

ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM (AZPDES)

This document gives pertinent information concerning the issuance of the AZPDES permit listed below. This facility is a constructed wetlands to treat acid mine drainage and is considered to be a minor facility under the NPDES program. The effluent limitations contained in this permit will maintain the Water Quality Standards listed in Arizona Administrative Code (A.A.C.) R18-11-101 et seq. This permit is proposed to be issued for a period of 5 years.

| I. PERMITTEE INFORMATION | |
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| Permittee's Name: | Gold Paradise Peak, Inc. |
| Permittee's Mailing Address: | 1650 S. Amphlett Blvd. Suite 200 San Mateo, CA 94402 |
| Facility Name: | Senator Mine Adit |
| Facility Address or Location: | 34° 25' 34.50 N / 112° 25' 55.80 W |
| County: | Yavapai County |
| Contact Person(s): Phone/e-mail address | Asa Chen, Vice President Phone: (650) 212-7900 Email: asagangchen@sina.com |
| AZPDES Permit Number: | AZ0026514 |
| Inventory Number: | 513667 |
| LTF Number: | 90178 |

| II. STATUS OF PERMITS | |
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| AZPDES permit applied for: | New |
| Date application received: | 7/16/2021 |
| Date application was determined administratively complete: | 7/30/2021 |
| Previous permit number (if different): | n/a |
| Previous permit expiration date: | n/a |

208 Consistency:

In accordance with A.A.C. R18-9-A903(6), a permit cannot be issued for any discharge inconsistent with a plan or plan amendment approved under section 208(b) of the Clean Water Act. 208 Plan consistency is not required for industrial facilities.

Gold Paradise Peak, Inc. is currently designing and constructing the wetlands and estimates that they will be operational in December 2021.

Gold Paradise has the following permits issued by ADEQ applicable to the Senator Mine:

Type of Permit

| | | |
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| Aquifer Protection Permit (APP) | Application for a Type 3.06 General Permit for Constructed Wetlands is also currently being processed by ADEQ. | Regulates discharges to the local aquifer |
| Multi-Sector General Permit (MSGP Mining) | P81366 | Regulates stormwater discharge |

III. GENERAL FACILITY INFORMATION

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|--------------------------------|---|
| Type of Facility: | Constructed wetlands to treat acid mine drainage from historic and inactive gold-silver mine. No mining, milling, or production is planned at the site. |
| Facility Location Description: | Facility has no street address. It is located on the south side of Senator Highway and Walker Road in an unincorporated area of Yavapai County. |
| Discharge Flow: | 0.063 cubic feet per second / 0.041 MGD is based upon the waste load allocation in the 2002 Hassayampa TMDL. |
| Nature of the discharge: | Acid mine drainage from the Senator Mine Adit will be treated using aerobic wetlands for phytoremediation. The passive treatment methodology will consist of five (5) thickly vegetated aerobic wetlands in series. The bulk of precipitated metals will accumulate in Cells 1, 2, and 3. Cells 4 and 5 will be used for "final polishing" or physical accumulation of precipitated metals that have undergone vegetated uptake. |
| Treatment Processes: | <p>The conceptual site plan proposes a passive treatment system of constructed wetlands. The wetlands will include placement of a porous substrate layer consisting of coarse gravel, wood chips, and compost to promote vegetative establishment for phytoremediation. The porous, high hydraulic conductivity substrate will promote up flow of acid mine drainage around and through the root structure of treatment vegetation. Vegetation will be selected based on selective uptake of specific metals species, as indicated in published literature. The bulk of precipitated metals will accumulate in Wetland Cells 1-3, with Wetland Cells 4-5 achieving "final polishing" or physical accumulation of precipitated metals that have not undergone vegetative uptake.</p> <p>The interspersed berms with spillways act to distribute flow across the full width of treatment cells; thereby, reducing the propensity to short-circuit. Wide flow distribution increases retention time facilitating greater oxygenation to promote metals precipitation and reduces velocity sufficiently to achieve solids settling, adsorption onto organic</p> |

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| | <p>substrate, and vegetative uptake. The cascading six (6)-inch drop height over spillways will further facilitate metals oxygenation via physical agitation and promote up flow around root structures.</p> <p>Wetland liners will consist of either a geo-synthetic clay liner or a synthetic liner due to ease of handling, placement, and impermeability. Geo-synthetic liners consist of a series of synthetic pouches having a desiccated clay core. Upon installation, the clay core saturates, binds individual liner panels, and forms an impermeable seal. Synthetic liner installation consists of geotextile above and below a 30-mil PVC liner. The geotextile layering reduces puncture potential from both subsurface conditions and overlying wetland substrate. The final selection of geo-synthetic vs. synthetic liner will be determined by availability, cost, and client / regulatory agency direction.</p> <p>Due to the presence of impermeable bedrock on the mine bench, the wetlands may be unlined. Revegetation of the entire site includes three (3) zones: treatment wetlands, wetland banks, and site grading. The treatment wetlands will utilize specific, phreatophyte species for phytoremediation. Wetland banks will utilize phreatophyte grass seed and live stake trees and shrubs, suited more to accommodate an occasional saturated environment.</p> <p>The site will be prepared (pre-planting) with the following soil amendments: compost, quicklime, slow release fertilizer, and biotic soil amendment with micronutrients. Fresh plantings will be hydro-mulched and steep slopes will utilize biodegradable coir fiber, shoreflex, or flexmat for pre-vegetative stabilization. The final spillway parallels the existing site access road, increasing ease of both construction and maintenance. The spillway is proposed with a twelve-foot bottom width for the purpose of distributing flow, reducing water depth, and ultimately reducing shear stress on a spillway substrate. The spillway substrate will utilize either 12" riprap, or manufactured geocell material through which a thick vegetative mat will be established. A thickly vegetated spillway will reduce shear stress during large stormwater events.</p> |
| Average flow per discharge: | 0.063 cfs / 0.041 MGD |
| Continuous or intermittent discharge: | Flow from the adit is continuous |
| Discharge pattern summary: | <p>Operations (treatment) will be consistent; flow from the adit is seasonal.</p> <p>Summer: 0.041 MGD</p> <p>Winter: 0.042 MGD</p> |
| <p>A National Pollutant Discharge Elimination System was issued for the Senator Mine Adit from 1978 to 1983, but it was not renewed. This is prior to the Gold Paradise Peak, Inc. and Sino Vantage Group ownership of the property.</p> | |

| IV. RECEIVING WATER | |
|---|---|
| The State of Arizona has adopted water quality standards to protect the designated uses of its surface waters. Streams have been divided into segments and designated uses assigned to these segments. The water quality standards vary by designated use depending on the level of protection required to maintain that use. | |
| Receiving Water : | Hassayampa River (Headwaters to confluence with Copper Creek / AZ1507013-007A) |
| River Basin: | Middle Gila |
| Outfall Location(s): | Outfall 001: Township 12.5 N, Range 2W, Section 35 Latitude 34° 25 37.43N, Longitude 112° 25 53.51W |
| Designated uses for the receiving water listed above: | Aquatic and Wildlife cold water (A&Wc) Full Body Contact (FBC) Fish Consumption (FC) Agricultural Irrigation (Agl) Agricultural Livestock watering (Agl) |
| Is the receiving water on the 303(d) list? | The receiving water is listed as impaired for cadmium, copper, and zinc. The Total Maximum Daily Loadings (TMDL) for cadmium, copper, and zinc in the Hassayampa River was approved by the U.S. EPA Region 9 on October 2, 2002. The Senator Mine Adit was assigned waste load allocations for cadmium, copper, and zinc. |
| Given the uses stated above, the applicable narrative water quality standards are described in A.A.C. R18-11-108, and the applicable numeric water quality standards are listed in A.A.C. R18-11-109 and in Appendix A thereof. There are two standards for the Aquatic and Wildlife uses, acute and chronic. In developing AZPDES permits, the standards for all applicable designated uses are compared and limits that will protect for all applicable designated uses are developed based on the standards. | |

| V. DESCRIPTION OF DISCHARGE | | |
|---|-------|---------------------------------------|
| Because the wetlands and treatment have yet to be constructed, the following are estimated discharge quality concentrations based upon estimated effectiveness of the treatment system. | | |
| Parameters | Units | Maximum Daily Discharge Concentration |
| Cadmium, Total | µg/L | <6 |
| Copper, Total | µg/L | <50 |
| Zinc, Total | µg/L | <5000 |

| VI. COMPLIANCE STATUS | |
|---|---|
| Date of most recent inspection: | March 30, 2021 |
| NOVs issued: | Two Notices of Violation (NOV) were issued on May 17, 2018 to Gold Paradise Peak, Inc. and Sino Vantage Group |
| NOVs closed: | N/A |
| Compliance orders / Consent Judgements: | ADEQ, Gold Paradise Peak, Inc. (GPPI) and Sino Vantage Group (SVG) entered into A Consent Order (APP-09-18) on November 13, 2018. The Order required GPPI and SVG to address the unauthorized discharges from the Senator Mine Adit. The terms of the Consent Order were not met. GPPI and SVG entered into Consent Judgement (CV2019-005385) with ADEQ on January 5, 2021. This permit application was submitted as a condition of the Consent Judgment. |

| VII. DETERMINATION OF EFFLUENT LIMITATIONS and ASSESSMENT LEVELS | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|----------------------|-----------------------|----------------------|---------|------|------|--------|------|------|---------|-------|-------|------|-----|-----|------|------|-----|-----------|-----------------------|----------------------|------------------------------|---------|---------|----|---|--|
| When determining what parameters need monitoring and/or limits included in the draft permit, both technology-based and water quality-based criteria were compared and the more stringent criteria applied. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Technology-based Limitations:</p> <p>The regulations found at 40 CFR, Part 440, require that mines operated to obtain copper, lead, zinc, gold, silver, or molybdenum bearing ores, or any combination of these ores from open-pit or underground operations achieve specified treatment standards for Total Suspended Solids (TSS), pH, cadmium, copper, lead, mercury, and zinc based on the type of treatment technology available. These parameters will be monitored with technology-based effluent limitations (TBELs) as applicable at the outfall. These provisions have been applied based on Best Practicable Control Technology (BPT) currently available and Best Available Technology (BAT) economically achievable.</p> <p>The following mine drainage limitations are listed in 40 CFR 440.103(a) representing the degree of discharge reduction available by the application of the best available technology economically achievable (BAT).</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>30-day Average (mg/L)</th> <th>Daily Maximum (mg/L)</th> </tr> </thead> <tbody> <tr> <td>Cadmium</td> <td>0.05</td> <td>0.10</td> </tr> <tr> <td>Copper</td> <td>0.15</td> <td>0.30</td> </tr> <tr> <td>Mercury</td> <td>0.001</td> <td>0.002</td> </tr> <tr> <td>Lead</td> <td>0.3</td> <td>0.6</td> </tr> <tr> <td>Zinc</td> <td>0.75</td> <td>1.5</td> </tr> </tbody> </table> <p>The following limitation is listed in Section 440.102(a) and represents the degree of discharge reduction attainable by the application of the best practicable control technology currently available (BPT).</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>30-day Average (mg/L)</th> <th>Daily Maximum (mg/L)</th> </tr> </thead> <tbody> <tr> <td>Total Suspended Solids (TSS)</td> <td>20 mg/L</td> <td>30 mg/L</td> </tr> <tr> <td>pH</td> <td colspan="2">Within the range of 6.0 standard units (S.U.) to 9.0 S.U.</td> </tr> </tbody> </table> <p>There are no other applicable technology-based effluent limitations for Outfall 001 beyond the prohibition to discharge process wastewater. The proposed permit includes water quality-based requirements in order to ensure that SWQS for Hassayampa River are achieved.</p> | | Parameter | 30-day Average (mg/L) | Daily Maximum (mg/L) | Cadmium | 0.05 | 0.10 | Copper | 0.15 | 0.30 | Mercury | 0.001 | 0.002 | Lead | 0.3 | 0.6 | Zinc | 0.75 | 1.5 | Parameter | 30-day Average (mg/L) | Daily Maximum (mg/L) | Total Suspended Solids (TSS) | 20 mg/L | 30 mg/L | pH | Within the range of 6.0 standard units (S.U.) to 9.0 S.U. | |
| Parameter | 30-day Average (mg/L) | Daily Maximum (mg/L) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cadmium | 0.05 | 0.10 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Copper | 0.15 | 0.30 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mercury | 0.001 | 0.002 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lead | 0.3 | 0.6 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Zinc | 0.75 | 1.5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Parameter | 30-day Average (mg/L) | Daily Maximum (mg/L) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Suspended Solids (TSS) | 20 mg/L | 30 mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | Within the range of 6.0 standard units (S.U.) to 9.0 S.U. | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Numeric Water Quality Standards: As outlined in A.A.C. R18-11-109 and Appendix A:

In developing the permit, the impact of the proposed discharge on the receiving water must be evaluated. TBELs alone may not achieve the applicable water quality standards and adequately protect the receiving water. Per 40 CFR 122.44(d)(1)(ii), (iii) and (iv), discharge limits must be included in the permit for parameters with “reasonable potential” (RP), that is, those known to be or expected to be present in the effluent at a level that could potentially cause any applicable numeric water quality standard to be exceeded. RP refers to the possibility, based on the statistical calculations using the data submitted, or consideration of other factors to determine whether the discharge may exceed the Water Quality Standards. The procedures used to determine RP are outlined in the *Technical Support Document for Water Quality-based Toxics Control (TSD)* (EPA/505/2-90-001). In most cases, the highest reported value for a parameter is multiplied by a factor (determined from the variability of the data and number of samples) to determine a “highest estimated value”. This value is then compared to the lowest applicable Water Quality Standard for the receiving water. If the value is greater than the standard, RP exists and a water quality-based effluent limitation (WQBEL) is required in the permit for that parameter. RP may also be determined from BPJ based on knowledge of the treatment facilities and other factors. The basis for the RP determination for each parameter with a WQBEL is shown in the table below.

Because wetlands have yet to be constructed, there is no water quality data available for the treated acid mine drainage. Therefore, the available water quality data of the untreated adit drainage was utilized to complete the RP analysis and to establish WQBELs in the permit. The proposed permit limits were established using a methodology developed by EPA. Long Term Averages (LTA) were calculated for each designated use and the lowest LTA was used to calculate the average monthly limit (AML) and maximum daily limit (MDL) necessary to protect all uses. This methodology takes into account criteria, effluent variability, and the number of observations taken to determine compliance with the limit and is described in Chapter 5 of the TSD. Limits based on A&W criteria were developed using the “two-value steady state waste load allocation” described on page 99 of the TSD. When the limit is based on human health criteria, the monthly average was set at the level of the applicable standard and a daily maximum limit was determined as specified in Section 5.4.4 of the TSD.

Where no sample data exists, no numeric discharge limits were placed on these pollutants in the permit. However, monitoring for these pollutants are required and assessment levels (ALs) are established for Trace Substances (Table 2 of the Permit). ALs serve to advise the permittee of the analytical sensitivity needed for data collection. ALs also alert the permitting authority if the discharge may have the potential to exceed water quality standards. In such case, the permit could be reopened and modified to include limits if RP is shown. In any event, RP will be re-evaluated based upon the collected data before a renewal of this permit could be issued in the future.

TMDL:

The 2002 Hassayampa River TMDL established waste load allocations (WLA) for Cadmium, Copper, and Zinc for the Senator Mine Adit at a base flow discharge of 0.063 cubic feet per second (cfs) or 0.041 MGD. These waste load allocations, listed below, were compared with effluent limitations/MDLs to ensure that the most stringent standard is applied, thus protecting the for all applicable uses. The permit limits for each of the listed pollutants have been set so that the most stringent water quality standard for the applicable designated uses can be supported.

| Parameter | 2002 Proposed A&Wc standard (µg/L) | 2016 A&Wc standard (µg/L) | 2002 Waste Load Allocation (g/day) |
|-----------|------------------------------------|---------------------------|------------------------------------|
| Cadmium | 6.2 | 0.64 | 1.00 g/day |
| Copper | 29.3 | 29.3 | 4.00 g/day |
| Zinc | 382.4 | 379 | 53 g/day |

Mixing Zone

The limits in this permit were determined without the use of a mixing zone. Arizona state water quality rules require that water quality standards be achieved without mixing zones unless the permittee applies for and is approved for a mixing zone. Since a mixing zone was not applied for or granted, all water quality criteria are applied at end-of-pipe.

Assessment Levels (ALs)

ALs are listed in Part I.B of the permit. An AL differs from a discharge limit in that an exceedance of an AL is not a permit violation. Instead, ALs serve as triggers, alerting the permitting authority when there is cause for re-evaluation of RP for exceeding a water quality standard, which may result in new permit limitations. The AL numeric values also serve to advise the permittee of the analytical sensitivity needed for meaningful data collection. Trace substance monitoring is required when there is uncertain RP (based on non-detect values or limited datasets) or a need to collect additional data or monitor treatment efficacy on some minimal basis. A reopener clause is included in the draft permit should future monitoring data indicate water quality standards are being exceeded.

Hardness

The permittee is required to sample hardness as CaCO₃ at the same time the trace metals are sampled because the water quality standards for some metals are calculated using the water hardness values. The hardness value of 400 mg/L (the average hardness of the receiving stream as supplied in the application) was used to calculate the applicable water quality standards and any assessment levels or limits for the hardness dependent metals (cadmium, chromium III, copper, lead, nickel, silver and zinc).

Whole Effluent Toxicity (WET)

WET testing is required in the draft permit (Parts I.C and III) to evaluate the discharge according to the narrative toxic standard in A.A.C. R18-11-108(A)(5), as well as whether the discharge has RP for WET per 40 CFR 122.44(d)(iv). At a minimum, the results reported on an AZPDES application must include quarterly testing for a 12-month period within the past year using multiple species or the results from four tests performed at least annually in the 4.5 years prior to the application. However, because this permit is for a new facility, the permittee may report these required WET test results up to two years after submitting the initial application for an AZPDES permit.

WET testing for chronic toxicity shall be conducted using the following three surrogate species:

- *Ceriodaphnia dubia* (water flea) – for evaluating toxicity to invertebrates
- *Pimephales promelas* (fathead minnow) – for evaluating toxicity to vertebrates
- *Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum* or *Raphidocelis subcapitata*) (a green alga) – for evaluating toxicity to plant life

ADEQ does not have a numeric standard for Whole Effluent Toxicity. However, ADEQ adopted the EPA recommended chronic toxicity benchmark of 1.0 Toxic Unit-Chronic (TUC) for a four day exposure period. Using this benchmark, the limitations and/or action levels for WET included in the draft permit were calculated in accordance with the methods specified in the TSD. The species chosen for WET testing are as recommended in the TSD and in *Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs*.

An exceedance of a limit or action level will trigger follow-up testing to determine if effluent toxicity is persistent. If toxicity above a limit or action level is found in a follow-up test, the permittee will be required to conduct a Toxicity Reduction Evaluation (TRE) and possibly a Toxicity Identification Evaluation (TIE) to identify the source of toxicity and reduce toxicity. These conditions are required to ensure that toxicants are not discharged in amounts that are toxic to organisms [A.A.C. R18-11-108(A)(5)]. A reopener clause is included in accordance with 40 CFR Parts 122 and 124 and AAC R18-9-B906.

The draft permit requires 8-hour composite samples be collected for WET testing. WET sampling must coincide with testing for all the parameters in Parts I.A and B of the draft permit, when testing of those parameters is required, to

aid in the determination of the cause of toxicity if toxicity is detected. Additional procedural requirements for the WET test are included in the proposed permit.

The required WET monitoring frequency for this facility is consistent with the WET testing frequency required for facilities with a similar design flow. The draft permit requires WET test results to be reported on discharge monitoring reports and submittal of the full WET lab report to ADEQ.

Permit Limitations and Monitoring Requirements

The table that follows summarizes the parameters that are limited in the permit and the rationale for that decision. Also included are the parameters that require monitoring without any limitations or that have not been included in the permit at all and the basis for those decisions. The corresponding monitoring requirements are shown for each parameter. In general, the regulatory basis for monitoring requirements is per 40 CFR §122.44(i) *Monitoring requirements*, and 40 CFR §122.48(b), *Required monitoring*; all of which have been adopted by reference in A.A.C. R18-9-A905, *AZPDES Program Standards*.

| Parameter | Lowest Standard / Designated Use | Maximum Reported Daily Value | No. of Samples | Estimated Maximum Value | RP Determination | Proposed Monitoring Requirement/ Rationale (1) |
|---|---|------------------------------|----------------|-------------------------|------------------------------|--|
| Flow | --- | --- | --- | --- | --- | Discharge flow is to be monitored on a continual basis using a flow meter. |
| Total Suspended Solids (TSS) | 30 mg/L Daily Maximum 20 mg/L Average of daily values for 30 consecutive days Technology-based limits (TBEL) 40 CFR, Part 440 | No data | N/A | N/A | TBELs applicable. | Monitoring is required and a TBEL is set. |
| pH | Minimum: 6.5 Maximum: 9.0 A&Wc and FBC A.A.C. R18-11-109(B) Minimum: 6.0 Maximum: 9.0 Technology-based limits 40 CFR 440 | Min: 4.98 Max: 8.42 | 30 | N/A | WQBEL or TBEL is applicable. | pH is to be monitored using a discrete sample of the effluent and a WQBEL is set. 40 CFR Part 136 specifies that grab samples must be collected for pH. At least one sample must coincide with WET testing to aid in the determination of the cause of toxicity if toxicity is detected. |
| Temperature | R18-11-109C the discharge shall not cause an increase in the ambient water temperature. A&Wc: no more than 1°C | 19.12°C | 30 | N/A | N/A | Effluent temperature is to be monitored by discrete sample. 40 CFR Part 136 specifies that discrete samples must be collected for temperature. |
| Nutrients (Total Nitrogen and Total Phosphorus) | No applicable standards | No data | N/A | N/A | N/A | Monitoring is not required. |
| Antimony | 30 µg/L/ A&Wc chronic | No data | NA | N/A | Indeterminate (No data) | Monitoring required and an assessment level is set. |
| Arsenic | 30 µg/L/ FBC | <20 µg/L | 5 | N/A | Indeterminate (Limited Data) | Monitoring required and an assessment level is set. |
| Barium | 98,000 µg/L | 18 µg/L | 3 | 133.2 | No RP | Monitoring is not required. |
| Beryllium | 84 µg/L/ FC | No data | N/A | N/A | Indeterminate (No data) | Monitoring is required and an assessment level is set. |
| Cadmium (2)(4) | 0.64 µg/L/ A&Wc chronic 50 µg/L/ 30-day average 100 µg/L/Daily maximum Technology-based limits (TBEL) 40 CFR, Part 440 | 157 µg/L | 13 | 424 µg/L | RP exists | Monitoring with limitations (WQBEL) is required for consistency with the Hassayampa River TMDL. |

| Parameter | Lowest Standard / Designated Use | Maximum Reported Daily Value | No. of Samples | Estimated Maximum Value | RP Determination | Proposed Monitoring Requirement/ Rationale (1) |
|------------------|---|------------------------------|----------------|-------------------------|--|---|
| Chromium (Total) | 1,000 µg/L/ Agl | <10 µg/L | 5 | N/A | No RP | Monitoring required as an indicator parameter for Chromium VI. |
| Chromium VI | 11 µg/L/ A&Wc chronic | NA | NA | N/A | RP Indeterminate (No data) | Monitoring required and an assessment level is set. |
| Copper (2)(4) | 29.3 µg/L/ A&Wc chronic Waste Load Allocation 4 g/day (0.063 cfs flow) 150 µg/L/ 30-day average 300 µg/L/ Daily Maximum Technology-based limits (TBEL) 40 CFR, Part 440 | 921 µg/L | 11 | 2,670 µg/L | RP Exists | Monitoring with limitations (WQBEL) is required for consistency with the Hassayampa River TMDL. |
| Cyanide | 5.2 µg/L/ A&Wc chronic | NA | NA | N/A | Indeterminate (No data) | Monitoring is required and an assessment level is set. |
| Hardness | No applicable standard. Hardness is used to determine standards for specific metal parameters. | 475 | 10 | N/A | N/A | A&W standards for cadmium, chromium III, copper, lead, nickel, silver and zinc used for RP determinations were based on the hardness value of 400 mg/L, which is the maximum value that can be used. Monitoring for hardness is required whenever monitoring for hardness dependent metals is required. |
| Hydrogen Sulfide | 2.0 µg/L / A&Wc chronic | No data | NA | N/A | RP Indeterminate | Monitoring is required and an assessment level is set. |
| Iron | 1,000 µg/L / A&Wc chronic | No data | NA | N/A | RP Indeterminate (Limited Data) | Monitoring is required and an assessment level is set. |
| Lead (2) | 10.9 µg/L / A&Wc chronic 300 µg/L /30-day average 600 µg/L/ Daily maximum Technology-based limits (TBEL) 40 CFR, Part 440 | 12.1 µg/L | 5 | N/A | RP Exists | Monitoring is required and a WQBEL is set. |
| Manganese | 10,000 µg/L / Agl | No data | N/A | N/A | RP Indeterminate (No data) | Monitoring is required and an assessment level is set. |
| Mercury | 0.01 µg/L/ A&Wc chronic 1 µg/L / 30-day average 2 µg/L / Daily maximum Technology-based limits (TBEL) 40 CFR, Part 440 | <2 µg/L | 7 | N/A | RP is Indeterminate [High Limit of Quantitation (LOQ)] | Monitoring is required a TBEL is set. The permittee is required to use a low-level mercury analytical method to achieve a reporting limit below the A&Wc standard. |
| Nickel (2) | 168 µg/L/ A&Wc chronic | No data | N/A | N/A | RP Indeterminate (No data) | Monitoring is required and an assessment level is set. |

| Parameter | Lowest Standard / Designated Use | | Maximum Reported Daily Value | No. of Samples | Estimated Maximum Value | RP Determination | Proposed Monitoring Requirement/ Rationale (1) |
|-------------------------------|--|--------------------------------------|------------------------------|----------------|-------------------------|-----------------------------|---|
| Selenium | 2 µg/L/ A&Wc chronic | | <10 µg/L | 5 | N/A | RP Indeterminate (High LOQ) | Monitoring is required and an assessment level is set. |
| Silver (2) | 35.0 µg/L/ A&Wc acute | | <8 µg/L | 7 | N/A | RP Indeterminate (High LOQ) | Monitoring is required and an assessment level is set. |
| Sulfides | No applicable standards | | N/A | N/A | N/A | N/A | Monitoring is required as an indicator for hydrogen sulfide. |
| Thallium | 7.2 µg/L/ FC | | No data | N/A | N/A | RP Indeterminate (No data) | Monitoring is required and an assessment level is set. |
| Zinc (2)(4) | 379 µg/L/ A&Wc acute and chronic 750 µg/L / 30-day average 1500 µg/L / Daily maximum Technology-based limits (TBEL) 40 CFR, Part 440 | | 7,300 µg/L | 12 | 20,000 µg/L | RP Exists | Monitoring with limitations (WQBEL) is required for consistency with the Hassayampa River TMDL. |
| Whole Effluent Toxicity (WET) | No toxicity (A.A.C. R18-11-108(A)(6)) | Pseudo-kirchneriella subcapitata (3) | No data | N/A | N/A | RP Indeterminate (No data) | Monitoring required and an action level is set |
| | | Pimephales promelas | No data | N/A | N/A | RP Indeterminate (No data) | Monitoring required and an action level is set. |
| | | Ceriodaphnia dubia | No data | N/A | N/A | RP Indeterminate (No data) | Monitoring required and an action level is set. |
| Radioactivity | No applicable standards | Alpha, Total | No data | N/A | N/A | No RP | Monitoring is not required. |
| | | Beta, Total | No data | N/A | N/A | No RP | Monitoring is not required. |
| | | Radium, Total | No data | N/A | N/A | No RP | Monitoring is not required. |
| | | Radium 226, Total | No data | N/A | N/A | No RP | Monitoring is not required. |

Footnotes:

- (1) The monitoring frequencies are as specified in the permit.
- (2) Hardness-dependent metal - the standard is for this parameter is based on the average hardness value of the receiving water as indicated above.
- (3) Formerly known as *Selenastrum capricornutum* or *Raphidocelis subcapitata*.
- (4) The permit limit is consistent with the Hassayampa River TMDL.

VII. NARRATIVE WATER QUALITY STANDARDS

All narrative limitations in A.A.C. R18-11-108 that are applicable to the receiving water are included in Part I, Sections E and F of the draft permit.

VIII. MONITORING AND REPORTING REQUIREMENTS (Part II of Permit)

Section 308 of the Clean Water Act and 40 CFR Part 122.44(i) require that monitoring be included in permits to determine compliance with effluent limitations. Additionally, monitoring may be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality.

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Monitoring frequencies for some parameters may be reduced in subsequent permits if all monitoring requirements have been met and the limits or ALs for those parameters have not been exceeded during the first permit term.

For the purposes of this permit, an "8-hour composite" sample has been defined as a flow-proportioned mixture of two or more discrete samples (aliquots) obtained at equal time intervals over an 8-hour period (if only two samples are collected, they should be taken approximately 8 hours apart). The volume of each aliquot shall be directly proportional to the discharge flow rate at the time of sampling.

These criteria for composite sampling are included in order to obtain samples that are representative of the discharge given the potential variability in the duration, frequency and magnitude of discharges from this facility.

Discrete (i.e., grab) samples are specified in the permit for parameters that for varying reasons are not amenable to compositing.

Monitoring locations are specified in the permit (Part I.A) in order to ensure that representative samples of the effluent are consistently obtained.

The requirements in the permit pertaining to Part II, Monitoring and Reporting, are included to ensure that the monitoring data submitted under this permit is accurate in accordance with 40 CFR 122.41(e). The permittee has the responsibility to determine that all data collected for purposes of this permit meet the requirements specified in this permit and is collected, analyzed, and properly reported to ADEQ.

The permit (Part II.A.3) requires the permittee to keep a Quality Assurance (QA) manual at the facility, describing sample collection and analysis processes; the required elements of the QA manual are outlined.

Reporting requirements for monitoring results are detailed in Part II, Section B of the permit, including completion and submittal of Discharge Monitoring Reports (DMRs) and AZPDES Flow Record forms. The permittee is responsible for conducting all required monitoring and reporting the results to ADEQ on DMRs or as otherwise specified in the permit.

Electronic reporting

The US EPA has published a final regulation that requires electronic reporting and sharing of Clean Water Act National Pollutant Discharge Elimination System (NPDES) program information instead of the current paper-based reporting (Federal Register, Vol. 80, No. 204, October 22, 2015). Beginning December 21, 2016 (one year after the effective date of the regulation), the Federal rule required permittees to make electronic submittals of any monitoring reports and forms called for in their permits. ADEQ has created an online portal called myDEQ that allows users to submit their discharge monitoring reports and other applicable reports required in the permit.

Requirements for retention of monitoring records are detailed in Part II.C.3 of the permit.

X. SPECIAL CONDITIONS (Part IV in Permit)

Best Management Practices

Requirements to develop and implement an Operation and Maintenance Plan have been included to ensure the constructed wetlands are properly operated and maintained to effectively treat the acid discharge. The plan is required to include start up procedures, establish operational parameters, and routine inspection procedures. The permittee is required to report annually summarizing their compliance with the best management practices.

Design and Construction of Treatment Facility

The Permittee shall execute a plan to design and construct a treatment facility and appurtenances needed to treat the acid mine drainage from the Senator Mine Adit.

Ambient Surface Water Monitoring

The regulations under 40 CFR 122.43(a) state that:

"(a) In addition to conditions required in all permits (122.41 and 122.42), the Director shall establish conditions, as required on a case-by-case basis, to provide for and assure compliance with all applicable requirements of CWA and regulations."

Monitoring and reporting at specified locations upstream and downstream of the outfall is required quarterly for cadmium, copper, and zinc. ADEQ considers the upgrades to which the facility has committed to constitute a good faith demonstration of intent to protect the stream quality to the maximum extent practicable for an existing facility. However, until the upgrades have been completed and until all data from the ambient monitoring have been collected, a complete assessment of the discharge's impact on the stream cannot be made.

Permit Reopener

This permit may be modified based on newly available information; to add conditions or limits to address demonstrated effluent toxicity; to implement any EPA-approved new Arizona water quality standard; or to re-evaluate reasonable potential (RP), if assessment levels in this permit are exceeded [A.A.C. R18-9-B906 and 40 CFR Part 122.62 (a) and (b)].

XI. ANTIDegradation

Antidegradation rules have been established under A.A.C. R18-11-107 to ensure that existing surface water quality is maintained and protected. The discharge from the Senator Mine Adit will be to a water that is listed on the 303(d) list for the pollutant that resulted in the listing, which receives Tier I antidegradation protection.

Effluent quality limitations and monitoring requirements have been established under the proposed permit to ensure that the discharge will meet the applicable water quality standards in the receiving water, and are consistent with the waste load allocations in the TMDL which was approved by the EPA in 2002. As long as the permittee maintains consistent compliance with these provisions, the designated uses of the receiving water will be presumed protected, and the facility will be deemed to meet currently applicable antidegradation requirements under A.A.C. R18-11-107.

XII. STANDARD CONDITIONS

Conditions applicable to all NPDES permits in accordance with 40 CFR, Part 122 are attached as an appendix to this permit.

XIII. ADMINISTRATIVE INFORMATION

Public Notice (A.A.C. R18-9-A907)

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft AZPDES permit or other significant action with respect to an AZPDES permit or application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit. This permit will be public noticed in a local newspaper after a pre-notice review by the applicant and other affected agencies.

Public Comment Period (A.A.C. R18-9-A908)

Rules require that permits be public noticed in a newspaper of general circulation within the area affected by the facility or activity and provide a minimum of 30 calendar days for interested parties to respond in writing to ADEQ. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

Public Hearing (A.A.C. R18-9-A908(B))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

EPA Review (A.A.C. R18-9-A908(C))

A copy of this draft permit and any revisions made to this draft as a result of public comments received will be sent to EPA Region 9 for review. If EPA objects to a provision of the draft, ADEQ will not issue the permit until the objection is resolved.

XIV. ADDITIONAL INFORMATION

Additional information relating to this proposed permit may be obtained from:

Arizona Department of Environmental Quality
Water Quality Division – Surface Water Permits Unit
Attn: Mindi Cross, Permit Writer
1110 West Washington Street
Phoenix, Arizona 85007

Or by contacting Mindi Cross at (602) 771 – 2209 or by e-mail at cross.mindi@azdeq.gov.

XV. INFORMATION SOURCES

While developing effluent limitations, monitoring requirements, and special conditions for the draft permit, the following information sources were used:

1. AZPDES Permit Application Form(s) 1, 2D, 2D-Addendum, and Senator Mine AZPDES Application Addendum received July 16, 2021, and revisions on August 3, 2021, along with supporting data, facility diagram, and maps submitted by the applicant with the application forms.
2. ADEQ files on the Senator Mine.
3. ADEQ Geographic Information System (GIS) Web site
4. Arizona Administrative Code (AAC) Title 18, Chapter 11, Article 1, *Water Quality Standards for Surface Waters*, adopted December 31, 2016.
5. A.A.C. Title 18, Chapter 9, Article 9. *Arizona Pollutant Discharge Elimination System* rules.
6. Code of Federal Regulations (CFR) Title 40:
 - . Part 122, *EPA Administered Permit Programs: The National Pollutant Discharge Elimination System*.
 - . Part 124, *Procedures for Decision Making*.
 - . Part 133. *Secondary Treatment Regulation*.
 - . Part 503. *Standards for the Use or Disposal of Sewage Sludge*.
7. EPA Technical Support Document for Water Quality-based Toxics Control dated March 1991.
8. *Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs*, US EPA, May 31, 1996.
9. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA /821-R-02-013).
10. U.S. EPA NPDES Permit Writers' Manual, September 2010.
11. TMDLs for Cadmium, Copper, and Zinc in the Hassayampa River HUC# 15070103-007.
14. *Constructed Wetlands Treatment of Municipal Wastewaters*, U.S. EPA, September 2000.
15. *A Handbook of Constructed Wetlands. A guide to creating wetlands for agricultural wastewater, domestic wastewater, coal mine drainage, stormwater in the Mid-Atlantic Region*, Volume 1, U.S. EPA Region III and USDA Natural Resources. n.d.