Bureau of Mining Regulation and Reclamation

PREPARATION REQUIREMENTS AND GUIDELINES FOR PERMANENT CLOSURE PLANS AND FINAL CLOSURE REPORTS

This document explains the regulatory requirements for closure of a mining operation in Nevada. Within the Nevada Division of Environmental Protection (Division), Bureau of Mining Regulation and Reclamation (BMRR), the Regulation and Closure Branches issue Water Pollution Control Permits (WPCPs) to construct, operate and close mining operations pursuant to Nevada Revised Statutes (NRS) 445A.300 through 445A.730, and Nevada Administrative Code (NAC) 445A.350 through 445A.447. The primary function of both the Regulation and Closure Branches is to ensure that waters of the State, as defined at NRS 445A.415, are not degraded during and after mining activities. These regulations apply to all metal mining operations located within the State of Nevada (with the exceptions noted in NAC 445A.387), regardless of land ownership. Pursuant to NAC 445A.409, a valid WPCP, as issued, renewed, or subsequently modified, must be maintained until permanent closure and post-closure monitoring are completed and the Division has formally terminated the WPCP. All closure-related activities must be reviewed and approved by the Closure Branch. Branch staff will evaluate plans, reports, studies, and monitoring data to confirm chemical stabilization of all pollutant sources included in the mining operation.

Appendix A of this guidance document contains a list of applicable NRS 445A statutes and NAC 445A regulations that apply to mine closure. The Division has additional guidance documents available that provide more detail on specific topics referred to herein. Several of these documents are mentioned in context below. All mining-related guidance documents may be obtained either directly from the agency or may be downloaded from the website located at Bureau of Mining NAC445A Program Guidance Documents.

There are four required closure documents, listed in sequential order, which must be submitted to the Division for review and approval. The first two are regulatory requirements while the third and fourth are Division requirements.

1. Tentative Plan for Permanent Closure (TPPC): Submitted as part of an application for a new, renewed or modified WPCP and revised when necessary to address changes to the facility or operating plans (NAC 445A.398). A TPPC must include sufficient detail on the conceptual permanent closure of all pollutant sources to support reclamation bonding assumptions and reflect those actions as approved by the Division in the Reclamation Plan. The Division document "Guidance for Preparing Tentative Plans for Permanent Closure" provides additional information.

2. Final Plan for Permanent Closure (FPPC): Submitted at least two years *prior* to the anticipated permanent closure of the mine as a whole or of a specific process component (NAC 445A.447). A FPPC must provide closure goals and a detailed methodology of activities necessary to achieve a stabilization of all known and potential sources at the site as defined by NAC 445A.379. The plan must include a detailed description of all proposed monitoring that will be conducted to demonstrate that closure goals are achieved. The Permittee must receive Division approval for the plan before initiating action. Reclamation activities such as regrading, covering, placing of growth media, applying soil amendments, and revegetation are, in many

cases, major elements of the site stabilization and closure process. These activities should therefore become part of the closure plan and should be described or referenced as part of the FPPC. It is in the Permittee's interest, as general closure scenarios become more detailed, that the reclamation plan, together with the bond cost calculations, be reviewed and amended as necessary. Failure to coordinate closure and reclamation activities and documentation may result in additional expenditures.

3. Final Closure Report (FCR): Summarizes all completed closure-related activities, for example, monitoring, component characterization, pond(s) converted to evaporation cell(s), all completed earthwork, closure cover construction on tailings, waste rock facilities, and leach pads (as applicable); provides closure related as-built documentation per NAC 445A.427, and proposes post-closure monitoring, as applicable. The FCR must include a proposal for post-closure monitoring for an initial period of time not less than five years in order to provide additional supporting data that stabilization has been achieved. The Division approval for completion of permanent closure cannot be considered without a satisfactory FCR. Permanent closure is completed when the requirements contained in NAC 445A.429, 445A.430 and 445A.431, as applicable, have been achieved and all other sources at the facility have been stabilized, removed, or mitigated. At this point upon approval of the FCR, the mine site is considered to be in the post-closure monitoring period and a revised WPCP for post-closure monitoring is issued; Permit fees are reduced to those as provided for post-closure monitoring under NAC 445A.232, "Fees for WPCPs." Post-closure monitoring is defined as the period of time required for monitoring of a facility following the permanent closure of that facility. The length of time the Permittee will be required to monitor components is a function of both the complexity of the site and the success of the closure activities as documented by the post-closure monitoring. Factors that enter into this time frame include, depth to and quality of ground water; location and quality of surface waters; history of a particular component, and other factors.

   If the Division determines that the FCR indicates all physical closure activities associated with the Division-approved FPPC have been completed but the requirements contained in NAC 445A.429, 445A.430 and 445A.431, as applicable, have not yet been achieved, or any other sources at the facility remain to be stabilized, removed, or mitigated, permanent closure will not be deemed complete. However, a revised WPCP will be issued and Permit fees will be reduced to those as provided for "monitoring of mining facility that has completed all physical closure activities and is undergoing source stabilization" under NAC 445A.232 "Fees for WPCPs." The facility will not be placed into post-closure monitoring status until it is demonstrated that the above-referenced requirements are achieved.

4. Request for Final Closure: Demonstrates source stabilization (both chemical and physical) has been achieved and requests WPCP termination. The request is made following the completion of permanent closure and the post-closure monitoring period. The post-closure monitoring period must validate the Permittee's assertion that completed closure activities have successfully stabilized each source (per NAC 445A.379). The request should contain all post-closure monitoring information and clearly demonstrate stabilization. Upon the successful demonstration of stabilization and confirmation via post-closure monitoring, the WPCP is eligible for termination.

Guidelines for the Preparation of Final Plans for Permanent Closure

The Permittee is free to format the FPPC as he or she wishes; however, the FPPC should include the items outlined below (as appropriate).

An updated evaluation of the closure plan, using specific characterization data for each process component with respect to achieving stabilization, is to be submitted as part of the WPCP annual report.

I. Introduction

General Statement of Purpose: The FPPC must be submitted to the Division with the intent to fulfill the requirements as defined in NAC 445A. It must detail the procedures proposed for achieving stabilization of all mine source components. Details and direction of any proposed modeling, fate and transport analysis, or other projections of final closure configurations, should be clearly described in the plan. The Permittee must clearly demonstrate through the use of credible source, fate and transport evaluations, modeling, or other projections, that the proposed source does not have the potential to degrade waters of the State.

II. Site Location and Background Information

A. Geographic location, site climatology, and overall site geology;

B. WPCP status, pre-mining land use, historic mining activity (under previous ownership as applicable), and recent mining and/or exploration activity (under current ownership);

C. Background water depth and quality; the Permittee must clearly establish both of these parameters, per component of concern. The Permittee should refer to NAC 445A.424 to review potential closure options. The FPPC should include a physical description of the aquifer(s) and nearest downgradient wells;

D. Background surface water location and quality (if applicable); as with groundwater, background surface water quality must be established. The Permittee should refer to NRS 445A.565 regarding treatment of, and control over, if a discharge to surface waters is a possibility. The Plan must discuss the locations of any springs (whether ephemeral or perennial) and identify any mining components located nearby.

III. Facility Description

A. Provide the status and locations of all mine components, both active and inactive, including, but not limited to, process solution circuit, heap leach pads, ore stockpiles, process building(s), ponds, tailings impoundment(s), and non-process components such as waste rock disposal areas, open pits, overflow event ponds, vehicle maintenance shops, petroleum-contaminated soil (PCS) storage facilities, and landfills.

B. Provide applicable figures and flow charts of all process fluid system facilities; include dimensions and capacities of all components.

C. As applicable, describe the engineering specifications for all liners, to include sub-base, and leak detection systems for heap leach pads, ponds, tailings impoundments, and all associated conveyance devices that require containment; provide a schematic that shows the locations of all leak detection systems and sampling ports.

D. Describe all past, existing, and anticipated solid and liquid mine wastes and/or sources that will require formal closure.

E. Provide all monitoring, production, condemnation, and exploratory well logs; provide mapping with the locations of all the site wells. The Permittee is required to demonstrate that all wells and drill holes will be abandoned per Nevada State regulations.

IV. Source Characterization Program

As defined by NAC 445A.378, a "Source" means any building, structure, facility or installation from which there is or may be a discharge of pollutants. A Source Characterization Program is a detailed sampling and analytical approach to identify the materials, both solid and liquid present, per mining component, and to identify the materials that may require special attention, per mining component, in the closure and post-closure monitoring phase.

A Nevada State certified laboratory must be utilized for all sample analyses. A listing of those laboratories can be found at NDEP Certified Lab List under the heading 'Certified Lab List'.

It is recommended that the Permittee submit a sampling and characterization plan to the Division for review and approval before executing the plan. The Meteoric Water Mobility Procedure, acid/base accounting and static/kinetic are the primary testing methods the agency requires for characterization of source materials and wastes.

A. General Requirements

The following general requirements are requisite for any source that has the potential to degrade waters of the State.

1. Describe all past and present sampling programs, per source; discuss field sampling protocols such as field filtering, sample preservation, sample holding times, approved analytical method(s), and respective method detection limits (MDL); provide the rationale for your sampling program per source, i.e., how the number of samples to adequately characterize the material was determined.
2. Provide sample analysis results from all previous and ongoing sampling programs.
3. Provide an accurate and appropriately scaled map showing all past and present sample locations.
4. Acid/Base Accounting is required for each individual lithology in waste rock disposal areas, leach pads, tailings materials, and open pits. The Permittee will be required to provide all test results and a discussion, per component, predicting whether or not a source is or will be a future Acid Rock Drainage (ARD) concern.
5. Describe the following physical characteristics (as applicable to source):
   a. Specific gravity of solids;
   b. Slurry density (solids: liquids ratio);
   c. Deposition rate and method of deposition;
   d. Average operational dry density;
   e. Final operational height;
   f. Final operational area;
   g. Final operational top surface topography;
   h. Final operational water balance;
   i. Final operational embankment geometry;
   j. Strength characteristics of embankment and related components;

k. Potentiometric characteristics of embankment and related components;
l. Anticipated range of stability characteristics under expected and of operational conditions (static and pseudo-static);
m. Anticipated process water inventory at end of operations;
n. Anticipated surface water hydrology at end of operations and for predicted post-operational conditions (upstream diversion, required storm volume storage and flow rate, run-off and infiltration characteristics).

6. Describe the following chemical characteristics of solids and anticipated residual drainage:
   a. Mineralogy;
   b. Geochemistry;
   c. Metals leaching potential;
   d. Potential final run-off chemistry;
   e. Potential final seepage chemistry;
   f. Potential final drainage discharge chemistry.

B. Individual Source Discussion (the following requirements are source specific)

1. Waste rock storage facilities
   a. The Division document "Waste Rock and Overburden Evaluation" provides characterization guidance.
   b. Provide pertinent sections of the facility's Division-approved waste rock management plan(s), if applicable.

2. Open pit(s)
   a. If applicable, provide pertinent sections of the facility's Division-approved pit lake study (per NAC 445A.429).

3. Heap leach pads
   a. Heap leach pads must be stabilized per NAC 445A.430. Detail all previous characterization and other closure-related activities for spent heap leach ore (e.g., pore volumes, sampling, etc.).

   b. Discuss amounts and kinds of materials that make up the heap, per pad, as applicable (e.g., homogenous vs. heterogeneous ore types); detail whether the ore was crushed; provide a discussion on any heap draindown chemical constituents that are anticipated to be of concern; discuss the placement of the ore (e.g., number of lifts, radial stacked, end dumped, etc.); if the heap was agglomerated, provide details.

4. Tailings impoundment(s)
   a. Tailings must be stabilized per NAC 445A.431; discuss the amount of and the physical and chemical characteristics of the tailings' solids.

5. Process ponds
   a. Provide remaining sludge quantity and Division Profile I characterization analyses for each pond.

6. Process facilities
   a. Discuss and characterize any liquid and solid wastes not discussed above proposed to be left onsite following closure. This includes any waste or debris

planned to be buried in a Class III landfill. This would include residual material in tanks, thickeners, and CIL circuit for example.

7. Ancillary facilities
   a. Identify all ancillary sources that will need characterization and/or stabilization.
   b. Provide characterization information on any hydrocarbon storage pads, landfills and any potential sources to remain onsite.
   c. Indicate areas where waste rock and/or spent ore were used for construction purposes; provide representative characterization data for these locations.

V. Source Stabilization Program

A Source Stabilization Program will be those measures, per source, designed to preclude the migration of any contaminant having the potential to degrade the waters of the State.

VI. General Requirements

The following general requirements are requisite for any source that has the potential to degrade waters of the State.

1. Modeling: The Division will accept computer modeling as a tool in predicting future behavior of a source. The Permittee should, when submitting modeling results to the agency, provide a discussion of all knowns and assumptions used. In addition, uncertainty analysis; stress runs (high and low extremes); statistical analysis and outputs should be presented.

2. Long Term Physical Stability: As required by NAC 445A.433, "Minimum Design Criteria," 1(c) All process components must be designed to withstand the run-off from a 24-hour storm event with a 100-year recurrence interval. The Division interprets this requirement as adequate for an operating mine with personnel available for immediate maintenance. However, in the permanent closure and post-closure monitoring period, personnel are generally not available for emergency response and repair. Under this condition, the above design criteria requirement may be inadequate. Therefore, the Division will require the Permittee to demonstrate that all components in closure are designed to be stable for the long term. As of August 2018, closure components, including cover and stormwater diversions, must be designed to withstand a 24-hour storm event with a 500-year recurrence interval.

3. Division experience has shown that the best method to ensure that a component does not develop a long-term water quality problem is to preclude meteoric water from infiltrating through the component. As such, the agency will require investigation into various alternatives to minimize meteoric water infiltration such as an engineered cap, a topsoil cover, diversion ditches, regrading, compacting, or impermeable synthetic covers.

4. Should the evaluation of a source indicate that discharge (either surface or subsurface) may be possible, the Permittee shall provide:
   a. Evaluation of anticipated seepage discharge rate and chemistry;
   b. Evaluation of anticipated drain discharge rate and chemistry;
   c. Evaluation of potential storm water discharge and chemistry;
   d. Physical properties of pathway;
   e. Potential attenuation and diffusion in pathways.

5. Should it be determined that there is the potential to degrade waters of the State, the Permittee shall investigate:
   a. The need for additional controls to reduce or treat anticipated source releases, including seepage, drainage and surface run-off;
   b. The necessity to further characterize potential pathways for source releases;
   c. The necessity for additional storm water run-on and run-off controls;
   d. Data gaps limiting characterization;
   e. Proposed methods and schedules for additional data acquisition and evaluation required to refine predictions (e.g., source-pathway-receiving water analysis, bench or field scale treatment tests, attenuation tests, etc.);
   f. Proposed operational modifications, additional construction, and schedules needed to reduce potential for post-operation releases;
   g. Proposed additional monitoring to validate the benefits of modifications supporting the demonstration of non-degradation to receiving waters;
   h. Potential alternatives for reducing and/or treating post-closure source releases (i.e., cover application, anaerobic sulfate reduction);
   i. Anticipated closure period (the time required for near equilibrium condition to be attained, where after any source releases have no potential to degrade waters of the State).

6. Reuse or disposal of mine waste solids outside of containment is not allowed without approval from the Division and may be considered either a minor or major modification to a WPCP. To apply for approval, submit a proposal to the Division in accordance with the guidance document "Alternative Use of Mine Waste Solids, Disposal Outside of Containment."

7. Provide a complete and detailed post-closure monitoring plan. The proposed plan shall include sampling protocols such as field filtering, number of samples, sample preservation, sample holding times, and the approved method of analysis together with the method detection limits (MDL); include anticipated frequency and duration of closure and post-closure monitoring.

VII. Individual Source Discussion

The following requirements are source specific.

1. Waste Rock Storage Facilities (WRSFs): In general, as part of the active mine operating plan, waste rock is characterized, evaluated, and disposed of in the regulatory agency's approved manner. The Permittee should present current characterization and stabilization information. The Permittee will be required to observe the WRSFs during post-closure monitoring to ensure seepage does not emanate from the facilities.

2. Open Pits: As with WRSFs above, the Permittee must demonstrate that the pit(s) do not have the potential to degrade waters of the State (per NAC 445A.429). The Permittee will be required to monitor any open pits, whether or not they penetrated the water table, during post-closure monitoring to ensure they are behaving as predicted in the pit lake model.

3. Heap Leach Pads (HLPs): There are alternative methods to closing HLPs. A complete discussion of all scenarios is beyond the scope of this document. Presented below are basic requirements.

a. Heap leach facilities must meet the requirements as specified in NAC 445A.430, "Stabilization of Spent Ore."
b. The Permittee may describe or propose heap detoxification activities for WAD cyanide if applicable; provide required pore volume, application rates and duration, and planned sampling of the heap.
c. Provide a draindown curve (residual draindown flow over time); provide all knowns and assumptions used in predicting what the long-term residual volume of draindown will be.
d. Discuss the actual and anticipated residual heap draindown quality; include long-term draindown estimates; propose HLP effluent treatment, if necessary, and provide specific details of such items as dosing tanks, sampling ports, active or passive treatment systems, and the disposal system for treated effluent (in most cases a septic type leach field). The Division document titled "Monitoring and Analysis of Post-Closure Heap Discharge" provides details and guidelines for managing heap draindown in the post-closure monitoring period.
e. Describe the procedures for completing physical closure activities on the heap surface (e.g., re-sloping, capping or covering, solar reshaping, construction of diversion ditches, etc.)

4. Tailings Storage Facilities (TSFs)
   a. TSFs must meet the requirements specified in NAC 445A.431 "Stabilization of Tailings."
   b. The Permittee must consult with the State of Nevada's Division of Water Resources, Bureau of Engineering and Dam Safety, regarding closure of tailings dams.
   c. TSFs require dewatering activities that may involve the conversion of the underdrain pond to an evaporation or evapo-transpiration cell. Draindown management must be modeled and the rates incorporated into the FPPC.
   d. Describe the procedures for completing physical closure activities on the tailings surface (e.g., re-sloping, covering, construction of diversion ditches, etc.).

5. Process Ponds
   a. Based on analytical characterization data, describe the proposed fate of the pond solids (e.g., disposed of or left in place); if proposed to be left in place, describe method of stabilization or encapsulation;
   b. Describe whether liner material will be disposed of or left in place;
   c. Describe the ultimate fate of the process component (i.e., if the pond basin will be backfilled, describe the procedures and what backfill material is proposed for use).

6. Process Facilities
   a. Discuss the ultimate fate of all process facilities;
   b. Discuss any proposed decontamination of refineries, assay labs or associated areas, as applicable.

7. Ancillary Facilities
   1. Discuss the fate of all ancillary facilities (e.g., buildings removed, foundations buried onsite, area ripped, stabilized onsite, etc.); if materials are buried in place, a Class III Waivered landfill filing is required.

APPENDIX A

The following Nevada State statutes and regulations pertain to closure. Please note: this list may be incomplete depending upon site-specific conditions. Please refer to NAC 445A.350 through 445A.447, inclusive, for complete State mining regulations.

Applicable Statues

NRS 445A.415 "Waters of the State" defined. "Waters of the State" means all waters situated wholly or partly within or bordering upon this state, including but not limited to:

1. All streams, lakes, ponds, impounding reservoirs, marshes, water courses, waterways, wells, springs, irrigation systems and drainage systems, and
2. All bodies or accumulations of water, surface and underground, natural or artificial.

(Added to NRS by 1973, 1709) (Substituted in revision for NRS 445.191)

NRS 445A.565 Protection of surface waters of higher quality; treatment of and control over discharges constituting new or increased sources of pollution.

1. Any surface waters of the State whose quality is higher than the applicable standards of water quality as of the date when those standards become effective must be maintained in their higher quality. No discharges of waste may be made which will result in lowering the quality of these waters unless it has been demonstrated to the commission that the lower quality is justifiable because of economic or social considerations. This subsection does not apply to normal agricultural rotation, improvement or farming practices.
2. Any person who plans to discharge waste from any public or private project o development which would constitute a new or increased source of pollution to waters of the State whose quality is high shall, as part of the initial design of the project o development, provide:
   a. If the discharge will be from a point source, the highest and best degree of waste treatment available under the existing technology, consistent with the best practice in the particular field under the conditions applicable, and reasonably consistent with the economic capability of the project or development.
   b. If the discharge will be from a diffuse source, such measures, methods of operation or practices as are reasonably calculated or designed to prevent, eliminate or reduce water pollution from the source, under the circumstances pertaining to the particular place, in order to achieve control over water pollution which is reasonably consistent with the economic capability of the project or development.
3. This section does not limit a municipal sewage treatment plant in disposing of its solid sludge on land if the sludge is properly spread and incorporated into the soil.

(Added to NRS by 1979, 1029)(Substituted in revision for NRS 445.253)

Applicable Regulations

NAC 445A.357 "Degrade" defined. "Degrade" means to alter the physical or chemical properties of or to cause a change in the concentration of any substance in the waters of the State in violation of the standards established pursuant to NAC 445A.424. (Added to NAC by Environmental Comm'n, eff. 9-1-89)(Substituted in revision for NAC 445.24214)

NAC 445A.359 "Facility" defined. "Facility" means all portions of a mining operation, including, without limitation, the mine, waste rock piles, ore piles, beneficiation process components, processed ore disposal sites, and all associated buildings and structures. The term does not include any process component or non-process component which is not used for mining or mineral production and has not been used in the past for mining or mineral production as part of an operation which is active as of

September 1, 1989. (Added to NAC by Environmental Comm'n, eff. 9-1-89)-(Substituted in revision for NAC 445.24218)

NAC 445A.361 "Groundwater" defined. "Ground water" means all subsurface water comprising the zone of saturation, including perched zones of saturation, which could produce usable water. (Added to NAC by Environmental Comm'n, eff. 9-1-89)-(Substituted in revision for NAC 445.24222)

NAC 445A.363 "Meteoric waters" defined. "Meteoric waters" means any form of precipitation falling from the earth's atmosphere. (Added to NAC by Environmental Comm'n, eff. 9-1-89)-(Substituted in revision for NAC 445.24226)

NAC 445A.___"Mitigate" or "mitigation" defined. "Mitigate" or "mitigation" includes, without limitation:

1. Avoiding the potential degradation of waters of the State by taking or not taking a certain action or parts of an action;
2. Minimizing the degradation or potential degradation of waters of the State by limiting the degree or magnitude of an action and its implementation;
3. Reducing or eliminating the degradation or potential for degradation of waters of the State by taking corrective action as defined in NAC 445A.2262; or
4. Reducing or eliminating the degradation or potential for degradation of waters of the State over time through preservation and maintenance over the life of the action.

(Ref. NAC 445A.711**)** (Effective August 2018, not yet codified).

NAC 445A.367 "Permanent closure" defined**.** "Permanent closure" means the time in the life of a facility when activities for the final stabilization, removal or mitigation of sources are undertaken.
(Added to NAC by Environmental Comm'n, eff. 9-1-89; A by R046-18, 8-30-2018)-(Substituted in revision for NAC 445.24234)

NAC 445A.___ "Post-closure monitoring" defined. "Post-closure monitoring" means the period of time required for monitoring of a facility following the permanent closure of that facility.
(Effective August 2018, not yet codified).

NAC 445A.375 "Process component" defined. "Process component" means a distinct portion of a constructed facility which is a point source. (Added to NAC by Environmental Comm'n, eff. 9-1-89)-(Substituted in revision for NAC 445.2425)

NAC 445A.376 "Process fluid" defined. "Process fluid" means any liquids, including meteoric waters, which are intentionally or unintentionally introduced into any portion of the beneficiation process components. (Added to NAC by Environmental Comm'n, eff. 9-1-89)-(Substituted in revision for NAC 445.24252)

NAC 445A.378 "Source" defined. "Source" means any building, structure, facility or installation from which there is or may be the discharge of pollutants. (Added to NAC by Environmental Comm'n, eff. 9-1-89)-(Substituted in revision for NAC 445.24256)

NAC 445A.379 "Stabilized" defined. "Stabilized" means the condition which results when contaminants in a material are bound or contained so as to prevent them from degrading the waters of the State under the environmental conditions that may reasonably be expected to exist at a site.
(Added to NAC by Environmental Comm'n, eff. 9-1-89)-(Substituted in revision for NAC 445.24258)

NAC 445A.382 "Temporary closure" defined. "Temporary closure" means the cessation of the operation of a process component for more than 30 days as a result of a planned or unplanned activity.
(Added to NAC by Environmental Comm'n, eff. 9-1-89)-(Substituted in revision for NAC 445.24264)

NAC 445A.383 "WAD cyanide" defined. "WAD cyanide" means the weak acid dissociable cyanide concentration as determined by one of the following methods:

1. ASTM D2036-082, “Standard Test Methods for Cyanides in Water,” Method C, Part 31. A copy of ASTM D2036-082 is available for purchase at the HIS Standards Store, 15 Inverness Way East, Englewood, Colorado 80112, or at the Internet address https://global.ihs.com, for the price of $72.
2. ASTM D2036-06, “Standard Test Methods for Cyanides in Water,” Method C, followed by Part 16.2 (titrimetric), Part 16.3 (colorimetric) or Part 16.4 (ion-specific electrode). A copy of ASTM D2036-06 is available from ASTM International, P.O. Box C700, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428-2959, by telephone at (877) 909-2786 or at the Internet address https://www.astm.org, for the price of $62.40.
3. ASTM D2036-09, “Standard Test Methods for Cyanides in Water,” Method C, followed Page 7 of 36 by Part 16.2 (titrimetric), Part 16.3 (colorimetric) or Part 16.4 (ion-specific electrode). A copy of ASTM D2036-09 is available from ASTM International, P.O. Box C700, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428-2959, by telephone at (877) 909-2786 or at the Internet address https://www.astm.org, for the price of $52.
4. “Standard Methods for the Examination of Water and Wastewater,” SM 4500-CN-I, followed by SM 4500-CN-D (titrimetric), SM 4500-CN-E (colorimetric) or SM 4500-CN-F (cyanide-ion selective electrode). A copy of these standards is available from Standard Methods at the Internet address https://standardmethods.org, for the price of $75.
5. Another version or method approved by the Department and scientifically demonstrated to achieve performance in determining weak acid dissociable cyanide which is equivalent to one of the methods described in subsections 1 to 4, inclusive. (Effective August 2018, not yet codified).

NAC 445A.398 Contents of application: Proposed operating plans (August 2020 Update)**.**
The proposed operating plans for a facility must include:

7. A tentative plan for the permanent closure of the facility which describes the procedures, methods and schedule for stabilizing spent process materials and all other sources at the facility. The plan must:
    a. Include:
        1) Procedures for characterizing spent process materials as they are generated;
        2) The procedures to stabilize all process components and all other sources at the facility with an emphasis on stabilizing spent process materials and the estimated cost for the procedures; and
        3) Conceptual closure plans for all sources at the facility with sufficient detail to support an estimate of the cost of executing the plan for reclamation determined pursuant to NAC 519A.360.
    b. Be updated and resubmitted to the Department if the holder of the permit:
        1) Submits a request to modify a plan for reclamation pursuant to NAC 519A.295 and the requested modification will affect the conceptual closure plans. The revised plan must be submitted with the request to modify the plan for reclamation.
        2) Makes any other change to the facility or operating plans that requires submitting new information to the Department pursuant to NAC 445A.392, 445A.420 or 445A.427.

(Added to NAC by Environmental Comm'n, eff. 9-1-89; A by R046-18, 8-30-2018 and R018-20, 8-26-2020)-(Substituted in revision for NAC 445.24296)

NAC 445A.424 Limitations on degradation of water; exemptions.

1. A facility, regardless of size or type, may not degrade the waters of the State to the extent that:
    a. The quality of surface water is lowered below that allowed by NRS 445.565.
    b. For ground water:

1) The concentration of a constituent exceeds the greater of:
   (I) A state or federal regulation prescribing standards for drinking water; or
   (II) The natural background concentration of the regulated drinking water constituent; or
2) The concentration of WAD cyanide exceeds 0.2 mg/l. The department may establish a numerical limit for any constituent not regulated by subparagraphs 1 and 2 which may reasonably be expected to be discharged by the facility in sufficient volume and concentration to cause an adverse impact on human health.

c. The quality of those waters of the State which already exceed the criteria established by subsection 2 is lowered to a level that the department finds would render those waters unsuitable for the existing or potential municipal, industrial, domestic or agricultural use.

2. The department may exempt a body of ground water or portion thereof from the standards established in subsection 1 if the request for an exemption to the ground water standards and the supporting information is submitted as part of the application for the permit. The following criteria will be considered by the department in determining whether to exempt a potentially impacted body of ground water from the standards in subsection 1:
   a. The impacted ground water does not currently serve as a source of drinking water and because of the following reasons the ground water will not serve as a source of drinking water:
      1) The ground water produces a mineral, hydrocarbon or geothermal fluid which the applicant can demonstrate to the satisfaction of the department exists at a concentration that is expected to be capable of commercial production and that releases by the facility will not affect this production;
      2) The ground water is situated at a depth or location which makes recovery of water for drinking economically or technologically impractical; or
      3) It would be economically or technologically impractical to render the water fit for human consumption; or
   b. The total dissolved solids in the ground water is more than 10,000 milligrams per liter and the ground water is not reasonably expected to become a supply of drinking water.

(Added to NAC by Environmental Comm'n, eff. 9-1-89; A by R046-18, 8-30-2018)-(Substituted in revision for NAC 445.24342)

NAC 445A.429 Procedures required to prevent release of contaminants; requirements concerning impoundments. (August 2018 update.)

1. The holder of the permit must institute appropriate procedures to ensure that all mined areas do not release contaminants that have the potential to degrade the waters of the State.
2. Open pit mines must, to the extent practicable, be free-draining or left in a manner which minimizes the impoundment of surface drainage and the potential for contaminants to be transported and degrade the waters of the State.
3. Underground mines must, to the extent practicable, be left in a manner which minimizes the inflow and outflow of water through the openings to the mine on the surface of the land.
4. Bodies of water which are a result of mine pits penetrating the water table must not create an impoundment which:
   a. Has the potential to degrade the ground waters of the State, or
   b. Has the potential to affect adversely the health of human, terrestrial or avian life.
5. The holder of a permit may apply to the commission to establish a beneficial use with a level of protection less than that required by paragraph (b) of subsection 3 for water impounded in a specific mine pit.

(Added to NAC by Environmental Comm'n, eff. 9-1-89; A by R046-18, 8-30-2018)--(Substituted in revision for NAC 445.24352)

NAC 445A.430 Stabilization of spent ore.

1. Spent ore which has been left on pads or which will be removed from a pad must first demonstrate the stability of the discharge effluent from the pads or from the spent ore such that:
   a. WAD cyanide levels in the effluent rinse water are less than 0.2 mg/l;
   b. The pH level of the effluent is between 6.0 and 9.0, and
   c. Contaminants in any effluent from the processed ore which would result from meteoric waters would not degrade waters of the State.
2. If the requirements established in subsection 1 cannot be achieved, the Department will grant a variance to those conditions if the holder of the permit can demonstrate that:
   a. The remaining solid material, when representatively sampled, does not contain levels of contaminants that are likely to become mobile and degrade the waters of the State under the conditions that will exist at the site; or
   b. The spent ore is stabilized in such a fashion as to inhibit meteoric waters from migrating through the material and transporting contaminants that have the potential to degrade the waters of the State.
3. The Department may approve an alternate method for stabilizing ore that has been leached if the holder of the permit can clearly demonstrate that the condition in which the materials will be left will not create a potential for the waters of the State to be degraded.

(Added to NAC by Environmental Comm'n, eff. 9-1-89; A by R141-06, 10-31-2007) (Substituted in revision for NAC 445.24354)

NAC 445A.431 Stabilization of tailings. Upon termination of the active use of a tailings impoundment, representative samples of the material deposited in the impoundment must be collected and characterized. The tailings must be stabilized during the final closure of a facility so as to inhibit the migration of any contaminant that has the potential to degrade the waters of the State.
(Added to NAC by Environmental Comm'n, eff. 9-1-89)--(Substituted in revision for NAC 445.24356)

NAC 445A.433 Minimum design criteria: Universal requirements; areas where ground water is near surface; proximity of new process components to dwellings; liability for degradation of water. (NRS 445A.425, 445A.465) (August 2018 update.)

2) If the final plan for permanent closure of a facility that is required pursuant to NAC 445A.447 has not been approved by the Department before September 1, 2018, the following minimum criteria apply for the permanent closure period:
   a. All process components must be designed or modified to withstand the runoff from a 24-hour storm event with a 500-year recurrence interval.
   b. The primary fluid management system must be designed or modified to be able to remain fully functional and fully contain all fluids, including all accumulations resulting from a 24-hour storm event with a 500-year recurrence interval. The Department may require additional containment based on the following factors:
      1) Proximity to surface water bodies;
      2) Depth to groundwater, and
      3) Proximity to population.
   c. The fluid management system must be designed or modified to be functional for 5 years after the time required for post-closure monitoring pursuant to NAC 445A.446.

NAC 445A.445 Procedure upon unplanned temporary closure of process component (NRS 445A.425, 445A.465) (August 2018 update.)

NAC 445A.446 Permanent closure of facility. (August 2018 update.)

1. In the event of an unplanned temporary closure of one or more process components, the holder of the permit shall:
   a. Within 30 days after an unplanned temporary closure begins, inform the Department of the closure and describe the procedures and controls which have been carried out to maintain the process components during this period.
   b. Within 90 days after the Department has been notified of the unplanned temporary closure:
      1) Begin to evaluate the procedures which will be required to carry out a permanent closure of the process components affected and petition the Department to approve one or ore procedures needed for the permanent closure of the process components affected; or
      2) For just cause, request that the Department grant an extension and delay permanent closure. Except as otherwise provided in subsection 2 of NAC 445A.420, the extension may not be longer than the remaining term of the existing permit or for 3 years, whichever is greater.
2. The Department shall approve or disapprove the proposed procedures for permanent closure within 30 days after they are submitted to the Department.
3. Unless the Department has granted an extension pursuant to subparagraph (2) of paragraph (b) of subsection 1**,** within 270 days after the Department has been notified of the unplanned temporary closure, the holder of the permit shall initiate the approved procedures for permanent closure.
4. If the holder of the permit fails to inform the Department of an unplanned temporary closure as required pursuant to subsection 1 and the Department otherwise becomes aware of such closure, the Department may:
   a. Establish procedures and controls to maintain the process components during such closure;
   b. Establish procedures needed for the permanent closure of the process components affected, and
   c. Require the holder to implement the procedures and controls established pursuant to paragraphs (a) and (b).

NAC 445A.446 Permanent closure of facility. (August 2018 update.)

1. The permanent closure of a facility or a source at a facility, as applicable, must be initiated:
   a. Following the request of the holder of the permit;
   b. For a facility which is under a temporary closure, no later than at the end of one renewal of a 5-year permit which has been issued pursuant to subsection 2 of NAC 445A.420, or
   c. When the end of the design life of that process component is reached.
   d. For an underground mine, and any source therein, which has the potential to degrade the waters of the State, before the elimination of safe access to the mine.
2. Permanent closure is complete when the requirements contained in NAC 445A.429, 445A.430 and 445A.431, as applicable, have been achieved and all other sources at the facility have been stabilized, removed or mitigated.
3. The time required for post-closure monitoring depends upon the particular site and process characteristics, but, except as otherwise provided in subsection 4, the time required must not exceed 30 years.
4. If the Department determines that chemical stabilization, source removal or mitigation has not been achieved during the post-closure monitoring period, the Department shall require the holder of the permit to take additional actions to achieve the necessary chemical stabilization, source removal or mitigation. After such actions have been taken, the Department shall require an additional period of time for post-closure monitoring. The time required for this additional period of post-closure monitoring must not exceed 30 years.

   (Added to NAC by Environmental Comm'n, eff. 9-1-89; A by R046-18, 8-30-2018)--(Substituted in revision for NAC 445.24386)

NAC 445A.447 Plans for permanent closure; sources not classified as process components.
(August 2020 update.)

1. Plans for permanent closure are required for all sources at a facility.
2. A final plan for permanent closure of any source which has been identified as a process component must be submitted to the department at least two (2) years before the anticipated permanent closure of that process component.
3. Sources which have not been classified as process components must be evaluated at the end of their operating life to determine the potential for pollutants from these sources to migrate and degrade the waters of the State under the final proposed site conditions and must be closed in accordance with the state handbook of best management practices prepared pursuant to NAC 445A.336.
4. The Department may require the holder of a permit to revise a previously approved final plan for permanent closure if, based on new information received by the Department, the Department determines that the final plan for permanent closure will not achieve chemical stabilization, source removal or mitigation of a process component.
   (Added to NAC by Environmental Comm'n, eff. 9-1-89; A by R018-20, 8-26-2020)--Substituted in revision for NAC 445.24388)

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