	2.97E+05	3.70E+03	2.14E+06
5200	5.65E+05	2.07E+04	5.55E+06	2.97E+05	3.70E+03	2.25E+06
5250	7.33E+05	2.07E+04	5.75E+06	2.97E+05	3.70E+03	2.30E+06
5300	8.69E+05	2.07E+04	5.92E+06	2.97E+05	3.70E+03	2.32E+06
5350	1.02E+06	2.07E+04	6.05E+06	2.97E+05	3.70E+03	2.32E+06
5400	1.09E+06	2.07E+04	6.14E+06	2.97E+05	3.70E+03	2.32E+06
5450	1.22E+06	2.07E+04	6.19E+06	2.97E+05	3.70E+03	2.32E+06
5500	1.29E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
5550	1.43E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
5600	1.48E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
5650	1.53E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
5700	1.55E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
5750	1.56E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
5800	1.56E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
5850	1.56E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
5900	1.56E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
5950	1.56E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
6000	1.56E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
6050	1.56E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
6100	1.56E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06
6150	1.56E+06	2.07E+04	6.22E+06	2.97E+05	3.70E+03	2.32E+06

Rosemont Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	ARKOSE:1.2-3.0	BOLSA:<1.2	BOLSA:>3.0	BOLSA:1.2-3.0	EARP:>3.0	EPITAPH:>3.0
3650	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3700	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3750	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E+04	0.00E+00
3800	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.63E+04	0.00E+00
3850	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.58E+05	1.87E+04
3900	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.54E+05	4.35E+04
3950	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.15E+05	1.84E+05
4000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.59E+05	2.57E+05
4050	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.06E+05	3.60E+05
4100	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.28E+05	4.03E+05
4150	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.97E+05	4.82E+05
4200	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.19E+05	5.22E+05
4250	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.48E+05	6.17E+05
4300	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.56E+05	6.70E+05
4350	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.69E+05	7.76E+05
4400	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.75E+05	8.32E+05
4450	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.88E+05	8.90E+05
4500	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.95E+05	8.93E+05
4550	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.06E+05	9.05E+05
4600	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.14E+05	9.24E+05
4650	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.42E+05	9.42E+05
4700	9.59E+02	0.00E+00	0.00E+00	0.00E+00	6.53E+05	9.46E+05
4750	3.69E+03	3.12E+04	9.84E+02	7.24E+02	6.77E+05	9.49E+05
4800	3.98E+03	4.92E+04	5.57E+03	6.35E+03	6.89E+05	9.52E+05
4850	9.77E+03	7.93E+04	2.09E+04	2.28E+04	7.13E+05	9.52E+05
4900	2.85E+04	9.52E+04	3.04E+04	4.19E+04	7.24E+05	9.52E+05
4950	4.19E+04	1.23E+05	7.85E+04	6.82E+04	7.48E+05	9.52E+05
5000	4.20E+04	1.39E+05	1.31E+05	6.89E+04	7.62E+05	9.52E+05
5050	4.20E+04	1.66E+05	2.37E+05	6.89E+04	8.22E+05	9.52E+05
5100	4.20E+04	1.76E+05	2.99E+05	7.18E+04	8.41E+05	9.52E+05
5150	4.20E+04	1.86E+05	4.21E+05	8.57E+04	8.82E+05	9.52E+05
5200	4.20E+04	1.88E+05	4.92E+05	9.34E+04	9.09E+05	9.52E+05
5250	4.20E+04	1.91E+05	6.38E+05	1.01E+05	9.62E+05	9.52E+05
5300	4.20E+04	1.91E+05	7.22E+05	1.01E+05	9.91E+05	9.52E+05
5350	4.20E+04	1.91E+05	9.05E+05	1.07E+05	1.05E+06	9.52E+05
5400	4.20E+04	1.91E+05	1.05E+06	1.21E+05	1.08E+06	9.52E+05
5450	4.20E+04	1.91E+05	1.25E+06	1.48E+05	1.11E+06	9.52E+05
5500	4.20E+04	1.91E+05	1.36E+06	1.70E+05	1.13E+06	9.52E+05
5550	4.20E+04	1.91E+05	1.49E+06	2.26E+05	1.14E+06	9.52E+05
5600	4.20E+04	1.91E+05	1.55E+06	2.65E+05	1.15E+06	9.52E+05
5650	4.20E+04	1.91E+05	1.69E+06	3.25E+05	1.15E+06	9.52E+05
5700	4.20E+04	1.91E+05	1.73E+06	3.64E+05	1.15E+06	9.52E+05
5750	4.20E+04	1.91E+05	1.81E+06	4.36E+05	1.15E+06	9.52E+05
5800	4.20E+04	1.91E+05	1.84E+06	4.82E+05	1.15E+06	9.52E+05
5850	4.20E+04	1.93E+05	1.89E+06	5.72E+05	1.15E+06	9.52E+05
5900	4.20E+04	1.94E+05	1.91E+06	6.20E+05	1.15E+06	9.52E+05
5950	4.20E+04	1.94E+05	1.95E+06	6.90E+05	1.15E+06	9.52E+05
6000	4.20E+04	2.00E+05	1.97E+06	7.30E+05	1.15E+06	9.52E+05
6050	4.20E+04	2.03E+05	1.98E+06	7.50E+05	1.15E+06	9.52E+05
6100	4.20E+04	2.04E+05	1.99E+06	7.53E+05	1.15E+06	9.52E+05
6150	4.20E+04	2.04E+05	1.99E+06	7.53E+05	1.15E+06	9.52E+05

Rosemont Pit

Cumulative Surface Area (sq. ft) **(sq. ft)**

Stage (ft)	ESCABROSA:>3.0	GILA:>3.0	GLANCE:>3.0	GRANODIORITE:<1.2	GRANODIORITE:>3.0	GRANODIORITE:1.2-3.0
3650	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3700	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3750	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3800	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3850	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3900	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3950	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4050	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4100	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4150	4.83E+04	0.00E+00	3.10E+03	0.00E+00	0.00E+00	0.00E+00
4200	1.45E+05	0.00E+00	6.98E+03	0.00E+00	0.00E+00	0.00E+00
4250	2.25E+05	0.00E+00	6.98E+03	0.00E+00	0.00E+00	0.00E+00
4300	2.59E+05	0.00E+00	6.98E+03	0.00E+00	0.00E+00	0.00E+00
4350	3.21E+05	0.00E+00	1.04E+04	0.00E+00	0.00E+00	0.00E+00
4400	3.45E+05	0.00E+00	3.09E+04	0.00E+00	0.00E+00	0.00E+00
4450	4.03E+05	0.00E+00	8.52E+04	0.00E+00	0.00E+00	0.00E+00
4500	4.35E+05	0.00E+00	1.09E+05	0.00E+00	0.00E+00	0.00E+00
4550	5.01E+05	3.85E+03	1.23E+05	0.00E+00	0.00E+00	0.00E+00
4600	5.41E+05	3.85E+03	1.34E+05	0.00E+00	0.00E+00	0.00E+00
4650	6.26E+05	3.85E+03	1.45E+05	0.00E+00	0.00E+00	0.00E+00
4700	6.67E+05	3.85E+03	1.57E+05	0.00E+00	0.00E+00	0.00E+00
4750	7.62E+05	3.85E+03	1.70E+05	9.66E+03	6.11E+03	2.23E+04
4800	8.13E+05	3.85E+03	1.80E+05	2.08E+04	1.28E+04	3.62E+04
4850	9.10E+05	3.85E+03	2.00E+05	3.73E+04	2.94E+04	6.89E+04
4900	9.59E+05	3.85E+03	2.18E+05	3.74E+04	4.01E+04	9.42E+04
4950	1.06E+06	3.85E+03	2.42E+05	4.07E+04	6.52E+04	1.40E+05
5000	1.11E+06	3.85E+03	2.59E+05	4.53E+04	7.10E+04	1.67E+05
5050	1.21E+06	3.85E+03	2.84E+05	5.36E+04	9.24E+04	2.23E+05
5100	1.27E+06	3.85E+03	3.04E+05	5.90E+04	1.07E+05	2.53E+05
5150	1.40E+06	3.85E+03	3.34E+05	6.01E+04	1.53E+05	3.02E+05
5200	1.49E+06	3.85E+03	3.57E+05	6.01E+04	1.82E+05	3.27E+05
5250	1.57E+06	3.85E+03	3.85E+05	6.36E+04	2.28E+05	3.86E+05
5300	1.60E+06	3.85E+03	4.00E+05	6.71E+04	2.61E+05	4.10E+05
5350	1.68E+06	3.85E+03	4.24E+05	6.71E+04	3.26E+05	4.67E+05
5400	1.72E+06	3.85E+03	4.36E+05	6.71E+04	3.72E+05	4.88E+05
5450	1.78E+06	3.85E+03	4.52E+05	6.71E+04	4.58E+05	5.29E+05
5500	1.82E+06	3.85E+03	4.66E+05	6.71E+04	5.30E+05	5.59E+05
5550	1.87E+06	3.85E+03	4.73E+05	6.71E+04	7.00E+05	5.75E+05
5600	1.88E+06	3.85E+03	4.73E+05	6.71E+04	8.01E+05	6.16E+05
5650	1.88E+06	3.85E+03	4.89E+05	6.71E+04	9.49E+05	6.45E+05
5700	1.88E+06	3.85E+03	4.98E+05	6.71E+04	1.02E+06	6.63E+05
5750	1.88E+06	3.85E+03	5.00E+05	6.71E+04	1.13E+06	6.98E+05
5800	1.88E+06	3.85E+03	5.00E+05	6.71E+04	1.16E+06	7.17E+05
5850	1.88E+06	3.85E+03	5.00E+05	6.71E+04	1.21E+06	7.49E+05
5900	1.88E+06	3.85E+03	5.00E+05	6.71E+04	1.23E+06	7.66E+05
5950	1.88E+06	3.85E+03	5.00E+05	6.71E+04	1.25E+06	7.83E+05
6000	1.88E+06	3.85E+03	5.00E+05	6.71E+04	1.26E+06	7.84E+05
6050	1.88E+06	3.85E+03	5.00E+05	6.71E+04	1.27E+06	7.84E+05
6100	1.88E+06	3.85E+03	5.00E+05	6.71E+04	1.28E+06	7.84E+05
6150	1.88E+06	3.85E+03	5.00E+05	6.71E+04	1.28E+06	7.84E+05

Rosemont Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	HORQUILLA:>3.0	MARTIN:>3.0	QMP:>3.0	QMP:1.2-3.0	SCHERRER:>3.0	SCHERRER:1.2-3.0
3650	7.11E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3700	1.42E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3750	3.41E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3800	4.75E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3850	7.05E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3900	8.33E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3950	1.07E+06	0.00E+00	0.00E+00	0.00E+00	9.50E+04	0.00E+00
4000	1.21E+06	0.00E+00	0.00E+00	0.00E+00	1.64E+05	5.11E+02
4050	1.52E+06	0.00E+00	0.00E+00	0.00E+00	3.09E+05	5.25E+03
4100	1.72E+06	0.00E+00	0.00E+00	0.00E+00	4.03E+05	7.84E+03
4150	2.08E+06	0.00E+00	0.00E+00	0.00E+00	7.10E+05	8.78E+03
4200	2.20E+06	5.06E+03	0.00E+00	0.00E+00	8.69E+05	8.78E+03
4250	2.43E+06	6.27E+04	0.00E+00	0.00E+00	1.12E+06	8.78E+03
4300	2.58E+06	1.18E+05	0.00E+00	0.00E+00	1.25E+06	8.78E+03
4350	2.83E+06	2.32E+05	9.61E+03	1.49E+02	1.46E+06	8.78E+03
4400	2.94E+06	3.03E+05	6.87E+04	1.55E+04	1.58E+06	8.78E+03
4450	3.13E+06	4.38E+05	1.42E+05	3.97E+04	1.76E+06	8.78E+03
4500	3.22E+06	5.31E+05	1.91E+05	5.90E+04	1.85E+06	8.78E+03
4550	3.35E+06	7.39E+05	2.11E+05	6.10E+04	2.01E+06	8.78E+03
4600	3.40E+06	8.58E+05	2.28E+05	6.10E+04	2.10E+06	8.78E+03
4650	3.46E+06	1.08E+06	2.83E+05	6.26E+04	2.24E+06	8.78E+03
4700	3.49E+06	1.20E+06	3.23E+05	7.61E+04	2.31E+06	8.78E+03
4750	3.54E+06	1.42E+06	3.36E+05	8.85E+04	2.41E+06	8.78E+03
4800	3.57E+06	1.53E+06	3.45E+05	1.07E+05	2.47E+06	8.78E+03
4850	3.61E+06	1.72E+06	3.74E+05	1.08E+05	2.56E+06	8.78E+03
4900	3.64E+06	1.81E+06	4.01E+05	1.08E+05	2.61E+06	8.78E+03
4950	3.68E+06	1.97E+06	4.29E+05	1.08E+05	2.68E+06	8.78E+03
5000	3.70E+06	2.03E+06	4.54E+05	1.08E+05	2.76E+06	8.78E+03
5050	3.74E+06	2.10E+06	4.78E+05	1.08E+05	2.81E+06	8.78E+03
5100	3.81E+06	2.13E+06	4.98E+05	1.08E+05	2.84E+06	8.78E+03
5150	3.86E+06	2.17E+06	5.21E+05	1.08E+05	2.87E+06	8.78E+03
5200	3.88E+06	2.22E+06	5.30E+05	1.08E+05	2.89E+06	8.78E+03
5250	3.92E+06	2.27E+06	5.30E+05	1.08E+05	2.92E+06	8.78E+03
5300	3.94E+06	2.30E+06	5.30E+05	1.08E+05	2.95E+06	8.78E+03
5350	3.99E+06	2.35E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5400	4.01E+06	2.38E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5450	4.06E+06	2.42E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5500	4.08E+06	2.45E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5550	4.13E+06	2.51E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5600	4.15E+06	2.52E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5650	4.18E+06	2.57E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5700	4.19E+06	2.58E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5750	4.19E+06	2.60E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5800	4.19E+06	2.61E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5850	4.19E+06	2.61E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5900	4.19E+06	2.61E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
5950	4.19E+06	2.61E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
6000	4.19E+06	2.61E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
6050	4.19E+06	2.61E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
6100	4.19E+06	2.61E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03
6150	4.19E+06	2.61E+06	5.30E+05	1.08E+05	2.97E+06	8.78E+03

Rosemont Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	UNKNOWN:>3.0	Total
3650	0.00E+00	7.11E+04
3700	0.00E+00	1.42E+05
3750	0.00E+00	3.69E+05
3800	0.00E+00	5.41E+05
3850	0.00E+00	8.82E+05
3900	0.00E+00	1.13E+06
3950	0.00E+00	1.66E+06
4000	0.00E+00	1.99E+06
4050	0.00E+00	2.60E+06
4100	0.00E+00	2.96E+06
4150	1.49E+04	3.84E+06
4200	3.04E+04	4.31E+06
4250	6.12E+04	5.14E+06
4300	7.13E+04	5.67E+06
4350	9.21E+04	6.59E+06
4400	1.17E+05	7.23E+06
4450	1.35E+05	8.18E+06
4500	1.41E+05	8.87E+06
4550	1.45E+05	9.87E+06
4600	1.45E+05	1.06E+07
4650	1.45E+05	1.17E+07
4700	1.45E+05	1.25E+07
4750	1.45E+05	1.37E+07
4800	1.45E+05	1.47E+07
4850	1.45E+05	1.59E+07
4900	1.45E+05	1.69E+07
4950	1.45E+05	1.81E+07
5000	1.45E+05	1.92E+07
5050	1.45E+05	2.05E+07
5100	1.45E+05	2.16E+07
5150	1.45E+05	2.27E+07
5200	1.45E+05	2.36E+07
5250	1.45E+05	2.45E+07
5300	1.45E+05	2.52E+07
5350	1.45E+05	2.60E+07
5400	1.45E+05	2.65E+07
5450	1.45E+05	2.73E+07
5500	1.45E+05	2.77E+07
5550	1.45E+05	2.84E+07
5600	1.45E+05	2.88E+07
5650	1.45E+05	2.93E+07
5700	1.45E+05	2.95E+07
5750	1.45E+05	2.98E+07
5800	1.45E+05	3.00E+07
5850	1.45E+05	3.02E+07
5900	1.45E+05	3.03E+07
5950	1.45E+05	3.04E+07
6000	1.45E+05	3.05E+07
6050	1.45E+05	3.06E+07
6100	1.45E+05	3.06E+07
6150	1.45E+05	3.06E+07

Rosemont Pit

Cumulative Surface Area **(%)**

Stage (ft)	ABRIGO:>3.0	ANDESITE:<1.2	ANDESITE:>3.0	ANDESITE:1.2-3.0	ARKOSE:<1.2	ARKOSE:>3.0
3650	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3750	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3800	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3850	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3900	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3950	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4050	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4150	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4200	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
4250	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%
4300	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%
4350	0.0%	0.0%	4.4%	0.0%	0.0%	0.0%
4400	0.0%	0.0%	5.7%	0.0%	0.0%	0.0%
4450	0.0%	0.0%	6.8%	0.1%	0.0%	0.0%
4500	0.0%	0.1%	8.9%	0.4%	0.0%	0.0%
4550	0.0%	0.1%	11.4%	0.7%	0.0%	0.0%
4600	0.0%	0.1%	14.1%	1.0%	0.0%	0.0%
4650	0.0%	0.1%	15.6%	1.3%	0.0%	0.4%
4700	0.2%	0.1%	17.5%	1.5%	0.0%	0.9%
4750	0.8%	0.1%	18.6%	1.7%	0.0%	1.6%
4800	0.8%	0.1%	19.9%	1.6%	0.0%	2.9%
4850	0.8%	0.1%	20.5%	1.5%	0.0%	4.1%
4900	0.9%	0.1%	21.4%	1.5%	0.0%	5.3%
4950	0.9%	0.1%	21.7%	1.5%	0.0%	6.4%
5000	1.1%	0.1%	22.3%	1.5%	0.0%	7.5%
5050	1.5%	0.1%	22.7%	1.4%	0.0%	8.3%
5100	1.7%	0.1%	23.1%	1.4%	0.0%	9.2%
5150	2.2%	0.1%	23.0%	1.3%	0.0%	9.4%
5200	2.4%	0.1%	23.5%	1.3%	0.0%	9.5%
5250	3.0%	0.1%	23.4%	1.2%	0.0%	9.4%
5300	3.5%	0.1%	23.5%	1.2%	0.0%	9.2%
5350	3.9%	0.1%	23.3%	1.1%	0.0%	8.9%
5400	4.1%	0.1%	23.1%	1.1%	0.0%	8.7%
5450	4.5%	0.1%	22.7%	1.1%	0.0%	8.5%
5500	4.7%	0.1%	22.4%	1.1%	0.0%	8.4%
5550	5.0%	0.1%	21.9%	1.0%	0.0%	8.2%
5600	5.1%	0.1%	21.6%	1.0%	0.0%	8.1%
5650	5.2%	0.1%	21.2%	1.0%	0.0%	7.9%
5700	5.3%	0.1%	21.1%	1.0%	0.0%	7.9%
5750	5.2%	0.1%	20.8%	1.0%	0.0%	7.8%
5800	5.2%	0.1%	20.7%	1.0%	0.0%	7.7%
5850	5.2%	0.1%	20.6%	1.0%	0.0%	7.7%
5900	5.2%	0.1%	20.5%	1.0%	0.0%	7.7%
5950	5.1%	0.1%	20.4%	1.0%	0.0%	7.6%
6000	5.1%	0.1%	20.4%	1.0%	0.0%	7.6%
6050	5.1%	0.1%	20.3%	1.0%	0.0%	7.6%
6100	5.1%	0.1%	20.3%	1.0%	0.0%	7.6%
6150	5.1%	0.1%	20.3%	1.0%	0.0%	7.6%

Rosemont Pit
Cumulative Surface Area

Stage (ft)	ARKOSE:1.2-3.0	BOLSA:<1.2	BOLSA:>3.0	BOLSA:1.2-3.0	EARP:>3.0	EPITAPH:>3.0
3650	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3750	0.0%	0.0%	0.0%	0.0%	7.7%	0.0%
3800	0.0%	0.0%	0.0%	0.0%	12.2%	0.0%
3850	0.0%	0.0%	0.0%	0.0%	17.9%	2.1%
3900	0.0%	0.0%	0.0%	0.0%	22.5%	3.8%
3950	0.0%	0.0%	0.0%	0.0%	18.9%	11.1%
4000	0.0%	0.0%	0.0%	0.0%	18.1%	12.9%
4050	0.0%	0.0%	0.0%	0.0%	15.6%	13.9%
4100	0.0%	0.0%	0.0%	0.0%	14.4%	13.6%
4150	0.0%	0.0%	0.0%	0.0%	12.9%	12.5%
4200	0.0%	0.0%	0.0%	0.0%	12.0%	12.1%
4250	0.0%	0.0%	0.0%	0.0%	10.7%	12.0%
4300	0.0%	0.0%	0.0%	0.0%	9.8%	11.8%
4350	0.0%	0.0%	0.0%	0.0%	8.6%	11.8%
4400	0.0%	0.0%	0.0%	0.0%	8.0%	11.5%
4450	0.0%	0.0%	0.0%	0.0%	7.2%	10.9%
4500	0.0%	0.0%	0.0%	0.0%	6.7%	10.1%
4550	0.0%	0.0%	0.0%	0.0%	6.1%	9.2%
4600	0.0%	0.0%	0.0%	0.0%	5.8%	8.7%
4650	0.0%	0.0%	0.0%	0.0%	5.5%	8.1%
4700	0.0%	0.0%	0.0%	0.0%	5.2%	7.6%
4750	0.0%	0.2%	0.0%	0.0%	4.9%	6.9%
4800	0.0%	0.3%	0.0%	0.0%	4.7%	6.5%
4850	0.1%	0.5%	0.1%	0.1%	4.5%	6.0%
4900	0.2%	0.6%	0.2%	0.2%	4.3%	5.6%
4950	0.2%	0.7%	0.4%	0.4%	4.1%	5.2%
5000	0.2%	0.7%	0.7%	0.4%	4.0%	5.0%
5050	0.2%	0.8%	1.2%	0.3%	4.0%	4.6%
5100	0.2%	0.8%	1.4%	0.3%	3.9%	4.4%
5150	0.2%	0.8%	1.9%	0.4%	3.9%	4.2%
5200	0.2%	0.8%	2.1%	0.4%	3.9%	4.0%
5250	0.2%	0.8%	2.6%	0.4%	3.9%	3.9%
5300	0.2%	0.8%	2.9%	0.4%	3.9%	3.8%
5350	0.2%	0.7%	3.5%	0.4%	4.0%	3.7%
5400	0.2%	0.7%	4.0%	0.5%	4.1%	3.6%
5450	0.2%	0.7%	4.6%	0.5%	4.1%	3.5%
5500	0.2%	0.7%	4.9%	0.6%	4.1%	3.4%
5550	0.1%	0.7%	5.2%	0.8%	4.0%	3.4%
5600	0.1%	0.7%	5.4%	0.9%	4.0%	3.3%
5650	0.1%	0.7%	5.8%	1.1%	3.9%	3.3%
5700	0.1%	0.6%	5.9%	1.2%	3.9%	3.2%
5750	0.1%	0.6%	6.1%	1.5%	3.9%	3.2%
5800	0.1%	0.6%	6.1%	1.6%	3.8%	3.2%
5850	0.1%	0.6%	6.3%	1.9%	3.8%	3.2%
5900	0.1%	0.6%	6.3%	2.0%	3.8%	3.1%
5950	0.1%	0.6%	6.4%	2.3%	3.8%	3.1%
6000	0.1%	0.7%	6.4%	2.4%	3.8%	3.1%
6050	0.1%	0.7%	6.5%	2.5%	3.8%	3.1%
6100	0.1%	0.7%	6.5%	2.5%	3.8%	3.1%
6150	0.1%	0.7%	6.5%	2.5%	3.8%	3.1%

Rosemont Pit
Cumulative Surface Area **(%)**

Stage (ft)	ESCABROSA:>3.0	GILA:>3.0	GLANCE:>3.0	GRANODIORITE:<1.2	GRANODIORITE:>3.0	GRANODIORITE:1.2-3.0
3650	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3750	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3800	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3850	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3900	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3950	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4050	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4150	1.3%	0.0%	0.1%	0.0%	0.0%	0.0%
4200	3.4%	0.0%	0.2%	0.0%	0.0%	0.0%
4250	4.4%	0.0%	0.1%	0.0%	0.0%	0.0%
4300	4.6%	0.0%	0.1%	0.0%	0.0%	0.0%
4350	4.9%	0.0%	0.2%	0.0%	0.0%	0.0%
4400	4.8%	0.0%	0.4%	0.0%	0.0%	0.0%
4450	4.9%	0.0%	1.0%	0.0%	0.0%	0.0%
4500	4.9%	0.0%	1.2%	0.0%	0.0%	0.0%
4550	5.1%	0.0%	1.2%	0.0%	0.0%	0.0%
4600	5.1%	0.0%	1.3%	0.0%	0.0%	0.0%
4650	5.4%	0.0%	1.2%	0.0%	0.0%	0.0%
4700	5.3%	0.0%	1.3%	0.0%	0.0%	0.0%
4750	5.5%	0.0%	1.2%	0.1%	0.0%	0.2%
4800	5.5%	0.0%	1.2%	0.1%	0.1%	0.2%
4850	5.7%	0.0%	1.3%	0.2%	0.2%	0.4%
4900	5.7%	0.0%	1.3%	0.2%	0.2%	0.6%
4950	5.8%	0.0%	1.3%	0.2%	0.4%	0.8%
5000	5.8%	0.0%	1.4%	0.2%	0.4%	0.9%
5050	5.9%	0.0%	1.4%	0.3%	0.4%	1.1%
5100	5.9%	0.0%	1.4%	0.3%	0.5%	1.2%
5150	6.2%	0.0%	1.5%	0.3%	0.7%	1.3%
5200	6.3%	0.0%	1.5%	0.3%	0.8%	1.4%
5250	6.4%	0.0%	1.6%	0.3%	0.9%	1.6%
5300	6.4%	0.0%	1.6%	0.3%	1.0%	1.6%
5350	6.4%	0.0%	1.6%	0.3%	1.3%	1.8%
5400	6.5%	0.0%	1.6%	0.3%	1.4%	1.8%
5450	6.5%	0.0%	1.7%	0.2%	1.7%	1.9%
5500	6.6%	0.0%	1.7%	0.2%	1.9%	2.0%
5550	6.6%	0.0%	1.7%	0.2%	2.5%	2.0%
5600	6.5%	0.0%	1.6%	0.2%	2.8%	2.1%
5650	6.4%	0.0%	1.7%	0.2%	3.2%	2.2%
5700	6.4%	0.0%	1.7%	0.2%	3.5%	2.2%
5750	6.3%	0.0%	1.7%	0.2%	3.8%	2.3%
5800	6.3%	0.0%	1.7%	0.2%	3.9%	2.4%
5850	6.2%	0.0%	1.7%	0.2%	4.0%	2.5%
5900	6.2%	0.0%	1.7%	0.2%	4.1%	2.5%
5950	6.2%	0.0%	1.6%	0.2%	4.1%	2.6%
6000	6.1%	0.0%	1.6%	0.2%	4.1%	2.6%
6050	6.1%	0.0%	1.6%	0.2%	4.2%	2.6%
6100	6.1%	0.0%	1.6%	0.2%	4.2%	2.6%
6150	6.1%	0.0%	1.6%	0.2%	4.2%	2.6%

Rosemont Pit
Cumulative Surface Area

Stage (ft)	HORQUILLA:>3.0	MARTIN:>3.0	QMP:>3.0	QMP:1.2-3.0	SCHERRER:>3.0	SCHERRER:1.2-3.0
3650	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3700	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3750	92.3%	0.0%	0.0%	0.0%	0.0%	0.0%
3800	87.8%	0.0%	0.0%	0.0%	0.0%	0.0%
3850	80.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3900	73.7%	0.0%	0.0%	0.0%	0.0%	0.0%
3950	64.3%	0.0%	0.0%	0.0%	5.7%	0.0%
4000	60.8%	0.0%	0.0%	0.0%	8.2%	0.0%
4050	58.5%	0.0%	0.0%	0.0%	11.9%	0.2%
4100	58.1%	0.0%	0.0%	0.0%	13.6%	0.3%
4150	54.1%	0.0%	0.0%	0.0%	18.5%	0.2%
4200	51.0%	0.1%	0.0%	0.0%	20.2%	0.2%
4250	47.4%	1.2%	0.0%	0.0%	21.7%	0.2%
4300	45.6%	2.1%	0.0%	0.0%	22.1%	0.2%
4350	42.9%	3.5%	0.1%	0.0%	22.1%	0.1%
4400	40.7%	4.2%	1.0%	0.2%	21.9%	0.1%
4450	38.3%	5.4%	1.7%	0.5%	21.5%	0.1%
4500	36.3%	6.0%	2.2%	0.7%	20.9%	0.1%
4550	34.0%	7.5%	2.1%	0.6%	20.4%	0.1%
4600	31.9%	8.1%	2.1%	0.6%	19.8%	0.1%
4650	29.6%	9.3%	2.4%	0.5%	19.2%	0.1%
4700	27.9%	9.6%	2.6%	0.6%	18.5%	0.1%
4750	25.8%	10.4%	2.4%	0.6%	17.5%	0.1%
4800	24.3%	10.4%	2.4%	0.7%	16.8%	0.1%
4850	22.7%	10.8%	2.4%	0.7%	16.1%	0.1%
4900	21.6%	10.8%	2.4%	0.6%	15.5%	0.1%
4950	20.3%	10.9%	2.4%	0.6%	14.8%	0.0%
5000	19.3%	10.6%	2.4%	0.6%	14.4%	0.0%
5050	18.2%	10.2%	2.3%	0.5%	13.7%	0.0%
5100	17.7%	9.9%	2.3%	0.5%	13.2%	0.0%
5150	17.0%	9.6%	2.3%	0.5%	12.6%	0.0%
5200	16.5%	9.4%	2.2%	0.5%	12.3%	0.0%
5250	16.0%	9.3%	2.2%	0.4%	11.9%	0.0%
5300	15.7%	9.1%	2.1%	0.4%	11.7%	0.0%
5350	15.3%	9.0%	2.0%	0.4%	11.4%	0.0%
5400	15.1%	9.0%	2.0%	0.4%	11.2%	0.0%
5450	14.9%	8.9%	1.9%	0.4%	10.9%	0.0%
5500	14.7%	8.8%	1.9%	0.4%	10.7%	0.0%
5550	14.5%	8.8%	1.9%	0.4%	10.4%	0.0%
5600	14.4%	8.8%	1.8%	0.4%	10.3%	0.0%
5650	14.3%	8.8%	1.8%	0.4%	10.1%	0.0%
5700	14.2%	8.8%	1.8%	0.4%	10.1%	0.0%
5750	14.0%	8.7%	1.8%	0.4%	9.9%	0.0%
5800	14.0%	8.7%	1.8%	0.4%	9.9%	0.0%
5850	13.9%	8.7%	1.8%	0.4%	9.8%	0.0%
5900	13.8%	8.6%	1.7%	0.4%	9.8%	0.0%
5950	13.7%	8.6%	1.7%	0.4%	9.7%	0.0%
6000	13.7%	8.6%	1.7%	0.4%	9.7%	0.0%
6050	13.7%	8.6%	1.7%	0.4%	9.7%	0.0%
6100	13.7%	8.5%	1.7%	0.4%	9.7%	0.0%
6150	13.7%	8.5%	1.7%	0.4%	9.7%	0.0%

Rosemont Pit
Cumulative Surface Area

Stage (ft)	UNKNOWN:>3.0	Total
3650	0.0%	100.0%
3700	0.0%	100.0%
3750	0.0%	100.0%
3800	0.0%	100.0%
3850	0.0%	100.0%
3900	0.0%	100.0%
3950	0.0%	100.0%
4000	0.0%	100.0%
4050	0.0%	100.0%
4100	0.0%	100.0%
4150	0.4%	100.0%
4200	0.7%	100.0%
4250	1.2%	100.0%
4300	1.3%	100.0%
4350	1.4%	100.0%
4400	1.6%	100.0%
4450	1.6%	100.0%
4500	1.6%	100.0%
4550	1.5%	100.0%
4600	1.4%	100.0%
4650	1.2%	100.0%
4700	1.2%	100.0%
4750	1.1%	100.0%
4800	1.0%	100.0%
4850	0.9%	100.0%
4900	0.9%	100.0%
4950	0.8%	100.0%
5000	0.8%	100.0%
5050	0.7%	100.0%
5100	0.7%	100.0%
5150	0.6%	100.0%
5200	0.6%	100.0%
5250	0.6%	100.0%
5300	0.6%	100.0%
5350	0.6%	100.0%
5400	0.5%	100.0%
5450	0.5%	100.0%
5500	0.5%	100.0%
5550	0.5%	100.0%
5600	0.5%	100.0%
5650	0.5%	100.0%
5700	0.5%	100.0%
5750	0.5%	100.0%
5800	0.5%	100.0%
5850	0.5%	100.0%
5900	0.5%	100.0%
5950	0.5%	100.0%
6000	0.5%	100.0%
6050	0.5%	100.0%
6100	0.5%	100.0%
6150	0.5%	100.0%

Peach Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	ABRIGO:>3.0	ABRIGO:1.2-3.0	BOLSA:>3.0	BOLSA:1.2-3.0	EPITAPH:>3.0
3950	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4000	0.00E+00	0.00E+00	1.80E+03	0.00E+00	0.00E+00
4050	0.00E+00	0.00E+00	4.93E+04	0.00E+00	0.00E+00
4100	3.87E+02	0.00E+00	1.28E+05	0.00E+00	0.00E+00
4150	8.74E+04	0.00E+00	2.34E+05	0.00E+00	0.00E+00
4200	2.44E+05	0.00E+00	3.21E+05	2.50E+03	3.08E+04
4250	4.48E+05	7.89E+02	4.12E+05	4.04E+03	1.65E+05
4300	5.62E+05	3.94E+03	4.39E+05	1.04E+04	3.47E+05
4350	6.15E+05	3.94E+03	4.39E+05	1.04E+04	4.81E+05
4400	6.15E+05	3.94E+03	4.39E+05	1.04E+04	5.73E+05
4450	6.15E+05	3.94E+03	4.39E+05	1.04E+04	6.45E+05
4500	6.15E+05	3.94E+03	4.39E+05	1.04E+04	6.95E+05
4550	6.15E+05	3.94E+03	4.39E+05	1.04E+04	7.21E+05
4600	6.15E+05	3.94E+03	4.39E+05	1.04E+04	7.47E+05
4650	6.15E+05	3.94E+03	4.39E+05	1.04E+04	7.61E+05
4700	6.15E+05	3.94E+03	4.39E+05	1.04E+04	7.61E+05

Peach Pit
Cumulative Surface Area (%)

Stage (ft)	ABRIGO:>3.0	ABRIGO:1.2-3.0	BOLSA:>3.0	BOLSA:1.2-3.0	EPITAPH:>3.0
3950	0.0%	0.0%	0.0%	0.0%	0.0%
4000	0.0%	0.0%	2.3%	0.0%	0.0%
4050	0.0%	0.0%	23.8%	0.0%	0.0%
4100	0.1%	0.0%	29.5%	0.0%	0.0%
4150	10.9%	0.0%	29.3%	0.0%	0.0%
4200	18.9%	0.0%	24.8%	0.2%	2.4%
4250	22.3%	0.0%	20.6%	0.2%	8.2%
4300	22.2%	0.2%	17.3%	0.4%	13.7%
4350	21.5%	0.1%	15.4%	0.4%	16.9%
4400	19.9%	0.1%	14.2%	0.3%	18.6%
4450	18.9%	0.1%	13.5%	0.3%	19.8%
4500	18.3%	0.1%	13.0%	0.3%	20.6%
4550	17.9%	0.1%	12.8%	0.3%	20.9%
4600	17.6%	0.1%	12.6%	0.3%	21.4%
4650	17.5%	0.1%	12.5%	0.3%	21.7%
4700	17.5%	0.1%	12.5%	0.3%	21.7%

Peach Pit

Cumulative Surface Area (sq. ft)

Stage (ft)	ESCABROSA:>3.0	GRANODIORITE:<1.2	GRANODIORITE:>3.0	GRANODIORITE:1.2-3.0	HORQUILLA:>3.0
3950	0.00E+00	0.00E+00	7.28E+03	8.25E+03	0.00E+00
4000	0.00E+00	0.00E+00	3.31E+04	4.34E+04	0.00E+00
4050	1.13E+03	7.77E+02	4.14E+04	1.10E+05	0.00E+00
4100	4.38E+04	1.33E+04	4.22E+04	1.64E+05	0.00E+00
4150	1.50E+05	1.82E+04	5.20E+04	1.72E+05	5.69E+02
4200	2.74E+05	1.82E+04	5.59E+04	1.75E+05	3.52E+04
4250	3.84E+05	1.82E+04	5.59E+04	1.75E+05	1.22E+05
4300	4.63E+05	1.82E+04	5.59E+04	1.75E+05	1.70E+05
4350	5.20E+05	1.82E+04	5.59E+04	1.75E+05	2.01E+05
4400	5.78E+05	1.82E+04	5.59E+04	1.75E+05	2.30E+05
4450	6.37E+05	1.82E+04	5.59E+04	1.75E+05	2.67E+05
4500	6.59E+05	1.82E+04	5.59E+04	1.75E+05	3.10E+05
4550	6.59E+05	1.82E+04	5.59E+04	1.75E+05	3.59E+05
4600	6.59E+05	1.82E+04	5.59E+04	1.75E+05	3.83E+05
4650	6.59E+05	1.82E+04	5.59E+04	1.75E+05	3.83E+05
4700	6.59E+05	1.82E+04	5.59E+04	1.75E+05	3.83E+05

Peach Pit

Cumulative Surface Area (%)

Stage (ft)	ESCABROSA:>3.0	GRANODIORITE:<1.2	GRANODIORITE:>3.0	GRANODIORITE:1.2-3.0	HORQUILLA:>3.0
3950	0.0%	0.0%	46.9%	53.1%	0.0%
4000	0.0%	0.0%	42.3%	55.4%	0.0%
4050	0.5%	0.4%	20.0%	53.2%	0.0%
4100	10.1%	3.1%	9.7%	37.9%	0.0%
4150	18.8%	2.3%	6.5%	21.6%	0.1%
4200	21.2%	1.4%	4.3%	13.6%	2.7%
4250	19.2%	0.9%	2.8%	8.8%	6.1%
4300	18.3%	0.7%	2.2%	6.9%	6.7%
4350	18.2%	0.6%	2.0%	6.1%	7.0%
4400	18.7%	0.6%	1.8%	5.7%	7.4%
4450	19.6%	0.6%	1.7%	5.4%	8.2%
4500	19.6%	0.5%	1.7%	5.2%	9.2%
4550	19.1%	0.5%	1.6%	5.1%	10.4%
4600	18.9%	0.5%	1.6%	5.0%	11.0%
4650	18.8%	0.5%	1.6%	5.0%	10.9%
4700	18.8%	0.5%	1.6%	5.0%	10.9%

Peach Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	MARTIN:>3.0	Total
3950	0.00E+00	1.55E+04
4000	0.00E+00	7.83E+04
4050	4.10E+03	2.07E+05
4100	4.13E+04	4.33E+05
4150	8.40E+04	7.99E+05
4200	1.36E+05	1.29E+06
4250	2.18E+05	2.00E+06
4300	2.88E+05	2.53E+06
4350	3.36E+05	2.86E+06
4400	3.86E+05	3.08E+06
4450	3.86E+05	3.25E+06
4500	3.86E+05	3.37E+06
4550	3.86E+05	3.44E+06
4600	3.86E+05	3.49E+06
4650	3.86E+05	3.50E+06
4700	3.86E+05	3.50E+06

Peach Pit
Cumulative Surface Area (%)

Stage (ft)	MARTIN:>3.0	Total
3950	0.0%	100.0%
4000	0.0%	100.0%
4050	2.0%	100.0%
4100	9.5%	100.0%
4150	10.5%	100.0%
4200	10.5%	100.0%
4250	10.9%	100.0%
4300	11.4%	100.0%
4350	11.8%	100.0%
4400	12.5%	100.0%
4450	11.9%	100.0%
4500	11.4%	100.0%
4550	11.2%	100.0%
4600	11.0%	100.0%
4650	11.0%	100.0%
4700	11.0%	100.0%

Elgin Pit

Cumulative Surface Area (sq. ft)

Stage (ft)	CONCHA:>3.0	EPITAPH:>3.0	GRANODIORITE:>3.0	HORQUILLA:>3.0	QMP:>3.0
4050	0.00E+00	5.13E+04	3.33E+03	0.00E+00	3.71E+03
4100	0.00E+00	1.71E+05	8.77E+04	0.00E+00	4.63E+04
4150	0.00E+00	3.64E+05	2.22E+05	3.51E+03	1.21E+05
4200	0.00E+00	5.87E+05	3.07E+05	2.80E+04	1.52E+05
4250	2.25E+04	8.93E+05	3.85E+05	4.59E+04	1.90E+05
4300	3.70E+04	1.14E+06	4.36E+05	4.63E+04	2.27E+05
4350	4.81E+04	1.27E+06	4.50E+05	4.63E+04	2.56E+05
4400	6.15E+04	1.31E+06	4.50E+05	4.63E+04	2.64E+05
4450	6.27E+04	1.32E+06	4.50E+05	4.63E+04	2.64E+05
4500	6.27E+04	1.33E+06	4.50E+05	4.63E+04	2.64E+05

Elgin Pit

Cumulative Surface Area (%)

Stage (ft)	CONCHA:>3.0	EPITAPH:>3.0	GRANODIORITE:>3.0	HORQUILLA:>3.0	QMP:>3.0
4050	0.0%	87.9%	5.7%	0.0%	6.4%
4100	0.0%	56.0%	28.8%	0.0%	15.2%
4150	0.0%	51.3%	31.3%	0.5%	17.0%
4200	0.0%	53.8%	28.1%	2.6%	14.0%
4250	1.4%	54.7%	23.6%	2.8%	11.7%
4300	1.8%	55.0%	21.0%	2.2%	10.9%
4350	2.1%	55.6%	19.8%	2.0%	11.3%
4400	2.6%	55.9%	19.2%	2.0%	11.3%
4450	2.7%	56.1%	19.1%	2.0%	11.2%
4500	2.7%	56.2%	19.1%	2.0%	11.2%

Elgin Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	QMP:1.2-3.0	Total
4050	0.00E+00	5.83E+04
4100	0.00E+00	3.05E+05
4150	0.00E+00	7.10E+05
4200	1.75E+04	1.09E+06
4250	9.60E+04	1.63E+06
4300	1.88E+05	2.08E+06
4350	2.11E+05	2.28E+06
4400	2.11E+05	2.34E+06
4450	2.11E+05	2.36E+06
4500	2.11E+05	2.36E+06

Elgin Pit
Cumulative Surface Area (%)

Stage (ft)	QMP:1.2-3.0	Total
4050	0.0%	100.0%
4100	0.0%	100.0%
4150	0.0%	100.0%
4200	1.6%	100.0%
4250	5.9%	100.0%
4300	9.1%	100.0%
4350	9.3%	100.0%
4400	9.0%	100.0%
4450	9.0%	100.0%
4500	9.0%	100.0%

Heavy Weight Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	CONCHA:>3.0	GRANODIORITE:>3.0	QMP:>3.0	QMP:1.2-3.0	Total
4150	0.00E+00	3.57E+04	0.00E+00	0.00E+00	3.57E+04
4200	0.00E+00	1.14E+05	0.00E+00	0.00E+00	1.14E+05
4250	0.00E+00	2.61E+05	0.00E+00	0.00E+00	2.61E+05
4300	3.01E+03	4.18E+05	5.30E+03	8.82E+01	4.26E+05
4350	3.70E+03	5.67E+05	3.89E+04	6.84E+03	6.16E+05
4400	4.95E+03	7.16E+05	1.23E+05	2.71E+04	8.71E+05
4450	9.34E+03	8.69E+05	2.57E+05	4.75E+04	1.18E+06
4500	1.47E+04	9.92E+05	4.31E+05	6.04E+04	1.50E+06
4550	2.33E+04	1.08E+06	6.01E+05	1.04E+05	1.80E+06
4600	3.78E+04	1.13E+06	6.89E+05	1.26E+05	1.98E+06
4650	5.11E+04	1.17E+06	7.43E+05	1.36E+05	2.10E+06
4700	6.49E+04	1.18E+06	7.97E+05	1.36E+05	2.18E+06
4750	8.17E+04	1.18E+06	8.33E+05	1.36E+05	2.23E+06
4800	9.28E+04	1.18E+06	8.49E+05	1.36E+05	2.26E+06
4850	9.99E+04	1.18E+06	8.53E+05	1.36E+05	2.27E+06
4900	1.02E+05	1.18E+06	8.53E+05	1.36E+05	2.27E+06

Heavy Weight Pit
Cumulative Surface Area (%)

Stage (ft)	CONCHA:>3.0	GRANODIORITE:>3.0	QMP:>3.0	QMP:1.2-3.0	Total
4150	0.0%	100.0%	0.0%	0.0%	100.0%
4200	0.0%	100.0%	0.0%	0.0%	100.0%
4250	0.0%	100.0%	0.0%	0.0%	100.0%
4300	0.7%	98.0%	1.2%	0.0%	100.0%
4350	0.6%	92.0%	6.3%	1.1%	100.0%
4400	0.6%	82.2%	14.1%	3.1%	100.0%
4450	0.8%	73.5%	21.7%	4.0%	100.0%
4500	1.0%	66.2%	28.8%	4.0%	100.0%
4550	1.3%	59.6%	33.3%	5.8%	100.0%
4600	1.9%	56.9%	34.8%	6.4%	100.0%
4650	2.4%	55.6%	35.5%	6.5%	100.0%
4700	3.0%	54.2%	36.6%	6.3%	100.0%
4750	3.7%	52.9%	37.3%	6.1%	100.0%
4800	4.1%	52.3%	37.5%	6.0%	100.0%
4850	4.4%	52.1%	37.5%	6.0%	100.0%
4900	4.5%	52.0%	37.5%	6.0%	100.0%

Copper World North Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	ABRIGO:<1.2	ABRIGO:>3.0	ABRIGO:1.2-3.0	BOLSA:<1.2	BOLSA:>3.0
4450	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4500	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.30E+04
4550	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.45E+04
4600	0.00E+00	3.47E+03	0.00E+00	0.00E+00	1.16E+05
4650	5.93E+02	9.34E+03	0.00E+00	0.00E+00	1.89E+05
4700	7.38E+03	1.60E+04	0.00E+00	0.00E+00	2.52E+05
4750	1.51E+04	5.55E+04	5.57E+02	4.94E+02	3.35E+05
4800	1.69E+04	5.72E+04	4.20E+03	4.15E+03	3.99E+05
4850	1.93E+04	6.32E+04	4.20E+03	4.15E+03	4.55E+05
4900	1.93E+04	7.04E+04	4.20E+03	4.15E+03	4.85E+05
4950	1.93E+04	7.45E+04	4.20E+03	4.15E+03	4.93E+05
5000	1.93E+04	7.45E+04	4.20E+03	4.15E+03	4.94E+05
5050	1.93E+04	7.45E+04	4.20E+03	4.15E+03	4.94E+05
5100	1.93E+04	7.45E+04	4.20E+03	4.15E+03	4.94E+05
5150	1.93E+04	7.45E+04	4.20E+03	4.15E+03	4.94E+05

Copper World North Pit
Cumulative Surface Area (%)

Stage (ft)	ABRIGO:<1.2	ABRIGO:>3.0	ABRIGO:1.2-3.0	BOLSA:<1.2	BOLSA:>3.0
4450	0.0%	0.0%	0.0%	0.0%	0.0%
4500	0.0%	0.0%	0.0%	0.0%	14.2%
4550	0.0%	0.0%	0.0%	0.0%	25.4%
4600	0.0%	1.0%	0.0%	0.0%	32.6%
4650	0.1%	1.8%	0.0%	0.0%	36.1%
4700	1.0%	2.2%	0.0%	0.0%	35.0%
4750	1.5%	5.5%	0.1%	0.0%	33.2%
4800	1.3%	4.4%	0.3%	0.3%	31.0%
4850	1.3%	4.2%	0.3%	0.3%	30.3%
4900	1.2%	4.3%	0.3%	0.3%	29.4%
4950	1.1%	4.3%	0.2%	0.2%	28.4%
5000	1.1%	4.2%	0.2%	0.2%	27.8%
5050	1.1%	4.1%	0.2%	0.2%	27.4%
5100	1.1%	4.1%	0.2%	0.2%	27.3%
5150	1.1%	4.1%	0.2%	0.2%	27.3%

Copper World North Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	BOLSA:1.2-3.0
4450	0.00E+00
4500	0.00E+00
4550	0.00E+00
4600	0.00E+00
4650	2.72E+02
4700	5.65E+03
4750	1.12E+04
4800	1.15E+04
4850	1.15E+04
4900	1.15E+04
4950	1.15E+04
5000	1.15E+04
5050	1.15E+04
5100	1.15E+04
5150	1.15E+04

Copper World North Pit
Cumulative Surface Area (%)

Stage (ft)	BOLSA:1.2-3.0
4450	0.0%
4500	0.0%
4550	0.0%
4600	0.0%
4650	0.1%
4700	0.8%
4750	1.1%
4800	0.9%
4850	0.8%
4900	0.7%
4950	0.7%
5000	0.6%
5050	0.6%
5100	0.6%
5150	0.6%

Copper World North Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	EARP:>3.0	EPITAPH:>3.0	GRANODIORITE:<1.2	GRANODIORITE:>3.0	GRANODIORITE:1.2-3.0
4450	0.00E+00	0.00E+00	0.00E+00	1.80E+04	0.00E+00
4500	0.00E+00	0.00E+00	0.00E+00	7.87E+04	0.00E+00
4550	0.00E+00	0.00E+00	3.87E+02	1.60E+05	0.00E+00
4600	0.00E+00	0.00E+00	1.34E+04	2.23E+05	0.00E+00
4650	0.00E+00	0.00E+00	3.53E+04	2.79E+05	0.00E+00
4700	0.00E+00	0.00E+00	6.24E+04	3.29E+05	1.51E+03
4750	3.02E+03	0.00E+00	1.11E+05	3.58E+05	1.43E+04
4800	2.74E+04	0.00E+00	1.64E+05	4.10E+05	3.81E+04
4850	7.79E+04	0.00E+00	1.94E+05	4.56E+05	3.87E+04
4900	1.23E+05	0.00E+00	2.02E+05	4.94E+05	3.87E+04
4950	1.67E+05	1.28E+03	2.02E+05	5.13E+05	3.87E+04
5000	2.05E+05	3.10E+03	2.02E+05	5.15E+05	3.87E+04
5050	2.21E+05	9.16E+03	2.02E+05	5.15E+05	3.87E+04
5100	2.29E+05	1.16E+04	2.02E+05	5.15E+05	3.87E+04
5150	2.29E+05	1.19E+04	2.02E+05	5.15E+05	3.87E+04

Copper World North Pit
Cumulative Surface Area (%)

Stage (ft)	EARP:>3.0	EPITAPH:>3.0	GRANODIORITE:<1.2	GRANODIORITE:>3.0	GRANODIORITE:1.2-3.0
4450	0.0%	0.0%	0.0%	100.0%	0.0%
4500	0.0%	0.0%	0.0%	85.8%	0.0%
4550	0.0%	0.0%	0.2%	74.4%	0.0%
4600	0.0%	0.0%	3.8%	62.7%	0.0%
4650	0.0%	0.0%	6.8%	53.5%	0.0%
4700	0.0%	0.0%	8.7%	45.7%	0.2%
4750	0.3%	0.0%	11.0%	35.5%	1.4%
4800	2.1%	0.0%	12.7%	31.9%	3.0%
4850	5.2%	0.0%	12.9%	30.3%	2.6%
4900	7.5%	0.0%	12.2%	29.9%	2.3%
4950	9.6%	0.1%	11.6%	29.6%	2.2%
5000	11.5%	0.2%	11.3%	29.0%	2.2%
5050	12.3%	0.5%	11.2%	28.6%	2.1%
5100	12.6%	0.6%	11.1%	28.4%	2.1%
5150	12.6%	0.7%	11.1%	28.4%	2.1%

Copper World North Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	HORQUILLA:>3.0	MARTIN:>3.0	Total
4450	0.00E+00	0.00E+00	1.80E+04
4500	0.00E+00	0.00E+00	9.17E+04
4550	0.00E+00	0.00E+00	2.14E+05
4600	0.00E+00	0.00E+00	3.56E+05
4650	0.00E+00	8.98E+03	5.22E+05
4700	1.96E+03	4.37E+04	7.19E+05
4750	2.16E+04	8.25E+04	1.01E+06
4800	6.30E+04	9.06E+04	1.29E+06
4850	8.95E+04	9.06E+04	1.50E+06
4900	1.08E+05	9.06E+04	1.65E+06
4950	1.17E+05	9.06E+04	1.74E+06
5000	1.17E+05	9.06E+04	1.78E+06
5050	1.17E+05	9.06E+04	1.80E+06
5100	1.17E+05	9.06E+04	1.81E+06
5150	1.17E+05	9.06E+04	1.81E+06

Copper World North Pit
Cumulative Surface Area (%)

Stage (ft)	HORQUILLA:>3.0	MARTIN:>3.0	Total
4450	0.0%	0.0%	100.0%
4500	0.0%	0.0%	100.0%
4550	0.0%	0.0%	100.0%
4600	0.0%	0.0%	100.0%
4650	0.0%	1.7%	100.0%
4700	0.3%	6.1%	100.0%
4750	2.1%	8.2%	100.0%
4800	4.9%	7.1%	100.0%
4850	6.0%	6.0%	100.0%
4900	6.5%	5.5%	100.0%
4950	6.8%	5.2%	100.0%
5000	6.6%	5.1%	100.0%
5050	6.5%	5.0%	100.0%
5100	6.5%	5.0%	100.0%
5150	6.5%	5.0%	100.0%

Copper World South Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	ABRIGO:<1.2	ABRIGO:>3.0	ABRIGO:1.2-3.0	BOLSA:<1.2	BOLSA:>3.0	BOLSA:1.2-3.0
4550	0.00E+00	0.00E+00	1.17E+03	0.00E+00	2.41E+02	8.05E+03
4600	0.00E+00	1.52E+04	5.73E+03	7.49E+02	6.59E+03	2.47E+04
4650	2.45E+03	4.60E+04	1.84E+04	3.98E+03	1.59E+04	3.64E+04
4700	2.81E+03	6.98E+04	2.48E+04	5.60E+03	6.59E+04	3.76E+04
4750	2.81E+03	1.06E+05	2.54E+04	1.00E+04	1.65E+05	3.76E+04
4800	2.81E+03	1.13E+05	2.54E+04	1.00E+04	2.26E+05	3.76E+04
4850	2.81E+03	1.13E+05	2.54E+04	1.00E+04	2.76E+05	3.76E+04
4900	2.81E+03	1.13E+05	2.54E+04	1.00E+04	3.17E+05	3.76E+04
4950	2.81E+03	1.13E+05	2.54E+04	1.00E+04	3.62E+05	3.76E+04
5000	2.81E+03	1.13E+05	2.54E+04	1.00E+04	4.08E+05	3.76E+04
5050	2.81E+03	1.13E+05	2.54E+04	1.00E+04	4.47E+05	3.76E+04
5100	2.81E+03	1.13E+05	2.54E+04	1.00E+04	4.72E+05	3.76E+04
5150	2.81E+03	1.13E+05	2.54E+04	1.00E+04	4.82E+05	3.76E+04
5200	2.81E+03	1.13E+05	2.54E+04	1.00E+04	4.83E+05	3.76E+04

Copper World South Pit
Cumulative Surface Area (%)

Stage (ft)	ABRIGO:<1.2	ABRIGO:>3.0	ABRIGO:1.2-3.0	BOLSA:<1.2	BOLSA:>3.0	BOLSA:1.2-3.0
4550	0.0%	0.0%	4.0%	0.0%	0.8%	27.3%
4600	0.0%	13.2%	5.0%	0.7%	5.7%	21.5%
4650	1.0%	19.6%	7.8%	1.7%	6.8%	15.5%
4700	0.7%	18.0%	6.4%	1.4%	16.9%	9.7%
4750	0.4%	16.6%	4.0%	1.6%	26.0%	5.9%
4800	0.3%	13.2%	3.0%	1.2%	26.4%	4.4%
4850	0.3%	10.9%	2.4%	1.0%	26.5%	3.6%
4900	0.2%	9.3%	2.1%	0.8%	26.2%	3.1%
4950	0.2%	8.3%	1.9%	0.7%	26.6%	2.8%
5000	0.2%	7.7%	1.7%	0.7%	27.8%	2.6%
5050	0.2%	7.3%	1.6%	0.7%	28.9%	2.4%
5100	0.2%	7.1%	1.6%	0.6%	29.6%	2.4%
5150	0.2%	7.0%	1.6%	0.6%	30.0%	2.3%
5200	0.2%	7.0%	1.6%	0.6%	30.0%	2.3%

Copper World South Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	EARP:>3.0	EPITAPH:>3.0	GRANODIORITE:<1.2	GRANODIORITE:>3.0	GRANODIORITE:1.2-3.0	HORQUILLA:>3.0
4550	0.00E+00	0.00E+00	0.00E+00	2.00E+04	0.00E+00	0.00E+00
4600	0.00E+00	0.00E+00	0.00E+00	6.21E+04	5.17E+01	0.00E+00
4650	0.00E+00	0.00E+00	2.64E+01	1.07E+05	4.04E+03	0.00E+00
4700	0.00E+00	0.00E+00	8.33E+03	1.59E+05	1.48E+04	0.00E+00
4750	0.00E+00	0.00E+00	2.16E+04	2.08E+05	2.70E+04	1.23E+04
4800	4.71E+02	0.00E+00	4.74E+04	2.44E+05	4.71E+04	5.70E+04
4850	1.58E+04	0.00E+00	7.45E+04	2.54E+05	4.75E+04	1.32E+05
4900	7.41E+04	0.00E+00	8.89E+04	2.64E+05	4.75E+04	1.79E+05
4950	1.57E+05	0.00E+00	9.94E+04	2.71E+05	4.75E+04	1.83E+05
5000	2.10E+05	1.19E+02	1.06E+05	2.73E+05	4.75E+04	1.83E+05
5050	2.37E+05	9.64E+03	1.08E+05	2.73E+05	4.75E+04	1.83E+05
5100	2.41E+05	2.92E+04	1.08E+05	2.73E+05	4.75E+04	1.83E+05
5150	2.41E+05	3.24E+04	1.08E+05	2.73E+05	4.75E+04	1.83E+05
5200	2.41E+05	3.24E+04	1.08E+05	2.73E+05	4.75E+04	1.83E+05

Copper World South Pit
Cumulative Surface Area (%)

Stage (ft)	EARP:>3.0	EPITAPH:>3.0	GRANODIORITE:<1.2	GRANODIORITE:>3.0	GRANODIORITE:1.2-3.0	HORQUILLA:>3.0
4550	0.0%	0.0%	0.0%	67.9%	0.0%	0.0%
4600	0.0%	0.0%	0.0%	53.9%	0.0%	0.0%
4650	0.0%	0.0%	0.0%	45.7%	1.7%	0.0%
4700	0.0%	0.0%	2.1%	40.9%	3.8%	0.0%
4750	0.0%	0.0%	3.4%	32.7%	4.2%	1.9%
4800	0.1%	0.0%	5.5%	28.5%	5.5%	6.7%
4850	1.5%	0.0%	7.2%	24.4%	4.6%	12.7%
4900	6.1%	0.0%	7.3%	21.8%	3.9%	14.8%
4950	11.6%	0.0%	7.3%	19.9%	3.5%	13.4%
5000	14.3%	0.0%	7.2%	18.6%	3.2%	12.4%
5050	15.4%	0.6%	7.0%	17.6%	3.1%	11.8%
5100	15.1%	1.8%	6.8%	17.1%	3.0%	11.5%
5150	15.0%	2.0%	6.7%	17.0%	3.0%	11.4%
5200	15.0%	2.0%	6.7%	17.0%	3.0%	11.4%

Copper World South Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	MARTIN:>3.0	Total
4550	0.00E+00	2.94E+04
4600	0.00E+00	1.15E+05
4650	0.00E+00	2.34E+05
4700	0.00E+00	3.89E+05
4750	2.06E+04	6.37E+05
4800	4.49E+04	8.55E+05
4850	5.15E+04	1.04E+06
4900	5.15E+04	1.21E+06
4950	5.15E+04	1.36E+06
5000	5.15E+04	1.47E+06
5050	5.15E+04	1.55E+06
5100	5.15E+04	1.59E+06
5150	5.15E+04	1.61E+06
5200	5.15E+04	1.61E+06

Copper World South Pit
Cumulative Surface Area (%)

Stage (ft)	MARTIN:>3.0	Total
4550	0.0%	100.0%
4600	0.0%	100.0%
4650	0.0%	100.0%
4700	0.0%	100.0%
4750	3.2%	100.0%
4800	5.3%	100.0%
4850	5.0%	100.0%
4900	4.2%	100.0%
4950	3.8%	100.0%
5000	3.5%	100.0%
5050	3.3%	100.0%
5100	3.2%	100.0%
5150	3.2%	100.0%
5200	3.2%	100.0%

Broadtop Butte Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	ABRIGO:<1.2	ABRIGO:>3.0	ABRIGO:1.2-3.0	ARKOSE:>3.0	BOLSA:<1.2
4850	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4900	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4950	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5050	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5100	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5150	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5200	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5250	0.00E+00	7.67E+02	0.00E+00	1.15E+03	0.00E+00
5300	0.00E+00	4.22E+04	0.00E+00	9.94E+04	0.00E+00
5350	0.00E+00	1.29E+05	0.00E+00	2.87E+05	0.00E+00
5400	0.00E+00	2.77E+05	0.00E+00	3.80E+05	0.00E+00
5450	0.00E+00	4.49E+05	2.63E+03	4.40E+05	0.00E+00
5500	8.36E+01	6.33E+05	1.65E+04	4.45E+05	0.00E+00
5550	6.22E+03	8.93E+05	2.59E+04	4.48E+05	0.00E+00
5600	6.22E+03	9.47E+05	3.09E+04	4.48E+05	0.00E+00
5650	6.22E+03	9.93E+05	3.09E+04	4.48E+05	0.00E+00
5700	6.22E+03	1.02E+06	3.09E+04	4.48E+05	2.95E+03
5750	6.22E+03	1.04E+06	3.09E+04	4.48E+05	3.74E+03
5800	6.22E+03	1.05E+06	3.09E+04	4.48E+05	7.06E+03
5850	6.22E+03	1.05E+06	3.09E+04	4.48E+05	7.49E+03
5900	6.22E+03	1.05E+06	3.09E+04	4.48E+05	7.49E+03
5950	6.22E+03	1.05E+06	3.09E+04	4.48E+05	7.49E+03
6000	6.22E+03	1.05E+06	3.09E+04	4.48E+05	7.49E+03
6050	6.22E+03	1.05E+06	3.09E+04	4.48E+05	7.49E+03
6100	6.22E+03	1.05E+06	3.09E+04	4.48E+05	7.49E+03
6150	6.22E+03	1.05E+06	3.09E+04	4.48E+05	7.49E+03
6200	6.22E+03	1.05E+06	3.09E+04	4.48E+05	7.49E+03

Broadtop Butte Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	BOLSA:>3.0	BOLSA:1.2-3.0	EPITAPH:>3.0	EPITAPH:1.2-3.0	ESCABROSA:>3.0
4850	0.00E+00	0.00E+00	7.52E+04	0.00E+00	0.00E+00
4900	0.00E+00	0.00E+00	4.42E+05	1.00E+04	0.00E+00
4950	0.00E+00	0.00E+00	8.05E+05	1.00E+04	0.00E+00
5000	0.00E+00	0.00E+00	1.06E+06	1.00E+04	0.00E+00
5050	0.00E+00	0.00E+00	1.25E+06	1.00E+04	0.00E+00
5100	0.00E+00	0.00E+00	1.46E+06	1.00E+04	0.00E+00
5150	0.00E+00	0.00E+00	1.67E+06	1.97E+04	0.00E+00
5200	5.57E+03	0.00E+00	1.90E+06	2.04E+04	1.24E+02
5250	2.06E+05	0.00E+00	2.06E+06	2.04E+04	5.93E+03
5300	3.32E+05	0.00E+00	2.14E+06	2.04E+04	2.21E+04
5350	4.39E+05	0.00E+00	2.15E+06	2.04E+04	3.39E+04
5400	5.23E+05	0.00E+00	2.16E+06	2.04E+04	4.39E+04
5450	6.24E+05	0.00E+00	2.16E+06	2.04E+04	4.87E+04
5500	7.25E+05	0.00E+00	2.16E+06	2.04E+04	5.44E+04
5550	9.38E+05	2.14E+04	2.16E+06	2.04E+04	5.44E+04
5600	9.99E+05	3.86E+04	2.16E+06	2.04E+04	5.44E+04
5650	1.04E+06	5.74E+04	2.16E+06	2.04E+04	5.44E+04
5700	1.07E+06	7.92E+04	2.16E+06	2.04E+04	5.44E+04
5750	1.10E+06	1.04E+05	2.16E+06	2.04E+04	5.44E+04
5800	1.13E+06	1.15E+05	2.16E+06	2.04E+04	5.44E+04
5850	1.15E+06	1.15E+05	2.16E+06	2.04E+04	5.44E+04
5900	1.15E+06	1.15E+05	2.16E+06	2.04E+04	5.44E+04
5950	1.15E+06	1.15E+05	2.16E+06	2.04E+04	5.44E+04
6000	1.15E+06	1.15E+05	2.16E+06	2.04E+04	5.44E+04
6050	1.15E+06	1.15E+05	2.16E+06	2.04E+04	5.44E+04
6100	1.15E+06	1.15E+05	2.16E+06	2.04E+04	5.44E+04
6150	1.15E+06	1.15E+05	2.16E+06	2.04E+04	5.44E+04
6200	1.15E+06	1.15E+05	2.16E+06	2.04E+04	5.44E+04

Broadtop Butte Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	GLANCE:>3.0	GLANCE:1.2-3.0
4850	7.34E+02	0.00E+00
4900	1.76E+04	0.00E+00
4950	6.73E+04	0.00E+00
5000	1.90E+05	0.00E+00
5050	3.64E+05	0.00E+00
5100	5.71E+05	1.02E+02
5150	8.19E+05	1.17E+04
5200	1.08E+06	2.02E+04
5250	1.38E+06	2.63E+04
5300	1.86E+06	2.74E+04
5350	2.08E+06	2.74E+04
5400	2.19E+06	2.74E+04
5450	2.27E+06	2.74E+04
5500	2.32E+06	2.74E+04
5550	2.57E+06	2.74E+04
5600	2.60E+06	2.74E+04
5650	2.60E+06	2.74E+04
5700	2.60E+06	2.74E+04
5750	2.60E+06	2.74E+04
5800	2.60E+06	2.74E+04
5850	2.60E+06	2.74E+04
5900	2.60E+06	2.74E+04
5950	2.60E+06	2.74E+04
6000	2.60E+06	2.74E+04
6050	2.60E+06	2.74E+04
6100	2.60E+06	2.74E+04
6150	2.60E+06	2.74E+04
6200	2.60E+06	2.74E+04

Broadtop Butte Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	GRANODIORITE:>3.0	GRANODIORITE:1.2-3.0	QMP:<1.2	QMP:>3.0	QMP:1.2-3.0
4850	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4900	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4950	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5050	0.00E+00	0.00E+00	0.00E+00	3.27E+02	4.80E+02
5100	0.00E+00	0.00E+00	0.00E+00	4.45E+03	2.79E+04
5150	0.00E+00	0.00E+00	1.69E+02	1.95E+04	1.45E+05
5200	0.00E+00	0.00E+00	1.98E+04	5.23E+04	2.41E+05
5250	7.49E+04	0.00E+00	3.53E+04	9.23E+04	2.91E+05
5300	1.41E+05	0.00E+00	4.36E+04	1.37E+05	3.30E+05
5350	2.19E+05	0.00E+00	6.73E+04	1.75E+05	3.53E+05
5400	3.03E+05	0.00E+00	8.99E+04	2.16E+05	3.73E+05
5450	3.71E+05	0.00E+00	1.10E+05	2.71E+05	3.87E+05
5500	4.38E+05	0.00E+00	1.24E+05	3.28E+05	4.02E+05
5550	5.05E+05	0.00E+00	1.39E+05	3.82E+05	4.13E+05
5600	5.61E+05	0.00E+00	1.39E+05	4.32E+05	4.13E+05
5650	5.96E+05	0.00E+00	1.39E+05	4.90E+05	4.13E+05
5700	6.17E+05	0.00E+00	1.39E+05	5.51E+05	4.13E+05
5750	6.28E+05	2.63E+03	1.39E+05	6.11E+05	4.13E+05
5800	6.46E+05	8.16E+03	1.39E+05	6.67E+05	4.13E+05
5850	6.83E+05	1.63E+04	1.39E+05	7.20E+05	4.13E+05
5900	7.23E+05	1.91E+04	1.39E+05	7.70E+05	4.13E+05
5950	7.57E+05	1.91E+04	1.39E+05	8.14E+05	4.13E+05
6000	7.77E+05	1.91E+04	1.39E+05	8.51E+05	4.13E+05
6050	7.82E+05	1.91E+04	1.39E+05	8.80E+05	4.13E+05
6100	7.82E+05	1.91E+04	1.39E+05	9.05E+05	4.13E+05
6150	7.82E+05	1.91E+04	1.39E+05	9.08E+05	4.13E+05
6200	7.82E+05	1.91E+04	1.39E+05	9.08E+05	4.13E+05

Broadtop Butte Pit
Cumulative Surface Area (sq. ft)

Stage (ft)	SCHERRER:>3.0	Total
4850	0.00E+00	7.59E+04
4900	5.23E+02	4.71E+05
4950	1.53E+04	8.98E+05
5000	3.61E+04	1.30E+06
5050	9.66E+04	1.72E+06
5100	1.58E+05	2.23E+06
5150	1.97E+05	2.88E+06
5200	2.75E+05	3.62E+06
5250	3.30E+05	4.52E+06
5300	3.48E+05	5.54E+06
5350	3.53E+05	6.34E+06
5400	3.53E+05	6.96E+06
5450	3.53E+05	7.53E+06
5500	3.53E+05	8.04E+06
5550	3.53E+05	8.95E+06
5600	3.53E+05	9.23E+06
5650	3.53E+05	9.42E+06
5700	3.53E+05	9.60E+06
5750	3.53E+05	9.75E+06
5800	3.53E+05	9.87E+06
5850	3.53E+05	9.98E+06
5900	3.53E+05	1.01E+07
5950	3.53E+05	1.02E+07
6000	3.53E+05	1.02E+07
6050	3.53E+05	1.02E+07
6100	3.53E+05	1.03E+07
6150	3.53E+05	1.03E+07
6200	3.53E+05	1.03E+07

Broadtop Pit
Cumulative Surface Area (%)

Stage (ft)	ABRIGO:<1.2	ABRIGO:>3.0	ABRIGO:1.2-3.0	ARKOSE:>3.0	BOLSA:<1.2
4850	0.0%	0.0%	0.0%	0.0%	0.0%
4900	0.0%	0.0%	0.0%	0.0%	0.0%
4950	0.0%	0.0%	0.0%	0.0%	0.0%
5000	0.0%	0.0%	0.0%	0.0%	0.0%
5050	0.0%	0.0%	0.0%	0.0%	0.0%
5100	0.0%	0.0%	0.0%	0.0%	0.0%
5150	0.0%	0.0%	0.0%	0.0%	0.0%
5200	0.0%	0.0%	0.0%	0.0%	0.0%
5250	0.0%	0.0%	0.0%	0.0%	0.0%
5300	0.0%	0.8%	0.0%	1.8%	0.0%
5350	0.0%	2.0%	0.0%	4.5%	0.0%
5400	0.0%	4.0%	0.0%	5.5%	0.0%
5450	0.0%	6.0%	0.0%	5.8%	0.0%
5500	0.0%	7.9%	0.2%	5.5%	0.0%
5550	0.1%	10.0%	0.3%	5.0%	0.0%
5600	0.1%	10.3%	0.3%	4.9%	0.0%
5650	0.1%	10.5%	0.3%	4.7%	0.0%
5700	0.1%	10.6%	0.3%	4.7%	0.0%
5750	0.1%	10.7%	0.3%	4.6%	0.0%
5800	0.1%	10.6%	0.3%	4.5%	0.1%
5850	0.1%	10.5%	0.3%	4.5%	0.1%
5900	0.1%	10.4%	0.3%	4.4%	0.1%
5950	0.1%	10.3%	0.3%	4.4%	0.1%
6000	0.1%	10.2%	0.3%	4.4%	0.1%
6050	0.1%	10.2%	0.3%	4.4%	0.1%
6100	0.1%	10.2%	0.3%	4.4%	0.1%
6150	0.1%	10.2%	0.3%	4.4%	0.1%
6200	0.1%	10.2%	0.3%	4.4%	0.1%

Broadtop Pit
Cumulative Surface Area (%)

Stage (ft)	BOLSA:>3.0	BOLSA:1.2-3.0	EPITAPH:>3.0	EPITAPH:1.2-3.0	ESCABROSA:>3.0
4850	0.0%	0.0%	99.0%	0.0%	0.0%
4900	0.0%	0.0%	94.0%	2.1%	0.0%
4950	0.0%	0.0%	89.7%	1.1%	0.0%
5000	0.0%	0.0%	81.7%	0.8%	0.0%
5050	0.0%	0.0%	72.6%	0.6%	0.0%
5100	0.0%	0.0%	65.5%	0.4%	0.0%
5150	0.0%	0.0%	57.9%	0.7%	0.0%
5200	0.2%	0.0%	52.6%	0.6%	0.0%
5250	4.6%	0.0%	45.6%	0.5%	0.1%
5300	6.0%	0.0%	38.6%	0.4%	0.4%
5350	6.9%	0.0%	34.0%	0.3%	0.5%
5400	7.5%	0.0%	31.0%	0.3%	0.6%
5450	8.3%	0.0%	28.7%	0.3%	0.6%
5500	9.0%	0.0%	26.9%	0.3%	0.7%
5550	10.5%	0.2%	24.1%	0.2%	0.6%
5600	10.8%	0.4%	23.4%	0.2%	0.6%
5650	11.0%	0.6%	22.9%	0.2%	0.6%
5700	11.2%	0.8%	22.5%	0.2%	0.6%
5750	11.3%	1.1%	22.2%	0.2%	0.6%
5800	11.5%	1.2%	21.9%	0.2%	0.6%
5850	11.5%	1.2%	21.6%	0.2%	0.5%
5900	11.4%	1.1%	21.4%	0.2%	0.5%
5950	11.3%	1.1%	21.3%	0.2%	0.5%
6000	11.2%	1.1%	21.1%	0.2%	0.5%
6050	11.2%	1.1%	21.1%	0.2%	0.5%
6100	11.2%	1.1%	21.0%	0.2%	0.5%
6150	11.2%	1.1%	21.0%	0.2%	0.5%
6200	11.2%	1.1%	21.0%	0.2%	0.5%

Broadtop Pit
Cumulative Surface Area (%)

Stage (ft)	GLANCE:>3.0	GLANCE:1.2-3.0
4850	1.0%	0.0%
4900	3.7%	0.0%
4950	7.5%	0.0%
5000	14.7%	0.0%
5050	21.2%	0.0%
5100	25.6%	0.0%
5150	28.4%	0.4%
5200	29.9%	0.6%
5250	30.4%	0.6%
5300	33.6%	0.5%
5350	32.8%	0.4%
5400	31.5%	0.4%
5450	30.1%	0.4%
5500	28.8%	0.3%
5550	28.7%	0.3%
5600	28.2%	0.3%
5650	27.6%	0.3%
5700	27.1%	0.3%
5750	26.7%	0.3%
5800	26.3%	0.3%
5850	26.0%	0.3%
5900	25.8%	0.3%
5950	25.6%	0.3%
6000	25.5%	0.3%
6050	25.4%	0.3%
6100	25.3%	0.3%
6150	25.3%	0.3%
6200	25.3%	0.3%

Broadtop Pit
Cumulative Surface Area (%)

Stage (ft)	GRANODIORITE:>3.0	GRANODIORITE:1.2-3.0	QMP:<1.2	QMP:>3.0	QMP:1.2-3.0
4850	0.0%	0.0%	0.0%	0.0%	0.0%
4900	0.0%	0.0%	0.0%	0.0%	0.0%
4950	0.0%	0.0%	0.0%	0.0%	0.0%
5000	0.0%	0.0%	0.0%	0.0%	0.0%
5050	0.0%	0.0%	0.0%	0.0%	0.0%
5100	0.0%	0.0%	0.0%	0.2%	1.3%
5150	0.0%	0.0%	0.0%	0.7%	5.0%
5200	0.0%	0.0%	0.5%	1.4%	6.6%
5250	1.7%	0.0%	0.8%	2.0%	6.4%
5300	2.5%	0.0%	0.8%	2.5%	6.0%
5350	3.5%	0.0%	1.1%	2.8%	5.6%
5400	4.4%	0.0%	1.3%	3.1%	5.4%
5450	4.9%	0.0%	1.5%	3.6%	5.1%
5500	5.4%	0.0%	1.5%	4.1%	5.0%
5550	5.6%	0.0%	1.5%	4.3%	4.6%
5600	6.1%	0.0%	1.5%	4.7%	4.5%
5650	6.3%	0.0%	1.5%	5.2%	4.4%
5700	6.4%	0.0%	1.4%	5.7%	4.3%
5750	6.4%	0.0%	1.4%	6.3%	4.2%
5800	6.5%	0.1%	1.4%	6.8%	4.2%
5850	6.8%	0.2%	1.4%	7.2%	4.1%
5900	7.2%	0.2%	1.4%	7.6%	4.1%
5950	7.5%	0.2%	1.4%	8.0%	4.1%
6000	7.6%	0.2%	1.4%	8.3%	4.0%
6050	7.6%	0.2%	1.4%	8.6%	4.0%
6100	7.6%	0.2%	1.3%	8.8%	4.0%
6150	7.6%	0.2%	1.3%	8.8%	4.0%
6200	7.6%	0.2%	1.3%	8.8%	4.0%

Broadtop Pit
Cumulative Surface Area (%)

Stage (ft)	SCHERRER:>3.0	Total
4850	0.0%	100.0%
4900	0.1%	100.0%
4950	1.7%	100.0%
5000	2.8%	100.0%
5050	5.6%	100.0%
5100	7.1%	100.0%
5150	6.8%	100.0%
5200	7.6%	100.0%
5250	7.3%	100.0%
5300	6.3%	100.0%
5350	5.6%	100.0%
5400	5.1%	100.0%
5450	4.7%	100.0%
5500	4.4%	100.0%
5550	3.9%	100.0%
5600	3.8%	100.0%
5650	3.7%	100.0%
5700	3.7%	100.0%
5750	3.6%	100.0%
5800	3.6%	100.0%
5850	3.5%	100.0%
5900	3.5%	100.0%
5950	3.5%	100.0%
6000	3.5%	100.0%
6050	3.4%	100.0%
6100	3.4%	100.0%
6150	3.4%	100.0%
6200	3.4%	100.0%

APPENDIX K
PHREEQC inputs

<table>
<tr><th>Sensitivity</th><th>PHREEQC Keyword</th><th colspan="3">Input</th><th>Units</th></tr>
<tr><td rowspan="17">Base case</td><td>Solution Master Species</td><td colspan="3">pH, Ag, Al, Alkalinity, As, B, Ba, Be, Bi, Ca, Cd, Cl, Cr, Co, Cu, Fe, F, Ga, Hg, K, Li, Mg, Mn, Mo, N, Na, Ni, P, Pb, SO4, Sb, Sc, Se, Sn, Sr, Tl, Ti, U, V, Zn</td><td>mg/L</td></tr>
<tr><td>pe</td><td colspan="3">4</td><td>-</td></tr>
<tr><td>Temperature</td><td colspan="3">15</td><td>°C</td></tr>
<tr><td rowspan="6">Equilibrium Phases (precipitate only)</td><td>Phase</td><td>Target SI</td><td>Initial</td><td></td></tr>
<tr><td>barite</td><td>0.5</td><td>0</td><td rowspan="5">-</td></tr>
<tr><td>calcite</td><td>0.5</td><td>0</td></tr>
<tr><td>ferrihydrite</td><td>0.2</td><td>0</td></tr>
<tr><td>fluorite, gibbsite, gypsum, H-jarosite, K-jarosite, malachite, Na-jarosite, rhodochrosite, pyrolusite, tenorite, otavite, zincite</td><td>0</td><td>0</td></tr>
<tr><td>CO2(g)</td><td>-2.5</td><td>10</td></tr>
<tr><td rowspan="3">Gas Phases (fixed)</td><td>Phase</td><td colspan="2">n</td><td></td></tr>
<tr><td>O2(g)</td><td colspan="2">0.0039</td><td rowspan="2">-</td></tr>
<tr><td>CO2(g)</td><td colspan="2">0.21</td></tr>
<tr><td rowspan="3">Surfaces</td><td>Site</td><td>Sites per Mole</td><td>Specific Area</td><td></td></tr>
<tr><td>Hfo_wOH - Ferrihydrite</td><td>0.2</td><td>53300</td><td rowspan="2">sq. m/mol</td></tr>
<tr><td>Hfo_sOH - Ferrihydrite</td><td>0.005</td><td>-</td></tr>
<tr><td>pE -4</td><td>pe</td><td colspan="3">-4</td><td>-</td></tr>
<tr><td rowspan="6">SI +1.0</td><td rowspan="6">Equilibrium Phases (precipitate only)</td><td>Phase</td><td>Target SI</td><td>Initial</td><td></td></tr>
<tr><td>barite</td><td>1.5</td><td>0</td><td rowspan="5">-</td></tr>
<tr><td>calcite</td><td>1.5</td><td>0</td></tr>
<tr><td>ferrihydrite</td><td>1.2</td><td>0</td></tr>
<tr><td>fluorite, gibbsite, gypsum, H-jarosite, K-jarosite, malachite, Na-jarosite, rhodochrosite, pyrolusite, tenorite, otavite, zincite</td><td>1</td><td>0</td></tr>
<tr><td>CO2(g)</td><td>-2.5</td><td>10</td></tr>
<tr><td>50 ft RRZ</td><td colspan="5" rowspan="6">Same as Base Case</td></tr>
<tr><td>Scale Factor</td></tr>
<tr><td>ET +15%</td></tr>
<tr><td>ET -15%</td></tr>
<tr><td>GW Inflow +25%</td></tr>
<tr><td>GW Inflow -25%</td></tr>
</table>

APPENDIX L
Rosemont Pit sensitivity analysis

			1 Year									2 Year						
Concentration (mg/L)	*MCL*	*AWQS*	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
pH	*6.5-8.5*	-----	7.77	7.79	7.77	7.79	7.77	7.77	7.77	7.78	7.77	7.75	7.78	7.76	7.79	7.76	7.75	7.76
pe	-----	-----	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	233	242	234	245	234	231	232	235	233	224	240	225	243	226	222	225
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.003	**0.007**	0.003	0.005	0.003	0.003	0.003	0.003	0.003	0.002	0.006	0.002	0.004	0.002	0.002	0.002
Arsenic	*0.01*	*0.05*	0.000	0.001	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.010	0.001	0.000	0.000	0.000
Barium	*2*	*2*	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.002	0.005	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.003	0.002	0.002	0.002
Calcium	-----	-----	112	110	112	109	113	111	116	107	112	110	111	110	111	111	109	114
Chloride	*250*	-----	11	18	11	18	11	11	11	11	11	11	16	11	16	11	10	11
Chromium	*0.1*	*0.1*	0.005	0.013	0.006	0.009	0.005	0.005	0.004	0.005	0.005	0.004	0.010	0.005	0.007	0.004	0.004	0.004
Copper	*1.3*	-----	0.03	0.03	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.05	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	2.40	3.11	2.40	3.15	2.42	2.39	2.27	2.59	2.40	2.26	3.08	2.26	3.13	2.28	2.24	2.16
Iron	*0.3*	-----	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.005	0.012	0.009	0.010	0.005	0.005	0.005	0.006	0.006	0.005	0.010	0.008	0.008	0.005	0.005	0.004
Magnesium	*150*	-----	17	18	17	20	17	17	18	16	17	17	18	17	20	17	17	18
Manganese	*0.05*	-----	0.124	0.130	0.124	0.144	0.125	0.123	0.132	0.114	0.124	0.125	0.130	0.125	0.145	0.126	0.123	0.133
Mercury	*0.002*	*0.002*	0.0002	0.0005	0.0002	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002	0.0003	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.04	0.04	0.04	0.05	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.05
Nickel	-----	*0.1*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	1.17	2.65	1.17	2.04	1.18	1.17	1.15	1.21	1.17	1.03	2.22	1.03	1.73	1.03	1.02	1.04
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	8.8	12.5	8.8	15.7	8.8	8.7	8.3	9.5	8.8	8.6	11.8	8.6	15.5	8.7	8.6	8.2
Selenium	*0.05*	*0.05*	0.012	0.023	0.013	0.023	0.012	0.012	0.011	0.013	0.012	0.011	0.020	0.012	0.021	0.011	0.011	0.010
Silver	*0.1*	-----	0.005	0.012	0.005	0.009	0.005	0.005	0.005	0.005	0.005	0.004	0.010	0.004	0.008	0.004	0.004	0.004
Sodium	-----	-----	23	35	23	40	23	23	22	24	23	22	32	22	37	22	21	21
Sulfate	*250*	-----	192	210	192	226	194	191	204	177	192	193	207	192	226	195	191	205
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	600	652	602	679	604	597	614	583	601	587	642	588	674	593	582	605
Uranium	*0.03*	-----	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Zinc	*5*	-----	0.14	0.16	0.15	0.16	0.15	0.14	0.16	0.13	0.15	0.14	0.15	0.15	0.16	0.15	0.14	0.16

AWQS Exceedance

					3 Year									5 Year				
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%
Time (yr)			2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0
pH	*6.5-8.5*	-----	7.75	7.75	7.75	7.78	7.75	7.79	7.75	7.74	7.75	7.75	7.75	7.74	7.78	7.74	7.79	7.75
pe	-----	-----	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00
Alkalinity Total	-----	-----	222	224	220	239	222	242	223	218	220	221	221	217	237	219	242	221
Aluminum	*0.2*	-----	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	0.005	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.003	0.002
Arsenic	*0.01*	*0.05*	0.000	0.000	0.000	0.001	0.010	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.010	0.001	0.000
Barium	*2*	*2*	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.002	0.002	0.001	0.004	0.001	0.003	0.001	0.001	0.001	0.002	0.001	0.001	0.003	0.001	0.003	0.001
Calcium	-----	-----	104	110	109	112	109	111	111	108	113	104	109	109	114	109	112	111
Chloride	*250*	-----	10	11	10	15	10	16	10	10	10	10	10	10	14	10	15	10
Chromium	*0.1*	*0.1*	0.004	0.004	0.003	0.009	0.005	0.006	0.003	0.003	0.003	0.004	0.003	0.003	0.008	0.004	0.005	0.003
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.05	0.03	0.03
Fluoride	*4*	*4*	2.39	2.26	2.20	3.06	2.20	3.12	2.23	2.18	2.08	2.37	2.20	2.15	3.05	2.15	3.11	2.18
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
Lead	*0.015*	*0.05*	0.005	0.005	0.004	0.009	0.008	0.008	0.004	0.004	0.004	0.005	0.005	0.004	0.008	0.007	0.007	0.004
Magnesium	*150*	-----	16	17	17	18	17	20	17	17	18	16	17	17	18	17	21	18
Manganese	*0.05*	-----	0.114	0.125	0.126	0.130	0.126	0.146	0.128	0.124	0.134	0.115	0.126	0.128	0.132	0.128	0.148	0.130
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0004	0.0002	0.0003	0.0002	0.0002	0.0001	0.0002	0.0002	0.0001	0.0003	0.0001	0.0003	0.0001
Molybdenum	-----	-----	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.05	0.05	0.05
Nickel	-----	*0.1*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	1.02	1.03	0.96	2.01	0.96	1.59	0.97	0.95	0.95	0.98	0.96	0.88	1.76	0.88	1.41	0.89
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	9.2	8.6	8.6	11.6	8.6	15.5	8.8	8.5	8.1	9.3	8.6	8.7	11.3	8.7	15.6	8.8
Selenium	*0.05*	*0.05*	0.012	0.011	0.010	0.019	0.011	0.020	0.010	0.010	0.010	0.011	0.010	0.010	0.017	0.011	0.019	0.010
Silver	*0.1*	-----	0.004	0.004	0.004	0.009	0.004	0.007	0.004	0.004	0.004	0.004	0.004	0.003	0.008	0.003	0.006	0.003
Sodium	-----	-----	23	22	21	30	21	36	21	21	20	22	21	21	28	21	35	21
Sulfate	*250*	-----	177	193	194	208	194	228	197	191	206	178	194	197	209	196	230	201
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	564	587	584	639	586	675	593	576	599	565	585	583	636	584	676	594
Uranium	*0.03*	-----	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.003	0.003	0.003	0.003	0.003	0.003
Zinc	*5*	-----	0.13	0.15	0.15	0.15	0.15	0.16	0.15	0.14	0.16	0.13	0.15	0.15	0.15	0.15	0.16	0.15

AWQS Exceedance

							10 Year											
Concentration (mg/L)	MCL	AWQS	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4
Time (yr)			5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	20.0	20.0	20.0
pH	6.5-8.5	-----	7.74	7.74	7.74	7.74	7.75	7.77	7.75	7.78	7.76	7.74	7.75	7.75	7.75	7.77	7.77	7.77
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00
Alkalinity Total	-----	-----	213	219	216	217	221	235	223	241	229	214	221	221	222	234	234	234
Aluminum	0.2	-----	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
Antimony	0.006	0.006	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.001	0.003	0.001
Arsenic	0.01	0.05	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
Barium	2	2	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Beryllium	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001
Calcium	-----	-----	107	114	103	109	112	117	112	114	116	109	117	106	112	118	120	118
Chloride	250	-----	10	10	10	10	10	13	10	15	10	10	10	10	10	10	13	10
Chromium	0.1	0.1	0.003	0.003	0.003	0.003	0.002	0.006	0.004	0.005	0.002	0.002	0.002	0.002	0.002	0.002	0.006	0.003
Copper	1.3	-----	0.03	0.03	0.03	0.03	0.03	0.03	0.06	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.07
Fluoride	4	4	2.12	2.06	2.28	2.15	2.20	3.02	2.20	3.11	2.27	2.14	2.09	2.36	2.20	2.36	3.02	2.36
Iron	0.3	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
Lead	0.015	0.05	0.004	0.004	0.004	0.004	0.004	0.007	0.007	0.007	0.004	0.004	0.003	0.004	0.004	0.004	0.007	0.007
Magnesium	150	-----	17	18	16	17	18	19	18	22	19	17	19	17	18	19	20	19
Manganese	0.05	-----	0.125	0.136	0.117	0.128	0.133	0.137	0.133	0.156	0.138	0.129	0.141	0.123	0.133	0.143	0.145	0.143
Mercury	0.002	0.002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001
Molybdenum	-----	-----	0.04	0.05	0.04	0.04	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.05
Nickel	-----	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	10	10	0.87	0.90	0.86	0.88	0.85	1.60	0.85	1.31	0.87	0.83	0.85	0.85	0.85	0.87	1.52	0.87
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	8.6	8.3	9.3	8.7	9.2	11.6	9.2	16.5	9.5	8.9	8.7	9.9	9.2	10.2	12.4	10.2
Selenium	0.05	0.05	0.010	0.009	0.011	0.010	0.010	0.015	0.011	0.018	0.010	0.009	0.009	0.011	0.010	0.010	0.015	0.011
Silver	0.1	-----	0.003	0.003	0.003	0.003	0.003	0.007	0.003	0.005	0.003	0.003	0.003	0.003	0.003	0.003	0.006	0.003
Sodium	-----	-----	20	20	22	21	21	26	21	36	21	20	20	22	21	22	25	22
Sulfate	250	-----	193	209	180	197	205	218	205	242	212	198	217	189	205	218	231	218
Thallium	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	500	-----	572	602	559	583	600	644	602	691	621	581	616	579	601	636	661	636
Uranium	0.03	-----	0.003	0.003	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Zinc	5	-----	0.14	0.16	0.13	0.15	0.15	0.16	0.16	0.17	0.16	0.15	0.16	0.14	0.15	0.16	0.17	0.17

AWQS Exceedance

			20 Year						30 Year									
Concentration (mg/L)	*MCL*	*AWQS*	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case
Time (yr)			20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	50.0
pH	*6.5-8.5*	-----	7.78	7.77	7.75	7.77	7.77	7.77	7.77	7.77	7.77	7.79	7.77	7.77	7.77	7.78	7.80	7.77
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-0.74	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	242	233	222	231	234	235	234	234	234	243	233	232	232	237	249	234
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
Antimony	*0.006*	*0.006*	0.003	0.002	0.001	0.001	0.002	0.001	0.001	0.003	0.001	0.003	0.002	0.001	0.001	0.002	0.001	0.002
Arsenic	*0.01*	*0.05*	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Barium	*2*	*2*	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001
Calcium	-----	-----	116	121	112	122	112	119	119	121	119	116	122	115	123	114	124	122
Chloride	*250*	-----	16	11	10	10	10	10	11	13	11	16	11	10	11	11	11	12
Chromium	*0.1*	*0.1*	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.003	0.004	0.002	0.002	0.002	0.002	0.002	0.002
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.06	0.03	0.03	0.03	0.03	0.03	0.04	0.03
Fluoride	*4*	*4*	3.13	2.48	2.24	2.23	2.52	2.36	2.50	3.02	2.50	3.15	2.65	2.36	2.39	2.66	2.50	2.87
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.007	0.004	0.004	0.003	0.004	0.004	0.004	0.006	0.007	0.007	0.004	0.004	0.003	0.004	0.004	0.004
Magnesium	*150*	-----	23	20	18	20	18	19	20	21	20	25	22	19	21	19	20	23
Manganese	*0.05*	-----	0.169	0.151	0.135	0.150	0.131	0.143	0.145	0.153	0.145	0.169	0.156	0.135	0.154	0.133	0.145	0.159
Mercury	*0.002*	*0.002*	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	-----	-----	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.07	0.06	0.05	0.06	0.05	0.05	0.06
Nickel	-----	*0.1*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	1.28	0.91	0.83	0.87	0.86	0.87	0.91	1.51	0.91	1.30	0.95	0.87	0.93	0.89	0.91	1.06
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	18.3	10.7	9.7	9.6	10.9	10.2	10.8	13.2	10.8	19.5	11.5	10.2	10.3	11.6	10.8	12.6
Selenium	*0.05*	*0.05*	0.019	0.011	0.010	0.009	0.011	0.010	0.011	0.015	0.012	0.020	0.011	0.010	0.010	0.011	0.010	0.012
Silver	*0.1*	-----	0.005	0.003	0.003	0.003	0.003	0.003	0.003	0.006	0.003	0.005	0.003	0.003	0.003	0.003	0.003	0.003
Sodium	-----	-----	38	24	21	21	24	22	24	26	24	41	26	22	23	25	24	28
Sulfate	*250*	-----	259	231	206	230	201	218	227	243	227	268	244	211	241	209	227	252
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	718	654	603	649	615	638	649	677	649	734	674	624	665	630	668	689
Uranium	*0.03*	-----	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004
Zinc	*5*	-----	0.18	0.17	0.15	0.17	0.15	0.16	0.16	0.17	0.17	0.18	0.18	0.15	0.18	0.15	0.16	0.18

AWQS Exceedance

			50 Year								75 Year							
Concentration (mg/L)	*MCL*	*AWQS*	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%
Time (yr)			50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
pH	*6.5-8.5*	-----	7.77	7.77	7.79	7.77	7.77	7.77	7.78	7.85	7.77	7.77	7.77	7.80	7.77	7.78	7.76	7.78
pe	-----	-----	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	234	235	246	233	236	232	238	285	235	235	236	250	234	237	232	240
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.003	0.002	0.003	0.002	0.001	0.002	0.002	0.002	0.002	0.003	0.002	0.003	0.002	0.002	0.002	0.002
Arsenic	*0.01*	*0.05*	0.000	0.014	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.001	0.000	0.000	0.000	0.000
Barium	*2*	*2*	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.03	0.03	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001
Calcium	-----	-----	126	122	116	127	117	127	116	139	125	129	125	117	133	119	130	118
Chloride	*250*	-----	15	12	18	13	11	12	12	12	14	16	14	21	16	12	14	14
Chromium	*0.1*	*0.1*	0.005	0.004	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.004	0.003	0.002	0.002	0.002	0.002
Copper	*1.3*	-----	0.03	0.06	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.06	0.03	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	3.03	2.87	3.21	3.03	2.60	2.71	3.07	2.87	3.05	3.05	3.06	3.28	3.05	2.91	3.02	3.10
Iron	*0.3*	-----	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.007	0.008	0.007	0.004	0.004	0.004	0.004	0.004	0.004	0.007	0.009	0.008	0.005	0.004	0.004	0.005
Magnesium	*150*	-----	24	23	28	25	20	24	21	23	26	27	26	32	30	22	27	24
Manganese	*0.05*	-----	0.174	0.159	0.183	0.177	0.142	0.169	0.144	0.159	0.174	0.191	0.174	0.197	0.203	0.150	0.186	0.159
Mercury	*0.002*	*0.002*	0.0003	0.0001	0.0003	0.0002	0.0001	0.0001	0.0002	0.0001	0.0002	0.0003	0.0002	0.0003	0.0002	0.0001	0.0001	0.0002
Molybdenum	-----	-----	0.06	0.06	0.08	0.07	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.09	0.08	0.06	0.07	0.07
Nickel	-----	*0.1*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	1.67	1.06	1.47	1.16	0.97	1.06	1.05	1.06	1.23	1.83	1.23	1.65	1.38	1.12	1.24	1.23
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	15.3	12.6	22.8	13.9	11.4	11.9	13.5	12.6	14.7	17.4	14.7	26.7	16.7	13.0	13.9	15.8
Selenium	*0.05*	*0.05*	0.017	0.013	0.023	0.013	0.011	0.011	0.013	0.012	0.014	0.018	0.015	0.026	0.015	0.013	0.013	0.015
Silver	*0.1*	-----	0.006	0.003	0.005	0.003	0.003	0.003	0.003	0.003	0.003	0.006	0.003	0.005	0.003	0.003	0.003	0.003
Sodium	-----	-----	30	28	49	31	26	27	30	28	34	35	34	59	38	30	32	36
Sulfate	*250*	-----	273	252	299	281	225	267	232	252	282	303	281	334	329	244	299	262
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	723	689	785	730	650	704	666	757	735	768	735	845	801	680	753	713
Uranium	*0.03*	-----	0.004	0.004	0.004	0.004	0.003	0.004	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.003	0.004	0.004
Zinc	*5*	-----	0.19	0.19	0.19	0.20	0.16	0.19	0.16	0.18	0.19	0.21	0.20	0.20	0.23	0.17	0.21	0.17

AWQS Exceedance

				100 Year									125 Year					
Concentration (mg/L)	*MCL*	*AWQS*	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%
Time (yr)			75.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	125.0	125.0	125.0	125.0	125.0	125.0
pH	*6.5-8.5*	-----	7.91	7.77	7.77	7.77	7.80	7.76	7.78	7.76	7.78	7.96	7.77	7.77	7.77	7.80	7.76	7.78
pe	-----	-----	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	328	236	235	237	254	234	238	233	241	375	237	236	238	258	234	239
Aluminum	*0.2*	-----	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.002	0.004	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.004	0.002	0.002
Arsenic	*0.01*	*0.05*	0.000	0.000	0.001	0.019	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.022	0.001	0.000	0.000
Barium	*2*	*2*	0.05	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.04	0.06	0.03	0.03	0.03	0.03	0.03	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.001	0.001	0.003	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001
Calcium	-----	-----	156	129	133	128	118	138	120	135	121	175	133	137	132	120	144	122
Chloride	*250*	-----	14	16	18	16	24	18	13	16	16	16	18	20	18	27	21	14
Chromium	*0.1*	*0.1*	0.002	0.002	0.005	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.006	0.004	0.004	0.002	0.002
Copper	*1.3*	-----	0.04	0.03	0.03	0.07	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.08	0.03	0.03	0.03
Fluoride	*4*	*4*	3.30	3.08	3.07	3.08	3.34	3.07	3.08	3.04	3.13	3.78	3.10	3.09	3.10	3.41	3.09	3.10
Iron	*0.3*	-----	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.005	0.005	0.007	0.011	0.008	0.005	0.004	0.004	0.005	0.006	0.005	0.008	0.013	0.009	0.005	0.005
Magnesium	*150*	-----	26	29	30	29	36	34	24	30	27	29	32	34	32	40	39	26
Manganese	*0.05*	-----	0.174	0.192	0.210	0.192	0.215	0.228	0.160	0.206	0.173	0.192	0.211	0.232	0.211	0.236	0.255	0.170
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0003	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
Molybdenum	-----	-----	0.07	0.08	0.08	0.08	0.10	0.09	0.07	0.08	0.07	0.08	0.09	0.09	0.09	0.11	0.11	0.07
Nickel	-----	*0.1*	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00
Total Nitrogen	*10*	*10*	1.23	1.44	2.08	1.44	1.90	1.61	1.27	1.46	1.42	1.44	1.67	2.36	1.67	2.17	1.88	1.42
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	14.7	17.0	19.9	17.0	31.0	19.5	14.6	16.1	18.1	17.0	19.4	22.6	19.4	35.6	22.6	16.1
Selenium	*0.05*	*0.05*	0.014	0.016	0.021	0.018	0.030	0.018	0.014	0.015	0.017	0.016	0.018	0.023	0.021	0.035	0.020	0.015
Silver	*0.1*	-----	0.003	0.003	0.006	0.003	0.006	0.004	0.003	0.003	0.003	0.003	0.004	0.007	0.004	0.006	0.004	0.003
Sodium	-----	-----	34	39	41	39	70	45	34	38	41	39	45	47	45	82	53	38
Sulfate	*250*	-----	282	315	338	315	375	374	264	335	290	315	352	376	351	419	424	283
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	858	786	820	786	913	869	712	808	759	972	842	878	842	987	944	743
Uranium	*0.03*	-----	0.004	0.004	0.005	0.004	0.005	0.005	0.004	0.005	0.004	0.004	0.005	0.005	0.005	0.006	0.006	0.004
Zinc	*5*	-----	0.19	0.21	0.23	0.22	0.22	0.25	0.18	0.23	0.19	0.21	0.23	0.25	0.25	0.24	0.28	0.19

AWQS Exceedance

						150 Year													
Concentration (mg/L)	MCL	AWQS	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor
Time (yr)			125.0	125.0	125.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	175.0	175.0	175.0	175.0
pH	6.5-8.5	-----	7.76	7.78	8.01	7.77	7.77	7.77	7.81	7.76	7.78	7.76	7.78	8.05	7.77	7.76	7.77	7.81
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00
Alkalinity Total	-----	-----	233	242	426	237	236	239	262	234	240	233	243	479	238	237	240	265
Aluminum	0.2	-----	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
Antimony	0.006	0.006	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.003	0.002	0.002	0.003	0.002	0.003	0.005	0.003	0.005
Arsenic	0.01	0.05	0.000	0.001	0.000	0.000	0.001	0.025	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.028	0.001
Barium	2	2	0.03	0.03	0.07	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.08	0.03	0.03	0.03	0.02
Beryllium	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	0.005	0.005	0.001	0.001	0.001	0.001	0.003	0.001	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.003
Calcium	-----	-----	139	123	196	136	141	136	121	151	123	143	127	217	140	145	140	122
Chloride	250	-----	18	18	18	20	22	20	30	24	16	19	20	20	22	25	22	34
Chromium	0.1	0.1	0.002	0.002	0.002	0.002	0.006	0.005	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.006	0.005	0.004
Copper	1.3	-----	0.03	0.03	0.05	0.03	0.03	0.09	0.03	0.03	0.03	0.03	0.03	0.06	0.03	0.03	0.10	0.03
Fluoride	4	4	3.06	3.16	**4.30**	3.12	3.11	3.13	3.47	3.10	3.12	3.07	3.19	**4.82**	3.14	3.13	3.15	3.54
Iron	0.3	-----	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00
Lead	0.015	0.05	0.005	0.006	0.007	0.006	0.008	0.014	0.009	0.006	0.005	0.005	0.006	0.008	0.006	0.009	0.016	0.010
Magnesium	150	-----	34	30	32	36	38	36	45	44	28	37	33	36	39	41	39	49
Manganese	0.05	-----	0.226	0.190	0.211	0.232	0.255	0.232	0.257	0.285	0.180	0.246	0.208	0.232	0.252	0.276	0.252	0.279
Mercury	0.002	0.002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002	0.0004	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002	0.0005
Molybdenum	-----	-----	0.09	0.08	0.09	0.10	0.10	0.10	0.13	0.12	0.08	0.10	0.09	0.10	0.11	0.11	0.11	0.14
Nickel	-----	0.1	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Total Nitrogen	10	10	1.66	1.64	1.67	1.90	2.61	1.90	2.43	2.17	1.57	1.87	1.88	1.90	2.12	2.87	2.12	2.69
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	18.4	20.6	19.4	22.0	25.2	22.0	40.3	25.9	17.6	20.5	23.4	22.0	24.5	27.9	24.5	45.1
Selenium	0.05	0.05	0.017	0.020	0.018	0.020	0.025	0.023	0.039	0.023	0.017	0.019	0.022	0.020	0.022	0.028	0.026	0.043
Silver	0.1	-----	0.003	0.004	0.004	0.004	0.007	0.004	0.007	0.005	0.003	0.004	0.004	0.004	0.004	0.008	0.004	0.007
Sodium	-----	-----	44	48	45	52	53	52	94	61	42	49	54	52	59	60	59	106
Sulfate	250	-----	371	323	352	389	414	388	464	478	302	407	358	389	427	452	426	510
Thallium	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	500	-----	862	809	1,096	898	935	899	1,062	1,024	774	916	863	1,222	955	993	956	1,137
Uranium	0.03	-----	0.005	0.004	0.005	0.006	0.006	0.006	0.006	0.007	0.004	0.006	0.005	0.006	0.006	0.006	0.006	0.007
Zinc	5	-----	0.25	0.21	0.23	0.26	0.27	0.27	0.26	0.32	0.20	0.28	0.23	0.26	0.28	0.30	0.30	0.28

AWQS Exceedance

			175 Year					200 Year								
Concentration (mg/L)	*MCL*	*AWQS*	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0
Time (yr)			175.0	175.0	175.0	175.0	175.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0
pH	*6.5-8.5*	-----	7.76	7.78	7.76	7.78	8.09	7.77	7.76	7.77	7.82	7.75	7.78	7.76	7.78	8.13
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	234	241	234	244	531	239	238	241	269	235	242	234	246	584
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Antimony	*0.006*	*0.006*	0.003	0.002	0.002	0.003	0.003	0.003	0.005	0.003	0.005	0.003	0.002	0.003	0.003	0.003
Arsenic	*0.01*	*0.05*	0.001	0.000	0.000	0.001	0.000	0.001	0.001	0.032	0.002	0.001	0.001	0.000	0.001	0.000
Barium	*2*	*2*	0.02	0.03	0.03	0.03	0.09	0.03	0.03	0.03	0.02	0.02	0.03	0.03	0.03	0.09
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.002	0.001	0.001	0.002	0.001	0.002	0.003	0.002	0.003	0.002	0.001	0.001	0.002	0.001
Calcium	-----	-----	158	125	147	130	239	144	149	143	123	165	128	152	133	260
Chloride	*250*	-----	27	17	21	22	22	43	53	43	48	56	32	44	41	43
Chromium	*0.1*	*0.1*	0.003	0.002	0.002	0.002	0.002	0.002	0.006	0.006	0.004	0.003	0.002	0.002	0.003	0.002
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.07	0.03	0.03	0.11	0.03	0.03	0.03	0.03	0.03	0.08
Fluoride	*4*	*4*	3.12	3.14	3.08	3.21	5.35	3.17	3.16	3.17	3.61	3.14	3.16	3.11	3.25	5.87
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.006	0.005	0.005	0.007	0.009	0.006	0.009	0.017	0.011	0.007	0.005	0.006	0.007	0.010
Magnesium	*150*	-----	49	30	40	37	39	43	45	43	54	54	32	44	40	43
Manganese	*0.05*	-----	0.316	0.191	0.266	0.227	0.252	0.272	0.297	0.272	0.300	0.348	0.204	0.285	0.247	0.272
Mercury	*0.002*	*0.002*	0.0003	0.0002	0.0002	0.0003	0.0002	0.0003	0.0004	0.0003	0.0005	0.0003	0.0002	0.0002	0.0003	0.0003
Molybdenum	-----	-----	0.13	0.08	0.11	0.10	0.11	0.12	0.12	0.12	0.15	0.15	0.09	0.12	0.11	0.12
Nickel	-----	*0.1*	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	2.48	1.73	2.06	2.13	2.12	2.35	3.13	2.35	2.95	2.79	1.91	2.26	2.39	2.35
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	29.4	19.2	22.6	26.2	24.5	27.0	30.6	27.0	49.8	32.9	20.8	24.7	29.1	27.0
Selenium	*0.05*	*0.05*	0.026	0.018	0.020	0.024	0.022	0.024	0.030	0.028	0.047	0.029	0.020	0.022	0.027	0.024
Silver	*0.1*	-----	0.005	0.003	0.004	0.004	0.004	0.004	0.008	0.004	0.007	0.006	0.004	0.004	0.005	0.004
Sodium	-----	-----	70	46	55	61	59	77	83	77	125	95	59	74	79	77
Sulfate	*250*	-----	534	324	442	394	427	464	490	463	554	592	347	477	432	464
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	1,107	807	968	920	1,350	1,043	1,095	1,044	1,230	1,237	866	1,055	1,007	1,507
Uranium	*0.03*	-----	0.008	0.005	0.006	0.005	0.006	0.007	0.007	0.007	0.007	0.008	0.005	0.007	0.006	0.007
Zinc	*5*	-----	0.35	0.21	0.30	0.25	0.28	0.30	0.32	0.32	0.30	0.38	0.23	0.32	0.27	0.30

AWQS Exceedance

APPENDIX M
Broadtop Butte Pit sensitivity analysis

			1 Year									2 Year						
Concentration (mg/L)	*MCL*	*AWQS*	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
pH	*6.5-8.5*	-----	7.90	7.90	7.96	7.96	7.92	7.75	7.90	7.90	7.97	7.89	7.89	7.94	7.94	7.90	7.80	7.89
pe	-----	-----	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	307	308	360	360	324	212	308	307	367	299	299	340	341	313	240	299
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.002	0.005	0.004	0.003	0.001	0.002	0.002	0.002	0.002	0.002	0.005	0.004	0.003	0.001	0.002
Arsenic	*0.01*	*0.05*	0.007	0.010	0.006	0.010	0.008	0.005	0.007	0.007	0.007	0.007	0.010	0.006	0.009	0.008	0.005	0.007
Barium	*2*	*2*	0.05	0.05	0.04	0.05	0.06	0.03	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.03	0.05
Beryllium	*0.004*	*0.004*	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.001	0.001	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.002	0.002	0.001	0.001
Calcium	-----	-----	62	62	53	51	58	49	62	61	82	64	64	58	56	61	55	65
Chloride	*250*	-----	8	8	11	12	9	5	8	8	8	7	7	10	11	9	6	8
Chromium	*0.1*	*0.1*	0.004	0.004	0.010	0.007	0.005	0.002	0.004	0.004	0.004	0.003	0.004	0.009	0.006	0.005	0.002	0.003
Copper	*1.3*	-----	0.02	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.04	0.02	0.03	0.03	0.03	0.03	0.02	0.02
Fluoride	*4*	*4*	3.93	3.94	**4.70**	**4.67**	**4.17**	2.34	3.94	3.93	**4.87**	3.82	3.82	**4.42**	**4.41**	**4.02**	2.80	3.82
Iron	*0.3*	-----	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.009	0.009	0.017	0.015	0.011	0.004	0.009	0.009	0.009	0.008	0.008	0.015	0.013	0.010	0.005	0.008
Magnesium	*150*	-----	14	14	28	24	17	8	15	14	14	13	13	25	22	16	9	13
Manganese	*0.05*	-----	0.006	0.006	0.010	0.008	0.006	0.005	0.007	0.005	0.006	0.006	0.006	0.010	0.008	0.006	0.006	0.007
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0004	0.0004	0.0003	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0003	0.0002	0.0001	0.0002
Molybdenum	-----	-----	0.08	0.08	0.17	0.14	0.10	0.04	0.08	0.08	0.08	0.07	0.07	0.15	0.12	0.09	0.05	0.07
Nickel	-----	*0.1*	0.01	0.01	0.02	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.01
Total Nitrogen	*10*	*10*	0.70	0.70	1.74	1.32	0.90	0.31	0.72	0.68	0.70	0.62	0.62	1.52	1.15	0.81	0.38	0.64
Phosphorus	-----	-----	0.04	0.04	0.04	0.04	0.03	0.06	0.05	0.03	0.04	0.04	0.05	0.04	0.04	0.04	0.06	0.06
Potassium	-----	-----	18.1	18.1	31.6	30.1	22.2	10.2	18.4	17.9	18.1	16.5	16.5	28.1	26.8	20.2	11.6	16.7
Selenium	*0.05*	*0.05*	0.019	0.019	0.024	0.029	0.022	0.012	0.019	0.019	0.019	0.018	0.018	0.022	0.026	0.021	0.014	0.018
Silver	*0.1*	-----	0.003	0.003	0.009	0.006	0.004	0.001	0.003	0.003	0.003	0.003	0.003	0.007	0.006	0.004	0.002	0.003
Sodium	-----	-----	75	75	126	123	91	44	76	74	75	68	68	111	109	83	50	69
Sulfate	*250*	-----	124	123	236	207	151	73	128	119	124	115	115	215	189	141	83	120
Thallium	*0.002*	*0.002*	0.001	0.001	0.002	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001
TDS	*500*	-----	613	613	852	814	678	404	620	606	695	588	588	794	760	648	458	595
Uranium	*0.03*	-----	0.003	0.003	0.007	0.005	0.004	0.001	0.003	0.003	0.003	0.003	0.003	0.006	0.005	0.003	0.002	0.003
Zinc	*5*	-----	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01

AWQS Exceedance

					3 Year									5 Year				
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%
Time (yr)			2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0
pH	*6.5-8.5*	-----	7.89	7.93	7.88	7.88	7.93	7.93	7.90	7.81	7.88	7.88	7.92	7.88	7.88	7.92	7.92	7.90
pe	-----	-----	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	299	334	296	296	333	335	310	246	296	296	325	293	293	325	328	306
Aluminum	*0.2*	-----	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	0.002	0.004	0.004	0.003	0.001	0.002	0.002	0.002	0.002	0.002	0.004	0.003	0.002
Arsenic	*0.01*	*0.05*	0.007	0.007	0.007	0.009	0.006	0.009	0.008	0.005	0.006	0.007	0.007	0.007	0.009	0.006	0.009	0.008
Barium	*2*	*2*	0.05	0.05	0.04	0.04	0.05	0.05	0.06	0.03	0.05	0.04	0.04	0.04	0.04	0.05	0.05	0.06
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.002	0.002
Calcium	-----	-----	64	76	65	65	60	57	62	57	66	65	75	66	66	62	59	64
Chloride	*250*	-----	7	7	7	7	10	11	9	6	8	7	7	7	7	10	11	8
Chromium	*0.1*	*0.1*	0.003	0.003	0.003	0.003	0.008	0.006	0.004	0.002	0.003	0.003	0.003	0.003	0.003	0.008	0.006	0.004
Copper	*1.3*	-----	0.02	0.03	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.02	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	3.82	**4.32**	3.78	3.78	**4.33**	**4.33**	3.97	2.89	3.78	3.78	**4.17**	3.74	3.74	**4.22**	**4.23**	3.93
Iron	*0.3*	-----	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.008	0.008	0.008	0.008	0.015	0.013	0.010	0.005	0.008	0.007	0.008	0.007	0.008	0.014	0.013	0.010
Magnesium	*150*	-----	12	13	13	13	24	21	16	9	13	12	13	12	12	23	20	15
Manganese	*0.05*	-----	0.005	0.006	0.006	0.006	0.010	0.008	0.006	0.006	0.007	0.005	0.006	0.006	0.006	0.010	0.008	0.006
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0002	0.0004	0.0003	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0002
Molybdenum	-----	-----	0.07	0.07	0.07	0.07	0.15	0.12	0.09	0.05	0.07	0.07	0.07	0.07	0.07	0.14	0.11	0.08
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.60	0.62	0.60	0.60	1.46	1.11	0.79	0.40	0.62	0.57	0.60	0.57	0.57	1.39	1.06	0.76
Phosphorus	-----	-----	0.03	0.04	0.05	0.05	0.05	0.05	0.04	0.06	0.06	0.03	0.05	0.05	0.05	0.05	0.05	0.04
Potassium	-----	-----	16.3	16.5	16.0	16.0	27.1	25.9	19.8	11.9	16.3	15.8	16.0	15.6	15.6	26.1	25.0	19.4
Selenium	*0.05*	*0.05*	0.018	0.018	0.017	0.017	0.022	0.025	0.020	0.014	0.017	0.017	0.017	0.017	0.017	0.021	0.024	0.020
Silver	*0.1*	-----	0.003	0.003	0.003	0.003	0.007	0.005	0.004	0.002	0.003	0.003	0.003	0.003	0.003	0.007	0.005	0.004
Sodium	-----	-----	67	68	66	66	106	105	80	51	67	65	66	64	64	101	100	78
Sulfate	*250*	-----	110	115	113	113	212	185	141	86	118	108	113	112	112	209	182	140
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	581	636	581	582	778	746	642	469	589	574	621	575	575	763	731	636
Uranium	*0.03*	-----	0.002	0.003	0.002	0.002	0.006	0.004	0.003	0.002	0.003	0.002	0.002	0.002	0.002	0.005	0.004	0.003
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01

AWQS Exceedance

											10 Year							
Concentration (mg/L)	*MCL*	*AWQS*	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ
Time (yr)			5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	20.0	20.0	20.0
pH	*6.5-8.5*	-----	7.79	7.88	7.88	7.91	7.87	7.87	7.91	7.91	7.89	7.74	7.87	7.87	7.90	7.87	7.87	7.90
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00
Alkalinity Total	-----	-----	235	293	293	316	290	290	317	321	303	208	290	290	307	288	288	311
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.002	0.002	0.002	0.002	0.002	0.004	0.003	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.004
Arsenic	*0.01*	*0.05*	0.005	0.006	0.007	0.007	0.006	0.009	0.006	0.009	0.008	0.005	0.006	0.007	0.006	0.006	0.009	0.006
Barium	*2*	*2*	0.03	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.03	0.04	0.04	0.04	0.04	0.04	0.05
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003
Calcium	-----	-----	55	67	66	74	68	68	65	61	65	49	68	67	73	68	68	67
Chloride	*250*	-----	6	7	7	7	7	7	10	10	8	5	7	7	7	7	7	10
Chromium	*0.1*	*0.1*	0.002	0.003	0.003	0.003	0.003	0.003	0.008	0.006	0.004	0.001	0.003	0.003	0.003	0.003	0.003	0.007
Copper	*1.3*	-----	0.02	0.02	0.02	0.03	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.03	0.02	0.03	0.03
Fluoride	*4*	*4*	2.72	3.74	3.74	**4.01**	3.70	3.70	**4.11**	**4.14**	3.88	2.27	3.70	3.69	3.86	3.66	3.66	**4.02**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
Lead	*0.015*	*0.05*	0.005	0.007	0.007	0.007	0.007	0.008	0.014	0.012	0.010	0.004	0.007	0.007	0.007	0.007	0.007	0.014
Magnesium	*150*	-----	9	13	12	12	12	12	23	20	15	8	12	11	12	11	11	22
Manganese	*0.05*	-----	0.006	0.007	0.005	0.006	0.006	0.006	0.010	0.008	0.006	0.006	0.007	0.005	0.006	0.005	0.005	0.009
Mercury	*0.002*	*0.002*	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003
Molybdenum	-----	-----	0.05	0.07	0.06	0.07	0.06	0.06	0.13	0.11	0.08	0.04	0.07	0.06	0.06	0.06	0.06	0.13
Nickel	-----	*0.1*	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.37	0.60	0.55	0.57	0.55	0.55	1.34	1.02	0.74	0.30	0.57	0.53	0.55	0.53	0.53	1.27
Phosphorus	-----	-----	0.06	0.06	0.03	0.05	0.04	0.05	0.04	0.04	0.03	0.06	0.06	0.03	0.04	0.04	0.04	0.04
Potassium	-----	-----	11.4	15.8	15.3	15.6	15.1	15.1	25.2	24.1	19.0	10.0	15.4	14.9	15.1	14.7	14.7	24.3
Selenium	*0.05*	*0.05*	0.013	0.017	0.017	0.017	0.017	0.017	0.020	0.024	0.020	0.012	0.017	0.016	0.017	0.016	0.016	0.020
Silver	*0.1*	-----	0.002	0.003	0.003	0.003	0.003	0.003	0.007	0.005	0.004	0.001	0.003	0.003	0.003	0.003	0.003	0.006
Sodium	-----	-----	48	65	63	64	62	62	96	96	76	43	62	61	62	59	59	91
Sulfate	*250*	-----	83	117	107	112	111	111	207	180	140	74	116	105	111	108	108	204
Thallium	*0.002*	*0.002*	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.001
TDS	*500*	-----	450	582	567	605	568	569	749	718	630	399	576	561	591	561	561	734
Uranium	*0.03*	-----	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.004	0.003	0.001	0.002	0.002	0.002	0.002	0.002	0.005
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02

AWQS Exceedance

			20 Year						30 Year										
Concentration (mg/L)	*MCL*	*AWQS*	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case
Time (yr)			20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	50.0
pH	*6.5-8.5*	-----	7.91	7.88	7.69	7.87	7.87	7.88	7.82	7.82	7.88	7.89	7.86	7.68	7.82	7.82	7.82	7.75
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	315	294	186	288	288	297	256	256	298	305	281	180	256	255	256	214
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
Antimony	*0.006*	*0.006*	0.003	0.002	0.001	0.002	0.002	0.002	0.001	0.001	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001
Arsenic	*0.01*	*0.05*	0.009	0.008	0.005	0.006	0.007	0.006	0.006	0.008	0.006	0.009	0.008	0.005	0.006	0.007	0.006	0.006
Barium	*2*	*2*	0.05	0.04	0.02	0.04	0.04	0.04	0.03	0.03	0.06	0.05	0.04	0.02	0.03	0.03	0.03	0.03
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.002	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.000	0.001	0.001	0.001	0.001
Calcium	-----	-----	63	66	44	69	68	72	59	59	68	64	62	43	60	58	59	46
Chloride	*250*	-----	10	7	5	7	7	7	6	6	8	9	7	5	6	6	6	5
Chromium	*0.1*	*0.1*	0.005	0.003	0.001	0.003	0.003	0.003	0.002	0.002	0.005	0.004	0.002	0.001	0.002	0.002	0.002	0.001
Copper	*1.3*	-----	0.03	0.02	0.02	0.02	0.02	0.03	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.02
Fluoride	*4*	*4*	**4.06**	3.74	1.92	3.66	3.62	3.70	2.94	2.94	3.83	3.90	3.24	1.82	2.92	2.97	2.94	2.27
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.012	0.007	0.004	0.007	0.007	0.007	0.006	0.006	0.010	0.009	0.007	0.003	0.006	0.006	0.006	0.005
Magnesium	*150*	-----	19	11	7	12	11	11	9	9	16	15	10	7	9	9	9	7
Manganese	*0.05*	-----	0.008	0.004	0.005	0.006	0.005	0.005	0.004	0.004	0.007	0.006	0.003	0.005	0.005	0.004	0.004	0.003
Mercury	*0.002*	*0.002*	0.0003	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	-----	-----	0.10	0.06	0.04	0.06	0.06	0.06	0.05	0.05	0.09	0.08	0.05	0.04	0.05	0.05	0.05	0.03
Nickel	-----	*0.1*	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	0.97	0.50	0.24	0.55	0.50	0.53	0.38	0.38	0.88	0.69	0.40	0.23	0.38	0.38	0.38	0.25
Phosphorus	-----	-----	0.04	0.03	0.06	0.05	0.03	0.04	0.04	0.04	0.04	0.04	0.02	0.06	0.04	0.03	0.04	0.02
Potassium	-----	-----	23.2	15.8	8.9	14.9	14.5	14.7	12.8	12.8	19.2	19.3	14.3	8.6	12.7	12.8	12.8	10.9
Selenium	*0.05*	*0.05*	0.023	0.018	0.011	0.016	0.016	0.016	0.015	0.015	0.018	0.021	0.017	0.011	0.015	0.015	0.015	0.014
Silver	*0.1*	-----	0.005	0.002	0.001	0.003	0.002	0.003	0.002	0.002	0.004	0.003	0.002	0.001	0.002	0.002	0.002	0.001
Sodium	-----	-----	91	64	38	60	59	59	53	53	74	78	59	37	53	53	53	46
Sulfate	*250*	-----	176	107	67	113	103	108	89	89	153	139	91	65	90	87	89	67
Thallium	*0.002*	*0.002*	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	704	570	358	568	554	574	488	488	642	633	528	347	492	486	489	400
Uranium	*0.03*	-----	0.004	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.001	0.002	0.002	0.002	0.001
Zinc	*5*	-----	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

			50 Year								75 Year							
Concentration (mg/L)	*MCL*	*AWQS*	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%
Time (yr)			50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
pH	*6.5-8.5*	-----	7.75	7.87	7.88	7.83	7.66	7.76	7.75	7.75	7.72	7.72	7.83	7.85	7.78	7.65	7.72	7.72
pe	-----	-----	0.51	4.00	4.00	4.00	4.00	4.00	9.83	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	214	288	295	258	173	216	211	215	197	197	259	272	230	167	197	196
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Arsenic	*0.01*	*0.05*	0.008	0.006	0.008	0.008	0.005	0.006	0.006	0.007	0.006	0.007	0.006	0.008	0.008	0.005	0.006	0.006
Barium	*2*	*2*	0.03	0.04	0.04	0.03	0.02	0.03	0.03	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000
Calcium	-----	-----	46	68	64	54	41	47	45	46	40	40	59	58	46	39	41	40
Chloride	*250*	-----	5	7	7	6	5	5	5	5	5	5	6	7	6	5	5	5
Chromium	*0.1*	*0.1*	0.001	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.002	0.001	0.001	0.001	0.001
Copper	*1.3*	-----	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Fluoride	*4*	*4*	2.27	3.67	3.54	2.87	1.71	2.28	2.26	2.27	2.02	2.02	3.25	3.04	2.41	1.62	2.02	2.02
Iron	*0.3*	-----	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.005	0.008	0.007	0.006	0.003	0.005	0.005	0.005	0.004	0.005	0.007	0.007	0.005	0.003	0.004	0.004
Magnesium	*150*	-----	7	11	11	9	6	7	7	7	6	6	9	9	7	6	6	6
Manganese	*0.05*	-----	0.003	0.004	0.003	0.002	0.005	0.003	0.002	0.003	0.002	0.002	0.003	0.003	0.001	0.005	0.002	0.002
Mercury	*0.002*	*0.002*	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	-----	-----	0.03	0.06	0.05	0.04	0.03	0.04	0.03	0.03	0.03	0.03	0.05	0.04	0.03	0.03	0.03	0.03
Nickel	-----	*0.1*	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	0.25	0.55	0.44	0.33	0.21	0.26	0.25	0.25	0.21	0.21	0.44	0.36	0.25	0.19	0.21	0.21
Phosphorus	-----	-----	0.02	0.02	0.02	0.01	0.06	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.06	0.02	0.01
Potassium	-----	-----	10.9	14.7	15.5	13.2	8.3	10.9	10.9	10.9	10.1	10.1	13.1	13.9	11.9	8.0	10.1	10.1
Selenium	*0.05*	*0.05*	0.014	0.016	0.019	0.017	0.011	0.014	0.014	0.014	0.014	0.014	0.015	0.017	0.016	0.011	0.013	0.014
Silver	*0.1*	-----	0.001	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001
Sodium	-----	-----	46	59	64	55	36	46	46	46	43	43	53	58	51	35	43	43
Sulfate	*250*	-----	67	105	100	79	62	68	66	67	58	58	87	84	66	60	59	57
Thallium	*0.002*	*0.002*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	400	556	562	478	333	403	394	400	362	362	491	505	421	321	364	360
Uranium	*0.03*	-----	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

				100 Year									125 Year					
Concentration (mg/L)	*MCL*	*AWQS*	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%
Time (yr)			75.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	125.0	125.0	125.0	125.0	125.0	125.0
pH	*6.5-8.5*	-----	7.72	7.70	7.70	7.80	7.82	7.76	7.64	7.70	7.70	7.70	7.68	7.67	7.77	7.79	7.75	7.62
pe	-----	-----	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	10.07	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	197	187	188	243	254	220	162	188	187	188	178	176	221	234	214	157
Aluminum	*0.2*	-----	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Arsenic	*0.01*	*0.05*	0.006	0.006	0.007	0.006	0.008	0.008	0.005	0.006	0.006	0.006	0.006	0.006	0.006	0.007	0.007	0.004
Barium	*2*	*2*	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000
Calcium	-----	-----	40	38	38	54	53	43	38	38	38	38	35	35	48	48	42	37
Chloride	*250*	-----	5	5	5	6	6	6	4	5	5	5	5	5	5	6	5	4
Chromium	*0.1*	*0.1*	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.001
Copper	*1.3*	-----	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Fluoride	*4*	*4*	2.02	1.89	1.89	2.97	2.79	2.23	1.54	1.90	1.89	1.89	1.74	1.74	2.59	2.48	2.14	1.48
Iron	*0.3*	-----	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.004	0.004	0.004	0.006	0.006	0.005	0.003	0.004	0.004	0.004	0.004	0.004	0.006	0.006	0.005	0.003
Magnesium	*150*	-----	6	6	6	9	8	7	6	6	6	6	5	5	8	8	6	6
Manganese	*0.05*	-----	0.002	0.002	0.002	0.003	0.002	0.001	0.005	0.002	0.001	0.002	0.001	0.001	0.002	0.002	0.001	0.004
Mercury	*0.002*	*0.002*	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	-----	-----	0.03	0.03	0.03	0.05	0.04	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.04	0.04	0.03	0.03
Nickel	-----	*0.1*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	0.21	0.19	0.19	0.40	0.32	0.22	0.18	0.19	0.19	0.19	0.16	0.16	0.33	0.27	0.20	0.17
Phosphorus	-----	-----	0.01	0.01	0.01	0.01	0.01	0.00	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.05
Potassium	-----	-----	10.1	9.6	9.6	12.2	13.0	11.4	7.8	9.7	9.6	9.6	9.2	9.2	11.2	12.0	11.1	7.6
Selenium	*0.05*	*0.05*	0.014	0.013	0.013	0.014	0.017	0.015	0.011	0.013	0.013	0.013	0.013	0.013	0.014	0.016	0.015	0.010
Silver	*0.1*	-----	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001
Sodium	-----	-----	43	41	41	50	55	49	34	41	41	41	40	40	46	51	48	33
Sulfate	*250*	-----	58	54	54	79	77	61	57	55	54	54	50	50	69	69	58	55
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	362	344	344	456	470	399	311	346	342	344	324	323	412	430	387	302
Uranium	*0.03*	-----	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

						150 Year												
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor
Time (yr)			125.0	125.0	125.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	175.0	175.0	175.0	175.0
pH	*6.5-8.5*	-----	7.68	7.68	7.67	7.65	7.65	7.73	7.76	7.74	7.60	7.65	7.65	7.65	7.64	7.64	7.70	7.73
pe	-----	-----	4.00	4.00	10.57	4.00	10.20	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00
Alkalinity Total	-----	-----	177	178	176	168	167	201	216	208	148	168	168	168	162	162	190	204
Aluminum	*0.2*	-----	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Arsenic	*0.01*	*0.05*	0.006	0.006	0.006	0.006	0.006	0.006	0.007	0.007	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.007
Barium	*2*	*2*	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Calcium	-----	-----	35	35	35	32	32	42	43	40	34	32	32	32	31	31	39	40
Chloride	*250*	-----	5	5	5	4	4	5	5	5	4	4	4	4	4	4	5	5
Chromium	*0.1*	*0.1*	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Copper	*1.3*	-----	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Fluoride	*4*	*4*	1.73	1.75	1.74	1.60	1.60	2.24	2.20	2.04	1.31	1.59	1.60	1.60	1.51	1.51	2.05	2.04
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Lead	*0.015*	*0.05*	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.005
Magnesium	*150*	-----	5	5	5	5	5	7	7	6	5	5	5	5	5	5	6	6
Manganese	*0.05*	-----	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.004	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Mercury	*0.002*	*0.002*	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	-----	-----	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.03
Nickel	-----	*0.1*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	0.16	0.16	0.16	0.14	0.14	0.26	0.22	0.19	0.14	0.14	0.14	0.14	0.12	0.12	0.22	0.19
Phosphorus	-----	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.05	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Potassium	-----	-----	9.1	9.2	9.2	8.7	8.7	10.3	11.1	10.8	7.2	8.7	8.7	8.7	8.5	8.5	9.7	10.6
Selenium	*0.05*	*0.05*	0.013	0.013	0.013	0.012	0.012	0.013	0.015	0.015	0.010	0.012	0.012	0.012	0.012	0.012	0.013	0.015
Silver	*0.1*	-----	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Sodium	-----	-----	39	40	40	38	38	43	48	46	31	38	38	38	37	37	41	46
Sulfate	*250*	-----	51	50	50	46	46	60	61	56	51	46	46	46	43	43	55	56
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	324	324	323	304	303	370	393	374	282	304	304	304	292	292	347	370
Uranium	*0.03*	-----	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.001
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

Rosemont Copper Company
Rosemont Copper World Project

Appendix M - Broadtop Butte Sensitivity Analysis

			175 Year					200 Year								
Concentration (mg/L)	*MCL*	*AWQS*	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0
Time (yr)			175.0	175.0	175.0	175.0	175.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0
pH	*6.5-8.5*	-----	7.73	7.57	7.64	7.64	7.64	7.63	7.63	7.69	7.72	7.73	7.56	7.63	7.63	7.63
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	10.39	4.00	4.00
Alkalinity Total	-----	-----	204	139	162	162	162	158	158	183	197	201	134	157	158	158
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Antimony	*0.006*	*0.006*	0.001	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000
Arsenic	*0.01*	*0.05*	0.007	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.007	0.007	0.004	0.006	0.006	0.006
Barium	*2*	*2*	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calcium	-----	-----	39	31	31	31	31	30	30	37	38	38	30	30	30	30
Chloride	*250*	-----	5	4	4	4	4	4	4	5	5	5	4	4	4	4
Chromium	*0.1*	*0.1*	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001
Copper	*1.3*	-----	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Fluoride	*4*	*4*	1.98	1.17	1.51	1.52	1.51	1.46	1.46	1.94	1.94	1.93	1.12	1.46	1.47	1.46
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.005	0.002	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.002	0.003	0.004	0.004
Magnesium	*150*	-----	6	5	5	5	5	5	5	6	6	6	4	5	5	5
Manganese	*0.05*	-----	0.001	0.004	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.003	0.000	0.000	0.000
Mercury	*0.002*	*0.002*	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	-----	-----	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.02
Nickel	-----	*0.1*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	0.18	0.11	0.12	0.12	0.12	0.11	0.11	0.21	0.18	0.17	0.10	0.11	0.11	0.11
Phosphorus	-----	-----	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
Potassium	-----	-----	10.6	6.8	8.4	8.5	8.5	8.3	8.3	9.4	10.2	10.4	6.6	8.3	8.3	8.3
Selenium	*0.05*	*0.05*	0.015	0.010	0.012	0.012	0.012	0.012	0.012	0.012	0.014	0.015	0.010	0.012	0.012	0.012
Silver	*0.1*	-----	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001
Sodium	-----	-----	46	30	37	37	37	36	36	40	44	45	29	36	36	36
Sulfate	*250*	-----	54	46	43	43	43	41	41	52	53	53	44	41	41	41
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	367	263	291	292	292	284	284	333	355	361	254	283	285	284
Uranium	*0.03*	-----	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000
Zinc	*5*	-----	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00

AWQS Exceedance

APPENDIX N
Copper World Pit sensitivity analysis

			1 Year									2 Year						
Concentration (mg/L)	*MCL*	*AWQS*	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
pH	*6.5-8.5*	-----	8.01	8.01	8.17	8.12	8.01	8.00	8.03	7.98	8.14	7.99	7.99	8.14	8.10	8.00	7.99	8.01
pe	-----	-----	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	397	398	591	527	405	389	417	376	559	387	387	548	501	390	383	400
Aluminum	*0.2*	-----	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.01	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.004	0.004	**0.011**	**0.007**	0.004	0.003	0.004	0.003	0.004	0.003	0.003	**0.010**	**0.006**	0.003	0.003	0.004
Arsenic	*0.01*	*0.05*	0.022	0.034	0.047	0.038	0.024	0.020	0.024	0.020	0.021	0.020	0.030	0.042	0.035	0.022	0.019	0.022
Barium	*2*	*2*	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.07	0.08	0.06	0.06	0.06	0.05	0.07	0.06	0.06
Beryllium	*0.004*	*0.004*	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.03	0.03	0.04	0.03	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.04	0.03
Cadmium	*0.005*	*0.005*	0.002	0.002	**0.007**	0.005	0.003	0.002	0.003	0.002	0.002	0.002	0.002	**0.006**	0.004	0.002	0.002	0.002
Calcium	-----	-----	40	40	21	26	39	42	37	43	93	42	42	24	28	41	43	40
Chloride	*250*	-----	20	20	34	30	21	20	22	18	20	19	19	31	28	19	19	21
Chromium	*0.1*	*0.1*	0.008	0.009	0.020	0.014	0.008	0.007	0.009	0.006	0.008	0.007	0.008	0.018	0.012	0.007	0.007	0.008
Copper	*1.3*	-----	0.03	0.11	0.03	0.03	0.03	0.03	0.03	0.03	0.09	0.03	0.09	0.03	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	**4.49**	**4.49**	**7.63**	**6.82**	**4.67**	**4.30**	**4.93**	**4.01**	**4.49**	**4.25**	**4.25**	**7.07**	**6.49**	**4.35**	**4.15**	**4.56**
Iron	*0.3*	-----	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.010	0.013	0.023	0.018	0.011	0.009	0.011	0.009	0.011	0.009	0.011	0.020	0.017	0.010	0.008	0.010
Magnesium	*150*	-----	19	19	25	26	19	20	21	17	19	19	19	24	25	18	20	20
Manganese	*0.05*	-----	0.049	0.049	0.060	0.054	0.045	0.054	0.054	0.042	0.049	0.049	0.049	0.060	0.054	0.045	0.054	0.054
Mercury	*0.002*	*0.002*	0.0003	0.0003	0.0008	0.0006	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0007	0.0005	0.0003	0.0002	0.0003
Molybdenum	-----	-----	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.09	0.07	0.07	0.08
Nickel	-----	*0.1*	0.01	0.01	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	1.14	1.14	3.61	2.26	1.29	0.99	1.34	0.94	1.14	0.99	0.99	3.10	1.95	1.08	0.90	1.10
Phosphorus	-----	-----	0.08	0.09	0.08	0.08	0.08	0.10	0.09	0.07	0.08	0.08	0.09	0.08	0.08	0.08	0.10	0.09
Potassium	-----	-----	21.4	21.4	46.8	39.7	23.5	19.1	23.6	19.3	21.4	19.6	19.6	41.0	36.1	21.1	17.9	20.8
Selenium	*0.05*	*0.05*	0.022	0.022	0.034	0.038	0.023	0.020	0.023	0.020	0.022	0.021	0.021	0.031	0.036	0.022	0.019	0.021
Silver	*0.1*	-----	0.006	0.006	0.018	0.011	0.006	0.005	0.007	0.005	0.006	0.005	0.005	0.015	0.010	0.005	0.004	0.005
Sodium	-----	-----	141	141	235	214	144	138	154	125	141	134	134	216	202	135	134	144
Sulfate	*250*	-----	146	145	181	195	143	150	157	131	146	143	143	173	189	139	148	153
Thallium	*0.002*	*0.002*	0.001	0.001	**0.003**	**0.002**	0.001	0.001	0.001	0.001	0.001	0.001	0.001	**0.003**	0.002	0.001	0.001	0.001
TDS	*500*	-----	790	791	1,146	1,067	799	784	839	736	1,005	769	770	1,067	1,018	770	771	806
Uranium	*0.03*	-----	0.010	0.010	0.010	0.011	0.009	0.012	0.011	0.009	0.010	0.010	0.010	0.010	0.011	0.009	0.012	0.011
Zinc	*5*	-----	0.02	0.02	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.03	0.02	0.02	0.02

AWQS Exceedance

					3 Year									5 Year				
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%
Time (yr)			2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0
pH	*6.5-8.5*	-----	7.98	8.12	7.99	7.99	8.13	8.09	7.99	7.99	8.00	7.98	8.12	7.99	7.99	8.12	8.09	7.99
pe	-----	-----	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	371	534	383	384	536	493	386	381	395	369	527	379	380	524	484	381
Aluminum	*0.2*	-----	0.00	0.06	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.01	0.00
Antimony	*0.006*	*0.006*	0.003	0.003	0.003	0.003	**0.009**	0.006	0.003	0.003	0.003	0.003	0.003	0.003	0.003	**0.009**	0.006	0.003
Arsenic	*0.01*	*0.05*	0.019	0.020	0.020	0.029	0.041	0.034	0.021	0.019	0.021	0.019	0.020	0.020	0.028	0.040	0.034	0.020
Barium	*2*	*2*	0.07	0.07	0.06	0.06	0.06	0.05	0.07	0.06	0.06	0.06	0.07	0.07	0.07	0.06	0.05	0.07
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000
Boron	-----	-----	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Cadmium	*0.005*	*0.005*	0.002	0.002	0.002	0.002	**0.006**	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	**0.006**	0.004	0.002
Calcium	-----	-----	44	90	43	42	24	29	42	43	41	45	89	43	43	25	30	43
Chloride	*250*	-----	17	19	19	19	30	27	19	19	20	17	19	18	18	29	27	18
Chromium	*0.1*	*0.1*	0.006	0.007	0.007	0.007	0.017	0.011	0.007	0.006	0.007	0.006	0.007	0.006	0.007	0.016	0.011	0.006
Copper	*1.3*	-----	0.03	0.08	0.03	0.09	0.03	0.03	0.03	0.03	0.03	0.03	0.08	0.03	0.09	0.03	0.03	0.03
Fluoride	*4*	*4*	3.89	**4.25**	**4.17**	**4.17**	**6.92**	**6.38**	**4.24**	**4.09**	**4.44**	3.84	**4.17**	**4.07**	**4.07**	**6.76**	**6.26**	**4.12**
Iron	*0.3*	-----	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.008	0.010	0.009	0.011	0.019	0.016	0.009	0.008	0.009	0.008	0.010	0.009	0.010	0.019	0.016	0.009
Magnesium	*150*	-----	17	19	19	19	24	25	18	20	20	17	19	19	19	23	24	18
Manganese	*0.05*	-----	0.042	0.049	0.049	0.049	0.060	0.054	0.045	0.054	0.054	0.043	0.049	0.049	0.049	0.061	0.054	0.044
Mercury	*0.002*	*0.002*	0.0002	0.0003	0.0003	0.0003	0.0007	0.0005	0.0003	0.0002	0.0003	0.0002	0.0003	0.0002	0.0002	0.0006	0.0005	0.0003
Molybdenum	-----	-----	0.06	0.07	0.07	0.07	0.08	0.09	0.07	0.07	0.08	0.06	0.07	0.07	0.07	0.08	0.09	0.07
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.01
Total Nitrogen	*10*	*10*	0.87	0.99	0.94	0.94	2.95	1.86	1.01	0.87	1.03	0.85	0.94	0.90	0.90	2.80	1.77	0.96
Phosphorus	-----	-----	0.07	0.09	0.08	0.09	0.08	0.08	0.08	0.10	0.09	0.07	0.08	0.08	0.08	0.08	0.08	0.07
Potassium	-----	-----	18.3	19.6	19.0	19.0	39.2	34.9	20.3	17.4	19.9	17.9	19.0	18.3	18.3	37.2	33.4	19.5
Selenium	*0.05*	*0.05*	0.020	0.021	0.020	0.020	0.030	0.036	0.022	0.019	0.021	0.020	0.020	0.020	0.020	0.029	0.035	0.021
Silver	*0.1*	-----	0.004	0.005	0.005	0.005	0.015	0.009	0.005	0.004	0.005	0.004	0.005	0.004	0.004	0.014	0.009	0.005
Sodium	-----	-----	122	134	132	132	210	198	132	132	141	121	132	129	129	204	193	129
Sulfate	*250*	-----	130	143	141	141	170	187	137	147	151	129	141	139	139	166	183	134
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	**0.003**	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	**0.003**	0.002	0.001
TDS	*500*	-----	726	966	762	762	1,044	1,002	760	765	794	721	952	751	752	1,018	982	748
Uranium	*0.03*	-----	0.009	0.010	0.010	0.010	0.010	0.011	0.009	0.012	0.011	0.009	0.010	0.010	0.010	0.010	0.010	0.009
Zinc	*5*	-----	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.03	0.03	0.02

AWQS Exceedance

							10 Year											
Concentration (mg/L)	*MCL*	*AWQS*	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ
Time (yr)			5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	20.0	20.0	20.0
pH	*6.5-8.5*	-----	7.98	8.00	7.97	8.11	7.98	7.98	8.11	8.08	7.98	7.98	7.99	7.97	8.10	7.97	7.97	8.09
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00
Alkalinity Total	-----	-----	377	390	366	517	373	374	509	472	375	371	383	361	502	366	366	492
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.01
Antimony	*0.006*	*0.006*	0.003	0.003	0.003	0.003	0.003	0.003	**0.008**	0.005	0.003	0.003	0.003	0.003	0.003	0.003	0.003	**0.008**
Arsenic	*0.01*	*0.05*	0.018	0.021	0.018	0.019	0.019	0.027	0.039	0.033	0.020	0.018	0.020	0.018	0.019	0.018	0.026	0.037
Barium	*2*	*2*	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Boron	-----	-----	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Cadmium	*0.005*	*0.005*	0.002	0.002	0.002	0.002	0.002	0.002	**0.005**	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005
Calcium	-----	-----	44	42	45	88	44	44	26	31	43	45	43	46	86	45	45	28
Chloride	*250*	-----	19	20	17	18	18	18	27	25	17	18	19	16	18	17	17	26
Chromium	*0.1*	*0.1*	0.006	0.007	0.006	0.006	0.006	0.007	0.015	0.010	0.006	0.006	0.006	0.005	0.006	0.006	0.006	0.014
Copper	*1.3*	-----	0.03	0.03	0.03	0.08	0.03	0.08	0.03	0.03	0.03	0.03	0.03	0.03	0.07	0.03	0.07	0.03
Fluoride	*4*	*4*	**4.01**	**4.30**	3.77	**4.07**	3.91	3.91	**6.56**	**6.10**	3.97	3.85	**4.14**	3.63	3.91	3.73	3.73	**6.22**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00
Lead	*0.015*	*0.05*	0.008	0.009	0.008	0.009	0.008	0.010	0.018	0.015	0.009	0.008	0.009	0.008	0.009	0.008	0.009	0.017
Magnesium	*150*	-----	19	20	17	19	18	18	22	23	17	19	19	16	18	17	17	21
Manganese	*0.05*	-----	0.054	0.053	0.042	0.049	0.047	0.047	0.061	0.053	0.043	0.053	0.052	0.042	0.047	0.045	0.045	0.060
Mercury	*0.002*	*0.002*	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0006	0.0004	0.0003	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0006
Molybdenum	-----	-----	0.07	0.08	0.06	0.07	0.07	0.07	0.08	0.09	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.08
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03
Total Nitrogen	*10*	*10*	0.83	0.97	0.82	0.90	0.85	0.85	2.64	1.67	0.91	0.78	0.91	0.78	0.85	0.79	0.79	2.46
Phosphorus	-----	-----	0.09	0.09	0.07	0.08	0.08	0.08	0.08	0.08	0.07	0.09	0.09	0.07	0.08	0.07	0.07	0.07
Potassium	-----	-----	16.8	19.0	17.4	18.3	17.4	17.4	34.7	31.5	18.6	15.9	18.1	16.6	17.4	16.5	16.5	32.2
Selenium	*0.05*	*0.05*	0.018	0.020	0.019	0.020	0.019	0.019	0.028	0.033	0.021	0.018	0.020	0.019	0.019	0.019	0.019	0.027
Silver	*0.1*	-----	0.004	0.005	0.004	0.004	0.004	0.004	0.013	0.008	0.005	0.004	0.005	0.004	0.004	0.004	0.004	0.012
Sodium	-----	-----	130	137	119	129	125	125	196	185	125	125	133	115	125	119	119	186
Sulfate	*250*	-----	145	148	127	139	134	134	159	175	129	140	142	123	134	127	127	150
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	0.001	0.001	**0.003**	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	**0.002**
TDS	*500*	-----	756	781	714	935	734	735	984	951	730	739	762	698	906	712	712	944
Uranium	*0.03*	-----	0.011	0.011	0.009	0.010	0.010	0.010	0.010	0.010	0.009	0.011	0.011	0.009	0.010	0.009	0.009	0.009
Zinc	*5*	-----	0.01	0.02	0.01	0.02	0.02	0.02	0.03	0.03	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.03

AWQS Exceedance

			20 Year						30 Year									
Concentration (mg/L)	*MCL*	*AWQS*	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case
Time (yr)			20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	50.0
pH	*6.5-8.5*	-----	8.06	7.97	7.97	7.98	7.96	8.08	7.97	7.97	8.08	8.05	7.97	7.96	7.97	7.95	8.07	7.95
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	457	368	364	375	355	482	360	360	478	445	362	358	368	350	465	347
Aluminum	*0.2*	-----	0.01	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.05	0.00
Antimony	*0.006*	*0.006*	0.005	0.003	0.002	0.003	0.002	0.003	0.002	0.002	**0.007**	0.005	0.003	0.002	0.003	0.002	0.002	0.002
Arsenic	*0.01*	*0.05*	0.031	0.019	0.017	0.019	0.017	0.018	0.018	0.025	0.036	0.030	0.019	0.016	0.019	0.017	0.017	0.016
Barium	*2*	*2*	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.05	0.06	0.05	0.06	0.05
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.03	0.02	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.02	0.03	0.02
Cadmium	*0.005*	*0.005*	0.003	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.005	0.003	0.002	0.001	0.002	0.001	0.002	0.001
Calcium	-----	-----	32	44	46	44	47	83	46	46	29	33	45	47	45	48	80	49
Chloride	*250*	-----	24	16	17	18	15	17	16	16	24	23	16	16	17	15	16	14
Chromium	*0.1*	*0.1*	0.010	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.014	0.009	0.006	0.005	0.006	0.005	0.005	0.005
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.03	0.07	0.03	0.07	0.03	0.03	0.03	0.03	0.03	0.03	0.06	0.03
Fluoride	*4*	*4*	**5.78**	3.79	3.66	3.93	3.47	3.73	3.58	3.58	**5.94**	**5.52**	3.65	3.51	3.77	3.34	3.58	3.26
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.014	0.009	0.007	0.008	0.008	0.009	0.008	0.009	0.016	0.014	0.008	0.007	0.008	0.007	0.008	0.007
Magnesium	*150*	-----	22	16	18	18	15	17	16	16	20	21	15	17	17	15	16	15
Manganese	*0.05*	-----	0.052	0.041	0.051	0.049	0.040	0.045	0.043	0.043	0.058	0.050	0.038	0.049	0.047	0.038	0.043	0.039
Mercury	*0.002*	*0.002*	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.09	0.06	0.07	0.07	0.06	0.07	0.07	0.07	0.08	0.08	0.06	0.07	0.07	0.06	0.07	0.06
Nickel	-----	*0.1*	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	1.56	0.85	0.72	0.85	0.73	0.79	0.75	0.75	2.33	1.48	0.82	0.68	0.80	0.69	0.75	0.63
Phosphorus	-----	-----	0.07	0.06	0.09	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.08	0.08	0.06	0.07	0.06
Potassium	-----	-----	29.6	17.8	14.9	17.1	15.8	16.5	15.9	15.9	30.5	28.1	17.3	14.2	16.4	15.2	15.9	14.5
Selenium	*0.05*	*0.05*	0.032	0.020	0.017	0.019	0.018	0.019	0.018	0.018	0.026	0.031	0.020	0.016	0.019	0.018	0.018	0.017
Silver	*0.1*	-----	0.008	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.012	0.007	0.004	0.003	0.004	0.003	0.004	0.003
Sodium	-----	-----	176	119	119	126	110	119	114	114	178	168	114	115	121	106	114	104
Sulfate	*250*	-----	166	122	133	135	116	127	121	121	143	158	116	128	129	111	121	112
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	**0.002**	0.001	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	914	708	717	738	679	866	694	695	912	884	691	700	718	664	833	660
Uranium	*0.03*	-----	0.009	0.008	0.011	0.010	0.008	0.009	0.009	0.009	0.009	0.009	0.007	0.010	0.009	0.008	0.009	0.008
Zinc	*5*	-----	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

			50 Year								75 Year							
Concentration (mg/L)	*MCL*	*AWQS*	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%
Time (yr)			50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
pH	*6.5-8.5*	-----	7.95	8.05	8.03	7.95	7.95	7.96	7.94	8.03	7.94	7.94	8.02	8.00	7.94	7.94	7.94	7.93
pe	-----	-----	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	347	440	418	347	348	352	341	424	336	337	408	395	338	335	343	329
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	**0.006**	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.003	0.002	0.002	0.002	0.002
Arsenic	*0.01*	*0.05*	0.022	0.032	0.027	0.017	0.015	0.016	0.016	0.016	0.014	0.019	0.027	0.024	0.015	0.013	0.015	0.014
Barium	*2*	*2*	0.05	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.08	0.07	0.05	0.04	0.05	0.04
Beryllium	*0.004*	*0.004*	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.02	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02
Cadmium	*0.005*	*0.005*	0.001	0.004	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.002	0.001	0.001	0.001	0.001
Calcium	-----	-----	49	33	37	48	49	48	50	74	51	51	37	40	50	52	50	52
Chloride	*250*	-----	14	21	20	14	15	15	14	14	13	13	19	18	13	14	14	12
Chromium	*0.1*	*0.1*	0.005	0.011	0.008	0.005	0.005	0.005	0.004	0.005	0.004	0.004	0.009	0.007	0.004	0.004	0.004	0.004
Copper	*1.3*	-----	0.06	0.03	0.03	0.03	0.03	0.03	0.03	0.06	0.03	0.05	0.03	0.03	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	3.26	**5.22**	**4.95**	3.29	3.25	3.40	3.12	3.26	2.99	2.99	**4.56**	**4.45**	3.07	2.93	3.15	2.81
Iron	*0.3*	-----	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.008	0.014	0.012	0.007	0.006	0.007	0.007	0.007	0.006	0.007	0.012	0.011	0.007	0.006	0.006	0.006
Magnesium	*150*	-----	15	18	19	14	16	16	14	15	14	14	17	18	13	15	15	13
Manganese	*0.05*	-----	0.039	0.053	0.045	0.034	0.046	0.042	0.035	0.039	0.036	0.036	0.048	0.041	0.031	0.042	0.039	0.031
Mercury	*0.002*	*0.002*	0.0002	0.0005	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0003	0.0002	0.0001	0.0002	0.0002
Molybdenum	-----	-----	0.06	0.08	0.08	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.05	0.06	0.06	0.05
Nickel	-----	*0.1*	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.63	1.94	1.24	0.65	0.61	0.64	0.64	0.63	0.52	0.52	1.56	1.01	0.57	0.47	0.54	0.50
Phosphorus	-----	-----	0.06	0.06	0.06	0.05	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.07	0.07	0.05
Potassium	-----	-----	14.5	26.4	25.0	15.5	13.1	14.6	14.3	14.5	13.1	13.1	22.5	22.2	14.5	11.5	13.4	12.8
Selenium	*0.05*	*0.05*	0.017	0.024	0.028	0.019	0.015	0.018	0.017	0.017	0.016	0.016	0.022	0.026	0.018	0.014	0.017	0.016
Silver	*0.1*	-----	0.003	0.010	0.006	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.008	0.005	0.003	0.002	0.003	0.002
Sodium	-----	-----	104	157	151	103	107	109	98	104	96	96	139	137	96	97	102	89
Sulfate	*250*	-----	112	130	145	107	120	119	104	112	105	105	119	134	101	111	112	96
Thallium	*0.002*	*0.002*	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.000
TDS	*500*	-----	660	834	821	653	671	679	639	763	632	632	767	769	630	638	653	608
Uranium	*0.03*	-----	0.008	0.008	0.008	0.007	0.009	0.009	0.007	0.008	0.007	0.007	0.007	0.007	0.006	0.009	0.008	0.006
Zinc	*5*	-----	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01

AWQS Exceedance

Rosemont Copper Company
Rosemont Copper World Project

Appendix N - Copper World North Sensitivity Analysis

				100 Year									125 Year					
Concentration (mg/L)	*MCL*	*AWQS*	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%
Time (yr)			75.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	125.0	125.0	125.0	125.0	125.0	125.0
pH	*6.5-8.5*	-----	8.00	7.93	7.93	8.00	7.99	7.93	7.93	7.94	7.92	7.98	7.93	7.93	7.99	7.98	7.93	7.92
pe	-----	-----	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	390	330	331	392	383	333	328	337	323	371	326	327	383	375	330	323
Aluminum	*0.2*	-----	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	0.004	0.003	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.004	0.003	0.002	0.001
Arsenic	*0.01*	*0.05*	0.014	0.014	0.018	0.025	0.022	0.015	0.012	0.014	0.013	0.014	0.013	0.017	0.024	0.021	0.014	0.011
Barium	*2*	*2*	0.04	0.04	0.04	0.07	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.07	0.06	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
Boron	-----	-----	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.002	0.001	0.001
Calcium	-----	-----	69	52	52	39	42	51	54	51	54	66	53	53	41	43	52	55
Chloride	*250*	-----	13	12	12	17	17	12	13	13	11	12	12	12	16	16	12	12
Chromium	*0.1*	*0.1*	0.004	0.004	0.004	0.008	0.006	0.004	0.003	0.004	0.003	0.004	0.003	0.004	0.008	0.005	0.004	0.003
Copper	*1.3*	-----	0.05	0.03	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.05	0.03	0.05	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	2.99	2.84	2.84	**4.22**	**4.18**	2.94	2.74	3.00	2.65	2.84	2.74	2.74	**4.01**	3.99	2.84	2.61
Iron	*0.3*	-----	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.006	0.006	0.007	0.011	0.010	0.007	0.005	0.006	0.006	0.006	0.006	0.006	0.011	0.009	0.006	0.005
Magnesium	*150*	-----	14	13	13	16	17	13	14	14	12	13	13	13	15	16	12	14
Manganese	*0.05*	-----	0.036	0.034	0.034	0.045	0.038	0.029	0.039	0.037	0.029	0.034	0.032	0.032	0.043	0.037	0.028	0.038
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0003	0.0003	0.0002	0.0001	0.0002	0.0001	0.0002	0.0001	0.0001	0.0003	0.0003	0.0002	0.0001
Molybdenum	-----	-----	0.06	0.05	0.05	0.07	0.07	0.05	0.06	0.06	0.05	0.05	0.05	0.05	0.07	0.07	0.05	0.06
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.00
Total Nitrogen	*10*	*10*	0.52	0.47	0.47	1.38	0.90	0.52	0.40	0.49	0.44	0.47	0.43	0.43	1.28	0.83	0.49	0.36
Phosphorus	-----	-----	0.06	0.06	0.06	0.06	0.06	0.05	0.07	0.06	0.05	0.06	0.05	0.05	0.05	0.05	0.04	0.07
Potassium	-----	-----	13.1	12.5	12.5	20.5	20.7	13.9	10.6	12.8	12.1	12.5	12.0	12.0	19.3	19.7	13.5	10.0
Selenium	*0.05*	*0.05*	0.016	0.016	0.016	0.020	0.025	0.018	0.014	0.016	0.015	0.016	0.016	0.016	0.020	0.024	0.018	0.013
Silver	*0.1*	-----	0.003	0.002	0.002	0.007	0.004	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.006	0.004	0.002	0.002
Sodium	-----	-----	96	91	91	129	129	92	91	97	84	91	88	88	123	123	89	87
Sulfate	*250*	-----	105	100	100	113	128	96	106	107	91	100	97	96	108	122	93	102
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000
TDS	*500*	-----	703	616	616	733	741	615	619	636	591	670	604	604	710	720	604	606
Uranium	*0.03*	-----	0.007	0.007	0.007	0.007	0.007	0.006	0.008	0.008	0.006	0.007	0.006	0.006	0.006	0.007	0.005	0.008
Zinc	*5*	-----	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01

AWQS Exceedance

						150 Year												
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor
Time (yr)			125.0	125.0	125.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	175.0	175.0	175.0	175.0
pH	*6.5-8.5*	-----	7.93	7.92	7.96	7.92	7.92	7.98	7.98	7.93	7.92	7.93	7.91	7.95	7.92	7.92	7.98	7.97
pe	-----	-----	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-0.41	4.00	4.00
Alkalinity Total	-----	-----	332	319	358	323	323	375	369	326	320	329	316	347	320	320	369	364
Aluminum	*0.2*	-----	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.001	0.002	0.001	0.001	0.004	0.003	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.004	0.003
Arsenic	*0.01*	*0.05*	0.014	0.012	0.013	0.013	0.016	0.023	0.020	0.014	0.011	0.013	0.012	0.013	0.012	0.016	0.022	0.020
Barium	*2*	*2*	0.04	0.04	0.04	0.04	0.04	0.07	0.06	0.04	0.03	0.04	0.03	0.04	0.04	0.04	0.06	0.05
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Boron	-----	-----	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002
Calcium	-----	-----	52	55	63	54	54	42	44	53	56	53	55	62	55	55	43	45
Chloride	*250*	-----	13	11	12	12	12	16	16	11	12	12	11	12	11	11	15	15
Chromium	*0.1*	*0.1*	0.004	0.003	0.003	0.003	0.003	0.007	0.005	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.007	0.005
Copper	*1.3*	-----	0.03	0.02	0.04	0.03	0.04	0.03	0.03	0.03	0.02	0.03	0.02	0.04	0.02	0.04	0.03	0.03
Fluoride	*4*	*4*	2.89	2.55	2.74	2.65	2.65	3.84	3.84	2.76	2.52	2.79	2.47	2.65	2.57	2.57	3.70	3.71
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
Lead	*0.015*	*0.05*	0.006	0.005	0.006	0.005	0.006	0.010	0.009	0.006	0.004	0.006	0.005	0.006	0.005	0.006	0.010	0.009
Magnesium	*150*	-----	14	11	13	12	12	14	15	12	13	13	11	12	12	12	14	15
Manganese	*0.05*	-----	0.036	0.028	0.032	0.031	0.031	0.042	0.035	0.026	0.037	0.034	0.026	0.031	0.029	0.029	0.040	0.034
Mercury	*0.002*	*0.002*	0.0002	0.0001	0.0001	0.0001	0.0001	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0002
Molybdenum	-----	-----	0.06	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
Nickel	-----	*0.1*	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01
Total Nitrogen	*10*	*10*	0.46	0.40	0.43	0.41	0.41	1.20	0.78	0.47	0.33	0.43	0.38	0.41	0.39	0.39	1.13	0.74
Phosphorus	-----	-----	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.06	0.06	0.04	0.05	0.05	0.05	0.05	0.05
Potassium	-----	-----	12.3	11.6	12.0	11.7	11.7	18.4	18.9	13.3	9.6	12.0	11.3	11.7	11.4	11.4	17.7	18.3
Selenium	*0.05*	*0.05*	0.016	0.015	0.016	0.015	0.015	0.019	0.024	0.017	0.013	0.016	0.015	0.015	0.015	0.015	0.019	0.023
Silver	*0.1*	-----	0.002	0.002	0.002	0.002	0.002	0.006	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.006	0.004
Sodium	-----	-----	93	81	88	85	85	118	118	86	84	90	78	85	82	82	114	114
Sulfate	*250*	-----	103	88	97	93	93	104	118	89	99	100	85	93	91	91	101	114
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
TDS	*500*	-----	623	580	645	594	594	693	704	594	596	612	571	625	585	585	678	690
Uranium	*0.03*	-----	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.008	0.007	0.005	0.006	0.006	0.006	0.006	0.006
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01

AWQS Exceedance

			175 Year					200 Year								
Concentration (mg/L)	*MCL*	*AWQS*	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0
Time (yr)			175.0	175.0	175.0	175.0	175.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0
pH	*6.5-8.5*	-----	7.92	7.91	7.92	7.91	7.94	7.91	7.92	7.97	7.97	7.92	7.91	7.92	7.90	7.93
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	323	317	326	312	337	318	318	364	359	319	314	322	305	328
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Antimony	*0.006*	*0.006*	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.002	0.001	0.001	0.001	0.001	0.001
Arsenic	*0.01*	*0.05*	0.014	0.011	0.013	0.012	0.012	0.012	0.015	0.022	0.019	0.013	0.010	0.013	0.011	0.012
Barium	*2*	*2*	0.04	0.03	0.04	0.03	0.04	0.03	0.03	0.06	0.05	0.04	0.03	0.04	0.03	0.03
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.02
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001
Calcium	-----	-----	53	56	53	55	60	55	55	44	46	54	57	54	54	58
Chloride	*250*	-----	11	11	12	10	11	11	11	14	14	10	11	11	10	11
Chromium	*0.1*	*0.1*	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.007	0.005	0.003	0.003	0.003	0.003	0.003
Copper	*1.3*	-----	0.02	0.02	0.03	0.02	0.04	0.02	0.04	0.03	0.03	0.02	0.02	0.03	0.02	0.04
Fluoride	*4*	*4*	2.67	2.44	2.71	2.40	2.57	2.51	2.51	3.58	3.60	2.56	2.38	2.62	2.34	2.51
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.006	0.004	0.006	0.005	0.005	0.005	0.006	0.009	0.009	0.006	0.004	0.005	0.005	0.005
Magnesium	*150*	-----	11	13	13	11	12	11	11	13	14	10	12	12	10	11
Manganese	*0.05*	-----	0.024	0.036	0.032	0.025	0.029	0.028	0.028	0.039	0.033	0.022	0.035	0.031	0.024	0.028
Mercury	*0.002*	*0.002*	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001
Molybdenum	-----	-----	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.06	0.06	0.04	0.05	0.05	0.04	0.05
Nickel	-----	*0.1*	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	0.45	0.31	0.41	0.36	0.39	0.37	0.37	1.08	0.71	0.42	0.29	0.39	0.34	0.37
Phosphorus	-----	-----	0.04	0.06	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.03	0.06	0.05	0.04	0.05
Potassium	-----	-----	13.0	9.3	11.7	11.0	11.4	11.2	11.2	17.1	17.7	12.7	9.0	11.4	10.8	11.2
Selenium	*0.05*	*0.05*	0.017	0.012	0.015	0.015	0.015	0.015	0.015	0.018	0.023	0.017	0.012	0.015	0.014	0.015
Silver	*0.1*	-----	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.004	0.002	0.001	0.002	0.002	0.002
Sodium	-----	-----	83	81	87	76	82	80	80	110	111	79	79	84	74	80
Sulfate	*250*	-----	86	97	96	83	91	88	88	97	110	82	94	93	81	88
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	583	588	602	562	607	577	577	665	677	571	580	591	548	591
Uranium	*0.03*	-----	0.005	0.008	0.007	0.005	0.006	0.006	0.006	0.006	0.006	0.004	0.007	0.006	0.005	0.006
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

Appendix N - Copper World South Sensitivity Analysis

			1 Year									2 Year						
Concentration (mg/L)	*MCL*	*AWQS*	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
pH	*6.5-8.5*	-----	7.91	7.91	7.98	8.00	7.91	7.90	7.90	7.91	8.21	7.91	7.91	7.98	8.00	7.91	7.90	7.90
pe	-----	-----	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	326	328	400	412	329	323	324	330	708	326	327	398	410	328	323	323
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.001	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.002	0.001	0.001	0.001
Arsenic	*0.01*	*0.05*	0.019	0.042	0.032	0.032	0.019	0.018	0.018	0.019	0.017	0.018	0.041	0.031	0.032	0.019	0.018	0.018
Barium	*2*	*2*	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.03	0.11	0.03	0.03	0.02	0.02	0.03	0.02	0.02
Beryllium	*0.004*	*0.004*	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.05	0.05	0.05	0.05	0.04	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.05	0.05
Cadmium	*0.005*	*0.005*	0.004	0.004	**0.013**	**0.008**	0.004	0.004	0.004	0.004	0.004	0.004	0.004	**0.013**	**0.008**	0.004	0.004	0.004
Calcium	-----	-----	79	78	67	58	76	82	82	75	206	79	78	67	59	76	82	81
Chloride	*250*	-----	26	26	52	43	25	27	26	25	26	26	26	51	42	25	26	26
Chromium	*0.1*	*0.1*	0.012	0.014	0.034	0.022	0.012	0.012	0.012	0.012	0.012	0.012	0.013	0.034	0.022	0.011	0.012	0.012
Copper	*1.3*	-----	0.03	0.18	0.03	0.03	0.03	0.03	0.03	0.03	0.10	0.03	0.18	0.03	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	**4.27**	**4.28**	**5.31**	**5.45**	**4.30**	**4.24**	**4.25**	**4.31**	**6.21**	**4.26**	**4.27**	**5.29**	**5.42**	**4.29**	**4.23**	**4.23**
Iron	*0.3*	-----	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.014	0.021	0.026	0.023	0.014	0.013	0.013	0.014	0.018	0.013	0.020	0.026	0.023	0.013	0.013	0.013
Magnesium	*150*	-----	35	35	55	49	33	37	36	32	35	34	34	55	48	32	36	36
Manganese	*0.05*	-----	0.232	0.232	0.226	0.196	0.208	0.262	0.255	0.202	0.232	0.228	0.228	0.226	0.197	0.204	0.259	0.251
Mercury	*0.002*	*0.002*	0.0007	0.0007	**0.0021**	0.0014	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	**0.0020**	0.0014	0.0007	0.0007	0.0007
Molybdenum	-----	-----	0.08	0.08	0.09	0.11	0.08	0.09	0.09	0.07	0.08	0.08	0.08	0.09	0.10	0.07	0.09	0.08
Nickel	-----	*0.1*	0.02	0.02	0.06	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.06	0.04	0.02	0.02	0.02
Total Nitrogen	*10*	*10*	2.01	2.01	6.44	4.00	2.01	2.01	2.01	2.02	2.01	1.98	1.98	6.35	3.94	1.98	1.99	1.98
Phosphorus	-----	-----	0.08	0.08	0.08	0.08	0.07	0.09	0.09	0.07	0.08	0.08	0.08	0.07	0.08	0.07	0.09	0.08
Potassium	-----	-----	33.1	33.1	71.4	60.6	33.2	33.1	33.0	33.2	33.1	32.7	32.7	70.5	59.9	32.7	32.7	32.6
Selenium	*0.05*	*0.05*	0.036	0.036	**0.057**	**0.062**	0.036	0.036	0.036	0.036	0.036	0.035	0.036	**0.057**	**0.061**	0.035	0.035	0.035
Silver	*0.1*	-----	0.010	0.010	0.032	0.020	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.032	0.020	0.010	0.010	0.010
Sodium	-----	-----	189	189	335	301	183	196	194	182	189	187	187	330	297	181	194	191
Sulfate	*250*	-----	465	464	789	655	438	499	490	431	465	458	458	777	645	430	494	483
Thallium	*0.002*	*0.002*	0.002	0.002	**0.006**	**0.004**	0.002	0.002	0.002	0.002	0.002	0.002	0.002	**0.006**	**0.004**	0.002	0.002	0.002
TDS	*500*	-----	1,159	1,160	1,782	1,588	1,124	1,204	1,192	1,116	1,671	1,148	1,149	1,762	1,571	1,112	1,195	1,180
Uranium	*0.03*	-----	0.008	0.008	0.013	0.011	0.008	0.009	0.009	0.008	0.008	0.008	0.008	0.013	0.011	0.008	0.009	0.009
Zinc	*5*	-----	0.03	0.03	0.07	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.07	0.05	0.03	0.03	0.03

AWQS Exceedance

Appendix N - Copper World South Sensitivity Analysis

					3 Year									5 Year				
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%
Time (yr)			2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0
pH	*6.5-8.5*	-----	7.91	8.21	7.90	7.91	7.98	7.99	7.91	7.90	7.90	7.91	8.21	7.90	7.90	7.97	7.99	7.90
pe	-----	-----	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	329	707	325	326	396	407	327	321	322	328	705	321	323	388	399	323
Aluminum	*0.2*	-----	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001
Arsenic	*0.01*	*0.05*	0.019	0.017	0.018	0.040	0.031	0.031	0.018	0.018	0.018	0.018	0.017	0.017	0.038	0.029	0.030	0.017
Barium	*2*	*2*	0.03	0.11	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.03	0.11	0.03	0.03	0.02	0.02	0.03
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000
Boron	-----	-----	0.04	0.05	0.04	0.04	0.05	0.05	0.04	0.05	0.05	0.04	0.04	0.04	0.04	0.05	0.05	0.04
Cadmium	*0.005*	*0.005*	0.004	0.004	0.004	0.004	**0.012**	**0.008**	0.004	0.004	0.004	0.004	0.004	0.004	0.004	**0.012**	**0.007**	0.004
Calcium	-----	-----	75	206	79	78	67	59	76	82	81	75	205	79	79	68	60	76
Chloride	*250*	-----	25	26	25	25	50	42	24	26	26	24	25	24	24	48	40	23
Chromium	*0.1*	*0.1*	0.012	0.012	0.011	0.013	0.033	0.021	0.011	0.012	0.012	0.011	0.011	0.011	0.012	0.031	0.020	0.010
Copper	*1.3*	-----	0.03	0.10	0.03	0.17	0.03	0.03	0.03	0.03	0.03	0.03	0.10	0.03	0.17	0.03	0.03	0.03
Fluoride	*4*	*4*	**4.30**	**6.13**	**4.25**	**4.25**	**5.25**	**5.37**	**4.27**	**4.21**	**4.22**	**4.28**	**6.03**	**4.20**	**4.21**	**5.14**	**5.26**	**4.21**
Iron	*0.3*	-----	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.014	0.018	0.013	0.020	0.026	0.023	0.013	0.013	0.013	0.013	0.017	0.013	0.019	0.024	0.022	0.013
Magnesium	*150*	-----	32	34	33	34	54	48	32	36	35	31	33	32	32	51	45	30
Manganese	*0.05*	-----	0.199	0.228	0.225	0.225	0.227	0.198	0.200	0.256	0.247	0.196	0.225	0.217	0.217	0.229	0.201	0.192
Mercury	*0.002*	*0.002*	0.0007	0.0007	0.0007	0.0007	0.0020	0.0013	0.0007	0.0007	0.0007	0.0007	0.0007	0.0006	0.0006	0.0019	0.0013	0.0006
Molybdenum	-----	-----	0.07	0.08	0.08	0.08	0.09	0.10	0.07	0.08	0.08	0.07	0.08	0.08	0.08	0.09	0.10	0.07
Nickel	-----	*0.1*	0.02	0.02	0.02	0.02	0.06	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.06	0.04	0.02
Total Nitrogen	*10*	*10*	1.99	1.99	1.95	1.95	6.23	3.86	1.94	1.95	1.94	1.96	1.95	1.83	1.83	5.85	3.63	1.78
Phosphorus	-----	-----	0.07	0.08	0.08	0.08	0.07	0.08	0.07	0.09	0.08	0.06	0.08	0.07	0.07	0.07	0.07	0.06
Potassium	-----	-----	32.9	32.7	32.2	32.2	69.2	58.8	32.2	32.2	32.0	32.4	32.2	30.8	30.8	65.5	55.9	30.4
Selenium	*0.05*	*0.05*	0.035	0.035	0.035	0.035	**0.056**	**0.060**	0.035	0.035	0.035	0.035	0.035	0.033	0.034	**0.053**	**0.057**	0.033
Silver	*0.1*	-----	0.010	0.010	0.010	0.010	0.031	0.019	0.010	0.010	0.010	0.010	0.010	0.009	0.009	0.029	0.018	0.009
Sodium	-----	-----	180	187	184	184	324	292	178	191	188	178	184	176	176	308	278	168
Sulfate	*250*	-----	426	458	450	450	763	634	422	486	475	419	451	432	432	726	605	400
Thallium	*0.002*	*0.002*	0.002	0.002	0.002	0.002	**0.006**	**0.004**	0.002	0.002	0.002	0.002	0.002	0.002	0.002	**0.006**	**0.003**	0.002
TDS	*500*	-----	1,107	1,659	1,135	1,136	1,736	1,549	1,098	1,182	1,166	1,095	1,644	1,102	1,103	1,666	1,492	1,058
Uranium	*0.03*	-----	0.007	0.008	0.008	0.008	0.013	0.010	0.007	0.009	0.009	0.007	0.008	0.008	0.008	0.012	0.010	0.007
Zinc	*5*	-----	0.03	0.03	0.03	0.03	0.06	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.06	0.05	0.03

AWQS Exceedance

Appendix N - Copper World South Sensitivity Analysis

							10 Year											
Concentration (mg/L)	*MCL*	*AWQS*	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ
Time (yr)			5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	20.0	20.0	20.0
pH	*6.5-8.5*	-----	7.90	7.90	7.91	8.21	7.89	7.89	7.94	7.96	7.89	7.89	7.89	7.90	8.17	7.88	7.88	7.92
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00
Alkalinity Total	-----	-----	319	318	325	701	312	313	361	376	314	310	310	316	628	303	304	337
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Arsenic	*0.01*	*0.05*	0.017	0.017	0.018	0.016	0.016	0.032	0.026	0.027	0.016	0.016	0.016	0.016	0.015	0.014	0.027	0.023
Barium	*2*	*2*	0.02	0.03	0.03	0.10	0.03	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.09	0.03	0.03	0.02
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000
Boron	-----	-----	0.05	0.05	0.04	0.04	0.04	0.04	0.05	0.04	0.03	0.05	0.04	0.03	0.04	0.04	0.04	0.04
Cadmium	*0.005*	*0.005*	0.004	0.004	0.004	0.004	0.003	0.003	**0.010**	**0.006**	0.003	0.003	0.003	0.003	0.003	0.003	0.003	**0.008**
Calcium	-----	-----	83	82	75	205	80	80	74	64	77	84	83	77	185	82	82	80
Chloride	*250*	-----	25	24	24	24	21	21	40	34	21	22	22	21	21	19	19	34
Chromium	*0.1*	*0.1*	0.011	0.011	0.011	0.011	0.009	0.010	0.025	0.016	0.009	0.009	0.009	0.009	0.009	0.008	0.009	0.021
Copper	*1.3*	-----	0.03	0.03	0.03	0.10	0.03	0.15	0.03	0.03	0.03	0.03	0.03	0.03	0.09	0.03	0.13	0.03
Fluoride	*4*	*4*	**4.17**	**4.16**	**4.24**	**5.76**	**4.07**	**4.07**	**4.77**	**4.95**	**4.08**	**4.04**	**4.04**	**4.10**	**5.08**	3.93	3.94	**4.42**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00
Lead	*0.015*	*0.05*	0.013	0.012	0.013	0.016	0.011	0.016	0.021	0.019	0.011	0.011	0.011	0.012	0.014	0.010	0.014	0.019
Magnesium	*150*	-----	35	34	30	32	29	29	45	41	27	32	31	27	29	26	26	39
Manganese	*0.05*	-----	0.249	0.238	0.189	0.217	0.207	0.207	0.245	0.213	0.183	0.239	0.229	0.179	0.207	0.195	0.195	0.246
Mercury	*0.002*	*0.002*	0.0007	0.0006	0.0007	0.0006	0.0005	0.0005	0.0015	0.0010	0.0005	0.0005	0.0005	0.0005	0.0005	0.0004	0.0004	0.0012
Molybdenum	-----	-----	0.08	0.08	0.07	0.08	0.07	0.07	0.08	0.09	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.08
Nickel	-----	*0.1*	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.04
Total Nitrogen	*10*	*10*	1.86	1.78	1.87	1.83	1.49	1.49	4.71	2.94	1.47	1.51	1.47	1.51	1.49	1.21	1.21	3.82
Phosphorus	-----	-----	0.08	0.08	0.06	0.07	0.07	0.07	0.07	0.07	0.06	0.08	0.08	0.06	0.07	0.06	0.06	0.06
Potassium	-----	-----	31.0	30.3	31.2	30.8	27.6	27.6	56.9	49.5	27.8	27.5	27.6	27.7	27.6	25.0	25.0	50.7
Selenium	*0.05*	*0.05*	0.034	0.033	0.034	0.034	0.031	0.031	0.046	**0.052**	0.031	0.031	0.030	0.031	0.031	0.027	0.028	0.040
Silver	*0.1*	-----	0.009	0.009	0.009	0.009	0.007	0.007	0.024	0.015	0.007	0.008	0.007	0.008	0.007	0.006	0.006	0.019
Sodium	-----	-----	185	179	171	176	157	157	262	244	151	166	161	152	157	138	138	219
Sulfate	*250*	-----	471	453	404	432	392	391	634	539	362	430	415	362	392	351	350	557
Thallium	*0.002*	*0.002*	0.002	0.002	0.002	0.002	0.001	0.001	**0.005**	**0.003**	0.001	0.001	0.001	0.001	0.001	0.001	0.001	**0.004**
TDS	*500*	-----	1,155	1,126	1,067	1,610	1,026	1,027	1,483	1,356	987	1,078	1,055	989	1,448	949	950	1,325
Uranium	*0.03*	-----	0.009	0.008	0.007	0.008	0.007	0.007	0.010	0.009	0.006	0.008	0.008	0.006	0.007	0.006	0.006	0.009
Zinc	*5*	-----	0.03	0.03	0.03	0.03	0.03	0.03	0.06	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.07

AWQS Exceedance

Appendix N - Copper World South Sensitivity Analysis

			20 Year						30 Year									
Concentration (mg/L)	*MCL*	*AWQS*	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case
Time (yr)			20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	50.0
pH	*6.5-8.5*	-----	7.94	7.88	7.87	7.88	7.88	8.12	7.87	7.87	7.90	7.93	7.88	7.87	7.87	7.88	8.09	7.87
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	353	306	300	301	306	554	298	299	325	342	302	294	297	300	509	294
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
Antimony	*0.006*	*0.006*	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Arsenic	*0.01*	*0.05*	0.024	0.014	0.014	0.014	0.014	0.013	0.013	0.024	0.021	0.022	0.014	0.013	0.013	0.013	0.012	0.012
Barium	*2*	*2*	0.02	0.03	0.03	0.03	0.03	0.07	0.03	0.03	0.02	0.03	0.04	0.03	0.03	0.04	0.07	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.04	0.03	0.04	0.04	0.03	0.04	0.03	0.03	0.04	0.03	0.03	0.04	0.04	0.03	0.03	0.03
Cadmium	*0.005*	*0.005*	**0.005**	0.003	0.003	0.003	0.003	0.003	0.002	0.002	**0.007**	0.005	0.002	0.002	0.002	0.002	0.002	0.002
Calcium	-----	-----	69	79	86	85	79	165	82	82	82	71	78	87	84	79	151	80
Chloride	*250*	-----	30	18	19	19	18	19	17	17	31	27	17	18	18	16	17	15
Chromium	*0.1*	*0.1*	0.014	0.007	0.008	0.008	0.007	0.008	0.007	0.008	0.018	0.012	0.007	0.007	0.007	0.006	0.007	0.005
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.03	0.09	0.03	0.12	0.03	0.03	0.03	0.03	0.03	0.03	0.09	0.03
Fluoride	*4*	*4*	**4.63**	3.96	3.91	3.92	3.96	**4.45**	3.86	3.86	**4.26**	**4.46**	3.90	3.82	3.85	3.87	**4.08**	3.54
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.017	0.010	0.010	0.010	0.010	0.012	0.009	0.012	0.018	0.016	0.010	0.009	0.009	0.009	0.011	0.008
Magnesium	*150*	-----	36	24	29	28	24	26	24	24	35	33	22	27	25	22	24	20
Manganese	*0.05*	-----	0.217	0.170	0.227	0.216	0.168	0.195	0.181	0.181	0.237	0.205	0.154	0.216	0.198	0.158	0.181	0.152
Mercury	*0.002*	*0.002*	0.0009	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0011	0.0008	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003
Molybdenum	-----	-----	0.09	0.06	0.07	0.07	0.06	0.07	0.06	0.06	0.07	0.08	0.06	0.07	0.06	0.06	0.06	0.05
Nickel	-----	*0.1*	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	2.39	1.22	1.21	1.21	1.22	1.21	1.07	1.07	3.36	2.11	1.11	1.04	1.08	1.06	1.07	0.86
Phosphorus	-----	-----	0.06	0.05	0.07	0.07	0.05	0.06	0.06	0.06	0.06	0.06	0.05	0.07	0.06	0.05	0.06	0.05
Potassium	-----	-----	44.2	25.5	24.5	25.2	24.9	25.0	23.4	23.4	47.2	41.0	24.3	22.4	23.7	23.0	23.4	20.8
Selenium	*0.05*	*0.05*	0.045	0.028	0.027	0.028	0.027	0.027	0.026	0.026	0.037	0.042	0.026	0.025	0.026	0.025	0.026	0.023
Silver	*0.1*	-----	0.012	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.017	0.011	0.006	0.005	0.005	0.005	0.005	0.004
Sodium	-----	-----	209	133	146	143	133	138	126	126	196	189	121	133	131	121	126	108
Sulfate	*250*	-----	476	322	388	373	321	351	320	319	506	434	291	358	340	293	320	268
Thallium	*0.002*	*0.002*	**0.002**	0.001	0.001	0.001	0.001	0.001	0.001	0.001	**0.003**	**0.002**	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	1,225	913	998	980	911	1,283	896	897	1,231	1,142	861	945	924	860	1,176	810
Uranium	*0.03*	-----	0.008	0.005	0.007	0.007	0.006	0.006	0.006	0.006	0.008	0.007	0.005	0.007	0.006	0.005	0.006	0.004
Zinc	*5*	-----	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.07	0.05	0.03	0.03	0.03	0.03	0.03	0.03

AWQS Exceedance

Appendix N - Copper World South Sensitivity Analysis

			50 Year								75 Year							
Concentration (mg/L)	*MCL*	*AWQS*	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%
Time (yr)			50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
pH	*6.5-8.5*	-----	7.87	7.89	7.91	7.88	7.86	7.87	7.87	8.03	7.87	7.87	7.88	7.90	7.87	7.86	7.86	7.87
pe	-----	-----	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	294	313	329	297	289	293	295	442	289	289	300	317	292	285	288	290
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Arsenic	*0.01*	*0.05*	0.021	0.018	0.019	0.012	0.011	0.012	0.012	0.011	0.011	0.017	0.015	0.017	0.011	0.010	0.011	0.011
Barium	*2*	*2*	0.04	0.03	0.03	0.04	0.03	0.04	0.04	0.06	0.04	0.04	0.03	0.03	0.04	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.03	0.03	0.03	0.02	0.03	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02
Cadmium	*0.005*	*0.005*	0.002	**0.006**	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	**0.005**	0.003	0.002	0.001	0.002	0.002
Calcium	-----	-----	80	82	71	76	86	82	78	129	78	78	83	72	75	84	80	76
Chloride	*250*	-----	15	25	23	14	15	15	14	15	12	12	20	19	12	13	13	12
Chromium	*0.1*	*0.1*	0.006	0.015	0.010	0.005	0.006	0.005	0.005	0.005	0.004	0.005	0.011	0.007	0.004	0.004	0.004	0.004
Copper	*1.3*	-----	0.11	0.03	0.03	0.03	0.03	0.03	0.03	0.08	0.03	0.12	0.03	0.03	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	3.54	**4.08**	**4.28**	3.49	3.55	3.57	3.52	3.54	3.03	3.03	3.89	**4.10**	3.03	3.03	3.07	2.98
Iron	*0.3*	-----	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.010	0.015	0.014	0.008	0.008	0.008	0.008	0.009	0.007	0.009	0.013	0.012	0.008	0.007	0.007	0.007
Magnesium	*150*	-----	20	30	27	18	23	21	19	20	17	17	24	23	15	20	18	16
Manganese	*0.05*	-----	0.152	0.209	0.177	0.135	0.189	0.169	0.133	0.152	0.140	0.140	0.227	0.178	0.136	0.162	0.159	0.118
Mercury	*0.002*	*0.002*	0.0003	0.0009	0.0006	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0007	0.0005	0.0003	0.0003	0.0003	0.0003
Molybdenum	-----	-----	0.05	0.06	0.07	0.05	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.04	0.05	0.05	0.04
Nickel	-----	*0.1*	0.01	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.86	2.66	1.68	0.83	0.85	0.84	0.89	0.86	0.65	0.65	1.96	1.25	0.65	0.65	0.64	0.65
Phosphorus	-----	-----	0.05	0.05	0.05	0.04	0.06	0.05	0.04	0.05	0.04	0.04	0.04	0.04	0.03	0.05	0.04	0.03
Potassium	-----	-----	20.8	40.5	35.7	21.1	19.9	20.7	21.0	20.8	18.0	18.0	32.8	30.0	18.7	17.2	18.1	17.9
Selenium	*0.05*	*0.05*	0.023	0.032	0.037	0.024	0.022	0.023	0.023	0.023	0.021	0.021	0.028	0.033	0.022	0.020	0.021	0.021
Silver	*0.1*	-----	0.004	0.013	0.008	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.010	0.006	0.003	0.003	0.003	0.003
Sodium	-----	-----	108	162	160	103	115	112	105	108	93	93	131	134	88	99	96	89
Sulfate	*250*	-----	267	420	362	237	310	283	249	268	222	222	340	299	195	261	237	204
Thallium	*0.002*	*0.002*	0.001	**0.003**	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	811	1,080	1,015	770	863	831	786	1,007	734	734	937	899	699	783	754	709
Uranium	*0.03*	-----	0.004	0.006	0.005	0.004	0.006	0.005	0.004	0.004	0.004	0.004	0.005	0.004	0.003	0.005	0.004	0.003
Zinc	*5*	-----	0.03	0.07	0.05	0.04	0.03	0.03	0.03	0.03	0.04	0.04	0.10	0.07	0.05	0.02	0.04	0.03

AWQS Exceedance

				100 Year									125 Year					
Concentration (mg/L)	*MCL*	*AWQS*	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%
Time (yr)			75.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	150.0	150.0	150.0	150.0	150.0	150.0
pH	*6.5-8.5*	-----	7.97	7.86	7.86	7.87	7.89	7.87	7.85	7.86	7.86	7.92	7.86	7.86	7.86	7.88	7.87	7.85
pe	-----	-----	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	0.31	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	376	285	286	292	308	288	281	285	286	333	283	283	286	301	285	279
Aluminum	*0.2*	-----	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000
Arsenic	*0.01*	*0.05*	0.010	0.010	0.015	0.013	0.015	0.010	0.009	0.010	0.010	0.009	0.009	0.010	0.012	0.013	0.010	0.008
Barium	*2*	*2*	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.04	0.04	0.03	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02
Cadmium	*0.005*	*0.005*	0.002	0.002	0.002	0.005	0.003	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.005	0.003	0.002	0.001
Calcium	-----	-----	107	77	77	83	72	73	83	79	75	93	76	76	82	72	72	82
Chloride	*250*	-----	12	11	11	17	16	10	11	11	10	11	9	9	15	14	9	10
Chromium	*0.1*	*0.1*	0.004	0.003	0.004	0.009	0.006	0.003	0.004	0.003	0.003	0.003	0.003	0.003	0.007	0.005	0.003	0.003
Copper	*1.3*	-----	0.08	0.03	0.13	0.03	0.03	0.02	0.03	0.03	0.02	0.08	0.02	0.13	0.03	0.03	0.02	0.03
Fluoride	*4*	*4*	3.03	2.69	2.69	3.76	3.97	2.69	2.66	2.71	2.65	2.69	2.41	2.41	3.67	3.65	2.46	2.39
Iron	*0.3*	-----	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.008	0.006	0.008	0.012	0.010	0.007	0.006	0.006	0.007	0.007	0.006	0.006	0.010	0.009	0.006	0.005
Magnesium	*150*	-----	17	15	15	21	20	13	17	15	14	15	13	13	18	17	11	15
Manganese	*0.05*	-----	0.140	0.134	0.134	0.249	0.183	0.127	0.148	0.147	0.115	0.134	0.120	0.120	0.247	0.175	0.122	0.139
Mercury	*0.002*	*0.002*	0.0003	0.0002	0.0002	0.0005	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0003	0.0002	0.0002
Molybdenum	-----	-----	0.05	0.04	0.04	0.05	0.05	0.03	0.05	0.04	0.04	0.04	0.03	0.03	0.04	0.04	0.03	0.04
Nickel	-----	*0.1*	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.65	0.52	0.52	1.56	1.01	0.54	0.50	0.52	0.53	0.52	0.44	0.44	1.28	0.83	0.47	0.41
Phosphorus	-----	-----	0.04	0.03	0.03	0.03	0.03	0.02	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.04
Potassium	-----	-----	18.0	16.2	16.2	28.2	26.3	16.9	15.1	16.2	16.2	16.2	14.7	14.7	24.6	23.2	15.7	13.6
Selenium	*0.05*	*0.05*	0.021	0.020	0.020	0.025	0.029	0.020	0.018	0.020	0.019	0.020	0.018	0.018	0.023	0.027	0.019	0.017
Silver	*0.1*	-----	0.003	0.003	0.003	0.008	0.005	0.003	0.002	0.003	0.003	0.003	0.002	0.002	0.006	0.004	0.002	0.002
Sodium	-----	-----	93	82	82	111	116	76	88	83	79	82	72	72	95	101	68	79
Sulfate	*250*	-----	222	190	189	290	256	160	227	200	176	190	160	160	246	217	136	203
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000
TDS	*500*	-----	850	679	680	847	820	640	726	692	660	742	630	631	772	750	600	685
Uranium	*0.03*	-----	0.004	0.003	0.003	0.004	0.004	0.002	0.004	0.003	0.003	0.003	0.002	0.002	0.003	0.003	0.002	0.004
Zinc	*5*	-----	0.04	0.04	0.04	0.12	0.08	0.06	0.02	0.05	0.04	0.04	0.05	0.05	0.13	0.09	0.07	0.03

AWQS Exceedance

						150 Year											
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor
Time (yr)			150.0	150.0	150.0	175.0	175.0	175.0	175.0	175.0	175.0	175.0	175.0	175.0	200.0	200.0	200.0	200.0
pH	*6.5-8.5*	-----	7.86	7.86	7.88	7.83	7.84	7.86	7.88	7.86	7.84	7.83	7.84	7.83	7.80	7.80	7.85	7.87
pe	-----	-----	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00
Alkalinity Total	-----	-----	282	283	297	265	266	282	296	280	271	264	266	265	240	241	279	291
Aluminum	*0.2*	-----	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.001
Arsenic	*0.01*	*0.05*	0.009	0.009	0.009	0.008	0.012	0.011	0.012	0.009	0.008	0.008	0.009	0.008	0.008	0.011	0.010	0.011
Barium	*2*	*2*	0.03	0.03	0.03	0.03	0.03	0.05	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Boron	-----	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.002	0.001	0.002	0.001	0.001	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.002
Calcium	-----	-----	77	75	80	69	69	81	72	70	80	70	69	69	61	61	79	71
Chloride	*250*	-----	10	9	9	8	8	13	12	8	9	8	8	8	7	7	11	11
Chromium	*0.1*	*0.1*	0.003	0.003	0.003	0.002	0.003	0.006	0.004	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.005	0.003
Copper	*1.3*	-----	0.02	0.02	0.08	0.02	0.13	0.03	0.03	0.02	0.02	0.02	0.02	0.08	0.02	0.12	0.02	0.02
Fluoride	*4*	*4*	2.41	2.39	2.41	2.16	2.16	3.26	3.20	2.31	2.18	2.15	2.17	2.16	1.97	1.97	2.88	2.85
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
Lead	*0.015*	*0.05*	0.006	0.006	0.006	0.005	0.006	0.009	0.008	0.006	0.005	0.005	0.005	0.006	0.005	0.005	0.008	0.007
Magnesium	*150*	-----	13	12	13	11	11	15	14	10	14	11	10	11	9	9	13	12
Manganese	*0.05*	-----	0.128	0.109	0.120	0.104	0.104	0.229	0.158	0.123	0.130	0.107	0.098	0.104	0.089	0.089	0.211	0.141
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003
Molybdenum	-----	-----	0.04	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.43	0.44	0.44	0.37	0.37	1.05	0.69	0.42	0.34	0.36	0.37	0.37	0.31	0.31	0.88	0.58
Phosphorus	-----	-----	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.04	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Potassium	-----	-----	14.6	14.8	14.7	13.4	13.4	21.6	20.5	15.0	12.5	13.2	13.5	13.4	12.3	12.3	19.3	18.4
Selenium	*0.05*	*0.05*	0.018	0.018	0.018	0.017	0.017	0.021	0.024	0.019	0.016	0.017	0.017	0.017	0.016	0.016	0.019	0.022
Silver	*0.1*	-----	0.002	0.002	0.002	0.002	0.002	0.005	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.003
Sodium	-----	-----	73	70	72	63	63	82	87	62	72	64	63	63	57	57	72	77
Sulfate	*250*	-----	166	151	160	133	133	207	182	121	182	136	129	133	112	112	176	154
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
TDS	*500*	-----	637	619	649	566	567	705	688	570	644	568	561	566	501	501	653	638
Uranium	*0.03*	-----	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.003	0.002	0.002	0.002	0.001	0.001	0.002	0.002
Zinc	*5*	-----	0.05	0.04	0.05	0.04	0.04	0.13	0.08	0.07	0.03	0.04	0.04	0.04	0.04	0.04	0.13	0.08

AWQS Exceedance

			175 Year					200 Year								
Concentration (mg/L)	*MCL*	*AWQS*	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	pE -4	50 ft RRZ	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0
Time (yr)			200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0
pH	*6.5-8.5*	-----	7.84	7.81	7.80	7.80	7.80	7.77	7.77	7.85	7.87	7.83	7.77	7.77	7.77	7.77
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	267	248	240	241	241	223	224	277	288	259	227	223	223	223
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Antimony	*0.006*	*0.006*	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000
Arsenic	*0.01*	*0.05*	0.009	0.007	0.008	0.008	0.008	0.008	0.010	0.009	0.010	0.009	0.007	0.008	0.008	0.007
Barium	*2*	*2*	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.04	0.04	0.03	0.03	0.02	0.02	0.02
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.02	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.002	0.002	0.001	0.001	0.001	0.001
Calcium	-----	-----	66	71	61	60	61	54	54	78	71	64	64	55	54	54
Chloride	*250*	-----	8	8	7	7	7	7	7	10	9	8	8	7	7	7
Chromium	*0.1*	*0.1*	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.003	0.002	0.002	0.002	0.002	0.002
Copper	*1.3*	-----	0.02	0.02	0.02	0.02	0.08	0.02	0.12	0.02	0.02	0.02	0.02	0.02	0.02	0.08
Fluoride	*4*	*4*	2.21	2.00	1.96	1.98	1.97	1.83	1.83	2.62	2.60	2.15	1.84	1.83	1.83	1.83
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.006	0.004	0.005	0.005	0.005	0.005	0.005	0.008	0.007	0.006	0.004	0.005	0.005	0.005
Magnesium	*150*	-----	9	13	9	9	9	8	8	11	11	9	11	8	8	8
Manganese	*0.05*	-----	0.126	0.119	0.092	0.085	0.089	0.079	0.079	0.200	0.131	0.131	0.107	0.082	0.076	0.079
Mercury	*0.002*	*0.002*	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001
Molybdenum	-----	-----	0.03	0.04	0.03	0.03	0.03	0.02	0.02	0.03	0.03	0.02	0.03	0.02	0.02	0.02
Nickel	-----	*0.1*	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	0.39	0.29	0.31	0.32	0.31	0.28	0.28	0.76	0.51	0.37	0.24	0.28	0.28	0.28
Phosphorus	-----	-----	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Potassium	-----	-----	14.5	11.4	12.3	12.5	12.3	11.6	11.6	17.6	16.9	14.2	10.5	11.6	11.7	11.6
Selenium	*0.05*	*0.05*	0.018	0.015	0.016	0.016	0.016	0.015	0.015	0.018	0.021	0.018	0.014	0.015	0.015	0.015
Silver	*0.1*	-----	0.002	0.001	0.002	0.002	0.002	0.001	0.001	0.004	0.003	0.002	0.001	0.001	0.001	0.001
Sodium	-----	-----	59	66	57	56	57	52	52	64	69	56	61	52	52	52
Sulfate	*250*	-----	111	163	114	109	112	97	97	154	134	105	147	99	94	97
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	539	584	504	498	501	455	455	616	603	517	531	458	452	455
Uranium	*0.03*	-----	0.001	0.003	0.002	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.002	0.001	0.001	0.001
Zinc	*5*	-----	0.08	0.03	0.04	0.04	0.04	0.04	0.04	0.13	0.08	0.09	0.03	0.04	0.04	0.04

AWQS Exceedance

APPENDIX O
Heavy Weight Pit sensitivity analysis

			1 Year									2 Year							
Concentration (mg/L)	*MCL*	*AWQS*	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.95	8.10	7.95	8.01	7.95	7.94	7.96	7.93	8.15	7.94	8.07	7.94	8.00	7.94	7.93	7.95	7.92
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	354	516	354	416	357	351	367	338	597	346	478	346	397	349	344	355	335
Aluminum	*0.2*	-----	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.004	**0.011**	0.004	**0.007**	0.004	0.003	0.004	0.003	0.004	0.003	**0.009**	0.003	0.006	0.003	0.003	0.004	0.003
Arsenic	*0.01*	*0.05*	0.021	0.045	0.021	0.031	0.021	0.020	0.023	0.018	0.020	0.019	0.040	0.019	0.028	0.020	0.019	0.021	0.017
Barium	*2*	*2*	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.09	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.05
Cadmium	*0.005*	*0.005*	0.002	**0.007**	0.002	0.004	0.002	0.002	0.003	0.002	0.002	0.002	**0.006**	0.002	0.004	0.002	0.002	0.002	0.002
Calcium	-----	-----	61	32	61	46	59	62	58	65	140	63	36	63	49	61	64	61	66
Chloride	*250*	-----	23	37	23	29	23	23	25	21	23	22	34	22	27	22	22	23	20
Chromium	*0.1*	*0.1*	0.008	0.021	0.008	0.014	0.008	0.008	0.009	0.007	0.008	0.007	0.018	0.007	0.012	0.007	0.007	0.008	0.006
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.09	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	**4.63**	**6.75**	**4.63**	**5.45**	**4.66**	**4.59**	**4.81**	**4.27**	**4.81**	**4.52**	**6.24**	**4.52**	**5.19**	**4.55**	**4.49**	**4.64**	**4.16**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.010	0.022	0.010	0.015	0.010	0.009	0.011	0.008	0.011	0.009	0.019	0.009	0.013	0.009	0.009	0.010	0.008
Magnesium	*150*	-----	31	37	31	34	30	32	32	29	31	30	35	30	32	29	31	31	28
Manganese	*0.05*	-----	0.201	0.106	0.201	0.152	0.196	0.206	0.190	0.210	0.222	0.207	0.120	0.207	0.163	0.202	0.212	0.200	0.204
Mercury	*0.002*	*0.002*	0.0003	0.0008	0.0003	0.0005	0.0003	0.0003	0.0003	0.0002	0.0003	0.0003	0.0007	0.0003	0.0004	0.0003	0.0003	0.0003	0.0002
Molybdenum	-----	-----	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Nickel	-----	*0.1*	0.01	0.04	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.03	0.01	0.02	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	1.12	3.56	1.12	2.17	1.16	1.08	1.32	0.87	1.12	0.97	3.04	0.97	1.85	1.00	0.94	1.10	0.80
Phosphorus	-----	-----	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.12	0.13	0.12	0.12	0.12	0.12	0.11	0.13	0.12	0.12
Potassium	-----	-----	22.6	47.9	22.6	33.5	23.2	21.9	25.1	19.4	22.6	21.1	42.6	21.1	30.3	21.7	20.5	22.8	18.8
Selenium	*0.05*	*0.05*	0.024	0.036	0.024	0.029	0.025	0.023	0.026	0.022	0.024	0.023	0.034	0.023	0.028	0.024	0.023	0.025	0.022
Silver	*0.1*	-----	0.006	0.018	0.006	0.011	0.006	0.005	0.007	0.004	0.006	0.005	0.015	0.005	0.009	0.005	0.005	0.005	0.004
Sodium	-----	-----	173	265	173	213	172	174	185	157	173	165	244	165	199	163	167	174	153
Sulfate	*250*	-----	339	374	339	354	329	350	352	319	339	329	359	329	342	317	342	341	312
Thallium	*0.002*	*0.002*	0.001	**0.003**	0.001	**0.002**	0.001	0.001	0.001	0.001	0.001	0.001	**0.003**	0.001	0.002	0.001	0.001	0.001	0.001
TDS	*500*	-----	1,010	1,320	1,010	1,133	1,000	1,021	1,051	954	1,333	982	1,237	982	1,084	968	997	1,014	938
Uranium	*0.03*	-----	0.012	0.012	0.012	0.012	0.012	0.013	0.012	0.011	0.012	0.012	0.012	0.012	0.012	0.011	0.012	0.012	0.011
Zinc	*5*	-----	0.02	0.04	0.02	0.03	0.02	0.02	0.02	0.016	0.02	0.02	0.036	0.02	0.03	0.02	0.02	0.02	0.02

AWQS Exceedance

Appendix O - Heavy Weight Sensitivity Analysis

				3 Year									5 Year						
Concentration (mg/L)	*MCL*	*AWQS*	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%	Infiltration -25%	GW Inflow +25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	8.13	7.93	8.06	7.93	7.99	7.94	7.93	7.94	7.92	8.12	7.93	8.05	7.93	7.98	7.93	7.93	7.94
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	567	344	465	344	391	346	341	350	335	554	340	450	340	383	342	337	345
Aluminum	*0.2*	-----	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.003	0.003	**0.009**	0.003	0.005	0.003	0.003	0.003	0.003	0.003	0.003	**0.008**	0.003	0.005	0.003	0.003	0.003
Arsenic	*0.01*	*0.05*	0.018	0.018	0.038	0.018	0.027	0.019	0.018	0.020	0.017	0.018	0.018	0.036	0.018	0.026	0.018	0.017	0.019
Barium	*2*	*2*	0.08	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.08	0.03	0.03	0.03	0.03	0.04	0.03	0.03
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.06	0.05	0.06	0.05	0.06	0.05	0.06	0.06	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.06	0.05
Cadmium	*0.005*	*0.005*	0.002	0.002	**0.006**	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	**0.005**	0.002	0.003	0.002	0.002	0.002
Calcium	-----	-----	135	63	37	63	50	62	65	62	65	132	64	39	64	52	62	66	63
Chloride	*250*	-----	22	21	32	21	26	21	22	22	20	21	20	31	20	25	20	21	21
Chromium	*0.1*	*0.1*	0.007	0.007	0.017	0.007	0.011	0.007	0.007	0.008	0.006	0.007	0.007	0.016	0.007	0.011	0.007	0.007	0.007
Copper	*1.3*	-----	0.08	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.08	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	**4.55**	**4.44**	**6.07**	**4.44**	**5.10**	**4.44**	**4.44**	**4.58**	**4.12**	**4.44**	**4.27**	**5.87**	**4.27**	**4.99**	**4.27**	**4.28**	**4.49**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.010	0.009	0.018	0.009	0.013	0.009	0.008	0.009	0.008	0.009	0.008	0.017	0.008	0.012	0.008	0.008	0.009
Magnesium	*150*	-----	30	29	34	29	31	28	30	30	28	29	28	32	28	30	27	29	29
Manganese	*0.05*	-----	0.214	0.208	0.124	0.208	0.167	0.197	0.214	0.203	0.198	0.208	0.199	0.130	0.199	0.171	0.186	0.214	0.206
Mercury	*0.002*	*0.002*	0.0003	0.0003	0.0006	0.0003	0.0004	0.0003	0.0002	0.0003	0.0002	0.0003	0.0002	0.0006	0.0002	0.0004	0.0002	0.0002	0.0003
Molybdenum	-----	-----	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	0.09	0.09	0.09	0.09	0.08	0.09	0.09
Nickel	-----	*0.1*	0.01	0.01	0.03	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.02	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.97	0.92	2.86	0.92	1.75	0.94	0.89	1.02	0.79	0.92	0.85	2.66	0.85	1.63	0.88	0.83	0.94
Phosphorus	-----	-----	0.12	0.12	0.12	0.12	0.12	0.11	0.13	0.12	0.11	0.12	0.11	0.11	0.11	0.11	0.10	0.12	0.12
Potassium	-----	-----	21.1	20.6	40.8	20.6	29.2	21.1	20.0	21.9	18.8	20.6	19.8	38.6	19.8	27.8	20.4	19.2	21.0
Selenium	*0.05*	*0.05*	0.023	0.023	0.033	0.023	0.027	0.024	0.023	0.024	0.022	0.023	0.023	0.032	0.023	0.026	0.023	0.022	0.024
Silver	*0.1*	-----	0.005	0.005	0.014	0.005	0.009	0.005	0.004	0.005	0.004	0.005	0.004	0.013	0.004	0.008	0.004	0.004	0.005
Sodium	-----	-----	165	161	235	161	193	159	163	169	150	161	155	223	155	184	152	158	162
Sulfate	*250*	-----	329	321	349	321	333	308	336	333	305	321	308	334	308	320	294	325	320
Thallium	*0.002*	*0.002*	0.001	0.001	**0.003**	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	**0.003**	0.001	0.002	0.001	0.001	0.001
TDS	*500*	-----	1,276	966	1,203	966	1,061	950	983	994	927	1,245	941	1,157	941	1,028	923	961	967
Uranium	*0.03*	-----	0.012	0.011	0.011	0.011	0.011	0.011	0.012	0.012	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.012	0.011
Zinc	*5*	-----	0.017	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02

AWQS Exceedance

Rosemont Copper Company
Rosemont Copper World Project

Appendix O - Heavy Weight Sensitivity Analysis

					10 Year									20 Year					
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%	Infiltration - 25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.92	8.11	7.93	8.04	7.93	7.98	7.93	7.92	7.93	7.92	8.10	7.93	8.03	7.93	7.97	7.93	7.92
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	333	533	337	441	337	378	340	334	343	330	513	334	428	334	371	336	332
Aluminum	*0.2*	-----	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.003	0.003	0.003	**0.008**	0.003	0.005	0.003	0.003	0.003	0.002	0.003	0.003	**0.007**	0.003	0.005	0.003	0.002
Arsenic	*0.01*	*0.05*	0.016	0.017	0.017	0.035	0.017	0.025	0.018	0.017	0.018	0.016	0.017	0.017	0.033	0.017	0.024	0.017	0.016
Barium	*2*	*2*	0.04	0.08	0.04	0.03	0.04	0.04	0.04	0.03	0.03	0.04	0.07	0.04	0.04	0.04	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05
Cadmium	*0.005*	*0.005*	0.002	0.002	0.002	**0.005**	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.003	0.002	0.002
Calcium	-----	-----	65	127	63	40	63	52	61	66	62	65	121	63	41	63	53	61	66
Chloride	*250*	-----	19	20	19	29	19	24	19	20	20	18	19	18	27	18	22	18	19
Chromium	*0.1*	*0.1*	0.006	0.007	0.006	0.015	0.006	0.010	0.006	0.006	0.007	0.006	0.006	0.006	0.014	0.006	0.009	0.006	0.006
Copper	*1.3*	-----	0.03	0.08	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.07	0.03	0.03	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	**4.01**	**4.27**	**4.12**	**5.75**	**4.12**	**4.92**	**4.13**	**4.11**	**4.33**	3.83	**4.12**	3.94	**5.57**	3.94	**4.82**	3.93	3.96
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.008	0.009	0.008	0.017	0.008	0.012	0.008	0.008	0.008	0.007	0.009	0.008	0.016	0.008	0.011	0.008	0.007
Magnesium	*150*	-----	27	28	26	31	26	28	25	28	28	25	26	25	29	25	26	24	26
Manganese	*0.05*	-----	0.189	0.199	0.183	0.132	0.183	0.172	0.169	0.200	0.193	0.172	0.183	0.169	0.136	0.169	0.172	0.153	0.188
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0006	0.0002	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0004	0.0002	0.0002
Molybdenum	-----	-----	0.08	0.09	0.08	0.08	0.08	0.08	0.08	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.08
Nickel	-----	*0.1*	0.01	0.01	0.01	0.03	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01
Total Nitrogen	*10*	*10*	0.77	0.85	0.82	2.52	0.82	1.55	0.85	0.78	0.88	0.73	0.82	0.76	2.33	0.76	1.43	0.78	0.74
Phosphorus	-----	-----	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.10	0.10	0.10	0.09	0.10	0.10	0.09	0.11
Potassium	-----	-----	18.5	19.8	19.4	37.2	19.4	27.1	20.1	18.6	20.5	18.0	19.4	18.9	35.2	18.9	25.9	19.5	18.2
Selenium	*0.05*	*0.05*	0.022	0.023	0.022	0.031	0.022	0.026	0.023	0.022	0.023	0.021	0.022	0.022	0.030	0.022	0.026	0.023	0.021
Silver	*0.1*	-----	0.004	0.004	0.004	0.013	0.004	0.008	0.004	0.004	0.004	0.004	0.004	0.004	0.012	0.004	0.007	0.004	0.004
Sodium	-----	-----	146	155	148	212	148	175	145	151	155	138	148	140	200	140	166	137	144
Sulfate	*250*	-----	293	309	289	313	289	299	273	307	303	271	289	271	293	271	280	254	291
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	**0.002**	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	**0.002**	0.001	0.001	0.001	0.001
TDS	*500*	-----	906	1,197	908	1,112	908	990	890	930	938	870	1,141	876	1,062	876	951	855	901
Uranium	*0.03*	-----	0.010	0.011	0.010	0.010	0.010	0.010	0.009	0.011	0.011	0.009	0.010	0.009	0.009	0.009	0.009	0.008	0.010
Zinc	*5*	-----	0.01	0.02	0.02	0.03	0.02	0.02	0.02	0.01	0.02	0.01	0.02	0.01	0.03	0.01	0.02	0.01	0.01

AWQS Exceedance

						30 Year									50 Year				
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.93	7.92	8.08	7.92	8.02	7.92	7.96	7.93	7.92	7.93	7.92	8.07	7.92	8.01	7.92	7.96	7.92
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	337	330	490	331	416	331	364	334	328	335	327	475	329	407	329	360	332
Aluminum	*0.2*	-----	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.003	0.002	0.003	0.002	**0.007**	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	**0.006**	0.002	0.004	0.002
Arsenic	*0.01*	*0.05*	0.017	0.016	0.016	0.016	0.031	0.016	0.023	0.017	0.015	0.017	0.015	0.016	0.016	0.030	0.016	0.022	0.016
Barium	*2*	*2*	0.04	0.04	0.07	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.07	0.04	0.04	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.05	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Cadmium	*0.005*	*0.005*	0.002	0.002	0.002	0.001	0.004	0.001	0.003	0.002	0.001	0.002	0.001	0.001	0.001	0.004	0.001	0.003	0.001
Calcium	-----	-----	63	63	114	64	43	64	54	62	66	64	64	111	64	44	64	55	62
Chloride	*250*	-----	19	17	18	18	26	18	21	17	18	19	17	18	17	25	17	21	17
Chromium	*0.1*	*0.1*	0.006	0.006	0.006	0.005	0.013	0.005	0.009	0.005	0.006	0.006	0.005	0.005	0.005	0.012	0.005	0.008	0.005
Copper	*1.3*	-----	0.03	0.03	0.07	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.07	0.03	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	**4.10**	3.75	3.94	3.82	**5.41**	3.82	**4.73**	3.83	3.82	3.99	3.60	3.82	3.73	**5.29**	3.73	**4.58**	3.74
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.008	0.008	0.008	0.008	0.015	0.008	0.011	0.008	0.007	0.008	0.007	0.008	0.007	0.014	0.007	0.010	0.008
Magnesium	*150*	-----	26	23	25	24	28	24	26	23	26	26	22	24	23	27	23	25	22
Manganese	*0.05*	-----	0.180	0.155	0.169	0.162	0.142	0.162	0.165	0.147	0.181	0.175	0.146	0.162	0.157	0.146	0.157	0.159	0.142
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0003	0.0002
Molybdenum	-----	-----	0.08	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.79	0.72	0.76	0.71	2.16	0.71	1.33	0.73	0.68	0.74	0.67	0.71	0.67	2.02	0.67	1.25	0.69
Phosphorus	-----	-----	0.10	0.09	0.10	0.09	0.09	0.09	0.09	0.08	0.10	0.10	0.08	0.09	0.09	0.09	0.09	0.09	0.08
Potassium	-----	-----	19.4	18.1	18.9	18.3	33.4	18.3	24.8	19.0	17.5	18.9	17.5	18.3	17.9	32.0	17.9	23.9	18.6
Selenium	*0.05*	*0.05*	0.023	0.021	0.022	0.022	0.029	0.022	0.025	0.023	0.021	0.022	0.021	0.022	0.022	0.028	0.022	0.024	0.022
Silver	*0.1*	-----	0.004	0.004	0.004	0.004	0.011	0.004	0.007	0.004	0.003	0.004	0.003	0.004	0.003	0.010	0.003	0.006	0.003
Sodium	-----	-----	147	132	140	136	191	136	159	133	139	143	127	136	132	184	132	154	130
Sulfate	*250*	-----	286	252	271	262	282	262	271	245	282	279	240	262	255	274	255	263	239
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	**0.002**	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001
TDS	*500*	-----	903	841	1,083	857	1,027	857	926	838	881	888	818	1,049	843	1,001	843	908	826
Uranium	*0.03*	-----	0.010	0.009	0.009	0.009	0.009	0.009	0.009	0.008	0.010	0.010	0.008	0.009	0.009	0.009	0.009	0.009	0.008
Zinc	*5*	-----	0.02	0.01	0.01	0.01	0.03	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.02	0.01

AWQS Exceedance

							75 Year												
Concentration (mg/L)	*MCL*	*AWQS*	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.91	7.92	7.91	8.06	7.92	8.00	7.92	7.95	7.92	7.91	7.92	7.91	8.05	7.91	7.98	7.91	7.94
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	325	332	324	464	326	397	326	354	328	324	328	323	454	323	384	323	347
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	0.002	0.002	0.006	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.003
Arsenic	*0.01*	*0.05*	0.015	0.016	0.015	0.015	0.015	0.028	0.015	0.021	0.015	0.015	0.015	0.015	0.015	0.014	0.026	0.014	0.020
Barium	*2*	*2*	0.04	0.04	0.04	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.06	0.04	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.001	0.004	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.002
Calcium	-----	-----	67	64	64	108	65	46	65	56	63	67	65	64	106	66	49	66	58
Chloride	*250*	-----	18	18	16	17	17	24	17	20	16	17	18	16	17	16	23	16	19
Chromium	*0.1*	*0.1*	0.005	0.006	0.005	0.005	0.005	0.011	0.005	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.010	0.005	0.007
Copper	*1.3*	-----	0.03	0.03	0.03	0.06	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.06	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	3.71	3.91	3.49	3.73	3.64	**5.16**	3.64	**4.43**	3.62	3.65	3.77	3.44	3.64	3.54	**4.98**	3.54	**4.23**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.007	0.008	0.007	0.008	0.007	0.013	0.007	0.010	0.007	0.007	0.007	0.007	0.008	0.007	0.012	0.007	0.009
Magnesium	*150*	-----	25	25	21	23	23	26	23	24	22	25	25	21	23	23	25	23	24
Manganese	*0.05*	-----	0.175	0.171	0.139	0.157	0.155	0.152	0.155	0.157	0.140	0.173	0.169	0.136	0.155	0.153	0.158	0.153	0.155
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002	0.0003
Molybdenum	-----	-----	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.06	0.07	0.07	0.07	0.07	0.07
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01
Total Nitrogen	*10*	*10*	0.63	0.70	0.62	0.67	0.62	1.87	0.62	1.16	0.62	0.61	0.62	0.60	0.62	0.56	1.66	0.56	1.03
Phosphorus	-----	-----	0.10	0.10	0.08	0.09	0.09	0.09	0.09	0.09	0.08	0.10	0.10	0.08	0.09	0.09	0.09	0.09	0.09
Potassium	-----	-----	16.9	18.5	17.0	17.9	17.4	30.4	17.4	23.0	17.9	16.7	17.6	16.8	17.4	16.7	28.2	16.7	21.6
Selenium	*0.05*	*0.05*	0.021	0.022	0.021	0.022	0.021	0.028	0.021	0.024	0.022	0.020	0.022	0.021	0.021	0.021	0.026	0.021	0.023
Silver	*0.1*	-----	0.003	0.003	0.003	0.003	0.003	0.009	0.003	0.006	0.003	0.003	0.003	0.003	0.003	0.003	0.008	0.003	0.005
Sodium	-----	-----	135	140	122	132	130	177	130	150	126	133	136	120	130	127	169	127	145
Sulfate	*250*	-----	274	273	231	255	251	269	251	259	235	271	270	227	251	249	265	249	256
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001
TDS	*500*	-----	866	876	800	1,023	834	978	834	893	813	859	864	792	1,004	825	949	825	876
Uranium	*0.03*	-----	0.010	0.009	0.008	0.009	0.009	0.009	0.009	0.009	0.008	0.010	0.009	0.008	0.009	0.008	0.008	0.008	0.008
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02

AWQS Exceedance

Appendix O - Heavy Weight Sensitivity Analysis

			100 Year					125 Year											
Concentration (mg/L)	*MCL*	*AWQS*	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.92	7.91	7.91	7.91	8.04	7.91	7.98	7.91	7.94	7.91	7.91	7.91	7.91	8.03	7.91	7.97	7.91
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	325	321	325	321	443	321	376	321	343	323	319	323	318	434	320	371	320
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002
Arsenic	*0.01*	*0.05*	0.015	0.014	0.015	0.014	0.014	0.014	0.025	0.014	0.019	0.014	0.013	0.014	0.014	0.014	0.014	0.024	0.014
Barium	*2*	*2*	0.04	0.04	0.04	0.04	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.06	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.03	0.04	0.04	0.04	0.04
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001
Calcium	-----	-----	64	68	66	65	105	66	50	66	59	64	69	67	66	103	66	51	66
Chloride	*250*	-----	16	17	17	15	16	16	22	16	19	16	17	17	15	16	16	21	16
Chromium	*0.1*	*0.1*	0.004	0.005	0.005	0.004	0.005	0.004	0.010	0.004	0.007	0.004	0.005	0.005	0.004	0.004	0.004	0.009	0.004
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.06	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.06	0.03	0.03	0.03
Fluoride	*4*	*4*	3.53	3.56	3.67	3.36	3.54	3.47	**4.87**	3.47	**4.10**	3.45	3.49	3.59	3.29	3.47	3.40	**4.80**	3.40
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.007	0.006	0.007	0.007	0.007	0.006	0.012	0.006	0.009	0.007	0.006	0.007	0.006	0.007	0.006	0.011	0.006
Magnesium	*150*	-----	21	24	24	21	23	22	25	22	24	21	24	24	20	22	22	24	22
Manganese	*0.05*	-----	0.138	0.172	0.166	0.135	0.153	0.151	0.155	0.151	0.153	0.134	0.171	0.163	0.134	0.151	0.148	0.152	0.148
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002
Molybdenum	-----	-----	0.07	0.08	0.08	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.07	0.06	0.07	0.07	0.07	0.07
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01
Total Nitrogen	*10*	*10*	0.56	0.55	0.56	0.56	0.56	0.52	1.54	0.52	0.95	0.53	0.51	0.53	0.51	0.52	0.49	1.45	0.49
Phosphorus	-----	-----	0.08	0.10	0.09	0.08	0.09	0.09	0.09	0.09	0.09	0.08	0.10	0.09	0.08	0.09	0.08	0.08	0.08
Potassium	-----	-----	17.3	16.0	17.0	16.3	16.7	16.3	26.9	16.3	20.8	16.9	15.6	16.6	15.9	16.3	16.0	25.9	16.0
Selenium	*0.05*	*0.05*	0.022	0.020	0.022	0.020	0.021	0.021	0.026	0.021	0.023	0.022	0.020	0.021	0.020	0.021	0.021	0.025	0.021
Silver	*0.1*	-----	0.003	0.003	0.003	0.003	0.003	0.003	0.008	0.003	0.005	0.003	0.003	0.003	0.003	0.003	0.002	0.007	0.002
Sodium	-----	-----	124	131	133	118	127	124	163	124	141	121	129	130	116	124	122	158	122
Sulfate	*250*	-----	233	269	267	224	249	246	260	246	252	227	267	261	223	246	241	255	241
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.000
TDS	*500*	-----	805	850	854	785	984	817	930	817	864	793	845	843	779	967	808	914	808
Uranium	*0.03*	-----	0.008	0.009	0.009	0.007	0.008	0.008	0.008	0.008	0.008	0.007	0.009	0.009	0.007	0.008	0.008	0.008	0.008
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01

AWQS Exceedance

			150 Year						175 Year										
Concentration (mg/L)	*MCL*	*AWQS*	Scale Factor	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.93	7.91	7.90	7.91	7.91	8.02	7.91	7.97	7.91	7.93	7.91	7.90	7.91	7.90	8.02	7.90	7.96
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	340	322	317	322	317	426	318	366	318	338	320	316	320	316	420	317	362
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
Antimony	*0.006*	*0.006*	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.004
Arsenic	*0.01*	*0.05*	0.018	0.014	0.013	0.014	0.013	0.014	0.013	0.023	0.013	0.018	0.014	0.013	0.014	0.013	0.013	0.013	0.022
Barium	*2*	*2*	0.04	0.04	0.04	0.04	0.04	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.04	0.03	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.03	0.04	0.04	0.04
Cadmium	*0.005*	*0.005*	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003
Calcium	-----	-----	60	64	69	67	66	101	67	52	67	60	65	69	67	66	100	67	53
Chloride	*250*	-----	18	15	16	17	15	16	16	21	16	18	15	16	16	15	16	15	20
Chromium	*0.1*	*0.1*	0.006	0.004	0.004	0.004	0.004	0.004	0.004	0.009	0.004	0.006	0.004	0.004	0.004	0.004	0.004	0.004	0.008
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.03	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.05	0.03	0.03
Fluoride	*4*	*4*	**4.00**	3.39	3.42	3.53	3.23	3.40	3.35	**4.68**	3.35	3.92	3.33	3.36	3.48	3.18	3.35	3.30	**4.55**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.009	0.007	0.006	0.006	0.006	0.007	0.006	0.011	0.006	0.008	0.006	0.006	0.006	0.006	0.007	0.006	0.011
Magnesium	*150*	-----	23	21	24	23	20	22	22	24	22	23	20	24	23	20	22	22	24
Manganese	*0.05*	-----	0.150	0.131	0.169	0.160	0.133	0.148	0.146	0.149	0.146	0.147	0.130	0.166	0.158	0.130	0.146	0.144	0.147
Mercury	*0.002*	*0.002*	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003
Molybdenum	-----	-----	0.07	0.06	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.06	0.07	0.07	0.07
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.91	0.51	0.48	0.50	0.48	0.49	0.47	1.38	0.47	0.86	0.48	0.46	0.48	0.46	0.47	0.45	1.31
Phosphorus	-----	-----	0.08	0.07	0.10	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.09	0.09	0.07	0.08	0.08	0.08
Potassium	-----	-----	20.2	16.6	15.2	16.3	15.5	16.0	15.7	25.2	15.7	19.8	16.3	14.9	16.0	15.3	15.7	15.5	24.3
Selenium	*0.05*	*0.05*	0.023	0.021	0.020	0.021	0.020	0.021	0.020	0.025	0.020	0.022	0.021	0.019	0.021	0.020	0.020	0.020	0.024
Silver	*0.1*	-----	0.005	0.003	0.002	0.002	0.002	0.002	0.002	0.007	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.007
Sodium	-----	-----	138	119	127	128	115	122	120	155	120	135	117	124	126	112	120	119	151
Sulfate	*250*	-----	247	224	264	258	221	241	238	251	238	244	221	260	255	217	238	236	248
Thallium	*0.002*	*0.002*	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001
TDS	*500*	-----	852	785	837	835	773	949	801	901	801	842	779	829	829	764	935	795	889
Uranium	*0.03*	-----	0.008	0.007	0.009	0.009	0.007	0.008	0.008	0.008	0.008	0.008	0.007	0.009	0.009	0.007	0.008	0.008	0.008
Zinc	*5*	-----	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02

AWQS Exceedance

			200 Year						
Concentration (mg/L)	*MCL*	*AWQS*	pE -4	Scale Factor	Infiltration +25%	Infiltration - 25%	GW Inflow +25%	GW Inflow - 25%	SI +1.0
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.90	7.93	7.91	7.90	7.91	7.90	8.01
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	317	335	319	315	319	314	414
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.05
Antimony	*0.006*	*0.006*	0.002	0.003	0.002	0.002	0.002	0.002	0.002
Arsenic	*0.01*	*0.05*	0.013	0.017	0.014	0.013	0.013	0.013	0.013
Barium	*2*	*2*	0.04	0.04	0.04	0.04	0.04	0.04	0.05
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.04	0.04	0.03	0.04	0.04	0.03	0.04
Cadmium	*0.005*	*0.005*	0.001	0.002	0.001	0.001	0.001	0.001	0.001
Calcium	-----	-----	67	61	65	70	68	66	99
Chloride	*250*	-----	15	17	15	16	16	14	15
Chromium	*0.1*	*0.1*	0.004	0.006	0.004	0.004	0.004	0.004	0.004
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.03	0.03	0.05
Fluoride	*4*	*4*	3.30	3.84	3.29	3.32	3.43	3.13	3.30
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.006	0.008	0.006	0.006	0.006	0.006	0.006
Magnesium	*150*	-----	22	22	20	23	23	20	22
Manganese	*0.05*	-----	0.144	0.145	0.128	0.164	0.157	0.127	0.144
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.07	0.07	0.06	0.07	0.07	0.06	0.07
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.45	0.82	0.46	0.44	0.46	0.44	0.45
Phosphorus	-----	-----	0.08	0.08	0.07	0.09	0.09	0.07	0.08
Potassium	-----	-----	15.5	19.3	16.1	14.7	15.7	15.1	15.5
Selenium	*0.05*	*0.05*	0.020	0.022	0.021	0.019	0.021	0.020	0.020
Silver	*0.1*	-----	0.002	0.004	0.002	0.002	0.002	0.002	0.002
Sodium	-----	-----	119	133	116	123	125	111	119
Sulfate	*250*	-----	236	241	219	257	253	213	236
Thallium	*0.002*	*0.002*	0.000	0.001	0.000	0.000	0.000	0.000	0.000
TDS	*500*	-----	795	834	774	823	824	758	924
Uranium	*0.03*	-----	0.008	0.008	0.007	0.009	0.009	0.007	0.008
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

APPENDIX P
Elgin Pit sensitivity analysis

			1 Year									2 Year							
Concentration (mg/L)	*MCL*	*AWQS*	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.92	8.05	7.92	8.03	7.92	7.91	7.92	7.92	8.06	7.90	8.00	7.90	8.00	7.91	7.90	7.90	7.91
pe	-----	-----	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	8.91	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	326	460	326	430	329	322	324	328	464	313	403	310	401	317	310	312	315
Aluminum	*0.2*	-----	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.003	**0.010**	0.003	**0.006**	0.003	0.003	0.003	0.003	0.003	0.002	**0.007**	0.002	0.005	0.002	0.002	0.002	0.002
Arsenic	*0.01*	*0.05*	0.005	0.007	0.013	0.009	0.005	0.005	0.005	0.005	0.005	0.005	0.007	0.005	0.010	0.005	0.005	0.005	0.005
Barium	*2*	*2*	0.05	0.03	0.05	0.03	0.05	0.05	0.05	0.05	0.10	0.06	0.04	0.06	0.04	0.06	0.06	0.06	0.06
Beryllium	*0.004*	*0.004*	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.002	**0.007**	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.003	0.002	0.001	0.002	0.002
Calcium	-----	-----	60	39	60	42	59	61	61	59	109	62	46	64	45	62	63	63	61
Chloride	*250*	-----	13	25	13	24	14	13	13	13	13	12	21	12	21	13	11	12	12
Chromium	*0.1*	*0.1*	0.006	0.019	0.007	0.012	0.006	0.006	0.006	0.006	0.006	0.004	0.013	0.005	0.009	0.005	0.004	0.004	0.004
Copper	*1.3*	-----	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	**4.22**	**6.12**	**4.22**	**5.69**	**4.27**	**4.17**	**4.19**	**4.24**	**8.02**	**4.03**	**5.31**	3.99	**5.27**	**4.09**	3.99	**4.02**	**4.05**
Iron	*0.3*	-----	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.007	0.024	0.008	0.014	0.008	0.007	0.007	0.007	0.008	0.005	0.017	0.004	0.010	0.005	0.005	0.005	0.005
Magnesium	*150*	-----	21	48	21	40	22	21	22	21	21	18	36	18	34	19	17	18	18
Manganese	*0.05*	-----	0.046	0.055	0.046	0.050	0.049	0.044	0.055	0.037	0.046	0.043	0.050	0.043	0.046	0.046	0.040	0.052	0.034
Mercury	*0.002*	*0.002*	0.0002	0.0007	0.0002	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.13	0.30	0.13	0.25	0.14	0.13	0.13	0.13	0.13	0.11	0.23	0.11	0.20	0.12	0.11	0.11	0.11
Nickel	-----	*0.1*	0.01	0.03	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	1.15	3.41	1.15	2.20	1.18	1.11	1.13	1.17	1.15	0.89	2.49	0.89	1.66	0.92	0.87	0.88	0.90
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	22.2	50.9	22.2	44.1	23.1	21.5	21.9	22.6	22.2	19.1	39.1	19.1	37.9	20.0	18.3	18.9	19.4
Selenium	*0.05*	*0.05*	0.006	0.017	0.006	0.011	0.006	0.006	0.006	0.006	0.006	0.005	0.013	0.005	0.009	0.005	0.004	0.005	0.005
Silver	*0.1*	-----	0.005	0.017	0.005	0.011	0.005	0.005	0.005	0.005	0.005	0.004	0.012	0.004	0.008	0.004	0.004	0.004	0.004
Sodium	-----	-----	98	209	98	184	102	94	99	97	98	85	163	85	160	90	82	87	84
Sulfate	*250*	-----	179	384	179	320	187	172	185	173	179	153	291	153	268	160	145	158	146
Thallium	*0.002*	*0.002*	0.001	**0.003**	0.001	**0.002**	0.001	0.001	0.001	0.001	0.001	0.001	**0.002**	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	725	1,226	726	1,093	742	710	731	719	916	668	1,008	666	975	685	652	675	660
Uranium	*0.03*	-----	0.006	0.014	0.006	0.010	0.006	0.006	0.007	0.006	0.006	0.005	0.010	0.005	0.007	0.005	0.005	0.005	0.004
Zinc	*5*	-----	0.01	0.03	0.01	0.02	0.01	0.01	0.01	0.011	0.01	0.01	0.024	0.01	0.02	0.01	0.01	0.01	0.01

AWQS Exceedance

				3 Year									5 Year						
Concentration (mg/L)	*MCL*	*AWQS*	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	8.00	7.90	7.99	7.90	8.00	7.91	7.90	7.90	7.90	7.98	7.90	7.98	7.90	8.00	7.91	7.90	7.90
pe	-----	-----	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-0.66	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	398	311	387	311	396	315	307	310	312	382	312	378	312	399	317	307	311
Aluminum	*0.2*	-----	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.002	**0.006**	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.004	0.002	0.002	0.002
Arsenic	*0.01*	*0.05*	0.005	0.006	0.007	0.012	0.010	0.006	0.005	0.005	0.006	0.006	0.006	0.008	0.013	0.012	0.007	0.006	0.006
Barium	*2*	*2*	0.08	0.06	0.04	0.06	0.04	0.06	0.07	0.06	0.06	0.08	0.06	0.04	0.06	0.04	0.06	0.07	0.06
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
Boron	-----	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.002	0.001	0.004	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.001	0.002	0.001	0.001	0.001
Calcium	-----	-----	93	62	48	62	46	62	63	63	62	88	62	49	62	45	61	63	63
Chloride	*250*	-----	12	12	19	12	21	12	11	12	11	12	12	19	12	22	13	11	12
Chromium	*0.1*	*0.1*	0.004	0.004	0.012	0.004	0.007	0.004	0.004	0.004	0.004	0.004	0.003	0.010	0.004	0.007	0.004	0.003	0.003
Copper	*1.3*	-----	0.04	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.04	0.03	0.03	0.03	0.03
Fluoride	*4*	*4*	**6.70**	4.00	**5.08**	4.00	**5.19**	**4.06**	3.94	3.99	**4.01**	**6.36**	**4.01**	**4.95**	**4.01**	**5.23**	**4.09**	3.94	**4.00**
Iron	*0.3*	-----	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.005	0.005	0.014	0.005	0.009	0.005	0.004	0.005	0.005	0.005	0.004	0.012	0.005	0.008	0.004	0.004	0.004
Magnesium	*150*	-----	18	17	32	17	32	18	16	17	17	17	17	30	17	31	18	16	17
Manganese	*0.05*	-----	0.043	0.041	0.047	0.041	0.044	0.045	0.038	0.050	0.033	0.041	0.039	0.044	0.039	0.042	0.044	0.035	0.047
Mercury	*0.002*	*0.002*	0.0002	0.0001	0.0004	0.0001	0.0003	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0004	0.0001	0.0003	0.0001	0.0001	0.0001
Molybdenum	-----	-----	0.11	0.10	0.20	0.10	0.19	0.11	0.10	0.11	0.10	0.10	0.10	0.18	0.10	0.19	0.11	0.09	0.10
Nickel	-----	*0.1*	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.89	0.83	2.20	0.83	1.51	0.86	0.80	0.82	0.84	0.83	0.82	2.01	0.82	1.43	0.85	0.79	0.81
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	19.1	18.5	35.6	18.5	36.6	19.4	17.6	18.3	18.7	18.5	18.6	33.4	18.6	36.9	19.9	17.5	18.5
Selenium	*0.05*	*0.05*	0.005	0.004	0.011	0.004	0.008	0.004	0.004	0.004	0.004	0.004	0.004	0.010	0.004	0.007	0.004	0.004	0.004
Silver	*0.1*	-----	0.004	0.003	0.010	0.003	0.007	0.004	0.003	0.003	0.003	0.003	0.003	0.009	0.003	0.006	0.003	0.003	0.003
Sodium	-----	-----	85	83	149	83	154	87	78	84	81	83	83	140	83	156	89	77	84
Sulfate	*250*	-----	153	145	261	145	254	154	137	151	139	145	141	238	141	249	153	131	147
Thallium	*0.002*	*0.002*	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	785	653	940	653	947	673	635	661	645	753	651	894	651	946	676	627	658
Uranium	*0.03*	-----	0.005	0.004	0.009	0.004	0.007	0.005	0.004	0.005	0.004	0.004	0.004	0.008	0.004	0.006	0.004	0.004	0.005
Zinc	*5*	-----	0.008	0.01	0.02		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02		0.01	0.01	0.01	0.01

AWQS Exceedance

					10 Year									20 Year					
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.90	7.98	7.92	7.99	7.92	8.03	7.93	7.91	7.92	7.92	8.03	7.95	8.01	7.95	8.09	7.98	7.93
pe	-----	-----	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	313	383	323	383	324	427	333	314	323	324	427	353	409	354	502	377	331
Aluminum	*0.2*	-----	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	0.005	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.004	0.002	0.002
Arsenic	*0.01*	*0.05*	0.006	0.006	0.007	0.010	0.015	0.014	0.008	0.007	0.007	0.008	0.007	0.010	0.012	0.020	0.019	0.012	0.008
Barium	*2*	*2*	0.07	0.08	0.06	0.04	0.06	0.04	0.05	0.07	0.06	0.06	0.09	0.05	0.04	0.05	0.03	0.05	0.06
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Boron	-----	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001
Calcium	-----	-----	61	87	59	47	58	40	57	60	59	58	95	52	43	52	32	48	56
Chloride	*250*	-----	12	12	13	19	13	25	15	12	14	13	13	17	22	17	32	20	14
Chromium	*0.1*	*0.1*	0.003	0.003	0.003	0.009	0.004	0.006	0.003	0.003	0.003	0.003	0.003	0.003	0.008	0.004	0.006	0.003	0.003
Copper	*1.3*	-----	0.03	0.04	0.03	0.03	0.05	0.03	0.03	0.03	0.03	0.03	0.05	0.03	0.03	0.07	0.03	0.03	0.03
Fluoride	*4*	*4*	**4.02**	**6.30**	**4.16**	**5.01**	**4.17**	**5.61**	**4.30**	**4.04**	**4.16**	**4.17**	**6.98**	**4.58**	**5.36**	**4.58**	**6.64**	**4.92**	**4.26**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.004	0.004	0.004	0.011	0.005	0.007	0.004	0.004	0.004	0.004	0.004	0.004	0.010	0.005	0.007	0.004	0.003
Magnesium	*150*	-----	16	17	18	29	18	34	20	16	19	18	18	23	32	23	43	27	19
Manganese	*0.05*	-----	0.031	0.039	0.035	0.039	0.035	0.037	0.043	0.029	0.042	0.028	0.035	0.032	0.036	0.032	0.035	0.044	0.023
Mercury	*0.002*	*0.002*	0.0001	0.0001	0.0001	0.0003	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001	0.0002	0.0001	0.0001
Molybdenum	-----	-----	0.10	0.10	0.11	0.17	0.11	0.20	0.12	0.10	0.11	0.11	0.11	0.13	0.19	0.13	0.26	0.16	0.11
Nickel	-----	*0.1*	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.82	0.82	0.94	1.99	0.94	1.52	0.99	0.89	0.94	0.94	0.94	1.28	2.20	1.28	1.86	1.41	1.12
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	18.8	18.6	21.1	34.0	21.1	41.8	23.3	19.1	20.9	21.2	21.1	27.4	38.6	27.4	54.4	32.3	22.6
Selenium	*0.05*	*0.05*	0.004	0.004	0.004	0.009	0.004	0.007	0.004	0.003	0.004	0.004	0.004	0.004	0.008	0.004	0.007	0.004	0.003
Silver	*0.1*	-----	0.003	0.003	0.003	0.008	0.003	0.006	0.003	0.003	0.003	0.003	0.003	0.003	0.008	0.003	0.006	0.003	0.003
Sodium	-----	-----	81	83	92	142	92	174	102	82	93	90	92	116	159	116	224	138	95
Sulfate	*250*	-----	135	142	150	231	150	269	169	133	155	144	150	181	250	181	335	219	147
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000
TDS	*500*	-----	643	749	681	893	681	1,019	725	642	688	673	824	775	962	776	1,232	869	689
Uranium	*0.03*	-----	0.004	0.004	0.004	0.007	0.004	0.006	0.004	0.003	0.004	0.003	0.004	0.004	0.006	0.004	0.005	0.005	0.003
Zinc	*5*	-----	0.01	0.01	0.01	0.02		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.01	0.01	0.01

AWQS Exceedance

						30 Year									50 Year				
Concentration (mg/L)	MCL	AWQS	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.95	7.95	8.13	7.99	8.04	7.99	8.15	8.03	7.95	7.99	7.99	8.20	8.05	8.09	8.05	8.24	8.12
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00
Alkalinity Total	-----	-----	352	354	547	384	437	385	580	429	348	383	385	667	449	496	450	738	539
Aluminum	*0.2*	-----	0.00	0.00	0.06	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.07	0.00	0.01	0.00	0.01	0.01
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	0.002	0.004	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.004	0.002
Arsenic	*0.01*	*0.05*	0.010	0.010	0.010	0.012	0.014	0.024	0.023	0.015	0.010	0.012	0.012	0.012	0.016	0.018	0.033	0.030	0.021
Barium	*2*	*2*	0.05	0.05	0.12	0.05	0.04	0.05	0.03	0.04	0.06	0.05	0.05	0.14	0.04	0.03	0.04	0.03	0.03
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Boron	-----	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.003	0.002
Calcium	-----	-----	52	51	120	46	39	46	26	40	52	47	46	144	37	33	37	19	30
Chloride	*250*	-----	17	17	17	20	25	20	39	26	16	21	20	20	27	31	27	52	37
Chromium	*0.1*	*0.1*	0.003	0.003	0.003	0.003	0.007	0.004	0.006	0.003	0.002	0.003	0.003	0.003	0.003	0.007	0.004	0.005	0.004
Copper	*1.3*	-----	0.03	0.03	0.06	0.03	0.03	0.08	0.03	0.03	0.03	0.03	0.03	0.07	0.03	0.03	0.11	0.03	0.03
Fluoride	*4*	*4*	**4.57**	**4.59**	**8.95**	**5.01**	**5.74**	**5.01**	**7.72**	**5.64**	**4.50**	**5.00**	**5.02**	**9.61**	**5.91**	**6.56**	**5.91**	**9.89**	**7.16**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00
Lead	*0.015*	*0.05*	0.004	0.004	0.004	0.003	0.009	0.005	0.007	0.004	0.003	0.003	0.004	0.004	0.004	0.008	0.005	0.008	0.005
Magnesium	*150*	-----	23	22	23	27	35	27	52	35	21	28	27	27	36	43	36	70	49
Manganese	*0.05*	-----	0.039	0.025	0.032	0.031	0.035	0.031	0.034	0.047	0.020	0.038	0.025	0.031	0.031	0.034	0.031	0.034	0.055
Mercury	*0.002*	*0.002*	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001	0.0003	0.0002
Molybdenum	-----	-----	0.14	0.13	0.13	0.16	0.21	0.16	0.31	0.20	0.12	0.16	0.16	0.16	0.21	0.25	0.21	0.41	0.29
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	1.27	1.28	1.28	1.61	2.43	1.61	2.21	1.87	1.37	1.61	1.61	1.61	2.26	2.94	2.26	2.90	2.75
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	27.3	27.5	27.4	33.5	43.5	33.5	66.7	42.1	26.2	33.4	33.6	33.5	45.3	53.6	45.3	90.0	60.7
Selenium	*0.05*	*0.05*	0.004	0.004	0.004	0.004	0.008	0.004	0.007	0.005	0.003	0.004	0.004	0.004	0.004	0.008	0.004	0.008	0.006
Silver	*0.1*	-----	0.003	0.003	0.003	0.003	0.007	0.003	0.006	0.004	0.003	0.003	0.003	0.003	0.003	0.007	0.003	0.006	0.004
Sodium	-----	-----	117	115	116	140	179	140	273	178	108	141	139	140	187	219	187	367	254
Sulfate	*250*	-----	187	176	182	215	276	215	402	277	164	220	210	215	281	331	280	533	387
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	782	768	1,042	874	1,043	875	1,451	1,035	741	880	867	1,259	1,071	1,216	1,072	1,882	1,368
Uranium	*0.03*	-----	0.004	0.003	0.004	0.004	0.006	0.004	0.006	0.005	0.003	0.004	0.003	0.004	0.004	0.006	0.004	0.006	0.006
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.01	0.01

AWQS Exceedance

							75 Year												
Concentration (mg/L)	*MCL*	*AWQS*	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.99	8.05	8.05	8.26	8.11	8.14	8.11	8.33	8.21	8.03	8.11	8.11	8.30	8.16	8.18	8.16	8.39
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00
Alkalinity Total	-----	-----	385	448	450	786	527	567	528	919	669	431	525	528	850	594	628	595	1,070
Aluminum	*0.2*	-----	0.00	0.00	0.01	0.08	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.09	0.01	0.01	0.01	0.01
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.004	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.005
Arsenic	*0.01*	*0.05*	0.013	0.016	0.017	0.016	0.021	0.022	0.042	0.038	0.028	0.015	0.021	0.021	0.020	0.024	0.025	0.050	0.044
Barium	*2*	*2*	0.05	0.04	0.04	0.19	0.03	0.03	0.03	0.02	0.03	0.04	0.03	0.03	0.24	0.03	0.03	0.03	0.02
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000
Boron	-----	-----	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.003	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.003
Calcium	-----	-----	45	38	37	152	30	27	30	14	22	39	30	30	140	26	24	25	12
Chloride	*250*	-----	20	28	27	27	35	38	35	67	49	24	35	34	35	41	43	41	79
Chromium	*0.1*	*0.1*	0.002	0.003	0.003	0.003	0.003	0.006	0.004	0.005	0.004	0.002	0.003	0.003	0.003	0.003	0.005	0.005	0.005
Copper	*1.3*	-----	0.03	0.03	0.03	0.10	0.03	0.03	0.15	0.04	0.03	0.03	0.03	0.03	0.11	0.03	0.03	0.17	0.04
Fluoride	*4*	*4*	**5.01**	**5.89**	**5.92**	**9.92**	**6.98**	**7.54**	**6.99**	**12.37**	**8.96**	**5.65**	**6.96**	**7.00**	**10.83**	**7.92**	**8.38**	**7.93**	**14.41**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00
Lead	*0.015*	*0.05*	0.003	0.004	0.004	0.004	0.004	0.008	0.006	0.009	0.006	0.003	0.004	0.004	0.005	0.004	0.007	0.006	0.010
Magnesium	*150*	-----	26	36	36	36	46	51	46	89	65	32	46	46	46	54	58	54	105
Manganese	*0.05*	-----	0.015	0.038	0.024	0.031	0.031	0.033	0.031	0.034	0.064	0.012	0.038	0.025	0.031	0.031	0.033	0.031	0.034
Mercury	*0.002*	*0.002*	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001	0.0003	0.0002	0.0001	0.0002	0.0001	0.0001	0.0002	0.0002	0.0002	0.0003
Molybdenum	-----	-----	0.15	0.21	0.21	0.21	0.27	0.30	0.27	0.52	0.38	0.19	0.27	0.27	0.27	0.32	0.34	0.32	0.61
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	1.86	2.26	2.26	2.26	2.97	3.52	2.97	3.66	3.69	2.44	2.97	2.98	2.97	3.56	4.00	3.56	4.28
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	33.4	45.2	45.4	45.3	58.2	64.9	58.2	115.4	80.8	41.9	58.1	58.3	58.2	68.8	74.2	68.8	136.0
Selenium	*0.05*	*0.05*	0.003	0.004	0.004	0.004	0.005	0.007	0.005	0.009	0.007	0.003	0.005	0.005	0.005	0.005	0.007	0.005	0.010
Silver	*0.1*	-----	0.003	0.003	0.003	0.003	0.004	0.006	0.004	0.007	0.005	0.003	0.004	0.004	0.004	0.004	0.006	0.004	0.008
Sodium	-----	-----	136	188	186	187	238	264	238	469	336	168	239	237	238	280	301	280	551
Sulfate	*250*	-----	201	286	275	281	353	393	353	675	507	246	358	348	353	413	445	413	790
Thallium	*0.002*	*0.002*	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	853	1,077	1,065	1,527	1,297	1,417	1,298	2,365	1,743	992	1,302	1,292	1,735	1,488	1,587	1,490	2,763
Uranium	*0.03*	-----	0.002	0.004	0.003	0.004	0.004	0.006	0.004	0.007	0.007	0.002	0.005	0.004	0.004	0.004	0.006	0.004	0.007
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.01

AWQS Exceedance

			100 Year					125 Year												
Concentration (mg/L)	*MCL*	*AWQS*	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	8.27	8.07	8.16	8.16	8.32	8.20	8.21	8.20	8.43	8.31	8.10	8.19	8.20	8.34	8.22	8.23	8.22
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00
Alkalinity Total	-----	-----	783	475	593	596	905	651	679	652	1,193	880	513	649	653	951	698	721	699
Aluminum	*0.2*	-----	0.01	0.01	0.01	0.01	0.09	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10	0.01	0.01	0.01
Antimony	*0.006*	*0.006*	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.005	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.002
Arsenic	*0.01*	*0.05*	0.033	0.018	0.024	0.024	0.023	0.027	0.028	**0.056**	0.049	0.037	0.020	0.027	0.027	0.026	0.029	0.030	**0.061**
Barium	*2*	*2*	0.02	0.04	0.03	0.03	0.29	0.03	0.03	0.03	0.02	0.02	0.04	0.03	0.03	0.32	0.03	0.03	0.03
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
Boron	-----	-----	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.002	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.002
Calcium	-----	-----	18	34	26	25	131	23	21	23	10	16	31	23	22	125	21	20	21
Chloride	*250*	-----	59	29	41	41	41	46	48	46	88	68	32	46	45	46	50	51	50
Chromium	*0.1*	*0.1*	0.004	0.002	0.003	0.003	0.003	0.003	0.005	0.005	0.006	0.004	0.002	0.003	0.003	0.003	0.003	0.005	0.005
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.11	0.03	0.03	0.19	0.05	0.04	0.03	0.03	0.03	0.12	0.03	0.03	0.21
Fluoride	*4*	*4*	**10.53**	**6.26**	**7.89**	**7.94**	**11.60**	**8.70**	**9.08**	**8.71**	**16.05**	**11.86**	**6.79**	**8.67**	**8.73**	**12.25**	**9.34**	**9.65**	**9.36**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53
Lead	*0.015*	*0.05*	0.007	0.003	0.004	0.004	0.005	0.005	0.007	0.006	0.011	0.007	0.003	0.005	0.005	0.005	0.005	0.007	0.007
Magnesium	*150*	-----	78	38	54	54	54	60	64	60	117	88	43	61	60	60	66	68	66
Manganese	*0.05*	-----	0.062	0.011	0.038	0.025	0.031	0.032	0.033	0.032	0.034	0.054	0.009	0.038	0.025	0.032	0.032	0.033	0.032
Mercury	*0.002*	*0.002*	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.46	0.22	0.32	0.31	0.32	0.35	0.37	0.35	0.69	0.52	0.25	0.36	0.35	0.35	0.38	0.40	0.38
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	4.48	2.96	3.56	3.57	3.56	4.03	4.39	4.03	4.77	5.13	3.39	4.03	4.04	4.03	4.41	4.70	4.41
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	97.5	49.4	68.7	69.0	68.8	77.4	81.7	77.4	152.5	111.3	55.7	77.2	77.5	77.4	84.2	87.7	84.2
Selenium	*0.05*	*0.05*	0.008	0.004	0.005	0.005	0.005	0.006	0.007	0.006	0.010	0.008	0.004	0.006	0.005	0.006	0.006	0.007	0.006
Silver	*0.1*	-----	0.005	0.003	0.004	0.004	0.004	0.004	0.006	0.004	0.008	0.006	0.003	0.004	0.004	0.004	0.004	0.006	0.004
Sodium	-----	-----	404	197	281	279	280	314	331	314	618	461	222	315	313	314	341	355	341
Sulfate	*250*	-----	606	287	418	408	413	461	487	461	882	688	321	465	456	461	499	520	499
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	2,062	1,119	1,493	1,484	1,909	1,645	1,725	1,647	3,083	2,330	1,229	1,649	1,641	2,052	1,773	1,838	1,775
Uranium	*0.03*	-----	0.008	0.003	0.005	0.004	0.004	0.005	0.006	0.005	0.008	0.009	0.003	0.005	0.004	0.005	0.005	0.006	0.005
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	

AWQS Exceedance

Rosemont Copper Company
Rosemont Copper World Project

Appendix P - Elgin Sensitivity Analysis

			150 Year						175 Year										
Concentration (mg/L)	*MCL*	*AWQS*	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	8.45	8.34	8.13	8.22	8.22	8.35	8.24	8.25	8.24	8.48	8.37	8.15	8.24	8.24	8.36	8.26	8.27
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	1,291	962	547	695	700	989	736	755	737	1,369	1,031	574	733	739	1,020	767	782
Aluminum	*0.2*	-----	0.01	0.01	0.01	0.01	0.01	0.10	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10	0.01	0.01
Antimony	*0.006*	*0.006*	0.005	0.004	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.005	0.004	0.002	0.003	0.003	0.003	0.003	0.003
Arsenic	*0.01*	*0.05*	**0.053**	0.040	0.022	0.029	0.029	0.028	0.031	0.031	**0.065**	**0.056**	0.043	0.023	0.031	0.031	0.030	0.032	0.032
Barium	*2*	*2*	0.02	0.02	0.03	0.03	0.03	0.33	0.03	0.03	0.03	0.02	0.02	0.03	0.03	0.03	0.32	0.03	0.03
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.003	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.001	0.002	0.002	0.002	0.002	0.002
Calcium	-----	-----	9	14	28	21	20	120	19	19	19	9	13	26	19	19	116	18	18
Chloride	*250*	-----	96	74	35	50	49	50	53	54	53	102	80	38	53	53	53	55	57
Chromium	*0.1*	*0.1*	0.006	0.004	0.002	0.003	0.003	0.003	0.003	0.004	0.005	0.006	0.005	0.002	0.003	0.003	0.003	0.003	0.004
Copper	*1.3*	-----	0.05	0.04	0.03	0.03	0.03	0.12	0.03	0.03	0.22	0.06	0.04	0.03	0.03	0.03	0.12	0.03	0.03
Fluoride	*4*	*4*	**17.36**	**12.97**	**7.24**	**9.31**	**9.37**	**12.77**	**9.86**	**10.12**	**9.88**	**18.40**	**13.90**	**7.63**	**9.83**	**9.89**	**13.20**	**10.28**	**10.49**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.012	0.008	0.003	0.005	0.005	0.006	0.005	0.007	0.007	0.012	0.008	0.004	0.005	0.005	0.006	0.005	0.007
Magnesium	*150*	-----	127	97	47	66	65	66	70	72	70	135	105	50	70	69	70	73	75
Manganese	*0.05*	-----	0.033	0.048	0.008	0.038	0.025	0.032	0.032	0.033	0.032	0.031	0.044	0.007	0.038	0.025	0.032	0.032	0.032
Mercury	*0.002*	*0.002*	0.0003	0.0003	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.75	0.57	0.27	0.39	0.38	0.38	0.41	0.42	0.41	0.79	0.61	0.29	0.41	0.41	0.41	0.43	0.44
Nickel	-----	*0.1*	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	5.17	5.67	3.76	4.41	4.42	4.41	4.72	4.95	4.72	5.48	6.12	4.05	4.71	4.73	4.72	4.96	5.15
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	165.6	122.7	61.0	84.0	84.4	84.2	89.7	92.5	89.7	176.1	132.2	65.3	89.5	89.9	89.7	94.1	96.4
Selenium	*0.05*	*0.05*	0.011	0.009	0.004	0.006	0.006	0.006	0.006	0.007	0.006	0.011	0.009	0.004	0.006	0.006	0.006	0.006	0.007
Silver	*0.1*	-----	0.008	0.006	0.003	0.004	0.004	0.004	0.004	0.005	0.004	0.008	0.006	0.003	0.004	0.004	0.004	0.004	0.005
Sodium	-----	-----	670	507	242	342	340	341	363	374	363	712	546	259	364	362	363	381	389
Sulfate	*250*	-----	956	756	350	504	494	499	530	547	530	1,014	813	374	535	525	530	555	568
Thallium	*0.002*	*0.002*	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	3,338	2,553	1,321	1,776	1,769	2,167	1,876	1,928	1,878	3,542	2,740	1,398	1,879	1,873	2,260	1,959	2,001
Uranium	*0.03*	-----	0.008	0.009	0.003	0.005	0.004	0.005	0.005	0.006	0.005	0.008	0.010	0.003	0.005	0.005	0.005	0.005	0.006
Zinc	*5*	-----	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

			200 Year						
Concentration (mg/L)	*MCL*	*AWQS*	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	8.26	8.49	8.39	8.16	8.26	8.26	8.37
pe	-----	-----	-4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	768	1,432	1,088	597	764	770	1,045
Aluminum	*0.2*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.11
Antimony	*0.006*	*0.006*	0.003	0.005	0.004	0.002	0.003	0.003	0.003
Arsenic	*0.01*	*0.05*	**0.068**	**0.059**	0.046	0.024	0.032	0.032	0.031
Barium	*2*	*2*	0.03	0.02	0.02	0.03	0.03	0.03	0.31
Beryllium	*0.004*	*0.004*	0.002	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.01	0.01	0.02	0.00	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.002	0.003	0.003	0.001	0.002	0.002	0.002
Calcium	-----	-----	18	8	12	25	18	18	113
Chloride	*250*	-----	55	106	85	40	56	55	55
Chromium	*0.1*	*0.1*	0.005	0.006	0.005	0.002	0.003	0.003	0.003
Copper	*1.3*	-----	0.23	0.06	0.04	0.03	0.03	0.03	0.13
Fluoride	*4*	*4*	**10.30**	**19.22**	**14.67**	**7.94**	**10.25**	**10.32**	**13.55**
Iron	*0.3*	-----	0.59	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.007	0.012	0.009	0.004	0.005	0.005	0.006
Magnesium	*150*	-----	73	141	111	53	73	73	73
Manganese	*0.05*	-----	0.032	0.030	0.042	0.006	0.038	0.025	0.032
Mercury	*0.002*	*0.002*	0.0002	0.0004	0.0003	0.0001	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.43	0.83	0.65	0.31	0.43	0.43	0.43
Nickel	-----	*0.1*	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	4.96	5.73	6.49	4.30	4.95	4.97	4.96
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	94.1	184.4	140.1	68.8	93.9	94.4	94.2
Selenium	*0.05*	*0.05*	0.006	0.012	0.010	0.004	0.006	0.006	0.006
Silver	*0.1*	-----	0.004	0.009	0.007	0.003	0.004	0.004	0.004
Sodium	-----	-----	381	745	578	273	381	380	381
Sulfate	*250*	-----	555	1,061	859	393	559	550	555
Thallium	*0.002*	*0.002*	0.001	0.002	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	1,961	3,705	2,895	1,462	1,962	1,956	2,336
Uranium	*0.03*	-----	0.005	0.008	0.010	0.003	0.005	0.005	0.005
Zinc	*5*	-----		0.02	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

APPENDIX Q
Peach Pit sensitivity analysis

			1 Year									2 Year							
Concentration (mg/L)	*MCL*	*AWQS*	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.90	8.01	7.90	8.02	7.91	7.90	7.90	7.90	7.90	7.90	7.99	7.90	8.02	7.91	7.89	7.90	7.90
pe	-----	-----	4.00	4.00	9.23	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	307	395	301	410	312	303	308	307	308	303	377	304	404	310	296	303	303
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.006	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.003	0.002	0.002	0.002	0.002
Arsenic	*0.01*	*0.05*	0.002	0.012	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.009	0.017	0.001	0.001	0.001	0.001	0.001
Barium	*2*	*2*	0.04	0.10	0.04	0.08	0.04	0.04	0.04	0.04	0.04	0.04	0.09	0.04	0.07	0.04	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.001	0.004	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001	0.001	0.001
Calcium	-----	-----	52	36	52	35	53	51	52	52	52	52	39	52	36	53	51	52	52
Chloride	*250*	-----	9	17	9	18	9	9	9	9	9	9	15	9	17	9	9	9	9
Chromium	*0.1*	*0.1*	0.002	0.009	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.007	0.003	0.003	0.002	0.002	0.002	0.002
Copper	*1.3*	-----	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.06	0.02	0.03	0.09	0.03	0.02	0.02	0.02	0.02
Fluoride	*4*	*4*	3.49	**5.02**	3.49	**5.24**	3.55	3.44	3.49	3.50	3.49	3.49	**4.79**	3.49	**5.16**	3.58	3.40	3.49	3.49
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.003	0.007	0.001	0.004	0.003	0.003	0.003	0.003	0.003	0.002	0.006	0.005	0.004	0.002	0.002	0.002	0.002
Magnesium	*150*	-----	7	10	7	14	7	7	7	7	7	7	10	7	14	7	7	7	7
Manganese	*0.05*	-----	0.009	0.015	0.009	0.013	0.009	0.009	0.010	0.008	0.009	0.008	0.013	0.008	0.011	0.008	0.007	0.008	0.007
Mercury	*0.002*	*0.002*	0.0002	0.0004	0.0002	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.04	0.04	0.04	0.07	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.08	0.04	0.04	0.04	0.04
Nickel	-----	*0.1*	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.69	2.02	0.69	1.34	0.69	0.68	0.69	0.69	0.69	0.62	1.74	0.62	1.19	0.63	0.61	0.62	0.62
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	18.6	32.3	18.6	37.1	18.8	18.3	18.5	18.6	18.6	18.2	29.7	18.2	36.4	18.7	17.8	18.2	18.3
Selenium	*0.05*	*0.05*	0.004	0.010	0.004	0.007	0.004	0.004	0.004	0.004	0.004	0.003	0.009	0.004	0.007	0.003	0.003	0.003	0.003
Silver	*0.1*	-----	0.003	0.010	0.003	0.007	0.003	0.003	0.003	0.003	0.003	0.003	0.008	0.003	0.006	0.003	0.003	0.003	0.003
Sodium	-----	-----	62	113	62	124	63	61	62	62	62	60	103	60	120	62	59	61	60
Sulfate	*250*	-----	45	64	45	88	46	45	46	45	45	45	61	45	89	47	44	46	45
Thallium	*0.002*	*0.002*	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	506	675	500	733	514	499	507	505	507	499	642	501	723	511	487	500	498
Uranium	*0.03*	-----	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
Zinc	*5*	-----	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.007	0.01	0.01	0.016	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

				3 Year									5 Year						
Concentration (mg/L)	*MCL*	*AWQS*	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.90	7.90	7.98	7.89	8.01	7.91	7.89	7.90	7.90	7.90	7.91	7.97	7.91	8.02	7.91	7.90	7.91
pe	-----	-----	4.00	4.00	4.00	9.30	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	303	303	367	298	402	311	294	303	303	303	310	362	311	406	313	301	310
Aluminum	*0.2*	-----	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	*0.006*	*0.006*	0.002	0.002	0.004	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.001	0.004	0.001	0.003	0.001	0.001	0.001
Arsenic	*0.01*	*0.05*	0.000	0.001	0.007	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.006	0.015	0.001	0.001	0.001	0.001
Barium	*2*	*2*	0.04	0.04	0.08	0.04	0.07	0.04	0.03	0.04	0.03	0.04	0.03	0.07	0.03	0.07	0.03	0.03	0.03
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.001	0.001	0.003	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001	0.001
Calcium	-----	-----	52	53	41	53	36	54	51	53	53	53	54	42	54	36	53	53	54
Chloride	*250*	-----	9	9	14	9	17	9	8	9	9	9	9	13	9	17	9	8	9
Chromium	*0.1*	*0.1*	0.002	0.001	0.006	0.003	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.003	0.002	0.001	0.001	0.001
Copper	*1.3*	-----	0.06	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.06	0.02	0.03	0.09	0.03	0.02	0.02	0.02
Fluoride	*4*	*4*	3.49	3.52	**4.67**	3.52	**5.14**	3.64	3.41	3.52	3.52	3.52	3.67	**4.61**	3.67	**5.20**	3.84	3.51	3.67
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.003	0.002	0.006	0.001	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.004	0.003	0.002	0.002	0.002
Magnesium	*150*	-----	7	7	10	7	14	8	7	7	7	7	8	10	8	15	8	7	8
Manganese	*0.05*	-----	0.008	0.007	0.012	0.007	0.010	0.007	0.007	0.007	0.006	0.007	0.006	0.012	0.006	0.010	0.006	0.006	0.007
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0004	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0003	0.0002	0.0002	0.0002
Molybdenum	-----	-----	0.04	0.04	0.04	0.04	0.08	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.09	0.05	0.04	0.05
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Total Nitrogen	*10*	*10*	0.62	0.58	1.56	0.58	1.09	0.59	0.58	0.58	0.59	0.58	0.57	1.43	0.57	1.04	0.59	0.56	0.57
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	18.2	18.1	28.1	18.1	36.3	18.7	17.6	18.1	18.2	18.1	18.6	27.0	18.6	37.2	19.4	17.8	18.6
Selenium	*0.05*	*0.05*	0.003	0.003	0.008	0.003	0.006	0.003	0.003	0.003	0.003	0.003	0.003	0.007	0.003	0.006	0.003	0.003	0.003
Silver	*0.1*	-----	0.003	0.003	0.007	0.003	0.005	0.003	0.003	0.003	0.003	0.003	0.002	0.007	0.002	0.005	0.002	0.002	0.002
Sodium	-----	-----	60	60	98	60	119	62	58	60	60	60	61	95	61	122	64	59	61
Sulfate	*250*	-----	45	46	60	46	90	47	44	46	45	46	48	60	47	94	50	45	48
Thallium	*0.002*	*0.002*	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000
TDS	*500*	-----	499	500	624	495	722	513	485	501	499	500	512	615	513	734	521	496	512
Uranium	*0.03*	-----	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Zinc	*5*	-----	0.007	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

					10 Year									20 Year					
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.91	7.91	7.92	7.97	7.92	8.04	7.92	7.91	7.92	7.92	7.96	7.94	7.99	7.94	8.08	7.96	7.92
pe	-----	-----	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	310	315	317	364	318	426	324	311	317	317	350	335	377	336	471	349	323
Aluminum	*0.2*	-----	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.01	0.00	0.00
Antimony	*0.006*	*0.006*	0.001	0.001	0.001	0.003	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.001
Arsenic	*0.01*	*0.05*	0.001	0.000	0.000	0.004	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.016	0.000	0.000	0.000
Barium	*2*	*2*	0.03	0.03	0.03	0.06	0.03	0.07	0.03	0.03	0.03	0.03	0.03	0.04	0.06	0.04	0.07	0.04	0.03
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001
Calcium	-----	-----	54	56	52	42	52	34	51	54	52	52	63	49	40	49	29	46	51
Chloride	*250*	-----	9	9	9	13	9	19	10	9	9	9	9	12	15	12	23	13	10
Chromium	*0.1*	*0.1*	0.001	0.001	0.001	0.004	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.003	0.001	0.000	0.001
Copper	*1.3*	-----	0.02	0.05	0.02	0.03	0.09	0.03	0.02	0.02	0.02	0.02	0.06	0.03	0.03	0.10	0.03	0.03	0.02
Fluoride	*4*	*4*	3.67	3.67	**4.02**	**4.63**	**4.03**	**5.47**	**4.11**	3.83	**4.02**	**4.02**	**4.12**	**4.27**	**4.82**	**4.28**	**6.08**	**4.46**	**4.11**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.002	0.002	0.001	0.004	0.004	0.003	0.001	0.001	0.001	0.001	0.002	0.001	0.004	0.003	0.002	0.001	0.001
Magnesium	*150*	-----	8	8	9	11	9	17	9	8	9	9	9	11	13	11	22	13	10
Manganese	*0.05*	-----	0.006	0.006	0.006	0.013	0.006	0.011	0.006	0.006	0.006	0.006	0.006	0.015	0.023	0.015	0.020	0.016	0.014
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0003	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
Molybdenum	-----	-----	0.04	0.04	0.05	0.06	0.05	0.11	0.06	0.05	0.05	0.05	0.05	0.07	0.08	0.07	0.14	0.08	0.06
Nickel	-----	*0.1*	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00
Total Nitrogen	*10*	*10*	0.57	0.57	0.62	1.34	0.62	1.04	0.64	0.60	0.62	0.62	0.62	0.76	1.38	0.76	1.16	0.81	0.72
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	18.6	18.6	20.4	27.2	20.4	40.8	21.9	19.0	20.4	20.4	20.4	24.4	30.0	24.4	48.8	27.4	21.7
Selenium	*0.05*	*0.05*	0.003	0.003	0.003	0.006	0.003	0.005	0.003	0.003	0.003	0.003	0.003	0.003	0.006	0.003	0.005	0.003	0.003
Silver	*0.1*	-----	0.002	0.002	0.002	0.006	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.004	0.002	0.002
Sodium	-----	-----	61	61	67	96	67	133	71	62	67	67	67	80	105	80	159	89	71
Sulfate	*250*	-----	47	48	54	64	53	107	58	50	54	53	54	70	79	70	135	79	62
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000
TDS	*500*	-----	512	518	533	622	534	783	550	517	533	533	577	586	666	587	894	621	555
Uranium	*0.03*	-----	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

						30 Year									50 Year				
Concentration (mg/L)	*MCL*	*AWQS*	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.94	7.94	8.03	7.96	8.01	7.96	8.12	7.99	7.94	7.96	7.96	8.10	8.02	8.06	8.02	8.21	8.06
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00
Alkalinity Total	-----	-----	335	336	426	355	397	356	519	377	337	354	357	512	411	454	412	655	456
Aluminum	*0.2*	-----	0.00	0.00	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.06	0.00	0.01	0.00	0.01	0.01
Antimony	*0.006*	*0.006*	0.001	0.001	0.001	0.001	0.003	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.002	0.003	0.002	0.003	0.002
Arsenic	*0.01*	*0.05*	0.000	0.000	0.000	0.000	0.001	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.022	0.000	0.000
Barium	*2*	*2*	0.04	0.04	0.04	0.05	0.07	0.05	0.06	0.05	0.04	0.05	0.05	0.05	0.07	0.06	0.07	0.05	0.06
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Boron	-----	-----	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001
Calcium	-----	-----	49	49	79	46	38	45	26	42	49	46	45	99	38	32	37	19	32
Chloride	*250*	-----	12	12	12	15	18	15	27	17	13	15	15	15	22	25	22	39	26
Chromium	*0.1*	*0.1*	0.001	0.001	0.001	0.000	0.003	0.003	0.001	0.000	0.001	0.000	0.000	0.001	0.000	0.003	0.003	0.000	0.000
Copper	*1.3*	-----	0.03	0.03	0.07	0.03	0.03	0.11	0.03	0.03	0.03	0.03	0.03	0.08	0.03	0.03	0.14	0.03	0.03
Fluoride	*4*	*4*	**4.27**	**4.28**	**5.06**	**4.55**	**5.10**	**4.56**	**6.74**	**4.85**	**4.30**	**4.53**	**4.57**	**6.03**	**5.31**	**5.88**	**5.33**	**8.58**	**5.92**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84	0.00	0.00
Lead	*0.015*	*0.05*	0.001	0.001	0.002	0.001	0.004	0.004	0.002	0.001	0.001	0.001	0.001	0.002	0.001	0.004	0.004	0.002	0.001
Magnesium	*150*	-----	11	11	11	15	16	15	27	17	13	15	14	15	21	23	21	39	26
Manganese	*0.05*	-----	0.017	0.013	0.015	0.040	0.049	0.040	0.046	0.046	0.035	0.048	0.032	0.040	0.072	0.080	0.072	0.063	0.086
Mercury	*0.002*	*0.002*	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0004	0.0003	0.0005	0.0003
Molybdenum	-----	-----	0.07	0.07	0.07	0.09	0.10	0.09	0.17	0.10	0.08	0.09	0.09	0.09	0.13	0.14	0.13	0.24	0.15
Nickel	-----	*0.1*	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	0.76	0.77	0.76	0.95	1.53	0.95	1.36	1.01	0.88	0.94	0.96	0.95	1.41	1.97	1.41	1.88	1.54
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	24.3	24.5	24.4	28.4	33.7	28.4	56.7	32.8	24.5	28.0	28.8	28.4	39.4	44.3	39.4	78.4	47.5
Selenium	*0.05*	*0.05*	0.003	0.003	0.003	0.003	0.006	0.004	0.006	0.003	0.003	0.003	0.003	0.003	0.004	0.007	0.005	0.006	0.004
Silver	*0.1*	-----	0.002	0.002	0.002	0.002	0.005	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.003	0.005	0.003	0.005	0.003
Sodium	-----	-----	80	80	80	96	120	96	186	110	83	96	96	96	133	156	133	256	160
Sulfate	*250*	-----	71	69	70	94	104	93	169	108	81	97	91	94	140	151	140	246	169
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.001
TDS	*500*	-----	587	585	708	654	734	655	1,020	711	604	656	652	865	811	894	814	1,343	924
Uranium	*0.03*	-----	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.001	0.002	0.003	0.003	0.003	0.004	0.003
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

Rosemont Copper Company
Rosemont Copper World Project

Appendix Q - Peach Sensitivity Analysis

							75 Year												
Concentration (mg/L)	*MCL*	*AWQS*	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	7.98	8.02	8.02	8.23	8.10	8.13	8.10	8.32	8.15	8.04	8.10	8.10	8.28	8.16	8.18	8.16	8.39
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00
Alkalinity Total	-----	-----	373	408	414	716	498	541	500	864	575	431	496	500	810	577	615	580	1,044
Aluminum	*0.2*	-----	0.00	0.00	0.00	0.07	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.08	0.01	0.01	0.01	0.01
Antimony	*0.006*	*0.006*	0.001	0.002	0.002	0.002	0.002	0.003	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.004
Arsenic	*0.01*	*0.05*	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.000
Barium	*2*	*2*	0.05	0.06	0.06	0.07	0.05	0.05	0.05	0.04	0.05	0.06	0.05	0.06	0.09	0.05	0.05	0.05	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Boron	-----	-----	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Cadmium	*0.005*	*0.005*	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.003
Calcium	-----	-----	43	38	37	141	28	25	28	13	23	35	29	28	134	23	21	23	10
Chloride	*250*	-----	18	22	21	22	29	32	29	53	35	23	30	28	29	34	37	34	64
Chromium	*0.1*	*0.1*	0.000	0.000	0.000	0.000	0.000	0.002	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.000
Copper	*1.3*	-----	0.03	0.03	0.03	0.10	0.03	0.03	0.19	0.03	0.03	0.03	0.03	0.03	0.10	0.03	0.03	0.23	0.04
Fluoride	*4*	*4*	**4.80**	**5.28**	**5.34**	**8.48**	**6.49**	**7.05**	**6.52**	**11.36**	**7.52**	**5.59**	**6.47**	**6.51**	**10.15**	**7.54**	**8.05**	**7.58**	**13.72**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.43	0.00
Lead	*0.015*	*0.05*	0.001	0.001	0.001	0.002	0.001	0.003	0.005	0.002	0.001	0.001	0.001	0.001	0.002	0.001	0.003	0.005	0.002
Magnesium	*150*	-----	17	22	21	21	29	31	29	53	35	23	30	28	29	35	36	35	65
Manganese	*0.05*	-----	0.059	0.086	0.056	0.072	0.081	0.083	0.081	0.044	0.077	0.065	0.096	0.063	0.081	0.076	0.069	0.076	0.034
Mercury	*0.002*	*0.002*	0.0002	0.0003	0.0003	0.0003	0.0003	0.0004	0.0003	0.0007	0.0004	0.0003	0.0003	0.0004	0.0003	0.0004	0.0005	0.0004	0.0008
Molybdenum	-----	-----	0.11	0.13	0.13	0.13	0.18	0.19	0.18	0.34	0.22	0.14	0.18	0.17	0.18	0.22	0.22	0.22	0.41
Nickel	-----	*0.1*	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	1.29	1.40	1.43	1.41	2.05	2.55	2.05	2.59	2.22	1.87	2.06	2.05	2.05	2.57	2.99	2.57	3.14
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	32.2	38.8	40.1	39.4	55.3	59.7	55.3	109.9	67.6	43.9	55.0	55.7	55.3	68.6	72.3	68.6	136.1
Selenium	*0.05*	*0.05*	0.004	0.004	0.004	0.004	0.005	0.007	0.006	0.007	0.005	0.004	0.005	0.004	0.004	0.005	0.007	0.007	0.007
Silver	*0.1*	-----	0.002	0.003	0.003	0.003	0.003	0.006	0.003	0.006	0.003	0.003	0.003	0.003	0.003	0.003	0.005	0.003	0.006
Sodium	-----	-----	109	134	133	133	182	202	182	352	222	144	183	180	182	220	237	220	428
Sulfate	*250*	-----	115	146	134	140	190	199	190	339	231	151	198	182	190	224	232	224	409
Thallium	*0.002*	*0.002*	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	714	816	806	1,224	1,020	1,099	1,024	1,798	1,199	859	1,030	1,010	1,442	1,192	1,261	1,196	2,173
Uranium	*0.03*	-----	0.002	0.003	0.002	0.003	0.003	0.004	0.003	0.005	0.004	0.003	0.004	0.003	0.003	0.004	0.004	0.004	0.005
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02

AWQS Exceedance

			100 Year					125 Year											
Concentration (mg/L)	*MCL*	*AWQS*	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	8.21	8.09	8.16	8.16	8.31	8.19	8.22	8.20	8.43	8.25	8.13	8.19	8.19	8.33	8.22	8.24	8.23
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00
Alkalinity Total	-----	-----	668	490	577	577	870	635	668	638	1,171	726	541	635	634	915	682	711	686
Aluminum	*0.2*	-----	0.01	0.01	0.01	0.01	0.09	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09	0.01	0.01	0.01
Antimony	*0.006*	*0.006*	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002
Arsenic	*0.01*	*0.05*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039
Barium	*2*	*2*	0.04	0.06	0.05	0.05	0.10	0.05	0.05	0.05	0.04	0.04	0.05	0.05	0.05	0.11	0.04	0.04	0.04
Beryllium	*0.004*	*0.004*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Boron	-----	-----	0.02	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.002
Calcium	-----	-----	19	29	23	23	123	20	18	20	9	16	25	20	20	115	18	17	18
Chloride	*250*	-----	41	27	35	33	34	38	40	38	71	44	31	39	37	38	40	42	40
Chromium	*0.1*	*0.1*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
Copper	*1.3*	-----	0.03	0.03	0.03	0.03	0.11	0.03	0.03	0.26	0.05	0.03	0.03	0.03	0.03	0.11	0.03	0.03	0.28
Fluoride	*4*	*4*	**8.77**	**6.38**	**7.55**	**7.54**	**10.97**	**8.32**	**8.75**	**8.36**	**15.37**	**9.54**	**7.06**	**8.33**	**8.30**	**11.56**	**8.95**	**9.32**	**8.99**
Iron	*0.3*	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.77
Lead	*0.015*	*0.05*	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.006
Magnesium	*150*	-----	41	28	36	34	35	38	39	38	72	45	31	39	37	38	41	42	41
Manganese	*0.05*	-----	0.062	0.062	0.077	0.059	0.076	0.066	0.061	0.066	0.030	0.055	0.056	0.067	0.051	0.066	0.057	0.056	0.057
Mercury	*0.002*	*0.002*	0.0005	0.0003	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.0009	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0006	0.0005
Molybdenum	-----	-----	0.26	0.17	0.22	0.21	0.22	0.24	0.25	0.24	0.47	0.28	0.20	0.25	0.24	0.24	0.26	0.27	0.26
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	2.70	2.40	2.58	2.55	2.57	2.92	3.27	2.92	3.52	2.97	2.82	2.94	2.90	2.92	3.20	3.49	3.20
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	82.4	54.8	68.6	68.6	68.6	78.0	81.1	78.0	154.5	91.3	63.6	78.1	77.9	78.0	85.4	88.0	85.4
Selenium	*0.05*	*0.05*	0.005	0.004	0.005	0.005	0.005	0.005	0.007	0.008	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.008
Silver	*0.1*	-----	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.003	0.007	0.004	0.003	0.003	0.003	0.003	0.004	0.005	0.004
Sodium	-----	-----	265	175	222	217	220	245	260	245	481	288	199	248	243	245	266	278	266
Sulfate	*250*	-----	267	181	233	216	224	245	252	245	456	285	202	253	238	245	262	267	262
Thallium	*0.002*	*0.002*	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	1,395	994	1,205	1,178	1,589	1,311	1,370	1,316	2,434	1,509	1,103	1,324	1,298	1,690	1,407	1,458	1,413
Uranium	*0.03*	-----	0.004	0.003	0.004	0.003	0.004	0.004	0.004	0.004	0.005	0.004	0.003	0.004	0.003	0.004	0.003	0.004	0.003
Zinc	*5*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

			150 Year						175 Year										
Concentration (mg/L)	MCL	AWQS	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow -25%	SI +1.0	Base Case	50 ft RRZ
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	6.5-8.5	-----	8.46	8.27	8.16	8.22	8.22	8.35	8.25	8.26	8.25	8.49	8.29	8.19	8.25	8.25	8.36	8.27	8.28
pe	-----	-----	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	1,273	772	585	683	682	951	728	753	732	1,369	817	626	728	727	987	766	786
Aluminum	0.2	-----	0.01	0.01	0.01	0.01	0.01	0.10	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10	0.01	0.01
Antimony	0.006	0.006	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.003
Arsenic	0.01	0.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Barium	2	2	0.03	0.04	0.05	0.04	0.05	0.11	0.04	0.04	0.04	0.03	0.04	0.05	0.04	0.04	0.12	0.04	0.04
Beryllium	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	0.005	0.005	0.003	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.001	0.002	0.002	0.002	0.002	0.002
Calcium	-----	-----	8	15	22	18	18	109	16	15	16	7	14	20	16	16	104	15	15
Chloride	250	-----	76	46	34	41	39	40	43	44	43	82	48	36	44	42	43	45	46
Chromium	0.1	0.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Copper	1.3	-----	0.05	0.03	0.03	0.03	0.03	0.12	0.03	0.03	0.31	0.05	0.03	0.03	0.03	0.03	0.12	0.03	0.03
Fluoride	4	4	16.68	10.13	7.64	8.96	8.93	12.05	9.55	9.87	9.60	17.90	10.73	8.20	9.56	9.54	12.52	10.05	10.31
Iron	0.3	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	0.015	0.05	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.006	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Magnesium	150	-----	78	47	34	42	40	41	44	45	44	84	49	37	44	43	44	46	47
Manganese	0.05	-----	0.027	0.051	0.050	0.060	0.045	0.057	0.050	0.052	0.050	0.024	0.047	0.045	0.055	0.040	0.050	0.044	0.047
Mercury	0.002	0.002	0.0010	0.0006	0.0004	0.0005	0.0005	0.0005	0.0005	0.0006	0.0005	0.0011	0.0006	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006
Molybdenum	-----	-----	0.51	0.30	0.22	0.27	0.26	0.26	0.28	0.29	0.28	0.55	0.32	0.24	0.28	0.28	0.28	0.30	0.30
Nickel	-----	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	10	10	3.81	3.18	3.16	3.21	3.18	3.20	3.46	3.72	3.46	4.09	3.39	3.49	3.48	3.45	3.46	3.68	3.89
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	169.0	98.1	70.9	85.5	85.3	85.4	92.3	94.6	92.3	182.5	104.8	77.6	92.4	92.2	92.3	98.0	99.9
Selenium	0.05	0.05	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.009	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.006
Silver	0.1	-----	0.007	0.004	0.003	0.004	0.003	0.004	0.004	0.005	0.004	0.007	0.004	0.003	0.004	0.004	0.004	0.004	0.005
Sodium	-----	-----	522	307	219	268	263	266	285	296	285	561	325	238	287	283	285	301	309
Sulfate	250	-----	492	297	220	268	255	262	277	282	277	525	311	237	283	272	277	290	294
Thallium	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
TDS	500	-----	2,640	1,595	1,197	1,418	1,396	1,770	1,499	1,543	1,505	2,833	1,684	1,284	1,509	1,489	1,849	1,574	1,612
Uranium	0.03	-----	0.006	0.004	0.003	0.004	0.003	0.003	0.003	0.003	0.003	0.006	0.004	0.003	0.004	0.003	0.003	0.003	0.003
Zinc	5	-----	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance

			200 Year						
Concentration (mg/L)	*MCL*	*AWQS*	pE -4	Scale Factor	ET +15%	ET -15%	GW Inflow +25%	GW Inflow - 25%	SI +1.0
Time (yr)			1.0	1.0	1.0	1.0	1.0	1.0	1.0
pH	*6.5-8.5*	-----	8.27	8.51	8.31	8.21	8.27	8.27	8.37
pe	-----	-----	-4.00	4.00	4.00	4.00	4.00	4.00	4.00
Alkalinity Total	-----	-----	770	1,447	852	663	766	765	1,016
Aluminum	*0.2*	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Antimony	*0.006*	*0.006*	0.002	0.004	0.002	0.002	0.002	0.002	0.002
Arsenic	*0.01*	*0.05*	0.043	0.000	0.000	0.000	0.000	0.000	0.000
Barium	*2*	*2*	0.04	0.03	0.04	0.05	0.04	0.04	0.12
Beryllium	*0.004*	*0.004*	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Boron	-----	-----	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	*0.005*	*0.005*	0.002	0.003	0.002	0.001	0.002	0.002	0.002
Calcium	-----	-----	15	7	13	19	15	15	100
Chloride	*250*	-----	45	86	50	38	45	44	45
Chromium	*0.1*	*0.1*	0.004	0.000	0.000	0.000	0.000	0.000	0.000
Copper	*1.3*	-----	0.32	0.06	0.03	0.03	0.03	0.03	0.12
Fluoride	*4*	*4*	**10.10**	**18.89**	**11.18**	**8.69**	**10.06**	**10.04**	**12.91**
Iron	*0.3*	-----	2.03	0.00	0.00	0.00	0.00	0.00	0.00
Lead	*0.015*	*0.05*	0.006	0.002	0.001	0.001	0.001	0.001	0.001
Magnesium	*150*	-----	46	89	51	40	47	45	46
Manganese	*0.05*	-----	0.044	0.023	0.044	0.040	0.051	0.035	0.044
Mercury	*0.002*	*0.002*	0.0006	0.0011	0.0006	0.0005	0.0006	0.0006	0.0006
Molybdenum	-----	-----	0.30	0.58	0.33	0.26	0.30	0.30	0.30
Nickel	-----	*0.1*	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Nitrogen	*10*	*10*	3.68	4.32	3.55	3.77	3.69	3.67	3.68
Phosphorus	-----	-----	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	-----	-----	98.0	193.5	109.8	83.5	98.1	97.9	98.0
Selenium	*0.05*	*0.05*	0.009	0.008	0.006	0.005	0.005	0.005	0.005
Silver	*0.1*	-----	0.004	0.007	0.004	0.003	0.004	0.004	0.004
Sodium	-----	-----	301	593	339	254	302	299	301
Sulfate	*250*	-----	290	553	321	251	295	285	290
Thallium	*0.002*	*0.002*	0.001	0.001	0.001	0.001	0.001	0.001	0.001
TDS	*500*	-----	1,581	2,991	1,750	1,361	1,583	1,566	1,913
Uranium	*0.03*	-----	0.003	0.006	0.004	0.003	0.004	0.003	0.003
Zinc	*5*	-----	0.01	0.02	0.01	0.01	0.01	0.01	0.01

AWQS Exceedance