PROPOSED REMEDIAL ACTION PLAN

WEST CENTRAL PHOENIX – EAST GRAND AVENUE
WATER QUALITY ASSURANCE REVOLVING FUND SITE

PHOENIX, ARIZONA

November 15, 2020

Prepared by:

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Acronyms

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
AWQS	Aquifer Water Quality Standard
A.R.S.	Arizona Revised Statute
CAB	Community Advisory Board
COC	Contaminant(s) of Concern
1,1-DCE	1,1-Dichloroethene
ERA	Early Response Action(s)
ERD	Enhanced Reductive Dechlorination
FS	Feasibility Study
GPL	Groundwater Protection Level(s)
GPM	Gallons per Minute
ISCO	In-Situ Chemical Oxidation
LGAC	Liquid Phase Granular Activated Carbon
ug/L	Micrograms per Liter
MNA	Monitored Natural Attenuation
MTP	Mobile Home Trailer Park Well
ORP	Oxidation-Reduction Potential
PCE	Tetrachloroethene
PRAP	Proposed Remedial Action Plan
RO	Remedial Objective(s)
ROD	Record of Decision
SRL	Soil Remediation Level(s)
SRP	Salt River Project
SVE	Soil Vapor Extraction
TCE	Trichloroethene
VOC	Volatile Organic Compound(s)
VWR	Van Waters & Rodgers
WQARF	Water Quality Assurance Revolving Fund
ZVI	Zero-Valent Iron

1.0 INTRODUCTION

The Arizona Department of Environmental Quality (ADEQ) prepared this Proposed Remedial Action Plan (PRAP) for the West Central Phoenix – East Grand Avenue Water Quality Assurance Revolving Fund (WQARF) Site (Site), located in Phoenix, Arizona (Figure 1). This PRAP was prepared in accordance with Arizona Revised Statute (A.R.S.) Section (§) 49-287.04 and Arizona Administrative Code (A.A.C.) R18-16-408. The PRAP is based on information contained in the following documents:

- *Final Remedial Investigation Report, West Central Phoenix East Grand Avenue WQARF Site* (Weston, 2006)

- *Feasibility Study Report, East Grand Avenue Water Quality Assurance Revolving Fund Site, Phoenix, Arizona* (ARCADIS, 2020)

The information presented in the PRAP was taken directly from the above-referenced reports without attribution other than that noted in this document. The detailed history of environmental investigations, Early Response Actions (ERAs), and preliminary screening of remedial alternatives completed for the Site presented in the referenced documents and is not reiterated in detail in this document.

The purpose of the PRAP is to inform the public on the remedy selected from the alternatives evaluation presented in the Feasibility Study (FS), which addressed the site-specific Remedial Objectives (ROs). The PRAP is part of the final remedy selection process under the WQARF program where public input is solicited on the selected remedy and on the rationale for proposing the selected remedy. ADEQ will review the public comments and prepare a responsiveness summary to address the public comments. The responsiveness summary will be part of the Record of Decision (ROD). The remedy for the Site will be finalized by ADEQ in the ROD.

This PRAP, in accordance with A.R.S. §49-287.04, describes the following:

- The boundaries of the Site that is the subject of the remedial action.

- The results of the Remedial Investigation and the FS.

- The proposed remedy and estimated cost.

- How the remediation goals and selection factors in A.R.S. §49-282.06 and rules adopted by the ADEQ Director have been considered.

2.0 SITE BOUNDARIES

The boundaries of the Site subject to remedial action include the area located between the Salt River Project (SRP) Grand Canal to the north, 29th Avenue to the east, West Cheery Lynn Road to the south, and 33rd Avenue to the west in Phoenix, Arizona (Figure 1). The Site includes the area that encompasses the current groundwater plume impacted with volatile organic compounds (VOCs).

3.0 REMEDIAL INVESTIGATION RESULTS

This section presents a summary of the remedial investigations conducted at the Site. The results of the remedial investigations are presented in the following documents:

- *Final Remedial Investigation Report, West Central Phoenix East Grand Avenue WQARF Site* (Weston, 2006)

- *2018 Final Remedial Investigation Report Addendum* (ADEQ, 2018*)*

- *Feasibility Study Report, East Grand Avenue Water Quality Assurance Revolving Fund Site, Phoenix, Arizona* (ARCADIS, 2020). The FS Report presented a summary of the data collected at the Site since 2018.

3.1 Site Description and History

The Site is located within a commercial and industrial area that includes small to medium-sized businesses including manufacturers and fabricators. Groundwater contamination was discovered at the Site in 1982 when trichloroethene (TCE) was detected in nearby City of Phoenix water production wells. Subsequent investigations at the Site identified the former Univar facility as the source of contamination at the Site.

The former Univar facility is located at 2930/2940 West Osborn Road as shown on Figure 1. In 1957, Van Waters & Rodgers (VWR) began operation at the facility warehousing and distributing scientific and laboratory equipment. In the mid-1960s, the VWR expanded operations at the facility to include the warehousing and distribution of industrial and agricultural chemical products, upholstery supplies, and laundry and dry-cleaning supplies. In 1970, Motor Rim and Wheel Service of California purchased and began operating at the facility. By 1971, VWR had ceased all operations at the facility. In 2004, Motor Rim and Wheel Service of California sold the facility and property to Harry Ross Industries (HRI). HRI is the current owner of the property.

Motor Rim and Wheel Service of California changed their name to Century Wheel and Rim and then to Rockwell American. Rockwell American is a manufacturer and distributor of trailer products and is the current operator on the parcel at 2930 West Osborn Road. Energy Task Force is an insulated piping company and is the current operator of the parcel at 2940 West Osborn Road.

3.2 Source of Contamination

Data collected during the remedial investigation and follow-up investigations indicated that contaminant releases occurred in soil and groundwater at the Site. The source of this contamination is the area near and under the former building foundation at the former Univar facility. No other sources of contamination have been identified at the Site (ADEQ, 2018).

3.3 Contaminants of Concern

The Contaminants of Concern (COCs) at the Site include compounds that have been detected above regulatory standards in the soil and groundwater as presented below:

- **Soil** - The soil at the Site does not contain any compounds with concentrations that exceed regulatory standards.

- **Groundwater** - The COCs in the groundwater at the Site include tetrachloroethene (PCE), TCE, and 1-1-dichloroethene (1,1-DCE). These contaminants are currently present in the groundwater at the Site at concentrations that exceed regulatory standards.

- **Other Chemicals** - Other chemicals that have periodically been detected at concentrations above applicable regulatory standards at the Site include 1,1,1-trichloroethane and Freon 11. None of these compounds are considered COCs at the Site.

3.4 Nature and Extent of Contamination

The current extent of COCs in the groundwater at the Site is shown on Figure 2. Compounds that exceed the Aquifer Water Quality Standard (AWQS) include PCE, TCE, and 1,1-DCE. The maximum PCE, TCE, and 1,1-DCE concentrations currently detected in the groundwater are 8.1, 20.8, and 11.9 micrograms per liter (ug/L), respectively. The AWQS for PCE and TCE is 5 ug/L and the AWQS for 1,1-DCE is 7 ug/L. The groundwater data indicated the upper 30 to 50 feet of the aquifer is impacted with VOCs.

3.5 Risk Evaluation Summary

Multiple investigations have been conducted at the Site since VOCs were initially detected in the groundwater in 1982. The data from these investigations were used to evaluate the risks that the soil, soil vapor, and groundwater pose to the public and the environment. The risk evaluations indicate there is no current human health risk from soil, soil vapor, or groundwater contamination.

3.6 Remedial Objectives

3.6.1 Soil

The RO Report (ADEQ, 2006) identified the current and future land use at the Site as industrial. Soil sampling results at the Site confirmed that COCs in the soil are below their respective Arizona Soil Remediation Levels (SRLs) or Groundwater Protection Levels (GPLs). Thus, a RO for soil is not needed for the Site.

3.6.2 Groundwater

The RO Report (ADEQ, 2006) identified current and future groundwater uses at the Site. These included the current and future use of groundwater for drinking water by the Mobile Home Trailer Park (MTP) Well, the current and future use of groundwater for drinking water by the Danone wells, and the current use of groundwater for irrigation by SRP wells 10.5E-7.5N and 11.2E-7.7N. Based on these groundwater uses, ADEQ established the following ROs for the Site:

- To protect, replace, or otherwise provide alternative water supply should use of the MTP drinking water well be lost in the future due to changes in groundwater flow direction that would contaminate the well with TCE, PCE, and/or 1,1-DCE contamination emanating from the Site.

- To protect, replace, or otherwise provide alternative water supply should use of the Danone Waters drinking water well(s) be lost in the future due to contamination of the deeper aquifer by the TCE, PCE, and/or 1,1-DCE contamination emanating from the Site.

- To protect, replace, or otherwise provide alternative water supply should use of the SRP wells be lost in the future due to contamination of the wells with TCE, PCE, and/or 1,1-DCE contamination emanating from the Site.

In addition to the potential future groundwater uses identified in the RO Report (ADEQ, 2006), recent consultations with the water providers indicated potential future use of groundwater for drinking water by SRP and the potential future use of groundwater by the City of Phoenix for drinking water (ARCADIS, 2020).

3.6.3 Surface Water

Current surface water use at the Site is irrigation from SRP Grand Canal. The water in the Grand Canal is supplemented with groundwater pumped from SRP wells at the Site. The future use of the surface water in the canal includes irrigation and drinking water. The current and future source of the water in the Grand Canal originating from the Site is groundwater pumped by SRP wells. Thus, a RO for surface water use is not needed because the ROs for groundwater use for the water pumped into the canals are applicable.

3.7 Early Response Actions

One ERA was conducted at the Site. Source removal was implemented at the former Univar facility using soil vapor extraction (SVE) to remove soil gas impacted with VOCs. This system removed approximately 2,000 pounds of VOCs between January 2004 and September 2013. It was shut down after multiple rebound tests showed no appreciable rebound of VOCs in the vadose zone. Soil vapor sampling conducted in 2019 confirmed that soil concentrations at the former Univar facility are less than the SRLs and GPLs and that the soil is not a continuing source of contamination at the Site.

4.0 FEASIBILITY STUDY RESULTS

This section presents a summary of the FS conducted for the Site. The results of the FS are presented in the following document:

- *Feasibility Study Report, East Grand Avenue Water Quality Assurance Revolving Fund Site, Phoenix, Arizona* (ARCADIS, 2020)

4.1 Identification and Screening of Remedial Technologies

No soil contamination is present at the Site. Thus, the FS focused on technologies to address the groundwater contamination at the Site. The FS identified several remedial technologies for remediating the impacted groundwater at the Site including: Monitored Natural Attenuation (MNA), Enhanced Reductive Dechlorination (ERD), Air Sparging, In-Well Air Stripping, In-Site Chemical Oxidation (ISCO), Zero Valant Iron (ZVI) Treatment, Groundwater Extraction with Air Stripping, Groundwater Extraction with Advanced Oxidation, Groundwater Extraction with Liquid Phase Granular Activated Carbon (LGAC) Treatment, Well Modification (as a contingency), and Wellhead Treatment (as a contingency).

These remedial technologies were screened based on the anticipated ability of the technology to address the ROs at the Site and reduce the contaminant concentration, mass, and/or toxicity. Each technology was screened for effectiveness, implementability, health and safety concerns, flexibility, expandability, and cost. Based on the screening results, only MNA, Groundwater Extraction with LGAC Treatment, and Wellhead Treatment (as a contingency) were retained for use at the Site.

4.2 Development of the Reference Remedy and Alternative Remedies

The retained remedial technologies were used to develop a reference remedy and two alternative remedies (a less aggressive remedy and a more aggressive remedy). The reference remedy and the alternative remedies are capable of achieving the ROs. The development of the reference remedy and alternative remedies considered the following:

- The data obtained from the remedial investigations;

- The best available engineering and scientific information concerning available remedial technologies; and

- Preliminary analysis of the comparison criteria and the ability of the remedies to comply with A.R.S. §49-282.06.

4.2.1 Reference Remedy

The Reference Remedy included the following remedial technologies for the remediation of impacted groundwater at the Site:

- **MNA** – MNA would include groundwater monitoring and sampling on a semi-annual basis to monitor the natural degradation of the groundwater contamination at the Site.

- **Wellhead Treatment (Contingency)** – Wellhead treatment would be a contingency to treat impacted groundwater withdrawn from the aquifer from a drinking water well.

4.2.2 Less Aggressive Remedy

The Less Aggressive Remedy included the following remedial technologies for the remediation of impacted groundwater at the Site:

- **MNA** – MNA would include groundwater monitoring and sampling on an annual basis to monitor the natural degradation of the groundwater contamination at the Site.

- **Wellhead Treatment (Contingency)** – Wellhead treatment would be a contingency to treat impacted groundwater withdrawn from the aquifer from a drinking water well.

4.2.3 More Aggressive Remedy

The More Aggressive Remedy included the following remedial technologies for the remediation of impacted groundwater at the Site:

- **MNA** – MNA would include groundwater monitoring and sampling on an annual basis to monitor the natural degradation of the groundwater contamination at the Site.

- **Groundwater Extraction with LGAC Treatment** – Groundwater extraction would include pumping impacted groundwater from the aquifer, treating it with LGAG, and discharging the treated groundwater into the City of Phoenix sanitary sewer system, discharging the treated groundwater into the SRP Grand Canal, or reinjecting the treated groundwater back into the aquifer using injection wells.

- **Wellhead Treatment (Contingency)** – Wellhead treatment would be a contingency to treat impacted groundwater withdrawn from the aquifer from a drinking water well.

4.3 Evaluation and Comparison of the Remedies

A comparative evaluation was conducted for the Reference, Less Aggressive, and More Aggressive Remedies to demonstrate that each remedial alternative will achieve the ROs in accordance with A.A.C. R18-16-407(H). The criteria used to evaluate each remedial alternative included practicability, risk, cost, and benefit. A summary of the evaluation for each remedial alternative is presented in Table 1.

Table 1 - Summary of Remedial Alternatives

Alternative	Practicability	Risk	Cost*	Benefit
Reference Remedy	• Highly Feasible • Highly Implementable • Potentially Effective • Clean-Up Duration of 18 Years	• Some Potential Risk	$3.02M	• Protects Water Supply and Achieves ROs
Less Aggressive Remedy	• Highly Feasible • Highly Implementable • Potentially Effective • Clean-Up Duration of 18 Years	• Some Potential Risk	$2.61M	• Protects Water Supply and Achieves ROs
More Aggressive Remedy	• Moderately Feasible • Least Implementable • Likely Effective • Clean-Up Duration of 13 Years	• Some Potential Risk	$8.04M	• Protects Water Supply and Achieves ROs

Notes:
*The cost includes a 3% Inflation Rate
The costs do not include the contingency cost of $7.35M
The source of the costs presented in this table is Appendix F of the FS Report (ARCADIS, 2020)

4.4 Proposed Remedy

The remedy proposed by the FS for the Site was the Less Aggressive Remedy. The Less Aggressive Remedy is the most implementable and the least expensive. The Less Aggressive Remedy will achieve the ROs, will meet the remedial action criteria pursuant to A.R.S. §49-282.06, and is consistent with current and future land and water use.

5.0 PROPOSED REMEDY AND ESTIMATED COST

The Less Aggressive Remedy proposed in the FS is the remedial alternative proposed in the PRAP. As previously mentioned, no soil contamination is present at the Site. Thus, the remedy proposed in the PRAP addresses the remediation of the groundwater contamination at the Site. This section presents a description of the remedy and the estimated cost of the remedy.

5.1 Remedy Description

The proposed remedy for the Site includes MNA with a contingency for wellhead treatment as described below.

5.1.1 MNA

MNA is a remedial measure that involves routine groundwater sampling and analysis to monitor the results of one or more naturally occurring physical, chemical, or biological processes that reduce the mass, toxicity, volume, or concentration of chemicals in groundwater. MNA is a mechanism by which COCs are reduced by natural means without other control, removal, treatment, or aquifer-modifying activities. These in-situ processes may include dilution, adsorption, volatilization, precipitation, and biological degradation of the contaminants in the groundwater.

MNA will consist of routine groundwater monitoring and sampling to monitor groundwater contamination at the Site. The groundwater samples will be analyzed for VOCs and selected natural attenuation parameters such as dissolved oxygen, oxidation-reduction potential (ORP), iron, manganese, nitrate, sulfate, methane, and ethane. The groundwater monitoring data will be used to evaluate plume migration, plume stability, and natural attenuation of the plume. The data will also be used to trigger appropriate contingency actions (i.e., wellhead treatment at an impacted water supply well) to manage risk associated with the groundwater plume migration. MNA will continue until the concentrations of the COCs drop below the AWQS.

The MNA program will be conducted at the Site for a period of up to 18 years. The program will include annual water level monitoring of up to 20 wells, annual groundwater sampling of up to 10 wells, and annual reporting. The number of wells to be monitored and sampled and the frequency of monitoring and sampling will be adjusted over time in response to changing groundwater conditions. At a minimum, the number of wells and the frequency of monitoring will be evaluated and updated every five years.

5.1.2 Wellhead Treatment Contingency

Wellhead treatment could be implemented at two down-gradient production wells (Mobile Home Trailer Park Well and adjacent SRP production well 10.5E-7.5N) if they become impacted with groundwater contamination associated with the Site and their use is restricted due to COCs present in the water supplied from the well. Wellhead treatment will consist of LGAC treatment. The cost of installing wellhead

treatment at a production well is well specific and would be variable depending on the well location, well production rate, and the timing of bringing the well online. This contingency assumes that one production well with a production rate of 1,000 gallons per minute (gpm) and one production well with a production rate of 50 gpm will need wellhead treatment for a period of up to 12 years.

5.2 Periodic Reviews

Periodic reviews of remedial progress will be conducted as necessary to determine the effectiveness of the remedy in achieving the ROs. These reviews will be conducted, at a minimum, every five years.

5.3 Estimated Cost

The estimated cost of the proposed remedy is $2.61 million. The estimated cost with contingencies is $9.96 million. A summary of the costs associated with the remedy is presented in Table 2. The detailed costs are presented in Appendix A.

5.4 Duration

The duration of the remedy is up to 18 years. The duration is the estimated number of years required for the proposed remedy to achieve the ROs.

Table 2 - Summary of Costs for Proposed Remedy

Remedial Technology	**Cost**
MNA at Site (up to 18 years)	$1,763,300
Well Abandonment	$846,700
Subtotal	***$2,610,000***
Contingency	
Wellhead Treatment (up to 12 years)	$7,352,000
Subtotal	***$7,352,000***
TOTAL	**$9,962,000**

Notes:
*The cost includes a 3% Inflation Rate
The costs for the Proposed Remedy is based on Appendix F of the FS Report (ARCADIS, 2020)

6.0 CONSIDERATION OF REMEDIATION GOALS AND SELECTION FACTORS

This section presents how the remediation goals and selection factors outlined in A.R.S. §49-282.06 and the rules adopted by the ADEQ Director were considered for the proposed remedy.

6.1 Rationale for Selection of the Remedy

The proposed remedy includes monitoring of the contamination. The proposed remedy provides the best combination of remedial effectiveness, practicability, cost, and benefit for the restoration and use of the groundwater resource. There are currently no unmitigated human health risks associated with the contamination at the Site and the components of the proposed remedy will be protective of the public health and the environment.

Each component of the proposed remedy is a proven, reliable remedial alternative that will be protective of the public health and the environment. The risk to human health and the environment with this remedy is low and all known exposure pathways have been addressed. Over time, the remedial actions will reduce the concentrations and the volume of contaminated groundwater at the Site. Groundwater monitoring and sampling will verify that the remedy is protective of public health and the environment during and after remedy implementation. The components of the proposed remedy are consistent and compatible with current and anticipated future land and resource use. Upon implementation, this remedy is considered to have a positive impact in terms of enhancement of future land uses and impacts on the local economy.

6.2 Achievement of Remedial Objectives

Per A.C.C. R18-16-408(B)(3), the proposed remedy must achieve each of the ROs established by ADEQ for the Site as presented in this PRAP. The proposed remedy for groundwater will achieve ROs for groundwater use by treating the source of contamination using MNA to remediate the groundwater plume. The proposed remedy will clean up the groundwater to levels that are less than the AWQS. Groundwater monitoring and sampling will be used to confirm the groundwater ROs are being met.

6.3 Achievement of Remedial Action Criteria

A.R.S. § 49-282.06 requires that remedial actions shall:

- Assure the protection of public health and welfare and the environment.
- To the extent practicable, provide for the control, management, or cleanup of the hazardous substances in order to allow the maximum beneficial use of the waters of the state.
- Be reasonable, necessary, cost-effective, and technically feasible.

As demonstrated in this PRAP, the proposed remedy for the Site meets the requirements of A.R.S. § 49-282.06. The proposed remedy is protective of human health and the environment, compliant with

applicable laws, and allows for the maximum beneficial use of the waters of the State with the lowest cost. The proposed remedy is the best combination of practicability, risk, cost, and benefit to achieve the ROs.

6.4 Consistency with Water Management Plans

The proposed remedy is consistent with the water management plans of local water providers. There are no active supply wells currently impacted by the plume and the proposed remedial actions will restore water quality. This remedy will allow for the maximum beneficial use of the waters of the State, protect the groundwater supply for future use, and ensure that wider areas are not impacted for future water development options.

6.5 Consistency with General Land Use Planning

The proposed remedy is consistent with the current land use and is not anticipated to negatively impact current or future land use at the Site.

6.6 Lead Agency Statement for Proposed Remedy

Based on the information currently available, ADEQ believes the proposed remedy provides the best balance of tradeoffs among the other alternatives with respect to the comparison criteria. ADEQ expects the proposed remedy will satisfy the remedial action criteria pursuant to A.R.S. § 49-282.06 and the ROs.

6.7 Uncertainties

Uncertainties associated with the proposed remedy at the Site include the duration of time required to remediate the groundwater at the Site. Linear regression analysis and pore-flushing calculations were used to estimate the duration of time required for the concentrations of COCs in the groundwater at the Site to reach the AWQS (Arcadis, 2020). The assumptions used in the two estimates may not fully represent all the conditions at the Site. Thus, the estimated duration required to remediate the groundwater at the Site could be more or less than the time frame estimated by the linear regression analysis and the pore-flushing calculations.

6.8 Public Comment Period

The PRAP will be issued for a 90-day public comment period. A Community Advisory Board (CAB) meeting may be held during the public comment period. ADEQ will accept written comments on this PRAP that are postmarked or emailed within the comment period and submitted to:

Arizona Department of Environmental Quality
Attention: Tom Titus, Project Manager
Address: 1110 West Washington Street, Phoenix, Arizona 85007
Email: Titus.Thomas@azdeq.gov

7.0 REFERENCES

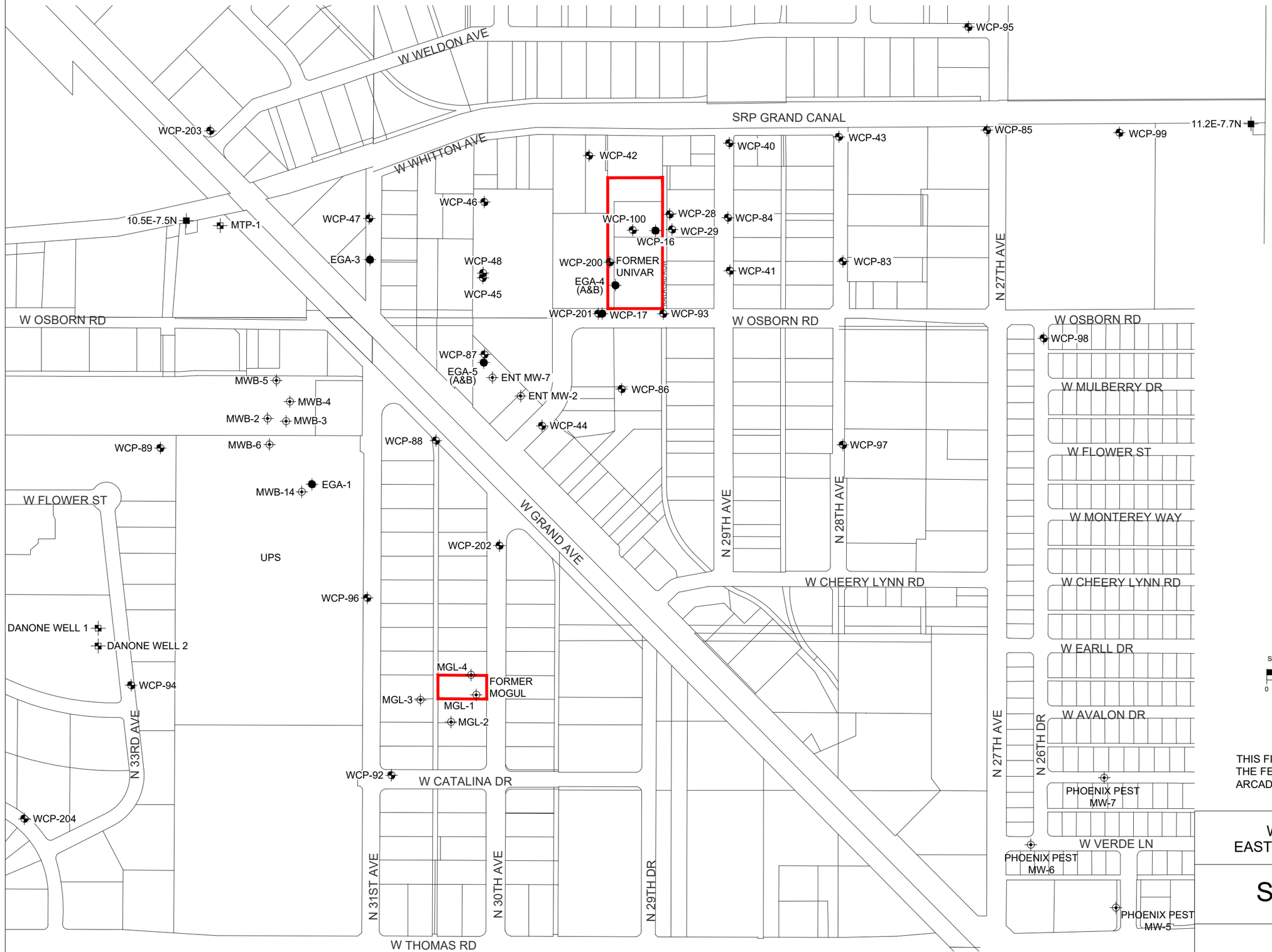
Arizona Department of Environmental Quality (ADEQ), 2006. Remedial Objectives Report, West Central Phoenix East Grand Avenue Site, Phoenix, Arizona. June.

ADEQ, 2018. 2018 Final Remedial Investigation Report Addendum. May 9.

ARCADIS, 2020. Feasibility Study Report, East Grand Avenue Water Quality Assurance Revolving Fund Registry Site, Phoenix, Arizona. June.

Weston Solutions (Weston), 2006. Final Remedial Investigation Report, West Central Phoenix East Grand Avenue WQARF Site, Phoenix, Arizona. June.

FIGURES



EXPLANATION

- MONITORING WELL, UNIVAR
- MONITORING WELL, ADEQ
- MONITORING WELL, OTHER
- PRODUCTION WELL, SRP
- PRODUCTION WELL, OTHER

SRP = SALT RIVER PROJECT

SOURCE PROPERTY

ADEQ = ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

N

SCALE: 1 INCH = 400 FEET

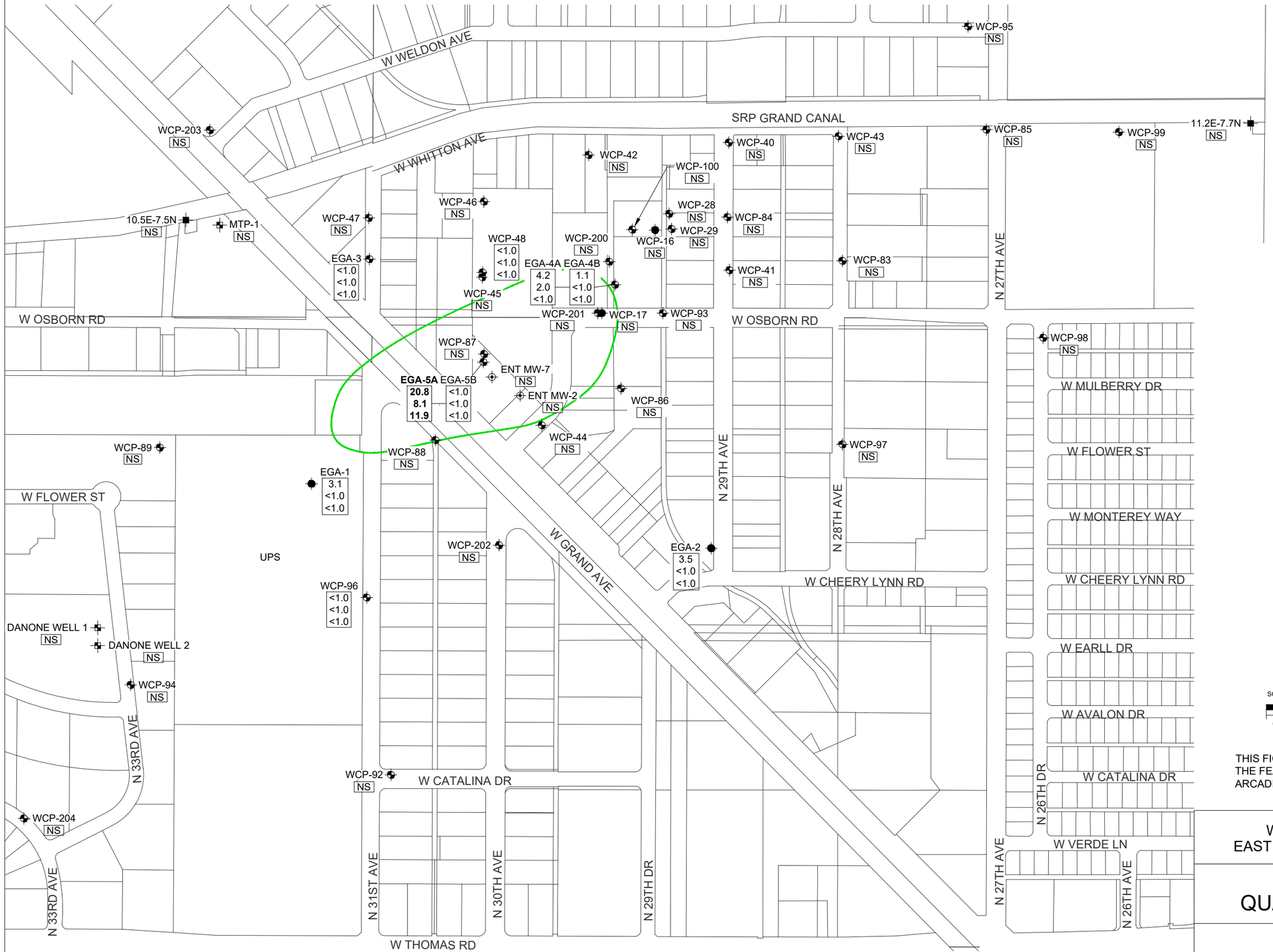
0 200 400 800

THIS FIGURE WAS MODIFIED FROM FIGURE 3 OF THE FEASIBILITY STUDY REPORT PREPARED BY ARCADIS AND DATED JUNE 2020

WEST CENTRAL PHOENIX,
EAST GRAND AVENUE WQARF SITE

SITE LOCATION

FIGURE
1



EXPLANATION

- MONITORING WELL, UNIVAR
- MONITORING WELL, ADEQ
- MONITORING WELL, OTHER
- PRODUCTION WELL, SRP
- PRODUCTION WELL, OTHER

WCP-96	WELL I.D	AWQS
<1.0	TRICHLOROETHENE	5
<1.0	TETRACHLOROETHENE	5
<1.0	1,1- DICHLOROETHENE	7

CONCENTRATIONS SHOWN IN MICROGRAMS PER LITER (µg/L)

ADEQ = ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

AWQS = ARIZONA AQUIFER WATER QUALITY STANDARD

NS = NOT SAMPLED, WELL WAS DRY (IN JANUARY AND/OR HISTORICALLY)

SRP = SALT RIVER PROJECT

BOLD = RESULT GREATER THAN THE RESPECTIVE AWQS

TRICHLOROETHENE (TCE) ISOCONCENTRATION CONTOUR - TCE HAS THE HIGHEST CONCENTRATION RELATIVE TO THE AWQS (5 µg/L)

N

SCALE: 1 INCH = 400 FEET

0 200 400 800

THIS FIGURE WAS MODIFIED FROM FIGURE 7 OF THE FEASIBILITY STUDY REPORT PREPARED BY ARCADIS AND DATED JUNE 2020

WEST CENTRAL PHOENIX,
EAST GRAND AVENUE WQARF SITE

GROUNDWATER QUALITY JANUARY 2020

FIGURE 2

APPENDIX A – DETAILED COST SUMMARY

Table A-1
Monitored Natural Attenuation Cost Summary

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	TOTAL
Groundwater Monitoring	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ 24,000	$ -	$ 432,000
Annual Reporting	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ -	$ 198,000
Remedial Action Plan	$ 60,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 60,000
Periodic Review	$ -	$ -	$ -	$ -	$ 30,000	$ -	$ -	$ -	$ -	$ 30,000	$ -	$ -	$ -	$ -	$ 30,000	$ -	$ -	$ -	$ -	$ 90,000
Closure Report	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 90,000	$ -	$ 90,000
Well Abandonment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 78,000	$ 369,000	$ 447,000
Stakeholder Communication	$ 5,000	$ 2,000	$ 2,000	$ 2,000	$ 4,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 4,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 4,000	$ 2,000	$ 2,000	$ 11,000	$ 19,000	$ 73,000
Project QA/QC	$ 3,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 7,000	$ 12,000	$ 54,000
Health & Safety Planning	$ 2,000	$ 1,000	$ 1,000	$ 1,000	$ 2,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 2,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 2,000	$ 1,000	$ 1,000	$ 5,000	$ 8,000	$ 34,000
Project Management	$ 10,000	$ 4,000	$ 4,000	$ 4,000	$ 7,000	$ 4,000	$ 4,000	$ 4,000	$ 4,000	$ 7,000	$ 4,000	$ 4,000	$ 4,000	$ 4,000	$ 7,000	$ 4,000	$ 4,000	$ 21,000	$ 37,000	$ 141,000
Contingency (10%)	$ 12,000	$ 5,000	$ 5,000	$ 5,000	$ 8,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 8,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 8,000	$ 5,000	$ 5,000	$ 25,000	$ 45,000	$ 171,000
Net Value Subotal	***$ 127,000***	***$ 49,000***	***$ 49,000***	***$ 49,000***	***$ 88,000***	***$ 49,000***	***$ 49,000***	***$ 49,000***	***$ 49,000***	***$ 88,000***	***$ 49,000***	***$ 49,000***	***$ 49,000***	***$ 49,000***	***$ 88,000***	***$ 49,000***	***$ 49,000***	***$ 272,000***	***$ 490,000***	***$ 1,790,000***
Inflation (3%)	$ -	$ 1,500	$ 2,100	$ 4,700	$ 11,400	$ 8,100	$ 9,800	$ 11,600	$ 13,500	$ 27,800	$ 17,400	$ 19,500	$ 21,600	$ 23,800	$ 46,800	$ 28,400	$ 30,800	$ 184,500	$ 356,700	$ 820,000
Total	**$ 127,000**	**$ 50,500**	**$ 51,100**	**$ 53,700**	**$ 99,400**	**$ 57,100**	**$ 58,800**	**$ 60,600**	**$ 62,500**	**$ 115,800**	**$ 66,400**	**$ 68,500**	**$ 70,600**	**$ 72,800**	**$ 134,800**	**$ 77,400**	**$ 79,800**	**$ 456,500**	**$ 846,700**	**$ 2,610,000**

Notes:
Groundwater Monitor, Sample, & Report Frequency = Annual
Number of Wells Monitored = 20 @ $200/well
Number of Wells Sampled = 10 @ $2,000/well
Source: Costs from Appendix F of the Feasibilty Study Report dated June 2020

Table A-2

Wellhead Treatment Contingency Cost Summary

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	TOTAL
System Design	$ 107,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 107,000
Permits/Survey/Utilities	$ 57,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 57,000
System Equipment	$ 1,170,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,170,000
System Installation	$ 399,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 399,000
System Start-Up	$ 55,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 55,000
System Contingency	$ 336,200	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 336,200
System Decommision	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 75,000	$ 75,000
System Operation & Maintenance	$ -	$ 283,000	$ 283,000	$ 283,000	$ 283,000	$ 283,000	$ 283,000	$ 283,000	$ 283,000	$ 283,000	$ 283,000	$ 283,000	$ -	$ 3,113,000
System Evaluation & Reporting	$ -	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ -	$ 121,000
Stakeholder Communication	$ 5,350	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 3,750	$ 170,800
Project QA/QC	$ 3,450	$ 8,800	$ 8,800	$ 8,800	$ 8,800	$ 8,800	$ 8,800	$ 8,800	$ 8,800	$ 8,800	$ 8,800	$ 8,800	$ 2,500	$ 102,750
Health & Safety Planning	$ 1,270	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 1,000	$ 33,070
Project Management	$ 5,350	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 14,700	$ 3,750	$ 170,800
Contingency (10%)	$ 180,380	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 9,000	$ 563,380
Net Value Subotal	***$ 2,320,000***	***$ 369,000***	***$ 369,000***	***$ 369,000***	***$ 369,000***	***$ 369,000***	***$ 369,000***	***$ 369,000***	***$ 369,000***	***$ 369,000***	***$ 369,000***	***$ 369,000***	***$ 95,000***	***$ 6,474,000***
Inflation (3%)	$ -	$ 11,400	$ 23,200	$ 35,300	$ 47,800	$ 60,700	$ 74,000	$ 87,700	$ 101,800	$ 116,400	$ 131,400	$ 146,400	$ 41,900	$ 878,000
Total	**$ 2,320,000**	**$ 380,400**	**$ 392,200**	**$ 404,300**	**$ 416,800**	**$ 429,700**	**$ 443,000**	**$ 456,700**	**$ 470,800**	**$ 485,400**	**$ 500,400**	**$ 515,400**	**$ 136,900**	**$ 7,352,000**

Notes:

Costs Assume Well Production Rate of 1,000 gpm (SRP Well) and 50 gpm (Mobile Home Trailer Park Well)

Source: Costs from Appendix F of the Feasibilty Study Report dated June 2020