MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Water Protection Bureau
P.O. Box 200901
Helena, MT 59620-0901

Permit Fact Sheet
Montana Ground Water Pollution Control System (MGWPCS)

Permittee:	The O.T. Mining Corporation
Permit Number:	MTX000014
Facility Name:	O.T. Mining – Basin Mill
Facility Location:	Latitude: 46.27111º; Longitude: -112.256419 Section 17, Township 06 North, Range 05 West Jefferson County
Facility Contact:	Rosemary Christensen
Receiving Water:	Class I Ground Water
Number of Impoundments:	One
Impoundment Type:	Basin Mill Tailings Impoundment – Tailings Settling

I. PERMIT STATUS AND CHANGES

The following fact sheet outlines the basis for renewing an existing MGWPCS wastewater discharge permit to The O.T. Mining Corporation (permittee) for the O.T. Mining Basin Mill located near Basin. The MGWPCS permit application and supplemental materials provide the information that serves as the basis for maintaining monitoring requirements and special conditions as outlined within this fact sheet. The scope of this permitting action is for the operation and maintenance of the tailings disposal system.

The Montana Ground Water Pollution Control System (MGWPCS) permit was first issued to Medallion Minerals, Inc. in November 1983. The permit soon reflected new ownership with Cumberland Mining and finally O.T. Mining Corporation (April 28, 1988). The permit was renewed in July 1989, January 1995, April 2001, and October 2009. DEQ received a permit renewal application on November 03, 2014.

The permittee does not have authorization to discharge storm water.

Specific to the Basin Mill site, the permittee does not hold a license or approval under the Montana Metal Mine Reclamation Act (MMRA) because it was in existence prior to promulgation of the law. The permittee does maintain a MMRA Small Miner Exclusion (SME) for its Columbia Patented Lode claims (#51-180), and a MMRA Exploration License (#00371) for the Kit Carson/Ruby Mine project.

Permit Changes

DEQ has updated the ground water compliance limits to reflect the most recent Montana Numeric Water Quality Standards Circular document (DEQ-7).

DEQ has updated the existing reclamation conditions (Section VI) to reflect current site conditions.

DEQ is reinstating the following conditions found within the 1983 and 1995 permits:

- The prohibition of cyanide products and cyanide treated tailings; and,
- The prevention of surface runoff from or through the mill site.

DEQ has recognized that the current reporting methods required in the 2009 permit do not fully or readily disclose monitoring and facility information. Therefore DEQ will restructure the method in which information is recorded and submitted to improve public information availability within the administrative record. The following areas may be impacted:

- Facility Operational Monitoring
- Erosion Mitigation
- Ground Water Monitoring

In addition, metal parameters will now be reported in micrograms per liter (µg/L). These permit conditions are further discussed in Section IV.

A recent onsite visit by DEQ (DEQ, 2017) documented instability within the tailings impoundment berm (inside embankment). In order to prevent unauthorized discharge or placement of tails slurry, the permittee must submit a report documenting the structural

integrity of the impoundment prior to: commencement of facility milling operations; placement of wastes within the impoundment; or discharge of wastewater into the impoundment. The submitted report must document any reconstruction efforts. The report must be certified by a professional engineer (or similar).

II. FACILITY INFORMATION

A. Mining District

The Basin mining district, also known as the Jefferson district, is primarily underlain by quartz monzonite of the Boulder batholith. The monzonite formations are cut by dikes of dacite and rhyolite. The district contains both placer and load ore deposits, the lode deposits being of late Cretaceous and Tertiary ages (DEQ, AMR website). The older lodes are valued for their silver, lead, and zinc content, while the younger lodes are valued for their gold and silver content (Sahinen, 1935).

Nearby gold deposits were reported to have been located as early as the summer of 1862 with extensive mining and milling occurring in the area into the late 1950's. The adjacent town of Basin reached a population of 1,500 persons in 1905.

B. Facility and Operations

The present day O.T. Mill was constructed in 1950. The compound includes a mill, tailings impoundment, and support structures (office and garage). The entire complex encompasses approximately 19 acres (Figure 1). The mill site is bounded by the town of Basin (to the west) and Interstate 15 (to the south). The entrance to the mill is located off of Cataract Creek Rd. (Figure 2). The mill has not been in operation since 1989.

The area is located within the Basin Mining Area Superfund Site, which consists of two operable units. The mill is located in the Town of Basin Operable Unit (OU) number 1. The Basin Mill was not one of the sites remediated in the OU1 efforts (EPA, 2001).

Basin Mill is used for ore mined from small hard rock mining operations. The mill utilizes crushing, grinding, and froth floatation to produce a concentrate from ore (Figure 3). The process results in the generation of tailings. This technique, first used in Montana in 1911, is commonly used for the recovery and upgrading of sulfide ores. The mill has a capacity of approximately 150 tons a day and can target trace metals such as lead, silver, copper, and gold. The mill is placed in operational shut-down when ore is unavailable. Cyanide has never been approved for use at this site.

A representative of the company provided an estimated wastewater discharge flow rate during a November 2006 MGWPCS compliance inspection. The estimated tails slurry production is 72,000 gallons per day (gpd), assuming 100 tons per day processed ore and 30% solids.

A letter dated November 30, 2000 from the permittee states that it may mill ore from its Ruby mine (located approximately 15 miles from the mill site) and/or ore from gold-silver-lead mines in the Basin area.

In 2010, DEQ excavated and hauled on-site waste rock piles to the Luttrell Repository (EPA, 2013).

C. Tailings Impoundments

The tailings impoundment is located adjacent to the mill building. The impoundment is oval shaped and approximately 390 by 185 feet.

The tailings impoundment is underlain by colluvium, trending with increasing depth from grus (weathered intrusive rock) to intrusive rock. The depth to top contact of the shallow water bearing unit below the tailings impoundment is approximately 55 to 62 feet in depth. Additional information is provided below.

The tailings impoundment is located on a bench approximately 50 feet above the Boulder River Valley. The river is located approximately 1,050 feet to the southeast.

The area in between the tailings impoundment and the Boulder River was historically used to dispose of tailings from the Katie/Jib Mill. It was also the location of the historic Atwater Mill which reworked these valley bottom tailings. The Town of Basin's domestic wastewater treatment system is also located in this area.

Table 1: Disposal and Impoundment System Summary

Tailings Impoundment
Location: South 1/2 of Section 17, Township 06 North, Range 05 West Latitude: 46.27106º; Longitude: -112.25533º Jefferson County
Contributing Sources: Tailing slurry from the mill. A typical daily operation may result in the production of approximately 72,000 gallons of slurry/day. Standard Industrial Code (SIC) of contributing sources: 1041: Gold Ore (milling) 1044: Silver Ore (milling) 1021: Copper Ore (milling)

D. Tailings Slurry Quality

The 2009 permit did not require slurry quality sampling. The mill has not been in operation since 1989, therefore slurry quality characteristics are currently unavailable.

The 2001 EPA Record of Decision (EPA, 2001) states that all mine wastes exceeding 800 mg/kg lead and/or 96 mg/kg arsenic should be removed and disposed of in an approved repository.

E. Ground Water Monitoring Wells

Three shallow monitoring wells were installed in the 1980's. The original West Well was deemed to be non-viable and was replaced in 2010. Well information and representation is summarized in the below table. The location and representation of all three have been summarized in the table below and are shown within Figure 2. Well construction diagrams, borehole lithologic logs, sampling operational procedures, and the West Well installation report can be found in Appendix II.

All three monitoring wells were required to be monitored over the previous permit cycle. Samples were collected from 2010 through 2015. The associated monitoring and sampling information has been summarized and provided within Appendix I. The permittee failed to report ground water samples during the 2016 calendar year (DEQ, 2017). DEQ will maintain monthly monitoring when the mill is in operation, and annual monitoring during periods of shutdown. The current site Ground Water Monitoring Standard Operating Procedures (SOP) and Sampling and Analysis Plan (SAP) is enclosed within Appendix III.

During a 1984 milling event, DEQ was able to establish a direct hydrological connection between the tailings impoundment and downgradient ground water. DEQ believes that the middle and east monitoring wells are located where tailings impoundment seepage can be detected.

Recent static water levels collected from the monitoring wells indicate that shallow ground water in the vicinity of the impoundment is flowing to the south-east (S40°E).

Table 2: Monitoring Well Summary
Monitoring Well: East Well (MW-1) Additional Well Log Report Identifiers: Well #2, North Well, MW1-A.
MBMG GWIC #: Not Registered
Status: Constructed on November 13, 1983.
Location: Located approximately 120 feet downgradient from the inside embankment of the tailings impoundment (Figure 2). Latitude: 46.27135º North Longitude: 112.25434º West
Representation: Downgradient ground water quality of the shallow water bearing zone found below the eastern portion of the tailings impoundment. The well is constructed to represent ground water found within colluvium and weathered intrusive rock (grus) which trends in depth to intrusive rock (dark grey to black fine grained). The well is perforated from 55 to 75 feet in depth. Reported static-water levels show an average of 61.9 feet in depth. The permittee has not reported a dry well (no water) event.
Monitoring Well: Middle Well (MW-2) Additional Well Log Report Identifiers: Well #1, South Well, MW2-A.
MBMG GWIC #: Not Registered
Status: Constructed on November 13, 1983.
Location: Located approximately 80 feet downgradient from the inside embankment of the tailings impoundment (Figure 2). Latitude: 46.27094º North Longitude: 112.25460º West
Representation: Downgradient ground water quality of the shallow water bearing zone found below the southeastern portion of the tailings impoundment. The well is constructed to represent ground water found within colluvium and weathered intrusive rock (grus) which trends in depth to intrusive rock (dark grey to black fine grained). The well is perforated from 52 to 152 feet in depth. Reported static-water levels shown an average of 55.5 feet in depth. The permittee has not reported a dry well (no water) event.
Monitoring Well: West Well (MW-3) Additional Well Log Report Identifiers: Well #3, Southwest Well, MW3-A.
MBMG GWIC #: Not Registered
Status: Constructed on September 29, 2010. Replaced the original non-viable well which was located 30 feet to the east of the new well (Appendix II).
Location: Located approximately 75 feet downgradient from the inside embankment of the tailings impoundment (Figure 2). Latitude: 46.27059º North Longitude: 112.25584º West
Representation: Ground water quality of the shallow water bearing zone found below the southwestern portion of the tailings impoundment. The well is constructed to represent ground water found within colluvium and weathered intrusive rock (grus) which trends in depth to intrusive rock (dark grey to black fine grained). The well is perforated from 69 to 99 feet in depth with the top contact of the sand pack occurring at 63 feet. Reported static-water levels shown an average of 60.7 feet in depth. The permittee has not reported a dry well (no water) event.

III. MIXING ZONE

The Montana Water Quality Act (75-5-103, Montana Code Annotated (MCA)) states that a mixing zone is an area of the receiving water, established in a permit, where the water quality standards may be exceeded. A mixing zone was authorized by DEQ in 2009. The mixing zone terminates at the extent of each monitoring well. Mixing zone information has been summarized below.

Table 3: Mixing Zone Information - Outfall 001

Parameter	Units	Value
Mixing Zone Type	-	Department Modified
Authorized Parameters	-	Parameters listed in Section V (GW compliance limits)
Ambient Ground Water Concentrations	mg/L	Appendix I (GW quality summary)
Ground Water Flow Direction	azimuth/bearing	S40°E
The mixing zone is 15 feet in depth. The mixing zone terminates at the extent of the three monitoring wells located 75 to 120 feet from the inside edge of the tailings embankment (Table 2). Ground water human health standards may be exceeded under the impoundment and within the mixing zone. However, all ground water compliance limits must be meet at each monitoring well (Section V).		

IV.MONITORING, REPORTING, AND MITIGATION

Operational and ground water monitoring and reporting will be required as a condition of this permit. These requirements and their respective rationale are summarized below and are further discussed in Appendix V.

DEQ will also require the development of mitigation plans to suffice compliance with existing special and standard permit conditions. These conditions are also discussed in Appendix V.

Table 4: Monitoring and Reporting Summary

Action	Reference	Monitoring Frequency	Reporting
Facility Operational Monitoring	Appendix V.A.	Daily	Annual Report and Permit Cycle Report
Erosion Monitoring and Mitigation	Appendix V.B.	TBD within the Mitigation Plan	Submit Mitigation Plan in addendum to the Monitoring Annual Report
Ground Water Monitoring	Appendix V.C.	Monthly	Annual Report with SOP/SAP plan, and Permit Cycle Report

V.GROUNDWATER COMPLIANCE LIMITS AND CONTINGENCY MEASURES

In 2009, DEQ established ground water compliance limits at all three monitoring wells. The limits listed are ground water human health standards (DEQ Circular 7) for metals commonly found when milling hard rock ore. In addition, DEQ also established limits for the pH and Specific Conductivity parameters in order to maintain the beneficial uses of state ground waters which are further discussed in Appendix IV. The ground water compliance limits are listed below.

Table 5: Ground Water Compliance Limits

Parameter	Units	Daily Maximum Limit(1)	Rationale
pH	s.u.	6.0-9.0	Protection of Beneficial Uses
Specific conductivity @ 25°C	µS/cm	1,000	Protection of Beneficial Uses
Nitrogen, Nitrite + Nitrate total [as N]	mg/L	10.0	Protection of Beneficial Uses
Antimony, dissolved [as Sb]	µg/L	6.0	Protection of Beneficial Uses
Arsenic, dissolved [as As]	µg/L	10.0	Protection of Beneficial Uses
Beryllium, dissolved [as Be]	µg/L	4.0	Protection of Beneficial Uses
Cadmium, dissolved [as Cd]	µg/L	5.0	Protection of Beneficial Uses
Chromium, dissolved [as Cr]	µg/L	100	Protection of Beneficial Uses
Copper, dissolved [as Cu]	µg/L	1,300	Protection of Beneficial Uses
Lead, dissolved [as Pb]	µg/L	15.0	Protection of Beneficial Uses
Mercury, dissolved [as Hg]	µg/L	2.00	Protection of Beneficial Uses
Nickel, dissolved [as Ni]	µg/L	100	Protection of Beneficial Uses
Selenium, dissolved [as Se]	µg/L	50	Protection of Beneficial Uses
Silver, dissolved [as Ag]	µg/L	100	Protection of Beneficial Uses
Thallium, dissolved [as Tl]	µg/L	2.0	Protection of Beneficial Uses
Zinc, dissolved [as Zn]	µg/L	2,000	Protection of Beneficial Uses

Footnotes:

s.u. = standard units

(1) pH has a daily minimum and a daily maximum limit.

In 2009, DEQ established contingency measures to be taken when the ground water compliance limits are exceeded. They are as follows:

If a ground water quality sample result exceeds a value given in Table 5, the permittee is required to re-sample the well(s) within 72 hours of receiving laboratory results and notify the Department within 24 hours of receiving the results of the conformational sampling.

Based on the re-sample results, the Department may direct the permittee to implement one or more contingency measures. Said measures could include, but are not necessarily limited to:

- In coordination with the Department, review water quality trends, discharge data, and other site activities to identify the probable cause and extent of the water quality changes;
- Increase sampling (frequency and/or constituents);
- Installation of additional ground water monitoring wells, including upgradient wells;
- Installation of additional treatment to the tailings slurry and/or other wastewater streams used during milling prior to wastewater disposal to lower the exceeded parameter concentration(s);
- Suspension of all milling operations until the cause of the exceedance(s) has been determined, remediation measures taken, and/or measures implemented to prevent a reoccurrence;
- Supply drinking water to residences, business and irrigation districts located downgradient of mill site; and/or
- Implement other measures as determined by the Department, which may include invoking reopener provisions set forth in Part IV. Section O of the renewed permit.

DEQ did not establish effluent discharge limits within the 2009 permit (DEQ, 2009). DEQ recognizes the infeasibility of being able to monitor the quality of the wastewater discharged from the tailings impoundment. The actual effluent quality cannot be determined because, once the tailings and wastewater are discharged into the tailings impoundment, geochemical processes occur as the wastewater migrates through the tailings and into the underlying shallow ground water.

VI.RECLAMATION, STORM WATER, AND OTHER

The permit will maintain existing reclamation and storm water requirements. These permit conditions are based on the status of the facility being either pre-cessation or post-cessation, with cessation being defined by:

- The termination of operations;
- The abandonment of the facility; or,
- When the permittee's business status with the Office of the Montana Secretary of State becomes inactive (or similar).

Pre-cessation requirements are currently in effect. They are included within the Erosion Monitoring and Mitigation Plan requirements located in Appendix V.

Post-cessation reclamation requirements are listed below.

- All topsoil must be salvaged from disturbed areas and stockpiled for use during reclamation.
- All areas impacted by ore, wasterock, tailings, sedimentation, or similar must be reclaimed to promote positive runoff. The areas must be covered with a minimum of two (2) feet of soil material and revegetated. The permittee may request a change in this requirement if it can be documented by a qualified soil scientist and supported with data processed by a qualified laboratory. Post reclamation monitoring must verify that the entire site meets state and federal soil standards for human health and environmental protection.
- The reclaimed areas must be reseeded, stabilized, and irrigated, if necessary, upon the request of the Department. Noxious weeds must be controlled prior to and after reclamation efforts. The Department may release the permittee from this reclamation monitoring responsibility at an earlier date upon review of the reclamation success.
- Reclamation and ground water must be monitored and a report submitted yearly to the Department for a period of two years following cessation of operations. The report must be submitted in writing for each calendar year and must be received by the Department no later than March 15th of the year following the report period. Responsibility for reclamation success must remain with the company until such time that the Department agrees in writing that the reclamation is complete.

VII.NONSIGNIFICANT DETERMINATION

DEQ has determined that the activity is not considered to be a new or increased source resulting in a change of existing water quality occurring on or after April 29, 1993 (DEQ, 2009). DEQ therefore has not performed a significance determination. The applicable beneficial uses for Class I ground water are summarized in Appendix V. This permit includes monitoring, mitigation, reporting, and corrective action requirements.

VIII.PUBLIC NOTICE

Legal notice information for water quality discharge permits are listed at the following website: http://deq.mt.gov/Public/notices/wqnotices. Public comments on this proposal are invited any time prior to close of business on **September 27, 2017**. Comments may be directed to:

DEQWPBPublicComments@mt.gov

or at:

Water Protection Bureau
PO Box 200901
Helena, MT 59620

All comments received or postmarked prior to the close of the public comment period will be considered in the formulation of the final permit. DEQ will respond to all substantive comments pertinent to this permitting action and may issue a final decision within thirty days of the close of the public comment period.

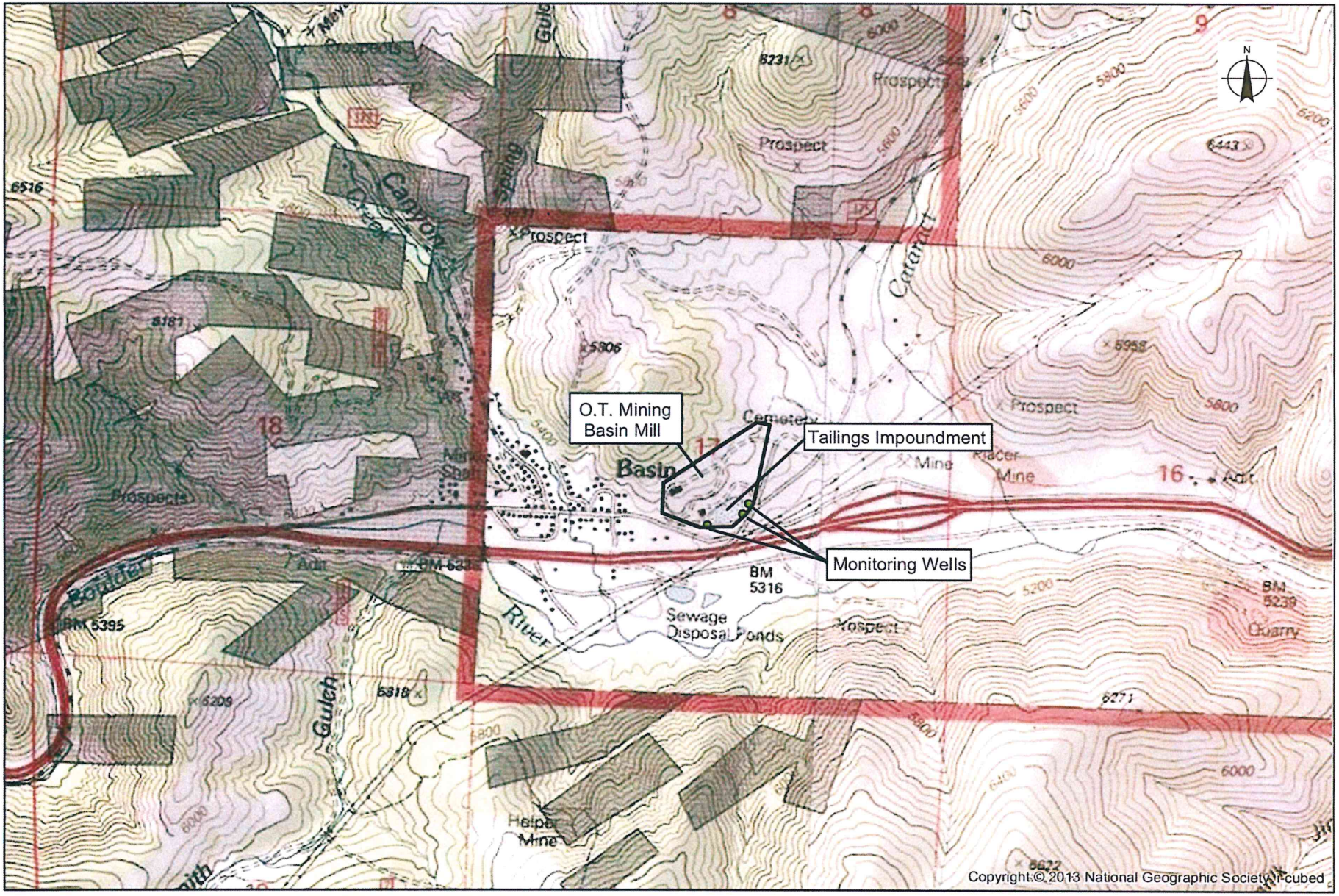
All persons, including the applicant, who believe any condition of the draft permit is inappropriate, or that DEQ's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, shall raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period (including any public hearing). All public comments received for this draft permit will be included in the administrative record and will be available for public viewing during normal business hours.

Copies of the public notice were mailed to the applicant, state and federal agencies and interested persons who have expressed interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this draft permit. Electronic copies of the public notice, draft permit, fact sheet, and draft environmental assessment are available at the following website: http://deq.mt.gov/Public/notices/wqnotices.

Any person interested in being placed on the mailing list for information regarding this permit may contact the DEQ Water Protection Bureau at (406) 444-3080 or email DEQWPBPublicComments@mt.gov. All inquiries will need to reference the permit number (MTX000014), and include the following information: name, address, and phone number.

During the public comment period provided by the notice, DEQ will accept requests for a public hearing. A request for a public hearing must be in writing and must state the nature of the issue proposed to be raised in the hearing.

FIGURE 1 – Vicinity Map



O.T. MINING CORPORATION
MGWPCS PERMIT RENEWAL

Figure E-1
Vicinity Topographic Map

K:\PROJECT\6003\WELL MAP.MXD

Hydrometrics, Inc.
Consulting Scientists and Engineers

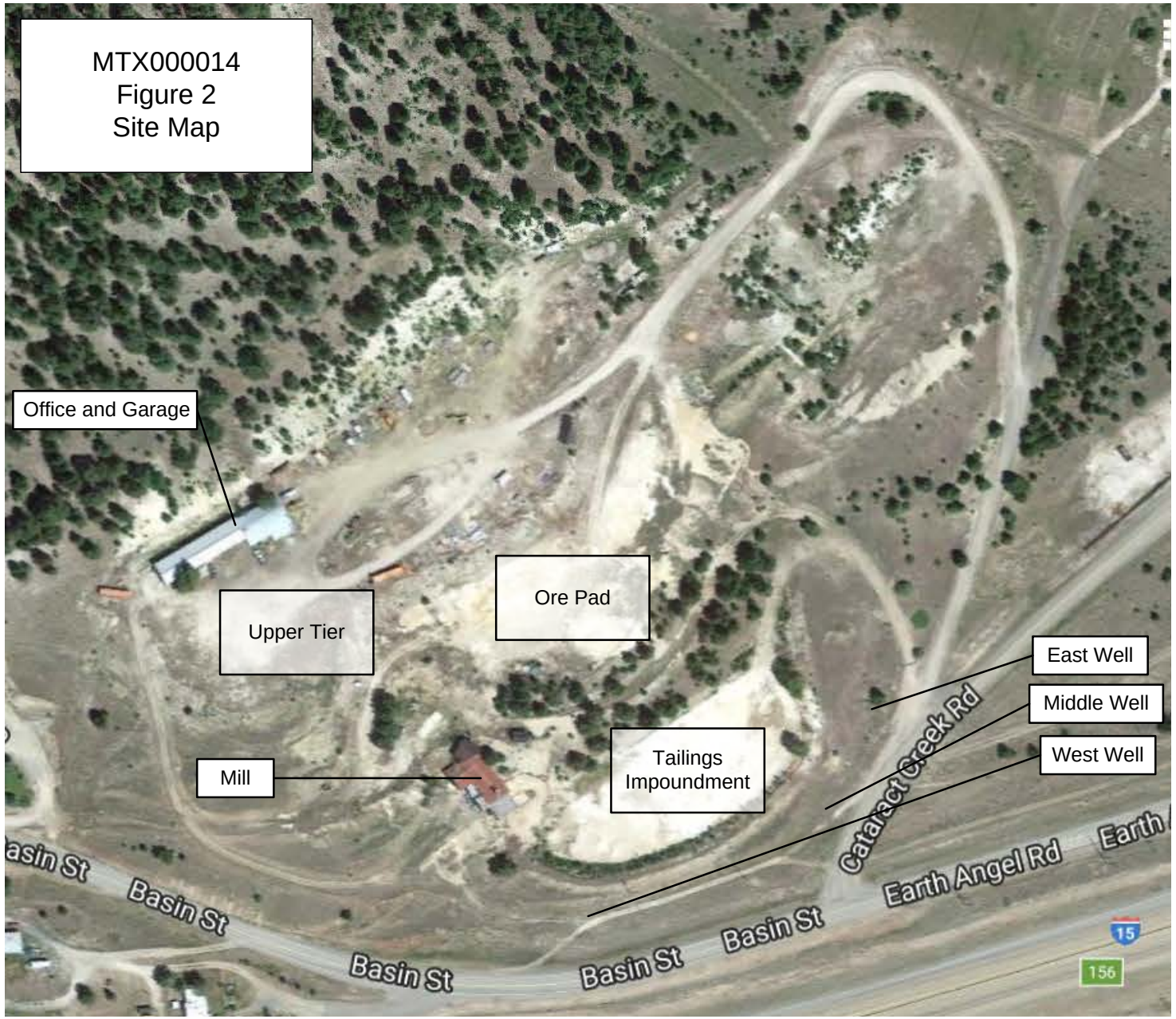
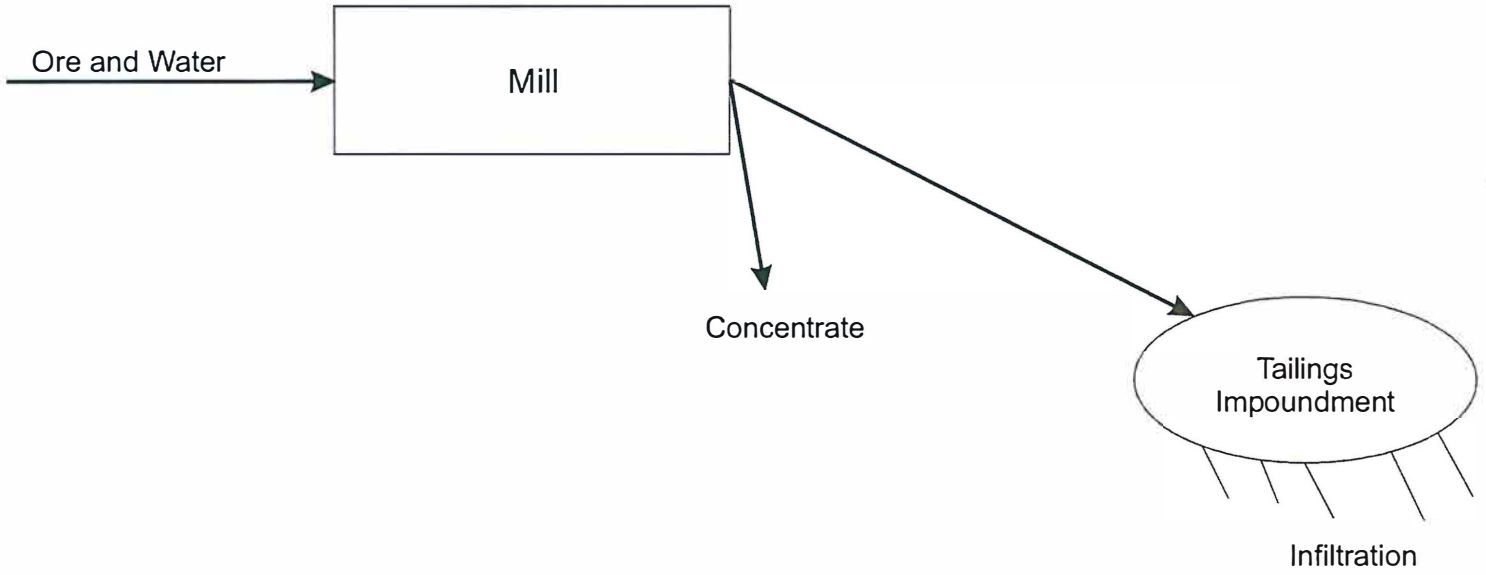

MTX000014
Figure 2
Site Map
Office and Garage
Upper Tier
Ore Pad
East Well
Middle Well
West Well
Mill
Tailings
Impoundment
Cataract Creek Rd
Earth Angel Rd
Basin St
Basin St
Basin St
Basin St
Basin St
15
156

FIGURE 3 – Process Flow Diagram



O.T. MINING CORPORATION
MGWPCS PERMIT RENEWAL

Figure F-1
Process Flow Diagram

APPENDIX I – GROUND WATER QUALITY SUMMARY

Ground Water Monitoring Results

Monitor Source[1]	Representation	Parameter	Units	Reported Minimum Value[2]	Reported Average Value	Reported Maximum[3] Value	Monitor and Sample Freq (Continuous)	Source of Data
East Well	Downgradient ground water quality of the shallow water bearing zone found below the eastern portion of the tailings impoundment.	The permittee has reported 6 annual samples over the POR. The mill was not in operation during this POR. There were no reported dry well (no water) events.						
		pH	s.u.	6.6	6.8	7.1	Annually	DMR
		Specific conductance	umho/cm	264	294	306	Annually	DMR
		Static water level	feet	59.80	61.94	62.90	Annually	DMR
		Antimony, dissolved [as Sb]	mg/L	<0.003	<0.003	<0.003	Annually	DMR
		Arsenic, dissolved [as As]	mg/L	<0.003	<0.003	<0.003	Annually	DMR
		Beryllium, dissolved [as Be]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Cadmium, dissolved [as Cd]	mg/L	0.00016	0.00021	0.00028	Annually	DMR
		Chromium, dissolved [as Cr]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Copper, dissolved [as Cu]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Iron, dissolved [as Fe]	mg/L	<0.05	0.13	0.32	Annually	DMR
		Lead, dissolved [as Pb]	mg/L	<0.0005	<0.0005	<0.0005	Annually	DMR
		Mercury, dissolved [as Hg]	mg/L	<0.00001	<0.00001	<0.00001	Annually	DMR
		Nickel, dissolved [as Ni]	mg/L	<0.010	<0.010	<0.010	Annually	DMR
		Nitrogen, Nitrite + Nitrate total [as N]	mg/L	0.68	0.85	1.16	Annually	DMR
		Nitrogen, Ammonia total [as N]	mg/L	<0.05	<0.05	<0.05	Annually	DMR
		Selenium, dissolved [as Se]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Silver, dissolved [as Ag]	mg/L	<0.0005	<0.0005	<0.0005	Annually	DMR
		Thallium, dissolved [as Tl]	mg/L	<0.0002	<0.0002	<0.0002	Annually	DMR
		Zinc, dissolved [as Zn]	mg/L	0.05	0.06	0.08	Annually	DMR
Monitor Source[1]	**Representation**	**Parameter**	**Units**	**Reported Minimum Value[2]**	**Reported Average Value**	**Reported Maximum[3] Value**	**Monitor and Sample Freq (Continuous)**	**Source of Data**
Middle Well	Downgradient ground water quality of the shallow water bearing zone found below the southeastern portion of the tailings impoundment.	The permittee has reported 6 annual samples over the POR. The mill was not in operation during this POR. There were no reported dry well (no water) events.						
		pH	s.u.	8.3	8.9	9.1	Annually	DMR
		Specific conductance	umho/cm	507	543	576	Annually	DMR
		Static water level	feet	54.40	55.54	59.05	Annually	DMR
		Antimony, dissolved [as Sb]	mg/L	<0.003	<0.003	<0.003	Annually	DMR
		Arsenic, dissolved [as As]	mg/L	<0.003	<0.003	<0.003	Annually	DMR
		Beryllium, dissolved [as Be]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Cadmium, dissolved [as Cd]	mg/L	<0.00008	<0.00008	<0.00008	Annually	DMR
		Chromium, dissolved [as Cr]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Copper, dissolved [as Cu]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Iron, dissolved [as Fe]	mg/L	0.07	0.11	0.15	Annually	DMR
		Lead, dissolved [as Pb]	mg/L	<0.0005	0.0008	0.0014	Annually	DMR
		Mercury, dissolved [as Hg]	mg/L	<0.00001	<0.00001	<0.00001	Annually	DMR
		Nickel, dissolved [as Ni]	mg/L	<0.010	<0.010	<0.010	Annually	DMR
		Nitrogen, Nitrite + Nitrate total [as N]	mg/L	<0.01	0.04	0.11	Annually	DMR
		Nitrogen, Ammonia total [as N]	mg/L	<0.05	<0.05	<0.05	Annually	DMR
		Selenium, dissolved [as Se]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Silver, dissolved [as Ag]	mg/L	<0.0005	<0.0005	<0.0005	Annually	DMR
		Thallium, dissolved [as Tl]	mg/L	<0.0002	<0.0002	<0.0002	Annually	DMR
		Zinc, dissolved [as Zn]	mg/L	<0.01	<0.01	<0.01	Annually	DMR

Monitor Source[1]	Representation	Parameter	Units	Reported Minimum Value[2]	Reported Average Value	Reported Maximum[3] Value	Monitor and Sample Freq (Continuous)	Source of Data
West Well	Ground water quality of the shallow water bearing zone found below the southwestern portion of the tailings impoundment.	The permittee has reported 6 annual samples over the POR. The mill was not in operation during this POR. There were no reported dry well (no water) events.						
		pH	s.u.	6.2	6.6	6.8	Annually	DMR
		Specific conductance	umho/cm	282	308	335	Annually	DMR
		Static water level	feet	59.14	60.68	62.15	Annually	DMR
		Antimony, dissolved [as Sb]	mg/L	<0.003	<0.003	<0.003	Annually	DMR
		Arsenic, dissolved [as As]	mg/L	<0.003	<0.003	<0.003	Annually	DMR
		Beryllium, dissolved [as Be]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Cadmium, dissolved [as Cd]	mg/L	0.00016	0.00023	0.00032	Annually	DMR
		Chromium, dissolved [as Cr]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Copper, dissolved [as Cu]	mg/L	<0.001	0.001	0.002	Annually	DMR
		Iron, dissolved [as Fe]	mg/L	0.05	0.08	0.11	Annually	DMR
		Lead, dissolved [as Pb]	mg/L	<0.0005	0.0014	0.0050	Annually	DMR
		Mercury, dissolved [as Hg]	mg/L	<0.00001	<0.00001	<0.00001	Annually	DMR
		Nickel, dissolved [as Ni]	mg/L	<0.010	<0.010	<0.010	Annually	DMR
		Nitrogen, Nitrite + Nitrate total [as N]	mg/L	0.68	0.85	1.12	Annually	DMR
		Nitrogen, Ammonia total [as N]	mg/L	<0.05	<0.05	<0.05	Annually	DMR
		Selenium, dissolved [as Se]	mg/L	<0.001	<0.001	<0.001	Annually	DMR
		Silver, dissolved [as Ag]	mg/L	<0.0005	<0.0005	<0.0005	Annually	DMR
		Thallium, dissolved [as Tl]	mg/L	<0.0002	<0.0002	<0.0002	Annually	DMR
		Zinc, dissolved [as Zn]	mg/L	0.05	0.09	0.12	Annually	DMR

Footnotes:

DMR = Self Reported Discharge Monitoring Reports

POR = Period of Record

Period of Record: 09/2010 through 12/2015.

s.u. = standard units

(1) Refer to Section II of the Fact Sheet for the existing location of the monitoring wells.

(2) Minimum value of all quarterly or annually reported average values.

(3) One sample per reporting period was common. Maximum of all reported values is listed for most parameters.

APPENDIX II – MONITORING WELL INSTALLATION REPORT AND WELL LOGS

Form No. 603 R2/81 (South) Well #1

Response: 3.m)

WELL LOG REPORT

RECEIVED
MAY 18 1989
MONTANA DEPT. OF HEALTH & ENV. SCIENCES
WATER QUALITY BUREAU

File No.

State law requires that this form be filed by the water well driller within 60 days after completion of the well.

1. WELL OWNER
Name Gladstone Construction Inc

2. CURRENT MAILING ADDRESS
1825 Gladstone
Butte MT 59701

3. WELL LOCATION
County JEFFERSON
Township ____ N/S Range ____ E/W
____ ¼ ____ ¼ ____ ¼ Section ____
Lot ____ Block ____
Subdivision ____

4. PROPOSED USE Domestic ☐ Stock ☐ Irrigation ☐
Other ☐ specify MONITORING well

5. DRILLING METHOD ____ cable, ____ bored,
X forward rotary, ____ reverse rotary, ____ jetted,
____ other (specify) ____

6. WELL CONSTRUCTION AND COMPLETION

Size of drilled hole	Size and weight of casing	From (feet)	To (feet)	Perforations X and/or Screens	Kind Size	From (feet)	To (feet)
	6 5/8 17#	0	71				
	160# PVC 4½"	52	152		¼x6" slots	52	152

Was casing left open end? X Yes ____ No
Was a packer or seal used? ____ Yes ____ No
If so, what material ____
Was the well gravel packed? ____ Yes ____ No
Was the well grouted? X Yes ____ No
To what depth? 15
Material used in grouting Slurry
Well head completion: Pitless adapter
____ Yes ____ No
Top of casing 12 in. or greater above grade
X Yes ____ No

7. WHAT IS THE TEMPERATURE OF THE WATER?
____ Degrees Fahrenheit
☐ Measured ☐ Estimated

8. WATER LEVEL
Static water level 90 feet below land surface
If flowing; closed-in pressure ____ psi
____ gpm
Controlled by: ____ valve, ____ reducers,
____ other, (specify) ____

9. WELL TEST DATA ____ pump ____ bailer
Air other, (specify) ____
Pumping level below land surface:
____ ft. after ____ hrs. pumping 1 Reading gpm
____ ft. after ____ hrs. pumping Final gpm

10. WAS WELL PLUGGED OR ABANDONED? ____ Yes X No
If yes, how? ____

11. DATE COMPLETED Nov 13 - 83

12. WELL LOG

Depth (ft.) From	To	Formation
0	68	Rock & gravel
68	95	clay
95	152	Red rock w/water

(use separate sheet if necessary)

13. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Dec 6-83
Date
H & L Drilling
Firm Name M.T. # — Box 301
Ph. 266-3035
Address Townsend, MT. 59644
Signature Harold Reich 334
License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION DNRC
32 SOUTH EWING HELENA, MONTANA 59620 449-3962

DEPARTMENT COPY
DRILLER: Please give this copy to the well owner to complete reverse side.
OWNER: Complete reverse side Form 603 and send to DNRC

Form No. 603 R2/81 (North) Well #2

Response: 3.m)

WELL LOG REPORT

File No. _____

State law requires that this form be filed by the water well driller within 60 days after completion of the well.

1. WELL OWNER
Name Gladstone Const. Inc

2. CURRENT MAILING ADDRESS
1823 Gladstone
Butte MT 59701

3. WELL LOCATION
County Jefferson
Township _____ N/S Range _____ E/W
_____ ¼ _____ ¼ _____ ¼ Section _____
Lot _____ Block _____
Subdivision _____

4. PROPOSED USE Domestic ☐ Stock ☐ Irrigation ☐
Other ☐ specify monitoring well

5. DRILLING METHOD _____ cable, _____ bored,
X forward rotary, _____ reverse rotary, _____ jetted,
_____ other (specify) _____

6. WELL CONSTRUCTION AND COMPLETION

Size of drilled hole	Size and weight of casing	From (feet)	To (feet)	Perforations X and/or Screen	Kind Size	From (feet)	To (feet)
7.5"	6 5/8 17.2	0	69				
	160# PVC 4½"	55	75		5/10's	55	75

Was casing left open end? X Yes ____ No
Was a packer or seal used? ____ Yes ____ No
If so, what material _____
Was the well gravel packed? ____ Yes ____ No
Was the well grouted? X Yes ____ No
To what depth? 15
Material used in grouting Slurry
Well head completion: Pitless adapter
____ Yes ____ No
Top of casing 12 in. or greater above grade
X Yes ____ No

7. WHAT IS THE TEMPERATURE OF THE WATER?
_____ Degrees Fahrenheit
☐ Measured ☐ Estimated

8. WATER LEVEL
Static water level 50 feet below land surface
If flowing; closed-in pressure _____ psi
_____ gpm
Controlled by: _____ valve, _____ reducers,
_____ other, (specify) _____

9. WELL TEST DATA _____ pump _____ bailer
Air other, (specify) _____
Pumping level below land surface:
70 ft. after _____ hrs. pumping 10 gpm
_____ ft. after _____ hrs. pumping _____ gpm

10. WAS WELL PLUGGED OR ABANDONED? ____ Yes X No
If yes, how? _____

11. DATE COMPLETED Nov 10-83

12. WELL LOG

Depth (ft.) From	To	Formation
0	67	Gravel & Clay
67	74	Clay
74	75	Gravel

(use separate sheet if necessary)

13. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Dec 6-83
Date
H & H Drilling
Firm Name
[redacted]
Address
Harold Hunt 334
Signature License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION DNRC
32 SOUTH EWING HELENA, MONTANA 59620 449-3962

DEPARTMENT COPY
DRILLER: Please give this copy to the well owner to complete reverse side.
OWNER: Complete reverse side Form 602 and send to DNRC.

Response: 3.m)

Form No. 603 R9/82

(South ●) Well #3

File No. _____

WELL LOG REPORT

State law requires that this form be filed by the water well driller within 60 days after completion of the well.

1. WELL OWNER
Name Medallion Minerals

2. CURRENT MAILING ADDRESS 1804 LAFAYette ST
Butte MT 59701

3. WELL LOCATION
County JEFFERSON
Township _____ N/S Range _____ E/W
_____ ¼ _____ ¼ _____ ¼ Section _____
Lot _____ Block _____
Subdivision _____

4. PROPOSED USE Domestic [ ] Stock [ ] Irrigation [ ]
Other [ ] specify MONITORING WELL

5. DRILLING METHOD _____ cable, _____ bored,
X forward rotary, _____ reverse rotary, _____ jetted,
_____ other (specify) _____

6. WELL CONSTRUCTION AND COMPLETION

Size of drilled hole	Size and weight of casing	From (feet)	To (feet)	Perforations / Screen Kind Size	From (feet)	To (feet)
"	6 5/8"	0	21.1'			
	4½" PVC 160#	1	75	⅛" x 6 Slots	55	75

Was casing left open end? X Yes ___ No
Was a packer or seal used? ___ Yes ___ No
If so, what material _____
Was the well gravel packed? ___ Yes ___ No
Was the well grouted? X Yes ___ No
To what depth? 20
Material used in grouting Slurry
Well head completion: Pitless adapter ___ Yes ___ No
Top of casing 12 in. or greater above grade X Yes ___ No

7. WHAT IS THE TEMPERATURE OF THE WATER?
_____ Degrees Fahrenheit
☐ Measured ☐ Estimated

8. WATER LEVEL
Static water level 58 feet below land surface
If flowing; closed-in pressure _____ psi
_____ gpm
Controlled by: _____ valve, _____ reducers,
_____ other, (specify) _____

9. WELL TEST DATA _____ pump _____ bailer
_____ other, (specify) AIR
Pumping level below land surface:
_____ ft. after _____ hrs. pumping 1 gpm
_____ ft. after _____ hrs. pumping _____ gpm

10. WAS WELL PLUGGED OR ABANDONED? ___ Yes X No
If yes, how? _____

11. DATE COMPLETED 4/16/85

12. WELL LOG

Depth (ft.) From	To	Formation
0	8	GRAVEL & CLAY
8	150	GRANITE
		WATER AT 75'

(use separate sheet if necessary)

13. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
April 16 1985
Date

Firm Name H & L Drilling, Ph. 266-3035
Address Rt. 1 — Box 301, Townsend, MT 59644
Signature Harold Reed 334
License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION DNRC
32 SOUTH EWING HELENA, MONTANA 59620 449-3962

DEPARTMENT COPY

DRILLER: Please give this copy to the well owner to complete reverse side.
OWNER: Complete reverse side Form 602 and send to DNRC.

4/9/1985

Medallion Mineral's INC.
1804 Lafayette
Butte MT. 59701

Well #1 6" Hole

Static 58'5"

Pumping time 11 Mi AT 20 G.P.M.

~~GPM 20~~

Ran out of Water

Recarge #1 16 P.H

#1 sample taken immediatly

#2 Sample taken 2 hr Later

Well #2 6" Hole

Static 62'

Pumping Time 1 hr AT 23 GPM

Draw Down 2'

#1 sample taken immediatly

#2 sample taken after 1 hr of pumping

April 9, 1985

Medallion Mineral's Inc.
1804 LaFayette
Butte, MT 59701

WELL #1

6 inch hole Static - 58' 5" Pumping time - 11 minutes at 20 gallon per minute

Ran out of water.

Recharge at 1 gallon per ~~minute~~ hour.

#1 sample taken immediately.
#2 sample taken 2 hours later.

April 9, 1985

Medallion Mineral's Inc.
1804 LaFayette
Butte, MT 59701

WELL #2

6 inch hole Static - 62' Pumping time - 1 hour at 23 Gallons per minute

Draw Down - 2'

#1 sample taken immediately.

#2 sample taken after 1 hour of pumping.

Hydrometrics, Inc.
consulting scientists and engineers

262 Burlington
Missoula, MT 59801
(406) 543-3660
Fax: (406) 721-4916
www.hydrometrics.com
September 30, 2010

Fess Foster
21 Paul Gulch Road
Whitehall, MT 59759

RE: O.T. Basin Mill – Installation Monitoring Well.

Fess,

A monitoring well was installed as a replacement for the "west" monitoring well at The O.T. Mining Corporation's Basin Mill. Drilling of the well started on September 27, 2010 and installation was completed on September 29, 2010. The new well is approximately 50 feet from the well that it is replacing (see photo). Unconsolidated materials (fill and colluvial (?)) deposits were intercepted to a depth of 70 feet. The drill hole was caving while in the unconsolidated material, requiring multiple drives of 8" steel casing, ultimately to a depth of 67.5 feet (see attached Gint log). Dark gray to black, fine-grained intrusive rock was intercepted from 70 feet to the total depth of 118 feet. The hole caved to a depth of 99 feet while pulling out the drill string, consequently the 4 inch well casing was completed to a depth of 99 feet.

The first discernible water appeared at about 80 feet. There may have been a minor amount of water above that, but we were injecting water to lift the cuttings. I had the driller stop drilling and wait 10 minutes or so and then blow the hole to check for water several times above 80 feet, but no water was noted. The static water level came up to 60.67 feet after completing the well installation.

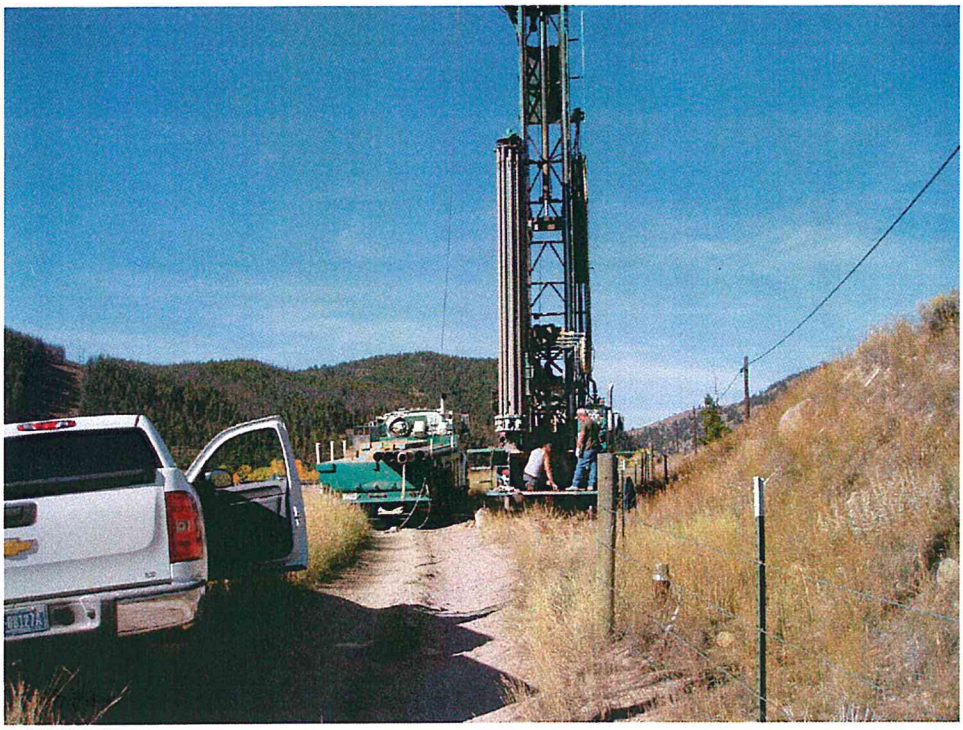
The screen in the well is from 69 feet to 99 feet. The top of the screen is approximately 1 foot above the bedrock contact such that it will monitor any flow that has come through the unconsolidated materials and follows the bedrock contact. The sand pack for the screen extends up to 63 feet, which at that point is inside the steel casing (bottom of steel at 67.5 feet). The new well has been registered into GWIC and the drill log and the GWIC record are attached.

The old well was also abandoned. Abandonment consisted of cutting off the pvc casing about 10 feet below ground surface and the steel casing was cut off about 2.5 feet below ground surface. The driller couldn't get below 70 feet with his measuring tape or his tremmie pipe. SuperGel x was tremmied into the hole from 70 feet to the top of the casing.

Thank you,

Larry M. Johnson

Larry M. Johnson



West well installation. Old well to the right of wooden fence post.

Hydrometrics, Inc.

Consulting Scientists and Engineers
Helena, Montana

Monitor Well Log

Hole Name: West Well

Date Hole Started: 9/27/10 Date Hole Finished: 9/29/10

Client: The O.T. Mining Corporation
Project:
County: Jefferson State: Montana
Property Owner: The O.T. Mining Corporation
Legal Description: NW1/4, SW1/4, SEC17, T6N, R5W
Location Description:

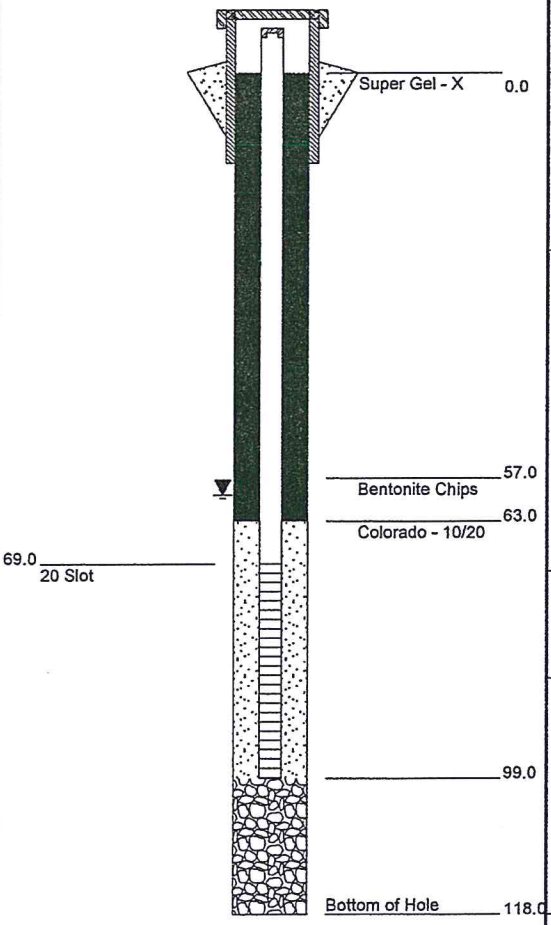
Recorded By: Larry Johnson
Drilling Company: H&L Drilling
Driller: Dan
Drilling Method: Rotary
Drilling Fluids Used:
Purpose of Hole: Monitoring Well
Target Aquifer: First Water
Hole Diameter (in): 8
Total Depth Drilled (ft): 118

WELL COMPLETION	Y/N	DESCRIPTION	INTERVAL
Well Installed?	Y	4-inch, flush threaded, Sch 40, PVC	-1.3 - 99
Surface Casing Used?	Y	8" Steel	-2.4 to 67.5
Screen/Perforations?	Y	4-inch, Sch 40, PVC, 20 Slot	69 - 99
Sand Pack?	Y	10/20 Colorado Sand	63 - 99
Annular Seal?	Y	Bentonite Chips/Super Gel	57 - 63/0 - 57
Surface Seal?	Y	Bentonite	0 - 20
DEVELOPMENT/SAMPLING			
Well Developed?	Y	Air Lift	
Water Samples Taken?	N		
Boring Samples Taken?	N		

Northing: 46.2706 Easting: -112.2559
Static Water Level Below MP: 60.67
Date: 9/29/10
MP Description: Top of 4" PVC
MP Height Above or Below Ground (ft): 1.3
Surface Casing Height (ft): 2.4
Riser Height (ft): 1.3
Ground Surface Elevation (ft): 5341
MP Elevation (ft):

Remarks: Surface casing driven with bentonite to 20 feet.

WELL CONSTRUCTION



GRAPHICS

GEOLOGICAL DESCRIPTION

0.0 - 25.0' Fill
Unconsolidated, mixed sand, silt, and chips of rounded intrusive rock pebbles and boulders to 2 feet. Using down hole hammber bit. Hole caving. Driving casing.

25.0 - 70.0' Colluvium
Injecting water. Unconsolidated "gruss" with cobbles and boulders of intrusive rock. Hole caving. Driving 8" steel casing. Injecting water. Start using tri-cone bit at 62 feet.

70.0 - 85.0' Intrusive Rock
Dark gray to black fine grained intrusive rock with some clay. "Soft" drilling. Hole making trace of water at 80 feet. Injecting water.

85.0 - 118.0' Intrusive Rock
Dark gray to black fine grained intrusive rock. Cuttings mostly coarse sand size with occasional 1 to 2 inch chips of intrusive. Injecting water.

Hole caved to 99 feet after pulling out drill string. Completed well wth 4-inch Schedule 40 PVC to top of caving (99 feet).

STANDARD_REV3 K:\GINT\PROJECTS\6003.GPJ HYDHLN2.GDT 10/1/10

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is complied electronically from the contents of the Ground-Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Plot this site on a topographic map

Site Name: THE O.T. MINING CORPORATION
GWIC Id: 258381

Section 1: Well Owner

Owner Name
THE O.T. MINING CROPORATION,
Mailing Address
310 VICTORIA AVENUE

City	State	Zip Code
WESTMOUNT	QUEBEC	H5Z 2M9

Well Address
BASIN MILL

City	State	Zip Code
BASIN	MT	

Section 2: Location

Township	Range	Section	Quarter Sections
06N	05W	17	NW¼ SW¼

County
JEFFERSON
Geocode

Latitude	Longitude	Geomethod	Datum
46.270611	112.2559	NAV-GPS	WGS84

Altitude	Method	Datum	Date

Addition **Block** **Lot**

Section 3: Proposed Use of Water
MONITORING (1)

Section 4: Type of Work
Drilling Method: ROTARY

Section 5: Well Completion Date
Date well completed: Wednesday, September 29, 2010

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	99	8

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-1.3	99	4			FLUSH THREAD	PVC-SCHED 40
0	67.5	8			WELDED	STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
69	99	4	20		SCREEN-CONTINUOUS-PVC

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	57	SURE GEL - X	Y
57	64	BENTONITE CHIPS	Y

Section 7: Well Test Data

Total Depth: 99
Static Water Level: 61
Water Temperature: 9

Air Test *

1 gpm with drill stem set at 100 feet for 0.25 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source
Unassigned

From	To	Description
0	70	UNCONSOLIDATED FILL AND COLLUVIAL DEPOSITS
70	99	DARK GRAY TO BLACK INTRUSIVE, (70-80 HIGHLY WEATHERED)

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name: LARRY JOHNSON
Company: HYDROMETRICS INC.
License No: MWC-388
Date Completed: 9/29/2010

64	99	SAND PACK	Y

APPENDIX III – GROUND WATER MONITORING SOP AND SAP

THE O.T. MINING CORPORATION BASIN MILL SITE
MGWPCS PERMIT NO. 0014
GROUND WATER MONITORING
STANDARD OPERATING PROCEDURES
AND
SAMPLING AND ANALYSIS PLAN

RECEIVED
OCT 11 2013
DEQ/WPB
PERMITTING & COMPLIANCE DIV.

Prepared for:

The O.T. Mining Corporation
310 Victoria Avenue, Suite 103
Westmount, Quebec, Canada H3Z 2M9

Prepared by:

Hydrometrics, Inc.
3020 Bozeman Avenue
Helena, MT 59601

September 2010
Revised October 2013

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

THE O.T. MINING CORPORATION BASIN MILL SITE
MGWPCS PERMIT NO. 0014
GROUND WATER MONITORING
STANDARD OPERATING PROCEDURES
AND
SAMPLING AND ANALYSIS PLAN

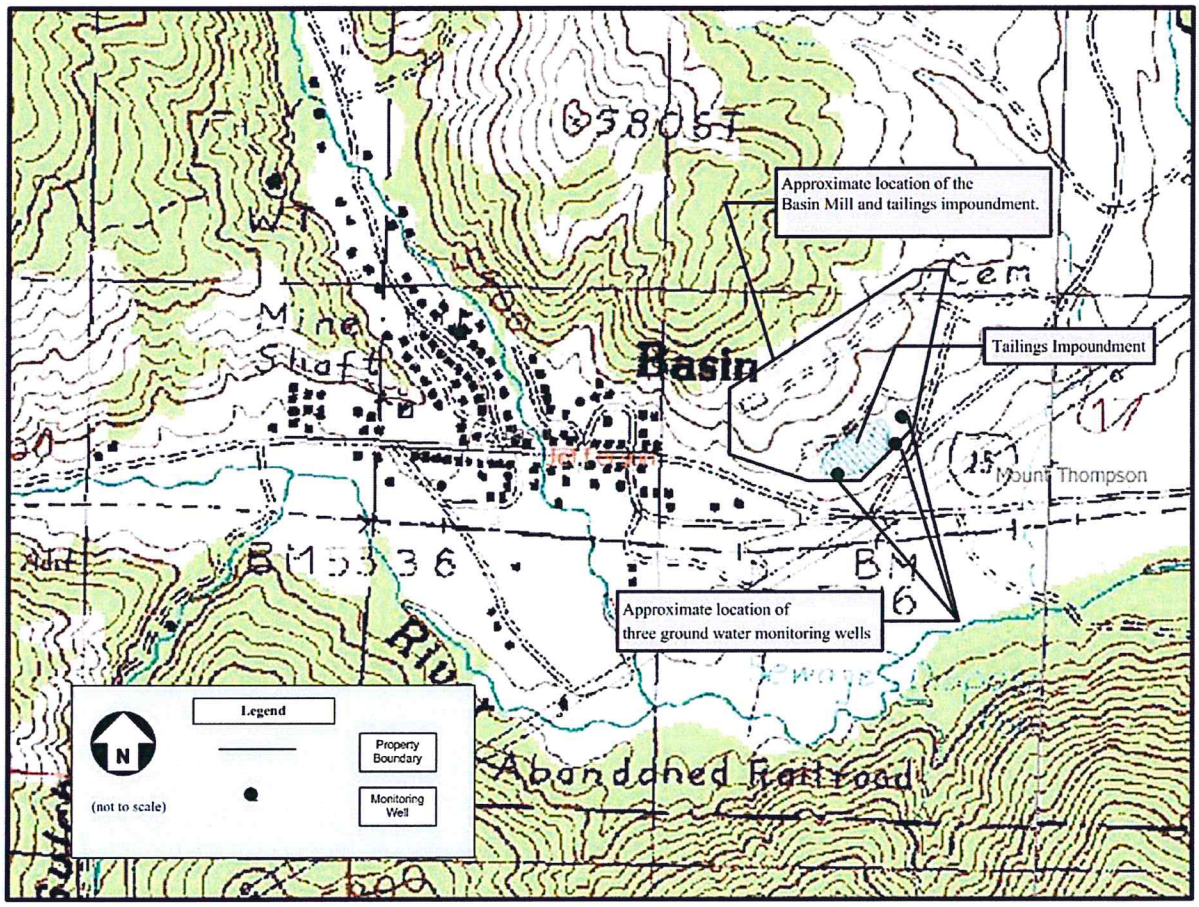
1.0 INTRODUCTION

The O.T. Mining Corporation is permitted for a Montana Ground Water Pollution Control System (permit No. 0014) addressing non-point ground water discharge from the Basin Mill site located in Jefferson County, MT (Figure 1-1). The permit requires ground water sampling from three monitoring wells on the site. Per the Statement of Basis for the MGWPCS permit from the Montana Department of Environmental Quality (MDEQ) Water Protection Bureau, The O.T. Mining Corporation provides the following Standard Operating Procedures (SOP) and Sampling and Analysis Plan (SAP).

1.1 PERMIT HISTORY

The permit history of the mill has been provided in a letter dated October 31, 2007 by Fess Foster (Foster, 2007) to the Water Protection Bureau and in the MGWPCS permit issued to The O.T. Mining Corporation dated October 15, 2009.

FIGURE 1-1. THE O.T. MINING CORPORATION BASIN MILL SITE



2.0 GROUND WATER SAMPLING STANDARD OPERATING PROCEDURES

The Standard Operating Procedure describes the methods to be used in collection of groundwater samples from monitoring wells at the Basin Mill site (Section 17, T6N, R5W) in Jefferson Co., MT. Groundwater monitoring at the Basin Mill is a requirement of the Montana Ground Water Pollution Control System (MGWPCS) permit #0014. A copy of this plan is kept on site and in The O.T. Mining Corporation files.

2.1 APPLICABILITY

These standard operational procedures are to be used whenever samples are collected in compliance with the stipulations of MGWCPS No. 0014 (the permit). The permit sets effluent limits for the site based on analysis of ground water sampling at a compliance point represented by three ground water monitoring wells.

2.2 EQUIPMENT

Sampling equipment includes:

- An electric water level probe;
- Meters to measure specific conductance, pH, and temperature;
- Distilled or deionized water for decontamination of sampling equipment;
- Standardized water sampling field forms (attached);
- Field notebook;
- 0.45 μm filter apparatus with inert filters;
- Peristaltic pump for filtering samples;
- Coolers with ice for preserving samples;
- Sample containers and sample preservatives provided by the analytical laboratory;
- Personal protection equipment (PPE): and
- Five gallon bucket for measuring volume.

The monitoring wells have dedicated pumps for sampling the ground water.

2.3 PROCEDURE

A. Obtain water level measurement using electronic probe measuring to the top of casing.

B. Calculate well volume as:

$[(H) \times (D)^2] / 25$, where H = height of water column (feet), and D = well diameter (inches).

C. Purge well using the dedicated pump. Standard procedure involves removal of a minimum of three well volumes of water while monitoring water quality parameters (S.C., pH, and Temperature) and water level over time. In addition, purge volume should be adequate to remove water from the well annulus (filter pack). Record all pertinent purging information in field notebook and/or on field sampling forms, including:

- Purge method, rate, and total volume;
- Field parameter measurements; and
- Water level changes (drawdown/recovery).

The USGS (1999) recommends pumping or otherwise purging at a rate that does not significantly lower the water level. Sets of field parameters should be collected at regular intervals while pumping at the rate to be used for sampling. Field parameters are considered "stable" when the variability between sequential measurements is as follows:

TABLE 2-1. FIELD PARAMETER STABILIZATION

PARAMETER	STABILITY CRITERIA
pH	$\pm$0.1
Temperature (°C)	$\pm$0.2
SC (µmhos/cm)	$\pm$5% (SC $\leq$ 100) or $\pm$3% (SC > 100)

Modifications of the standard purge procedure are allowable if site conditions, well volume production, the project work plan, or study objectives dictate such modifications. At a minimum, sufficient water must be removed to rinse equipment and sample bottles, and field measurements must be monitored prior to sampling. Actual purge volumes will be measured in a 5-gallon bucket and recorded on the field form.

In the case of the middle well, well recharge is not sufficient to produce three well volumes in a reasonable amount of time. The O.T. Mining Corporation has adopted the policy of purging approximately 30 gallons from the well and then taking the sample.

Samples will be collected after a sufficient purge volume is withdrawn and/or field parameters have stabilized and final field measurements have been collected. Bottles are to be triple rinsed with sample water and filled directly from well discharge or from another clean container.

D. Filter samples if required (i.e., for dissolved metals analysis).
E. Preserve and store samples as appropriate for the intended laboratory analysis. Preservation may include putting samples on ice and\or adding preservatives as called for by the laboratory.
F. Collect final water level measurements to determine water level recovery following purging.
G. Water quality meter(s) for measuring specific conductivity, pH, temperature, and the electronic water level meter will be decontaminated with distilled or deionized water before taking measurements at each well.
H. Prepare chain of custody.
I. Hand deliver samples to lab – sign chain of custody release.

Fresh nitrile or latex gloves will be worn for each sample to prevent any cross-contamination and for personal protection.

3.0 SAMPLING AND ANALYSIS PLAN

The sampling and analysis plan (SAP) identifies sampling locations, constituents to be analyzed and sample schedule.

3.1 SAMPLING LOCATIONS

Ground water monitoring for the Basin Mill site is conducted at three monitoring wells (Figure 1-1). The three wells are referred to geographically as the "west" well, the "middle" well and the "east" well. Currently, the west well is obstructed and cannot be sampled. A replacement well for the west well will be installed before the end of October 2010 and before the annual monitoring event. Well completion data is provided in Table 3-1.

TABLE 3-1. MONITOR WELL COMPLETION DATA

WELL	DEPTH	SCREENED INTERVAL	STATIC WATER LEVEL
WEST[1]	118'	69'-99'	61'
MIDDLE	152'	52'-152'	56'
EAST	75'	55'-75'	50'

1) West well was obstructed and therefore replaced during September 2010.

3.2 SAMPLING AND ANALYSIS

3.2.1 Field Parameters

Parameters to be measured in the field are:

- Specific Conductance;
- pH;
- Temperature; and
- Static water level.

Field parameter meters will be calibrated in the field prior to taking readings.

3.2.2 Sample Containers and Preservation

Samples will be:

- Collected in method specific containers supplied by the analytical laboratory;
- Preserved by adding preservatives dictated by the analytical method as prescribed by the laboratory; and
- Filtered in the field if required.

Sample containers will be triple rinsed with sampled water before taking the sample.

Sample bottle labels will contain sample number, sample date, sample time, an indication of whether the sample is filtered or non-filtered, and preservative if any.

3.2.3 Laboratory Analyses

Samples will be submitted to the laboratory for analyses of the constituents shown in Table 3-2 and reflect the changes in the new (2009) MGWPCS Permit. All future analyses will follow these procedures.

3.2.4 Sample Handling

Samples will be labeled with a unique number that will be recorded on the sampling form along with the well designation. Sample date and time will be noted on the sample label and on the field form. Sample numbers, dates, and times will be recorded on the chain of custody along with analyses to be performed and bottle order number. Chain of custody forms will include number of containers and type of sample for each sample submitted. A copy of the parameter list with required reporting values (Table 3-2) will be attached to the chain of custody. Samples will be hand carried to the laboratory if possible. If samples are shipped to the laboratory, coolers will be securely taped closed and a chain of custody seal will be attached to the cooler lid such that the seal is broken if the cooler is opened.

TABLE 3-2. THE O.T. MINING CORPORATION MGWPCS PERMIT NO. 0014 MONITOR WELL ANALYTICAL REQUIREMENTS

Parameter	Unit	Sample Frequency[1]	RRV[2]
Nitrate plus Nitrite as N	mg/L	Annual	0.010
Total Ammonia as N	mg/L	Annual	0.050
Antimony, dissolved	mg/L	Annual	0.003
Arsenic, dissolved	mg/L	Annual	0.003
Beryllium, dissolved	mg/L	Annual	0.001
Cadmium, dissolved	mg/L	Annual	0.00008
Chromium, dissolved	mg/L	Annual	0.001
Copper, dissolved	mg/L	Annual	0.001
Iron, dissolved	mg/L	Annual	0.050
Lead, dissolved	mg/L	Annual	0.0005
Mercury, dissolved	mg/L	Annual	0.00001
Nickel, dissolved	mg/L	Annual	0.010
Selenium, dissolved	mg/L	Annual	0.001
Silver, dissolved	mg/L	Annual	0.0005
Thallium, dissolved	mg/L	Annual	0.0002
Zinc, dissolved	mg/L	Annual	0.010

Footnote:

1. Sample Frequency during Operational Shutdown Period. Refer to permit for Operational Monitoring Frequency.
2. The Required Reporting Value (RRV) is the detection level that must be achieved in reporting ground water monitoring or compliance data to the Department. The RRV is the Department's best determination of a level of analysis that can be achieved by the majority of the commercial, university, or governmental laboratories using EPA approved methods or methods approved by the Department. PQL (Practical Quantification Limits) are not acceptable substitutions for RRV.

Notes:

- The samples are collected by Hydrometrics, Inc.
- Dissolved metal samples are filtered in the field, and acid preservative is then added in the field.
- Note that the detection limits are in **milligrams/liter** (not microgram/liter). **Please report them in milligrams/liter.**
- Note that **all** procedures **must** meet the standards given in 40 CFR 136.

3.2.5 Sample Quality Assurance and Quality Control

Either a sample blank, consisting of distilled or deionized water, or a sample duplicate will be submitted for each monitoring event. Duplicate samples will be compared for precision and blank samples will be analyzed for accuracy.

3.2.6 Sample Documentation and Record Keeping

Sample documentation, sample field forms, chain of custody, field notes, and field parameter meter calibrations will be retained by the permittee. The date of analysis, time of analysis, the name of the analytical technician, and analytical methods will all be recorded on the laboratory analytical report. The permitee will maintain analytical records for a minimum of three years.

3.2.7 Special Conditions

Within 72 hours of the receipt of laboratory results indicating one or more monitoring well(s) is in exceedance of water quality standards, as shown in Table 3-2, the permittee will re-sample the well(s) for confirmation of analytical results. A notification will be issued to the Department within 24 hours of receiving the results of the confirmation sampling.

4.0 FIELD FORM

Following is a water sample form to be used during sample events at the O.T. mill site.

Water Sampling Form ~~ HF-430

Hydrometrics, Inc.
Consulting Scientists and Engineers

Project Name: _____ **Site Designation:** _____
Project Code: _____ **Sample Code Number:** _____
Sample Team Member(s): _____ **Sample Date:** _____
Laboratory Used: _____ **Sample Time:** _____ (military)

If Duplicate Sample Collected, Please Record Below

Duplicate Sample Code #: _____
Duplicate Sample Time: _____

Site Conditions

New Site: Yes No Photo taken: Yes No
Site Type: DRY surface water process water
monitoring well domestic well adit seep
spring– other: _____
Weather Conditions: calm breeze windy
no precip. rain snow
clear p. cloudy overcast
Air Temperature: °C °F

For Groundwater Samples

well volume formula: $V = \frac{(TD-SWL)x(Dia.^2)}{25}$ Comments

TD (ft): _____
SWL (ft): _____ no access/pumping
Casing Diameter (I.D."): _____
Water Volume (V) (gal): _____
x 3=(gal.) _____
Actual Vol. Removed (gal.) _____
Water Level Recovery: slow moderate rapid

For Surface Water Samples

Flow Method: Marsh McBirney Volumetric Flume Weir Estimate
Other Flow or Description: _____
Flow: gpm cfs Staff Gage:

Field Parameter Stabilization

Time (military)	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/l)	pH	S.C. (µmhos/cm)	Turbidity (n.t.u.)	Temperature (°C)	Additional Parameters or Notes

Turbidity: (circle) clear moderate
slight very

Sample Method: (describe) grab composite pump bailer other _____

Field Parameters

	Sample	Duplicate
ORP (mV)		
DO (mg/l)		
pH		
SC (µmhos/cm)		
Turbidity (ntu)		
H_2O Tmp. (°C)		
Color		
Other: _____		

Bottles Collected

Quantity	Size	Filter or Unfilt.	Preservative	Parameter	Additional Notes
	ml	F or UF			
	ml	F or UF			
	ml	F or UF			
	ml	F or UF			
	ml	F or UF			
	ml	F or UF			
	ml	F or UF			
	ml	F or UF			
	ml	F or UF			
	ml	F or UF			

Comments: _____

Sample Team Member Signature: _____ Page of

5.0 REFERENCES

Foster, Fess, 2007. Letter to Water Protection Bureau, "The O.T. Mining Corporation MGWPCS Permit No. 0014," October 31.

USGS, 1999. National Field Manual for the Collection of Water-Quality Data: Chapter A4, Collection of Water Samples. USGS TWRI Book 9, September 1999.

APPENDIX IV - RATIONALE FOR GROUNDWATER COMPLIANCE LIMITS

A. Water Use Classification & Applicable Water Quality Standards

Ground water in the Basin area is Class I ground water and therefore high quality waters of the state (75-5-103, MCA). The quality of Class I ground water must be maintained so that these waters are suitable for the following beneficial uses with little or no treatment (ARM 17.30.1006):

- Public and private water supplies;
- Culinary and food processing purposes;
- Irrigation;
- Drinking water for livestock and wildlife; and,
- Commercial and industrial purposes.

Persons may not cause a violation of the following specific water quality standards in Class I ground water, pursuant to ARM 17.30.1006 (except within a DEQ approved mixing zone):

- The human health standards for ground water listed in Circular DEQ-7; and,
- For concentrations of parameters for which human health standards are not listed in DEQ-7, no increase of a parameter to a level that renders the waters harmful, detrimental, or injurious to the beneficial uses listed for Class I water. DEQ may use any pertinent credible information to determine these levels.

APPENDIX V – RATIONALE FOR MONITORING, REPORTING, AND MITIGATION

Facility operations monitoring, erosion mitigation, and ground water monitoring requirements will be maintained within the permit.

A. Facility Operational Monitoring

Operations monitoring was previously established by DEQ in order to obtain daily information on the production and placement of tailings slurry. The following operational information must be recorded on a daily basis:

- Operational status of the mill.
- Operational status of tailings slurry flow into the impoundment.

Record logs monitoring daily operations must be maintained on-site at all times. During periods of shut down, the records need to only show the shut down and startup calendar dates.

Current reporting requirements include use of the Environmental Protection Agency (EPA) Integrated Compliance Information System (ICIS) Discharge Monitoring Reports (DMR) tools. DEQ will no longer require these reports due to:

- The system was not constructed to handle reporting of this type;
- It does not allow all pertinent laboratory data to be reported; and,
- It may result in duplicate reporting.

Moving forward all operational information listed above must be submitted in a stand-alone report directly to DEQ. Reports must be submitted on a yearly basis and include all daily operational information as shown above. Narrative statements will be accepted for periods of shut down so long as the report clearly identifies the starting and ending dates for each. Monitoring and reporting requirements are summarized in the table below.

Towards the end of the new permit cycle, the permittee will also be required to submit a summary of the information collected over the permit cycle. This information may be submitted in tandem with the permit renewal application (Part IV.D. Duty to Reapply). The report must include all information as listed above. The report must be submitted in an electronic format (e.g. Microsoft excel summary table). The report must include digitized data and be in a format that allows all data to be queried.

Facility monitoring and reporting requirements are displayed within the following table.

Facility Operational Monitoring and Reporting Requirements

Annual Report Action Date:

To be completed annually on the anniversary of the permit effective date. The report must be received by DEQ 30 (thirty) calendar days following the anniversary of the permit effective date.

Permit Cycle Report Action Date:

A cumulative summary report must be received by DEQ 180 days prior to the permit expiration date.

Method	Units	Monitor Frequency	Reporting Requirements
Mill Operational Days	days	Daily	Number of Operational Days
For periods of operational shutdown (no outflows), report the calendar dates of when the shut down and start up occurred.			
Operational Days in which Tailings Slurry Flowed into the Impoundment.	days	Daily	Number of Operational Days

Footnotes:
Daily Maximum: Report highest measured daily value for the reporting period.

B. Erosion – Monitoring and Mitigation Plan

In protecting neighboring property and state waters, the current permit requires mitigation measures to be taken to prevent erosion, sedimentation, and transport of materials off-site. The permittee shall create or redevelop a standard operating procedure plan to monitor and mitigate these unauthorized activities and sources. The plan will use best management practices to identify and mitigate any anthropogenic or naturally occurring impacts. The plan must address the following:

- All topsoil must be salvaged from disturbed areas and stockpiled for use during reclamation.
- On-site and flow-through storm water management;
- On-site sedimentation control;
  - Best management practices (BMPs) must be utilized to control sedimentation. These include berms to prevent surface run-on and runoff from ore stockpiles and all other process materials.
- Impoundment free board;
  - Maintain a minimum of two (2) feet of freeboard in the impoundment at all times.
- Impoundment dike and berm;
  - Must be maintained to prevent erosion and transport of materials off the property of the permittee or into state waters.
  - The tailings impoundment must be revegetated concurrent with tailings disposal.
- Fugitive dust control,
  - Best management practices (BMPs) must be utilized to control fugitive dust emissions from the facility. The following BMPs are examples of what may be required on wind erosive sites: watering, temporary seeding, topsoiling and revegetation, wind breaks, chemical amendments, soil amendments and/or stabilization fabric.

- Spills of process solution or chemicals;
  - Must be immediately reported to the Department.

The plan must include a proposed timetable for recurring self-monitoring. If potential impacts are identified, the plan must document mitigation measures that will be or have been taken. A report documenting the monitoring and mitigation measures taken must be submitted to DEQ on an annual basis. Each submitted report must attach a copy of the most up-to-date monitoring and mitigation plan. A copy of the plan must be maintained on-site at all times

C. Ground Water Monitoring

Ground water monitoring must be completed through the term of the permit regardless of the operational status of the facility, or of the business status of the permittee. Ground water monitoring must at minimum be collected monthly or annually depending on the operational status. The permittee shall document the methodology and equipment used to sample monitoring wells during each sampling event. Records of all sampling events must be maintained on-site at all times. Monitoring and reporting requirements are provided in the tables below.

Operational Mill[1] Ground Water Monitoring Requirements.
Separately for East Well, Middle Well, and West Well.

Analyte	Monitor Location[2]	Units	Sample Type[3]	Minimum Sample Frequency
pH	East Well, Middle Well, West Well	s.u.	Grab or Instant.	1/Month
Specific conductivity @ 25°C	East Well, Middle Well, West Well	µS/cm	Grab or Instant.	1/Month
Static Water Level[3]	East Well, Middle Well, West Well	ft-bmp	Instant.	1/Month
Nitrogen, ammonia total [as N]	East Well, Middle Well, West Well	mg/L	Grab	1/Month
Nitrogen, Nitrite + Nitrate total [as N]	East Well, Middle Well, West Well	mg/L	Grab	1/Month
Arsenic, dissolved [as As]	East Well, Middle Well, West Well	µg/L	Grab	1/Month
Cadmium, dissolved [as Cd]	East Well, Middle Well, West Well	µg/L	Grab	1/Month
Copper, dissolved [as Cu]	East Well, Middle Well, West Well	µg/L	Grab	1/Month
Iron, dissolved [as Fe]	East Well, Middle Well, West Well	µg/L	Grab	1/Month
Lead, dissolved [as Pb]	East Well, Middle Well, West Well	µg/L	Grab	1/Month
Zinc, dissolved [as Zn]	East Well, Middle Well, West Well	µg/L	Grab	1/Month
Antimony, dissolved [as Sb]	East Well, Middle Well, West Well	µg/L	Grab	1/Quarter
Beryllium, dissolved [as Be]	East Well, Middle Well, West Well	µg/L	Grab	1/Quarter
Chromium, dissolved [as Cr]	East Well, Middle Well, West Well	µg/L	Grab	1/Quarter
Mercury, dissolved [as Hg]	East Well, Middle Well, West Well	µg/L	Grab	1/Quarter
Nickel, dissolved [as Ni]	East Well, Middle Well, West Well	µg/L	Grab	1/Quarter
Selenium, dissolved [as Se]	East Well, Middle Well, West Well	µg/L	Grab	1/Quarter
Silver, dissolved [as Ag]	East Well, Middle Well, West Well	µg/L	Grab	1/Quarter
Thallium, dissolved [as Tl]	East Well, Middle Well, West Well	µg/L	Grab	1/Quarter

Footnotes:

Dissolved: Metal parameters will be analyzed using the dissolved portion (0.45 micron filter).

Instant.: Instantaneous reading using on-site equipment.

If any monitoring wells are abandoned, destroyed or decommissioned, the permittee shall install a new well to replace the abandoned, destroyed, decommissioned, or non-viable well(s).

If any of the monitoring wells are no longer able to be sampled due to fluctuations in the ground water table; the permittee must install (or rehab) a new well to replace the non-viable well(s).

Parameter analytical methods shall be in accordance with the Code of Federal Regulations, 40 CFR Part 136, unless specified or approved by DEQ.

Static water levels shall be measured to the hundredth of a foot.

ft-bmp = feet below established measuring point

s.u. = standard units

(1) Monitoring and reporting requirements are based on the daily operational status of facility. The facility will be considered to be in operation if ore or tailings have been processed during any single day occurring within the reporting period.

(2) Refer to the Monitoring Well Summary Table for the existing or proposed location of the monitoring wells.

(3) See definitions in Part V of the permit.

Non-Operational Mill[1] Ground Water Monitoring Requirements.
Separately for East Well, Middle Well, and West Well.

Analyte	Monitor Location[2]	Units	Sample Type[3]	Minimum Sample Frequency
pH	East Well, Middle Well, West Well	s.u.	Grab or Instant.	1/Year
Specific conductivity @ 25°C	East Well, Middle Well, West Well	µS/cm	Grab or Instant.	1/Year
Static Water Level[3]	East Well, Middle Well, West Well	ft-bmp	Instant.	1/Year
Nitrogen, ammonia total [as N]	East Well, Middle Well, West Well	mg/L	Grab	1/Year
Nitrogen, Nitrite + Nitrate total [as N]	East Well, Middle Well, West Well	mg/L	Grab	1/Year
Antimony, dissolved [as Sb]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Arsenic, dissolved [as As]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Beryllium, dissolved [as Be]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Cadmium, dissolved [as Cd]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Chromium, dissolved [as Cr]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Copper, dissolved [as Cu]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Iron, dissolved [as Fe]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Lead, dissolved [as Pb]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Mercury, dissolved [as Hg]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Nickel, dissolved [as Ni]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Selenium, dissolved [as Se]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Silver, dissolved [as Ag]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Thallium, dissolved [as Tl]	East Well, Middle Well, West Well	µg/L	Grab	1/Year
Zinc, dissolved [as Zn]	East Well, Middle Well, West Well	µg/L	Grab	1/Year

Footnotes:

Dissolved: Metal parameters will be analyzed using the dissolved portion (0.45 micron filter).

Instant.: Instantaneous reading using on-site equipment.

If any monitoring wells are abandoned, destroyed or decommissioned, the permittee shall install a new well to replace the abandoned, destroyed, decommissioned, or non-viable well(s).

If any of the monitoring wells are no longer able to be sampled due to fluctuations in the ground water table; the permittee must install (or rehab) a new well to replace the non-viable well(s).

Parameter analytical methods shall be in accordance with the Code of Federal Regulations, 40 CFR Part 136, unless specified or approved by DEQ.

Static water levels shall be measured to the hundredth of a foot.

ft-bmp = feet below established measuring point

s.u. = standard units

(1) Monitoring and reporting requirements are based on the daily operational status of the facility. The facility will be considered to be in operation if ore or tailings have been processed during any single day occurring within the reporting period.

(2) Refer to the Monitoring Well Summary Table for the existing or proposed location of the monitoring wells.

(3) See definitions in Part V of the permit.

As discussed above, the method of reporting will now take place in stand-alone reports submitted directly to DEQ. Reports must be submitted on a yearly basis and include all information listed in the table below for each parameter.

Towards the end of the new permit cycle, the permittee will also be required to submit a summary of all ground water quality information collected over the permit cycle. This information may be submitted in tandem with the permit renewal application (Part IV.D. Duty to Reapply). The report must include all information as listed above. The report must be submitted in an electronic format (e.g. Microsoft excel summary table). The report must include data in a digital format that allows all data to be queried.

The current permit requires the permittee to develop, maintain, and implement a Ground Water Monitoring Standard Operating Procedures (SOP) and Sampling and Analysis (SAP) Plan. At a minimum, the plan should address:

- Well purging;
- Equipment and procedures used for sample collection or field parameter measurement;
- Sample collection, specifying sampling equipment and procedures;
- Equipment decontamination procedures and storage;
- Sample preservation and storage; and,
- Transportation to lab.

The current 2013 plan is shown in Appendix III. The permittee is required to review and update the current plan. An updated plan must be submitted to DEQ in conjunction with the 2018 ground water monitoring report.

Ground Water Reporting Requirements - Separately for East Well, Middle Well, and West Well.

Annual Report Action Date: ***To be completed annually on the anniversary date of permit. The report must be received by DEQ one month following the permit anniversary date.***

Permit Cycle Report Action Date: ***A cumulative summary report must be received by DEQ 180 days prior to the permit expiration date.***

Analyte	Units	Individual Sample Record (Repeat as Necessary)						Annual Statistical Summary Report							
		Sample Collection Date	Dry-Well Conditions? (y/n)	Result	Laboratory Reporting Level	Non-Detect? (y/n)	Laboratory Qualifier(s)	Count of Samples Collected	Count of Dry-Well Occurrences	Minimum	Average	Median	Maximum	Count of Non-detects	Average Laboratory Reporting Level
pH	s.u.														
Specific conductivity @ 25°C	µS/cm														
Static Water Level	ft-bmp														
Nitrogen, ammonia total [as N]	mg/L														
Nitrogen, Nitrite + Nitrate total [as N]	mg/L														
Antimony, dissolved [as Sb]	µg/L														
Arsenic, dissolved [as As]	µg/L														
Beryllium, dissolved [as Be]	µg/L														
Cadmium, dissolved [as Cd]	µg/L														
Chromium, dissolved [as Cr]	µg/L														
Copper, dissolved [as Cu]	µg/L														
Iron, dissolved [as Fe]	µg/L														
Lead, dissolved [as Pb]	µg/L														
Mercury, dissolved [as Hg]	µg/L														
Nickel, dissolved [as Ni]	µg/L														
Selenium, dissolved [as Se]	µg/L														
Silver, dissolved [as Ag]	µg/L														
Thallium, dissolved [as Tl]	µg/L														
Zinc, dissolved [as Zn]	µg/L														

Footnotes:

The permittee may create their own report in a format that suites their operating and reporting needs. It must however contain all data inputs as shown above and in Appendix V. All data must be in a digital form and the report must be queryable.

For calculation purposes, non-detects must be entered as "0" (zero).

Laboratory qualifiers are not common, leave blank if none, provide supplemental descriptions if using codes.

Daily Maximum: Report highest measured daily value for the reporting period.

Daily Minimum: Report lowest measured daily value for the reporting period.

APPENDIX VI - REFERENCES

40 CFR § 136 – Guidelines Establishing Test Procedures for the Analysis of Pollutants. 2011.

Administrative Rules of Montana, Title 17, Chapter 30, Water Quality:
- Subchapter 2 - Water Quality Permit Fees.
- Subchapter 5 – Mixing Zones in Surface and Ground Water.
- Subchapter 7 – Nondegradation of Water Quality.
- Subchapter 10 – Montana Ground Water Pollution Control System.
- Subchapter 13 – Montana Pollutant Discharge Elimination System.

Bunyak, Dawn. 2000. To Float or Sink: A Brief History of Flotation Milling. Mining History Journal.

Dams Safety Committee, New South Wales, Surveillance Reports for Dams, DSC2C, June 2010.

Dams Safety Committee, New South Wales, Tailings Dams Safety, DSC3F, June 2012.

Department of Environmental Quality, Water Quality Circulars:
- Circular DEQ-2 – Design Standards for Wastewater Facilities.
- Circular DEQ-4 – Montana Standards for On-Site Subsurface Sewage Treatment Systems.
- Circular DEQ-7 – Montana Numeric Water Quality Standards, Required Reporting Values, and Trigger Values.

Department of Environmental Quality, Abandoned Mines Report, Basin Mining District. http://deq.mt.gov/Land/abandonedmines/linkdocs/73tech.

Department of Environmental Quality. 1995, 2001, and 2009. Administrative Records of Montana Ground Water Pollution Control System (MGWPCS) permit applications and supplemental materials, OT Mining Corp. MTX000014.

Department of Environmental Quality, Montana Metal Mine Reclamation Act Status Notice, OT Mining - Basin Mill Site. September 03, 1997.

Department of Environmental Quality, Compliance Site Visit, OT Mining – Basin Mill Site, MTX000014. March 29, 2013.

Department of Environmental Quality, Violation Letter, OT Mining – Basin Mill Site, MTX000014. 2017.

Department of Environmental Quality, Site Visit Report, OT Mining – Basin Mill Site, MTX000002. July 26, 2017.

Fetter, C.W., Applied Hydrogeology, 1994.

Foster, F., Background Report for the OT Mining – Basin Mill. December 2006.

Freeze, R., and Cherry, J., Groundwater, 1979.

Kendy, E. and R.E. Tresch. 1996. Geographic, Geologic, and Hydrologic Summaries of Intermontane Basins of the Northern Rocky Mountains, Montana. USGS Water-Resources Investigations Report: 96-4025.

Montana Bureau of Mines and Geology, Ground-Water Information Center, http://mbmggwic.mtech.edu.

Montana Code Annotated, Title 75, Chapter 5, *Montana Water Quality Act*, 2011.

Hydrometrics, Inc., The O.T. Mining Corporation Basin Mill Site – Ground Water Monitoring Standard Operating Procedures and Sampling and Analysis Plan, Revised October 2013.

Sahinen, Uno M. 1935. Mining Districts of Montana. Montana School of Mines, Butte, Montana.

U.S. Environmental Protection Agency, Guidance Manual for Developing Best Management Practices <http://www.epa.gov/npdes/pubs/owm0274.pdf>, 1993.

U.S. Environmental Protection Agency and Montana Department of Environmental Quality, Second Five Year Review Report for Basin Mining National Priority List Site, Basin Montana, May 2013.

U.S. Environmental Protection Agency and Montana Department of Environmental Quality, Record of Decision for the Basin Mining Area – Operable Unit 1, Town of Basin Project, March 2001.

U.S. Environmental Protection Agency, EPA Ground Water Investigation Letter of Decision, Basin Mill Facility, October 03, 2000.

U.S. Environmental Protection Agency, NPDES Permit Writers' Manual, 833-K-10-001, September 2010.

U.S. Environmental Protection Agency, Nitrification, 625/R-00/008, Office of Ground Water and Office of Water. 2002a.

U.S. Environmental Protection Agency, 1991. *Technical Support Document for Water Quality-Based Toxics Control* (TSD). EPA-505/2-90-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0264.pdf.

U.S. Geological Survey, Basic Ground Water Hydrology, http://pubs.usgs.gov/wsp/2220/report.pdf, 2016.

U.S. Geological Survey, Groundwater Basics, http://water.usgs.gov/ogw/basics.html, 2016.

U.S. Geological Survey, Western Montana Mine Maps, Investigation Series, Map I-2050-C.

Wolle, Muriel Sibell. 1963. Montana Pay Dirt. Sage Books, Athens, Ohio.

Prepared By: Chris Boe, August 16, 2017