

CONDITIONS
GWD 1-94

1. The original application, the 1997 amendment application, the 1998 amendment application, and subsequent renewal applications for a Ground Water Discharge Plan shall become part of this plan, with the exception of those items specifically added, deleted, or amended in the conditions to the plan. The plan consists of a water quality variance, ground water discharge permit, and a facility construction permit.
2. For the purposes of this plan, neutralization shall be defined as fresh water rinsing and/or hydrogen peroxide treatment. Following are the requirements for spent ore effluent chemical characterization and neutralization compliance monitoring:
 - A. Wharf shall notify the Department 72 hours prior to the initiation of neutralization to provide the Department opportunity to take effluent samples for chemical characterization. Wharf shall also notify the Department 72 hours prior to the initiation of neutralization compliance monitoring.
 - B. Chemical Characterization of Effluent Prior to Initiation of Neutralization.
 1. Prior to initiation of neutralization (during drain down) a time composite sample (3 individual samples of equal volume taken over a 24 hour period and composited) of effluent draining from the toe of the heap will be obtained. This sample shall be tested for the parameters listed in Table 1. A complete chemical characterization of the effluent shall be completed for every heap.
 - C. Neutralization Compliance Monitoring
 1. Based on the results of the chemical characterization, the Department shall designate, in writing, key parameters (those parameters that do not meet the numeric ground water quality standards during the chemical characterization) to be monitored after neutralization has been completed. At minimum, weak-acid dissociable (WAD) cyanide, total dissolved solids, pH, fluoride, total mercury, nitrate as nitrogen (nitrate), arsenic, and conductivity are required as key parameters for every heap.
 2. Monitoring shall include collecting 3 individual effluent samples of equal volume over a 24 hour period from the heap, compositing the samples, and analyzing the composite sample for the key parameters, except nitrate as nitrogen and arsenic which are measured as the mean value of 9 samples taken over a 72 hour period. (These values are used to calculate the nitrate as nitrogen and dissolved arsenic off-loaded to the Reliance Spent Ore Depository.) If the effluent results indicate that the numerical standards cannot be met for fluoride, total mercury, pH, and total dissolved solids, neutralization compliance may be based on leachate samples obtained from a column leachate test to determine suitability for off-loading. Leachate results must demonstrate compliance with the numeric standards or the following off-load criteria:

Parameter	Off-Load Criteria
pH (standard units)	6.5 to 9.5
Total Dissolved Solids	1500 ppm
Fluoride	5.0 ppm

Other key parameters that do not meet the numeric ground water quality standard in the effluent may also be based on leachate samples obtained from a column leachate test if the Department determines that the parameter will not impact the ambient ground water quality at the compliance monitoring point. Wharf shall submit both the effluent and the leachate data to the Department prior to off-loading.

3. If monitoring shows extreme variability or unpredictability in analytical results, or if the reliability of the monitoring program or the parameters monitored are inappropriate, the monitoring program may be revised by the Department to correct the identified deficiencies. If future sampling (as determined by the neutralization studies conducted by/for the Department) proves treatment to be inadequate, other criteria may be specified by the Department on a site specific basis.
- D. Spent ore shall be considered suitable for off-loading when the following conditions have been met.
1. The mean value of 9 samples taken over a 72 hour period of the effluent draining from the toe of the neutralized heap is less than 0.50 mg/L WAD cyanide with no one sample exceeding 2.5 times 0.50 mg/L WAD cyanide concentration.
 2. The values for all other parameters measured in the effluent draining from the toe of the neutralized heap are less than the numeric ground water quality standards, with the exception of arsenic, nitrate, and nitrite. Leachate results for fluoride, total mercury, pH, total dissolved solids, and other key parameters must also meet the numeric ground water quality standards or specified off-load criteria, if consistent with the neutralization compliance monitoring criteria established above (Refer to C-2 above).
 3. Prior to off-loading, Wharf shall submit copies of all sampling and analytical data required by the monitoring schedules indicated above to the Department for review and approval. In addition, Wharf shall also submit all moisture content data collected during the off-load of the spent ore. This data must include the final moisture content of the spent ore that is off-loaded. Spent ore moisture content will be used as a tracking tool to determine the mass loading of arsenic and nitrate to the ground water system. Wharf shall obtain verbal approval from the Department prior to off-loading and the Department shall verbally respond within two (2) State working days. The Department shall confirm the verbal approval with written approval within seven (7) state working days. If the Department does not respond within two (2) working days and Wharf off-loads before receiving verbal approval, it will have been done at their own risk.

3. Monitoring sites (see attached figure), the sampling frequency, and the parameters to be measured are as follows:

MONITORING SITES	SCHEDULE+
MW-17	Quarterly
MW-18	Quarterly
MW-19	Quarterly
MW-33*	Quarterly
MW-52	Quarterly
Beaver Springs	Quarterly
Annie Creek II	Quarterly

* Compliance point monitoring well

+ A quarterly sampling frequency is defined as January, April, May, and August.

All monitoring stations will be sampled for the parameters listed in Table 2. All metals concentrations are measured as "dissolved" except Mercury which is "total". The compliance point monitoring well is MW-33.

4. The numeric Ground Water Quality Standards, ARSD 74:54:01:04, for arsenic, nitrite, nitrate, fluoride, total dissolved solids, and pH shall be the permitted allowable limits maintained at the compliance monitoring points.
5. Wharf is required to submit an annual report every March 1st, which shall address the amount of spent ore disposed of in the Reliance Spent Ore Depository, and the amount of nitrate as nitrogen and dissolved arsenic being off-loaded to the Reliance Spent Ore Depository.
6. When the concentration for nitrate as nitrogen reaches one-half the permitted allowable limit (5 mg/l) at the compliance monitoring point (MW-33), Wharf shall submit to the Water Management Board a preventative action plan which includes an analysis of the discharge in relation to the increasing pollutant concentrations and any preventative actions to be taken to ensure that ground water limitations will not be violated.
7. The long and short-term contingency plans outlined in Section 7.1 and 7.2 of the 2008 Ground Water Discharge Plan renewal application shall become part of this Ground Water Discharge Plan. The additional information submitted by Wharf on December 16, 1997, concerning the short-term contingency plan shall also be part of this Ground Water Discharge Plan.
8. With the removal of the Juno Pit spent ore disposal area from the Reliance Spent Ore Depository POP Zone, the remaining spent ore disposal capacity of Reliance is 3.1 million tons. Wharf submitted additionally required information on the fate and transport of contaminants discharging from the spent ore, and the subsequent Technical Revision approved on November 10, 2009, allows the disposal of spent ore into the 3.1 million ton remainder of the Reliance Waste Facility, and also established a nitrate loading limit within the Reliance Waste Facility (refer to Condition 12 below).

9. Wharf shall submit, two (2) years prior to closure of the spent ore depository, a post-closure monitoring plan based on water quality monitoring during operation of the facility. The post-closure monitoring plan will include a contingency plan for clean-up of any ground water contamination beyond the POP zone.
10. In accordance with ARSD 74:54:02:23(4) the Department is authorized to approve technical revisions to a ground water discharge facility without the requirement of a permit modification or renewal. Such technical revisions include the following:
 - a. Monitoring plans or parameters;
 - b. Plans and specifications for permitted facilities;
 - c. Reasonable changes to the quality of discharged waste;
 - d. Reasonable changes in volume of discharged waste;
 - e. Quality control and quality assurance plans;
 - f. Any other changes that will not result in the degradation of the ground water above the South Dakota Water Quality Standards.

Technical revisions must be submitted to the Department in writing. The Department shall either approve, disapprove, conditionally approve, or request additional information within 30 days after receipt.

11. Parameters that exceed the above described criteria (Refer to D. 2 & 3 above), except cyanide, will be evaluated for potential impact to the ground water system. Tests and calculations designed to assess the attenuation potential and the pathway and fate analysis will be provided to the Department for review and approval prior to off-loading. If the Department determines that ground water quality may be impacted, the matter will be referred to the Water Management Board for action.
12. Wharf shall not exceed the loading limit for nitrate as nitrogen, which is specified under "Off Load Criteria", item 1, in the Technical Revision approved on November 10, 2009. If the accepted loading limit is reached, Wharf shall cease off-loading spent ore into the Reliance Facility. The nitrate loading limit is 18.6 tons, which is based on a maximum concentration of 100 ppm nitrate.

TABLE 1
Parameters for Chemical Characterization of Effluent

pH	mercury	sulfate
potassium	selenium	nitrate*
arsenic	silver	nitrite
barium	magnesium	ammonia
cadmium	sodium	WAD cyanide
chromium	conductivity	chloride
copper	total dissolved solids	calcium
fluoride	carbonate	
lead	bicarbonate	

* Wharf may measure Nitrate + Nitrite with the requirement that the value obtained shall be treated as Nitrate as N.

TABLE 2
Ground Water Quality Monitoring Parameters

Field Parameters	Major Cations	Major Anions	Metals (dissolved)	Other
Water Table Elevation	Sodium	Sulfate	Arsenic	Total Cyanide
Sample Temperature		Bicarbonate	Copper	WAD Cyanide (If Total >0.01mg/l)
pH			Mercury, total	Nitrate*
Conductivity			Selenium	Nitrite
			Gold	Ammonia
				Fluoride
				TDS
				TSS**

* Wharf may measure Nitrate + Nitrite with the requirement that the value obtained shall be treated as Nitrate as N.

** Total suspended solids (TSS) are required to be sampled only at Annie Creek II.

