

Wyoming Administrative Rules

Environmental Quality, Dept. of

Land Quality - Non Coal

Chapter 11: In Situ Mining

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Chapter 11

In Situ Mining

Section 1. Definitions.

(a) “Abandoned well” means a well whose use has been permanently discontinued or which is in a state of disrepair such that it cannot be used for its intended purpose or for observation purposes.

(b) “Annular space” means the space between the well casing and the borehole or the space between two or more strings of well casing.

(c) “Area Permit” means that, for the purposes of this Chapter, the Administrator may issue a permit on an area basis, rather than for each well individually, provided that the permit is for UIC Class III wells:

(i) Described and identified by location in permit application(s) if the wells are existing wells, except that the Administrator may accept a single description of wells with substantially the same characteristics;

(ii) Within the same well field, facility site, reservoir, project, or similar unit in the same state;

(iii) Operated by a single owner or operator; and

(iv) That are not used to inject hazardous waste.

(d) “Baseline” means the constituents or parameters and the concentrations or measurements which describe water quality and water quality variability prior to the injection of recovery fluid.

(e) “Catastrophic collapse” means the sudden and utter failure of overlying strata caused by removal of underlying materials. This can occur in salt solution mining and other processes that remove reservoir material to recover product.

(f) “Class III well” means a well used for in situ mining for the injection of recovery fluid for the purpose of extracting minerals, or products, including a well used in:

(i) Mining of sulfur by the Frasch process;

(ii) In situ mining of uranium or other metals; this category includes only in situ production from ore bodies which have not been conventionally mined. Wells used for solution mining (such as stope leaching) of conventional mines are classified as Class V wells;

(iii) In situ mining of salts, trona, or potash. With the exception that wells,

used in reclamation activities, to inject into previously mined areas of underground trona mines will be classified as Class V wells rather than Class III wells (and therefore not regulated under this Chapter), regardless of whether such wells are used for secondary recovery of trona;

(iv) Fossil fuel recovery, including oil shale and tar sands; or

(v) Experimental technologies, such as pilot scale in situ mining wells in previously unmined areas.

(g) “Compliance schedule” means a schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the applicable statutes and regulations.

(h) “Confining zone” means a geological formation, group of formations, or part of a formation that is capable of significantly limiting fluid movement above or below an injection zone.

(i) “Contaminant” means any unwanted or unauthorized physical, chemical, biological, or radiological substance or matter in water.

(j) “Exempted aquifer” means an aquifer or any portion thereof that meets the criteria in the definition of "Underground Source of Water" but which has been exempted according to the procedures of Section 11 of this Chapter.

(k) “Fact sheet” means a document that briefly sets forth the principal facts and the significant factual, legal, methodological and policy questions considered in preparing a draft in situ class III permit.

(l) “Flow rate” means the volume per time unit given to the flow of gases or other fluid substance which emerges from an orifice, pump, turbine or passes along a conduit or channel.

(m) “Fluid” means material or substance which flows or moves whether in a semisolid, liquid, sludge, gas, or any other form or state.

(n) “Formation” means a body of rock characterized by a degree of lithologic homogeneity which is prevailing, but not necessarily, tabular and is mappable on the earth's surface or traceable in the subsurface.

(o) “Formation fluid” means "fluid" present in a "formation" under natural conditions as opposed to introduced fluids.

(p) “Injection well” means a well or conduit through which recovery fluid is introduced into the subsurface. If a well is used for both injection and recovery, it is considered an injection well for the purposes of this Chapter until the operator has adequately demonstrated

to the Administrator that the well has been converted to a use other than injection, per the requirements of Section 10 of this Chapter.

(q) “License area” means, with respect to an In Situ Research and Development License, an area described in the license application within which all affected land and water is contained.

(r) “Mechanical integrity” means, an injection well, a production well, or monitor well where there is no significant leak in the casing, tubing or packer, and there is no significant fluid movement into an unauthorized zone through vertical channels adjacent to the injection or recovery well bore.

(s) “Mechanical integrity testing” means the testing used to determine that a well has mechanical integrity as required in Section 9 of this Chapter.

(t) “Monitor well” means a well constructed or utilized to measure static water levels or to obtain liquid, solid, or gaseous analytical samples or other physical data that would be used for controlling the operations or to indicate potential circumstances that could affect the environment.

(u) “Monitor well ring” means the series of monitor wells surrounding a wellfield used to assess possible chemical and physical changes in groundwater due to ISR development.

(v) “Production well” or “Recovery well” means a well through which a recovery fluid or soluble mineral is produced or recovered from the subsurface. If a well is used for both injection and recovery, it is considered an injection well for the purposes of this chapter until the operator adequately demonstrates to the Wyoming Department of Environmental Quality (Department) that the well has been converted to use as a Production or Recovery Well.

(w) “Receiving strata” means the geologic units within which the production zones are contained.

(x) “Recovery fluid” means any material which flows or moves, whether semi-solid, liquid, sludge, gas or other form or state, used to dissolve, leach, gasify or extract a mineral. This may also include restoration fluid.

(y) “Research and Development License” means the permitting vehicle issued by the Administrator, per W.S. § 35-11-431 et seq., approving research and development testing as defined in W.S. § 35-11-103(f)(viii).

(z) “Sealing” means the operation whereby a cement slurry or other approved material is pumped into a drilled hole and/or forced into a well’s annulus between the borehole and the casing.

(aa) “Target Restoration Values” means the numerical groundwater protection standards, developed on a parameter-by-parameter basis for water quality constituents, used to

assess the success of groundwater restoration within the production zone.

(ab) “The Division” means the Land Quality Division of the Department.

(ac) “Underground Injection Control” (UIC) means the Underground Injection Control program under Part C of the Safe Drinking Water Act (42 USC 300h *et seq.* (2005)), including an “approved State program.”

(ad) “Underground Source of Water” (USW) means:

(i) Those aquifers or portions thereof which have a total dissolved solids content of less than 10,000 milligrams per liter (mg/l) and which contain a sufficient quantity of water to supply a public water supply as defined in W.S. § 35-11-103(c)(viii);

(ii) Those that can be classified as a “known source of supply” pursuant to Chapter 8, Section 4(c), Quality Standards for Wyoming Groundwaters, Water Quality Division Rules and Regulations.

(ae) “Upper Control Limit” (UCL) means a value greater than the maximum value of a chemical or physical parameter that can be attributed to natural fluctuations and analytical variability. UCL parameters and amounts are determined from the baseline sampling and agreed upon by the Administrator and the operator prior to initiation of mining. UCLs are used to determine when there is movement of recovery fluid out of authorized areas or unapproved changes to a chemical or physical parameter.

(af) “Well” means a bored, drilled, or driven shaft whose depth is greater than the largest surface dimension; or, a dug hole whose depth is greater than the largest surface dimension; or, an improved sinkhole, or a subsurface fluid distribution system, as codified in the UIC regulations at 40 CFR 144.3.

(ag) “Wellfield area” means the surface area overlying the injection and recovery zones. This area may be all or a portion of the entire area proposed for the injection and production of recovery fluid throughout the life of the mine.

(ah) “Well Stimulation” means a well mediation performed on an ISR well to increase production by improving the flow of injection fluids from the injection wells into the production well bore.

Section 2. General Requirements.

(a) All applications for mining permits and amendments must be submitted in a format satisfactory to the Administrator. The applicant shall provide information that is complete, current, presented clearly and concisely, and supported by appropriate references to technical and other written material. The Administrator may require the applicant to supplement the application with information beyond that specifically required by these rules if the Administrator believes that additional information is necessary to make an informed decision.

(b) In addition to the requirements of this Chapter, Chapter 7 of the Land Quality Noncoal Rules shall apply to in situ mining and Research and Development License operations.

(c) Applicable sections of Chapters 8 and 27 of the Water Quality Rules, regarding groundwater use classification, quality standards, and testing procedures, and, outside the aquifer exemption boundary, applicable Maximum Contaminant Levels from the U.S. Environmental Protection Agency Rules (40 CFR 141), shall also apply to in situ mining or Research and Development License operations.

(d) Applications for a permit or Research and Development License shall be filed with the Administrator. The applicant shall file two copies of the application to the Administrator.

(e) The Division shall prepare a fact sheet for each in situ Class III permit application.

(i) The fact sheet shall include, where applicable:

(A) A brief description of the type of facility or activity which is the subject of the draft permit;

(B) The type and quantity of wastes, fluids, or pollutants which are proposed to be or are being treated, stored, disposed of, injected, emitted, or discharged;

(C) Reasons why any requested variances or alternatives to required standards do or do not appear justified;

(D) A description of the procedures for reaching a final decision on the draft permit including:

(I) The beginning and ending dates of the comment period and the address where comments will be received;

(II) Procedures for requesting a hearing and the nature of that hearing; and

(III) Any other procedures by the public may participate in the final decision.

(E) The name and telephone number of a person to contact for additional information.

(ii) The Administrator shall send the fact sheet to the applicant and, on request, to any other person.

(f) Area permits shall specify the area within which underground injections are

authorized and the requirements for construction, monitoring, reporting, operation and abandonment for all wells authorized. The area permit may authorize the permittee to construct and operate, convert, or plug and abandon wells within the area permit provided the permittee notifies the Administrator at such times as the permit requires, the additional well meets the requirements under the definition of “area permit” and this section and the cumulative effects of drilling and operation of additional injection wells are considered by the Administrator during evaluation of the permit application and are acceptable to the Administrator. The area permit does not allow for the construction of non-bonded infrastructure.

(g) The operator shall allow the Administrator, or an authorized representative of the Division, to enter and inspect any property as provided by W.S. §§ 35-11-109(a)(iv), (v) and (vi).

(h) All applications shall be signed by a responsible corporate officer. All reports required by permits (including Annual Reports, Quarterly Monitoring Reports, and reports related to excursion monitoring and control) or other information required by the Administrator which pertain to Class III injection wells shall be signed by a responsible corporate officer or duly authorized representative. Any responsible corporate officer or duly authorized representative signing a document under this Section shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for known violations.

(i) “Responsible corporate officer” shall be:

(A) A president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs policy or decision-making functions for the corporation, or

(B) The manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures, or

(C) In the case of a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(D) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(I) The chief executive officer of the agency, or

(II) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of the U.S. Environmental Protection Agency (EPA)).

(ii) “Duly authorized representative” shall be a person who is authorized to sign a document to be submitted to the Land Quality Division as part of the official record regarding an in situ mining permit or Research and Development License. A person shall qualify for this title only if:

(A) The authorization is made in writing by a responsible corporate officer;

(B) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

(C) The written authorization is submitted to the Division.

(iii) If the responsible corporate officer or duly authorized representative is no longer correctly listed with the Administrator, a new name must be submitted, with required written authorization as required by Sections 2(h)(ii)(A) and (C) of this Chapter, to the Administrator prior to or with any reports, information, or applications to be signed by that individual.

Section 3. Application Content Requirements - Adjudication.

(a) All applications for a permit must include, at a minimum, the information and materials required in: W.S. § 35-11-428 and Chapter 2, Sections 1 and 2(a)(i)(A) through (J) of these rules and:

(i) A description of the activities conducted by the applicant for which permits are required under: the Resource Conservation and Recovery Act (RCRA), the UIC program of the Safe Drinking Water Act; the National Pollution Discharge Elimination System (NPDES) program of the Clean Water Act; and the Prevention of Significant Deterioration program of the Clean Air Act.

(ii) A listing of all permits or construction approvals received or applied for in association with the in situ permit area under the following programs:

(A) Hazardous Waste Management program under RCRA;

(B) UIC program under the Safe Drinking Water Act (as it pertains to wells other than Class III wells);

(C) Aquifer exemption from the EPA;

(D) NPDES program under the Clean Water Act (CWA);

(E) Prevention of Significant Deterioration (PSD) program under the Clean Air Act (CAA);

(F) Nonattainment program under the CAA;

(G) National Emission Standards for Hazardous Pollutants preconstruction approval under the CAA;

(H) Dredge and fill permits under Section 404 of the CWA;

(I) U.S. Nuclear Regulatory Commission, or Wyoming Uranium Recovery Program, Source Material License; or

(J) Other relevant environmental permits, including State permits.

(b) The map required in W.S. 35-11-406(a)(ix) must extend a minimum of one mile beyond the permit boundary.

Section 4. Application Content Requirements - Baseline Information.

(a) All applications for a permit must also include:

(i) A soil survey which maps and describes the general distribution of the soils within the permit area. A detailed soil survey and associated laboratory analysis may be required for soils on the affected lands.

(ii) A description of the nature and depth of the topsoil that will be removed from proposed affected land prior to disturbance by mining activities.

(iii) A survey of vegetative cover and species diversity on the proposed affected land determined by scientifically acceptable sampling procedures. Vegetation productivity sampling may be required, at the Administrator's discretion, depending on the nature of the communities to be disturbed. However, if existing data from other sources, such as National Resources Conservation Service publications or adjacent permit areas, can be provided and demonstrated to be applicable to the communities in question, the collection of production data may be waived.

(iv) A list of the indigenous vertebrate species by common and scientific names observed within the proposed permit area. Surface waters supporting fish that may be

affected by the operation shall be sampled for benthic invertebrates and periphyton. As required in Chapter 2, Section 1(f), the applicant shall consult with the Wyoming Game and Fish Department and the U.S. Fish and Wildlife Service prior to submission of a permit application to determine permitting requirements.

(v) A description of climatic conditions of the site in accordance with the requirements of Chapter 2, Section 2(a)(i)(C) and (D).

(vi) A description of the geology, including:

(A) Discussion, supported by maps, cross-sections and geologist's, driller's, and geophysical logs, which identifies: formations and aquifers; geologic features that could influence aquifer properties; and the areal and stratigraphic position of the production zone in relation to other geologic features within the proposed permit or Research and Development License area; and

(B) A generalized map and cross-sections illustrating the regional geologic setting.

(vii) A geochemical, lithological, and mineralogical description of the receiving strata and any aquifers that may be affected by the injection of recovery fluid.

(viii) For surface waters within the permit area and on adjacent lands:

(A) The names, descriptions, and a map of all such waters; and

(B) A list and map of all adjudicated and permitted surface water rights.

(ix) For groundwater within the permit area and on adjacent lands:

(A) The names (or numbers), descriptions, and a map of all wells installed for water supply or monitoring and all wells which penetrate the production zone. The description shall include: names of present owners, well completion data, producing interval(s), and variations in water level to the extent such information is available in the public records and from a reasonable inspection of the property;

(B) A list and map of all adjudicated and permitted groundwater rights;

(C) A list and map of all abandoned wells and drill holes, giving location, depth, producing interval(s), type of use, condition of casing, plugging procedures and date of completion for each well or drill hole within the permit area and on adjacent lands to the extent such information is available in public records and from a reasonable inspection of the property;

(D) A groundwater potentiometric surface contour map for each

aquifer that may be affected by the mining process, including overlying and underlying aquifers in which monitoring wells are installed.

(E) Aquifer characteristics for the water saturated portions of the receiving strata and aquifers which may be affected by the mining process, which may include, but is not limited to, aquifer thickness, velocity and direction of groundwater movement, storage coefficients or specific yields, transmissivity or hydraulic conductivity and the direction(s) of preferred flow under hydraulic stress in the saturated zones of the receiving strata. The extent of hydraulic connection between the receiving strata and overlying and underlying aquifers, and the hydraulic characteristics of any influencing boundaries in or near the proposed well field area(s) shall be determined and described. Information needed to meet the requirements of Section 8(d) of this Chapter shall also be provided; and

(F) Tabulated water quality analyses for samples collected from all groundwater which may be affected by the proposed operation. Sampling to characterize the pre-mining groundwater quality and its variability shall be conducted in accordance with established Department guidelines. All baseline groundwater quantity and quality information must be provided in an electronic format prescribed by and/or acceptable to the Administrator.

Section 5. Application Content Requirements - Mine (Operations) Plan

(a) All applications for a mine permit and amendments must include, at a minimum, the information and materials related to mine plans required in: W.S. §§ 35-11-428 and 35-11-429, Chapter 2, Section 1, and Chapter 3, Section 2 (excepting Subsections (b)(ii) and (iii), (c)(iv), and (h) and, with respect to subsection (k)(i), as modified in Section 6(a)(iv) of this Chapter) and:

(i) Contour (topographic) map(s) which accurately locate and identify the permit area and show the location of any public highways, dwellings, utilities and easements within the permit area and adjacent lands in relation to all proposed affected lands and proposed activities associated with the operation including, but not limited to: plant site, chemical storage areas, wellfield areas, roads, temporary and permanent drainage diversions, impoundments, stockpiles for topsoil, ore product and waste, and all processing facilities. The map(s) shall also clearly illustrate the location of monitoring wells required by Section 16 of this Chapter.

(ii) Discussion and illustration of the proposed mining schedule, including:

- (A) A list of the proposed wellfields;
- (B) Map(s) showing the proposed sequence for mining of the wellfields;
- (C) A proposed time schedule for mining each wellfield; and
- (D) The capacity of the water/waste water treatment systems and correlation of the capacity with the mining and restoration schedules.

(iii) The procedure(s) used to protect the topsoil and subsoil, as required in Chapter 3, Section 2(c)(i) through (iii), from excessive compaction, degradation, and wind and water erosion where stockpiling of topsoil and subsoil is necessary. The Administrator may authorize topsoil to remain on areas where minor disturbance will occur associated with construction and installation activities including but not limited to light-use roads, signs, wellfields, utility lines, fences, monitoring stations, and drilling provided that the minor disturbance will not destroy the protective vegetative cover, increase erosion, nor adversely affect the soil resource.

(iv) A description of and dimensions for all proposed impoundments, as defined by the State Engineer's Office. A leak detection plan may be required for impoundments that are not regulated by the Nuclear Regulatory Commission. For impoundments holding toxic or acid forming material, contingency plans to control unanticipated leakage shall be provided.

(v) A description of all temporary and permanent surface water diversions in accordance with the requirements of Chapter 3, Section 2(e) and (f).

(vi) The composition of all known and anticipated wastes and procedures for their disposal.

(vii) Procedures for ensuring that all acid-forming, or toxic, or other materials constituting a fire or health and safety hazard encountered during or created by the mining process are promptly treated, confined, or disposed of in a manner designed to prevent pollution of surface water or groundwater, degradation of soils; or vegetation, or threat to human or animal health and safety.

(viii) A description of the mitigating measures developed from the consultations with the Wyoming Game and Fish Department and the U.S. Fish and Wildlife Service as required per Chapter 2, Section 1(f).

(ix) A description of the location within the permit area where underground injection is planned.

(x) A description of the proposed method of operation, including:

(A) Injection rate, with the average and maximum daily rate and the volume of fluid to be injected;

(B) Injection pressures, with average and maximum injection pressures, as required by Section 8 of this Chapter;

(C) Proposed stimulation program;

(D) Type of injection/recovery fluid to be used;

(E) Proposed injection procedure; and

(F) Expected changes in pressure, native groundwater displacement and direction of movement of injection fluid.

(xi) The following information concerning the production zone shall be determined or calculated and submitted for new Class III wells or projects:

(A) Where the production zone is in a receiving strata which is naturally water-bearing:

(I) Fluid pressure;

(II) Fracture pressure; and

(III) Physical and chemical characteristics of the receiving strata fluids.

(B) Where the receiving strata is not a water-bearing formation, the fracture pressure in the production zone.

(xii) The procedure(s) to assure that the installation of recovery, injection, and monitor wells will not result in hydraulic communication between the production zone and overlying or underlying stratigraphic horizons.

(xiii) The procedures utilized to verify that the injection and recovery wells are in communication with monitor wells completed in the receiving strata and employed for the purpose of detecting excursions.

(xiv) Descriptions of:

(A) The completion details for all monitor wells; and

(B) A detailed description of the typical proposed well completion for monitoring, injection and recovery wells, as required by Section 8 of this Chapter.

(xv) Details of a monitoring program and reporting schedule as required by Sections 15 and 16 of this Chapter.

(xvi) A schedule for and description of the procedures to demonstrate and maintain mechanical integrity of all monitoring, recovery, and Class III injection wells as required by Section 9 of this Chapter. Monitor wells need only be tested upon completion.

(xvii) A corrective action plan, for any wells which are improperly sealed, completed, or abandoned, consisting of such steps or modifications as are necessary to prevent movement of fluid into unauthorized zones as required by Section 20 of this Chapter.

(xviii) A description of chemical reactions that may occur during mining as a result of recovery fluid injection.

(xix) A subsidence analysis, using established geotechnical principles, which estimates, based upon the proposed mining operation, the effect of subsidence upon the land surface and overlying groundwater aquifers. Subsidence shall be planned and controlled to the extent that the values and uses of the surface land resources and the groundwater aquifers will not be degraded.

(xx) A description of measures employed to prevent an excursion, and contingency and corrective action plans to be implemented in the event of an excursion, in accordance with Sections 19 and 20 of this Chapter.

(xxi) An assessment of impacts that may reasonably be expected as a result of the mining operation to water resources and water rights inside the permit area and on adjacent lands, and the steps that will be taken to mitigate these impacts.

(xxii) A maintenance plan to ensure:

(A) Wells are sufficiently covered to protect against entrance of undesirable material into the well;

(B) The wells are marked and can be clearly seen;

(C) The area surrounding each well is kept clear of brush or debris;

(D) Monitoring equipment is appropriately serviced and maintained so the monitoring requirements in Section 16(a)(i) of this Chapter can be met; and

(E) Effective spill response and reporting.

Section 6. Application Content Requirements - Reclamation Plan.

(a) All applications for a permit shall include, at a minimum, the information and materials related to reclamation required in: W.S. §§ 35-11-428 and 35-11-429, Chapter 2, Section 1, and Chapter 3, Section 2 (excepting Subsections (b)(ii) and (iii), (c)(iv), and (h) and with respect to subsection (k)(i), as modified in Section 6(a)(iv) of this Chapter); and

(i) Discussion and illustration of the proposed groundwater restoration schedule, including:

(A) A list of the proposed wellfields;

(B) Map(s) showing the proposed sequence for restoration of the wellfields;

(C) A proposed time schedule for each wellfield;

(D) The capacity of the water/waste water treatment systems and correlation of the capacity with the mining and restoration schedules.

(ii) The information necessary to demonstrate that the operation will return all affected groundwater to the pre-mining class of use or better using Best Practicable Technology, in accordance with the following provisions:

(A) In deciding whether a demonstration has been made by the operator that Best Practicable Technology has been applied, the Administrator shall, at a minimum, take the following factors into consideration:

- (I) The pre-mining background baseline water quality;
- (II) The character and degree of injury or interference with the health and well-being of the people, livestock, wildlife, aquatic life and plant life affected;
- (III) The social and economic value of the source of pollution;
- (IV) The social and economic value of the impacted aquifer;
- (V) The priority of location in the area involved;
- (VI) The technical practicability and economic reasonableness of reducing or eliminating the source of pollution;
- (VII) The effect upon the environment; and
- (VIII) The potential impacts to other waters of the state.

(B) The evaluation of restoration of the groundwater within the production zone shall be based on the target restoration values;

(C) The evaluation of groundwater restoration success shall be conducted on a parameter by parameter basis; and

(D) Regardless of the restored groundwater quality in the production zone, the adjacent aquifers and other waters within the same aquifers must be fully protected to their class of use and, outside the aquifer exemption boundary, to applicable Maximum Contaminant Levels from the U.S. Environmental Protection Agency Rules (40 CFR 141). If the restored groundwater in the production zone poses a threat to groundwater outside the production zone, then flow and/or fate and transport models shall be used to assist in determining what action, including monitoring sufficient to verify the model, needs to be taken. A monitoring program sufficient to verify the model may be required.

(E) If the operator demonstrates the application of Best Practicable

Technology to the satisfaction of the Administrator, but is unable to achieve the pre-mining class of use, then the operator can request that the Director recommend the Environmental Quality Council modify the water quality criteria used for groundwater restoration, in accordance with W.S. § 35-11-429(a)(iii), provided the operator can demonstrate the requirements of Section 6(a)(ii)(D) will be met.

(F) A minimum of one year of quarterly monitoring data for a full suite of parameters, except those shown to be unaffected by the mining and restoration process, must be provided to demonstrate groundwater stability during the evaluation of restoration.

(iii) A plan for well repair, plugging, and conversion as required by Section 10 of this Chapter.

(iv) A proposed schedule for achieving reclamation, including commitments that reclamation of mining-related surface disturbances in any mining area shall be completed within two years following approval of groundwater restoration in that area and that reclamation of all mining-related surface disturbances shall be completed within two years following approval of final groundwater restoration within the permit area.

(v) A contour map showing the approximate post-reclamation surface contours for affected lands and the immediate surrounding areas if the operation will substantially alter the pre-mining contours.

(vi) Procedures for reestablishing any surface drainage that may be disrupted by the mining operation.

(vii) Procedures for the reclamation of any temporary diversion ditches or impoundments.

(viii) Procedures for permanently disposing of any toxic or acid-forming materials.

(ix) Procedures for removing and disposing of structures used in conjunction with the mining operation.

(x) Procedures for mitigating or controlling the effects of subsidence.

(xi) Procedures for ground surface preparation, depth of topsoil replacement, erosion control and water conservation practices.

(xii) Procedures for revegetation to return the affected lands to the proposed post-mining land use and procedures for evaluation of revegetation success in accordance with Chapter 3, Section 2(d).

(xiii) The estimated costs for reclamation as computed in accordance with established engineering principles, including, but not limited to:

- (A) Cost of removing and disposing of structures;
- (B) Cost of topsoil restoration and reseeding all affected lands;
- (C) Cost of facilities, materials, and chemicals used for groundwater restoration;
- (D) Cost of capping, plugging, and sealing of all wells; and
- (E) Costs for personnel working on reclamation-related activities.

Section 7. Research and Development License Application.

(a) All applications for a Research and Development License shall include, at a minimum, the information and materials related to reclamation required by W.S. § 35-11-431 and Sections 8 through 12 and 15 through 20 of this Chapter, and shall:

- (i) Demonstrate that the operation is designed to:
 - (A) Evaluate mineability or workability of a mineral deposit using in situ mining techniques;
 - (B) Affect the land surface, surface waters and groundwater of the State to the minimum extent necessary; and
 - (C) Provide pre-mining, operational and post-mining data, information and experience that will be used for developing reclamation techniques for in situ mining.
- (ii) Contain a general description of the land, geology and groundwater hydrology for the proposed Research and Development License area including:
 - (A) The land use, vegetation, and topsoil characteristics of the affected lands;
 - (B) Location and name of surface waters and adjudicated water rights inside and within one-half mile of the Research and Development License area;
 - (C) Locations and present owners of all wells inside and within one-half mile of the Research and Development License area to include information concerning plugging and well completion and producing interval(s) to the extent such information is available in the public record or by a reasonable inspection of the property; and
 - (D) Groundwater quality data and potentiometric surface elevations for aquifers that may be affected by the proposed operation.

Section 8. Well Construction Requirements.

Construction requirements listed in Sections 8(a) through 8(f) of this Chapter are applicable to all wells installed for activities related to in situ mining, including pre-mining aquifer groundwater sampling and pumping tests. Additional requirements for Class III injection wells are included in Section 8(g). Additional requirements for monitoring wells are included in Section 8(h). The Administrator may grant a deviation from the requirements of this Section, except those in Section 8(g), provided the operator can supply documentation of reliability, mechanical integrity, design and construction to protect ground water of the state.

(a) Methods for well construction shall:

(i) Be approved by the Administrator and included in the permit or Research and Development License application (per Section 5(a)(xiv) of this Chapter);

(ii) Constitute a condition of the permit;

(b) In selecting well locations, protecting wells, and maintaining well covers, the following requirements apply:

(i) The top of the casing shall end above grade. Where possible, the top of the casing shall end above any known high-water conditions of flooding from runoff or ponded water, and the immediate area around the collar of the well shall slope away from the well to direct surface runoff away from the well. Installation of wells in the channels and flood plains of perennial drainages is prohibited. If a well must be located in an ephemeral or intermittent drainage:

(A) The well shall not be located in the streambed (i.e., the channel) of the drainage; and

(B) During well construction and use, steps shall be taken to minimize the potential for damage to the channel, such as from erosion and sedimentation, and to protect the well from damage due to erosion and to prevent surface water runoff from entering the well.

(ii) The well opening shall be closed with a cover to prevent the introduction of undesirable material into the well.

(c) Annular seals shall be installed to: protect the casing against corrosion; assure structural integrity of the casing; stabilize the upper formations; protect against contamination or pollution of the well from the surface; and prevent migration of ground water from one aquifer or water-bearing strata to another in accordance with the following requirements:

(i) The drill hole shall be of sufficient diameter for adequate sealing and, at any given depth, at least three inches greater in nominal diameter than the diameter of the outer casing at that depth;

(ii) Before placing the annular seal, all loose drill cuttings, rock chips, or other obstructions shall be removed from the annular space by circulating the borehole with water or drilling mud slurry;

(iii) The annular sealing material shall be placed from the bottom to the top of the well casing. The displacement fluid used to force the final sealing material through the casing shall remain shut-in, to prevent back flow, until the sealing material is set. If settling occurs during setting of the sealing material, additional material must be placed into the annular space, to bring the level of the sealing material to the ground surface. If, during cementing, the cement does not return to the surface and settling during curing of the cement is more than forty feet, then a tremie pipe must be used to complete the cement to the surface to ensure that bridging does not occur; and

(iv) Annular seals shall be created using one of the approved sealant materials outlined in Chapter 8, Section 2(d), of the of the noncoal rules.

(d) The casing shall be of sufficient strength and diameter to: prevent casing collapse during installation; convey liquid at a specified injection/recovery rate and pressure; and allow for sampling. Casing materials may include steel or polyvinyl chloride (PVC), which meet the relevant standards of ASTM International (formerly American Society for Testing and Materials).

(e) Casing shall be placed with sufficient care to avoid damage to casing sections and joints. All joints in the casing above the perforations or screens shall be watertight. The uppermost perforations or top of the screen shall be below the bottom of the annular seal. Casing shall be equipped with centralizers placed at a maximum spacing of one per forty feet to ensure even thickness of annular seal and gravel pack.

(i) Steel casing may be joined by either threading or coupling.

(ii) PVC casing may be glued or mechanically joined (no metal screws), depending on the type of material and its fabrication. Compatibility between injection fluids, formation fluids, process by-products, recovery fluids and the glue shall be demonstrated.

(f) Well development shall be done by methods which will not cause damage to the well or cause adverse subsurface conditions that may destroy barriers to the vertical movement of water between water-bearing strata.

(g) For Class III injection wells, the following construction requirements are in addition to the requirements listed in (a) through (f) of this Section:

(i) Appropriate logs and other tests shall be conducted during the drilling and construction of new Class III wells. A descriptive report prepared by a knowledgeable log analyst interpreting the results of such logs and tests shall be compiled and maintained by the operator and made available to the Division for inspection. The logs and tests appropriate to each type of Class III well shall be determined based on the intended function, depth, construction and

other characteristics of the well, availability of similar data in the area of the drilling site and the need for additional information that may arise from time to time as the construction of the well progresses. Deviation checks shall be conducted on all holes where pilot holes and reaming are used, unless the hole will be cased and sealed by circulating the sealing material to the surface. Where deviation checks are necessary, they shall be conducted at sufficiently frequent intervals to assure that vertical avenues for fluid migration are not created during drilling.

(ii) All Class III wells shall be constructed to prevent the migration of fluids to unauthorized zones. The casing and annular sealing material used in the construction of each newly drilled well shall be designed for the life expectancy of the well. In determining and specifying casing and annular sealing requirements, the following factors shall be considered:

- (A) Depth to the production zone;
- (B) Injection pressure, external pressure, internal pressure, axial loading, or other factors as determined by the Administrator;
- (C) Drill hole diameter;
- (D) Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification, and construction material);
- (E) Corrosiveness of injected fluids, formation fluids, process by-products, and recovery fluids;
- (F) Lithology of receiving strata and confining zones; and
- (G) Type and grade of sealing material.

(h) The following monitoring well construction requirements are in addition to the requirements listed in (a) through (f) of this Section:

(i) Where injection is into a receiving strata which contains water with less than 10,000 milligrams per liter (mg/l) Total Dissolved Solids (TDS), monitoring wells shall be completed into the production zone and any unauthorized zone or water-bearing strata which could be adversely affected by the mining operation. These wells shall be located in such a fashion as to detect any excursion of injection fluids, formation fluids, process by-products, or recovery fluids. If the operation may be affected by subsidence or catastrophic collapse, the monitoring wells shall be located so that they will not be physically affected.

(ii) Where injection is into a receiving strata which contains water with greater than 10,000 mg/l TDS, no monitoring wells are necessary in the production zone.

(iii) Where the injection wells penetrate an Underground Source of Water (USW) in an area subject to subsidence or catastrophic collapse, an adequate number of monitoring wells shall be completed into the USW to detect any movement of injection fluids,

formation fluids, process by-products, or recovery fluids into the USW. The monitoring wells shall be located outside the physical influence of the subsidence or catastrophic collapse.

(iv) In determining the number, location, and construction of the monitoring wells and frequency of monitoring, the following criteria shall be considered:

(A) The uses for which the groundwater in the receiving strata is suitable under pre-mining conditions, in any aquifer affected or potentially affected by the injection operation;

(B) The proximity of the injection operation to points of withdrawal;

(C) The local geology and hydrology;

(D) The operating pressures and whether a negative pressure gradient is being maintained;

(E) The chemical nature and volume of the injection fluids, formation fluids, process by-products, and recovery fluids; and

(F) The injection well density.

(i) No Class III well construction may commence until a permit or Research and Development License has been issued which includes well construction information in accordance with the requirements of Section 8 of this Chapter. Construction of wells needed to obtain the information required in Sections 3 and 4 of this Chapter may be:

(i) Allowed with approval of the Administrator; but

(ii) May not be used for injection until after permit issuance and only if those wells were constructed in accordance with the requirements of Section 8(g).

(j) The operator may not commence injection in a new injection well until construction is complete and the operator has demonstrated mechanical integrity. The operator shall submit notice of completion of construction and demonstrated mechanical integrity in the quarterly monitoring reports. Except for all new wells authorized by an area permit under Subsection 2(e) of this chapter, the operator may not commence injection in a new injection well until:

(i) The operator has submitted notice of completion of construction to the Administrator; and

(ii) With respect to inspection and review:

(A) The Administrator has inspected or otherwise reviewed the new injection well and finds the well is in compliance with the permit or Research and Development

Testing License; or

(B) The operator has not received notice from the Administrator of the intent to inspect or otherwise review the new injection wells within 13 days of the date of the notice in paragraph (b)(i) of this subsection, in which case prior inspection or review is waived and the operator may commence injection. If notice is given, the Administrator shall include in the notice a reasonable time period in which he or she shall inspect the well.

Section 9. Mechanical Integrity Testing of Class III Injection, Production, and Monitor Wells.

(a) A schedule and methods for mechanical integrity testing shall be approved by the Administrator and included in the permit or Research and Development License application (per Section 5(a)(xvi) of this Chapter) and shall constitute requirements of the permit. The schedule and methods shall meet the following requirements:

(i) The operator of a Class III or Production well shall establish mechanical integrity as defined in Section 1 of this Chapter for each well prior to commencing injection.

(ii) For demonstrating mechanical integrity as defined in Section 1 of this Chapter:

(A) One of the following methods must be used to evaluate the absence of significant leaks in the casing, tubing or packer:

(I) Following an initial pressure test, monitoring of the tubing-casing annulus pressure with sufficient frequency to be representative, as determined by the Administrator, while maintaining an annulus pressure different from atmospheric pressure measured at the surface; or

(II) Pressure test with liquid or gas.

(B) One of the following methods must be used to determine the absence of significant fluid movement into any unauthorized zone or water-bearing strata through vertical channels adjacent to the injection bore:

(I) The results of a temperature or noise log (e.g., cement bond log); or

(II) Where the nature of the casing precludes the use of the logging techniques prescribed above, sealing records demonstrating the presence of adequate sealing material to prevent such migration shall be provided; or

(III) Where the Administrator elects to rely on sealing records to demonstrate the absence of significant fluid movement, the monitoring program prescribed by Section 16 of this Chapter shall be designed to verify the absence of significant fluid movement.

(C) The Administrator may allow the operator to use a test to demonstrate mechanical integrity other than those listed in subsection (A) above, if the alternate testing method is approved by the EPA. To obtain approval, the Administrator with concurrence of the Director shall submit a written request to the EPA, which shall set forth the proposed test and all technical data supporting its use.

(iii) The operator shall demonstrate the mechanical integrity of each Class III and Production well at least once every five years, or on a schedule approved by the Administrator.

(iv) Before resuming operation of any well that has been damaged by surface or subsurface activity or that has undergone an activity that may jeopardize the mechanical integrity of the well, such as the use of downhole cutting and under reaming tools, the operator must demonstrate the mechanical integrity of that well, or with the approval of the administrator, demonstrate the ability to prevent the movement of fluid into unauthorized zones or onto the surface.

(v) If the Administrator determines that a well lacks mechanical integrity, he or she shall give written notice of this determination to the operator of the well. Unless the Administrator requires immediate cessation, the operator shall cease injection into, or production from the well within 48 hours of receipt of the Administrator's determination. The Administrator may allow plugging of the well or require the operator to perform such additional construction, operation, monitoring, reporting, and corrective action as is necessary to prevent the movement of fluid into unauthorized zones or onto the surface caused by the lack of mechanical integrity. The operator may resume injection or production upon written notification from the Administrator that the operator has demonstrated mechanical integrity.

(vi) The operator shall report the results of mechanical integrity testing shall be reported quarterly in an electronic format acceptable to the Administrator in accordance with the requirements in Section 15 of this Chapter.

Section 10. Requirements for Plugging of Drill Holes and Repair, Conversion, and Plugging of Wells.

(a) A plan for drill holes and well repair, plugging, and conversion shall be approved by the Administrator and included in the permit or Research and Development License application, as required by Section 6(a)(iii) of this Chapter, and shall constitute a condition of the permit.

(b) All drill holes shall be plugged in accordance with Chapter 8 of the noncoal rules and W.S. § 35-11-404.

(c) If a well lacks mechanical integrity, the operator shall repair or plug the well to prevent the movement of fluid into unauthorized zones or onto the surface caused by the lack of mechanical integrity. Repair or plugging of the well must be completed within 120 days of the

testing which indicates the well lacks mechanical integrity. If the well is repaired rather than plugged, retesting of the well, in accordance with the requirements of Section 9 of this Chapter must be completed within 120 days after the repair is completed. The operator may resume use of the well upon written notification from the Administrator that the operator has demonstrated mechanical integrity.

(d) The operator shall notify the Administrator, as required by the permit or Research and Development License, before plugging a well or wells within an area permit or converting a well to uses other than those defined in Section 1(f) of this Chapter.

(e) All abandoned wells shall be plugged or converted, in accordance with the Plugging/Conversion Plan in the permit or Research and Development License, in order to assure that groundwater is protected and preserved for future use and to eliminate any potential physical hazard. A well is considered "abandoned" when it has not been used for a period of two years, unless the operator submits to the Administrator and receives approval for a non-significant revision under Section 19(c)(vi) of this Chapter demonstrating their intention to use the well again and the actions and procedures they will take to ensure that mechanical integrity of the well is maintained under Section 7(a)(i) of this Chapter and the well will not endanger any unauthorized zone or water-bearing strata in accordance with the requirements of this Chapter.

(f) A well shall be plugged to meet the requirements below, using an approved sealant material as outlined in Chapter 8, Section 2(d), to assure that plugging of the well will not allow the movement of fluids into or between unauthorized zones or water-bearing strata:

(i) The well shall be plugged using a method which prevents fluid communication and adverse changes in water quality or quantity. Sealant materials shall be emplaced in a manner that provides a water tight seal utilizing one of the approved methods detailed in Chapter 8, Section 2(e) – (g) and shall meet the following requirements:

(A) If specific sections of the casing are to be plugged with cement:

(I) The operator shall log:

(1.) The type and number of plugs to be used;

(2.) The placement of each plug including the elevation of the top and the bottom;

(3.) The method of placement of the plugs, in accordance with Section 10(f);

(II) The operator shall ensure that the well to be plugged shall be in a state of static equilibrium with the mud weight equalized top to bottom, either by circulating the mud in the well at least once or by a comparable method prescribed by the Administrator, prior to the placement of the cement plug(s); and

(III) That the placement of the cement plugs shall be accomplished by one of the following:

- (1.) The Balance method;
- (2.) The Dump Bailer method;
- (3.) The Two-Plug method; or
- (4.) An alternative method approved by the

Administrator, which:

a. Includes placement of plugging materials in the interval or intervals to be sealed by methods that prevent free fall, dilution and/or separation of aggregates from sealing materials; and

b. Provides a comparable level of reliable protection to the methods identified in Section 10(f)(i).

(B) When the underground pressure head producing flow (i.e. gassy or artesian) is such that a counter-pressure must be applied to force a sealing material into the annular space, this counter-pressure shall be maintained for the length of time required for the plugging mixture to set or fully hydrate.

(C) The top of the plugging mixture of any plugged and abandoned well shall be backfilled to the surface with dry non-slurry materials or topped with a concrete cap set at least 2 feet below the ground surface and then backfilled to the surface with native earthen materials to ensure the safety of people, livestock, wildlife, and machinery in the area.

(g) In the case of an ISR operation which underlies or is in an aquifer which has been exempted under Section 11 of this Chapter, the Plugging/Conversion Plan in the permit or Research and Development License shall also demonstrate adequate protection of Underground Sources of Water (USWs). The Administrator shall prescribe aquifer cleanup and monitoring where he deems it necessary and feasible to assure adequate protection of USWs.

(h) To ensure the locations of the abandoned wells are adequately identified the operator shall:

(i) Record the boundaries of each wellfield and the location of the monitor well ring around each wellfield shall be recorded as a deed notice with the appropriate county; and

(ii) The top of the plugging mixture in each abandoned monitor well in the monitor well ring around each wellfield shall clearly show on a steel plate placed atop the sealing mixture, the permit number, well identification number, and date of plugging. All marking devices shall be installed at a minimum depth of two feet below the land surface.

(j) The operator shall report plugging and conversion activities in accordance with the requirements in Section 15 of this Chapter.

Section 11. Aquifer Classification and Exemption.

(a) Injections from Class III wells shall be restricted to those production zones that:

(i) Have been classified by the Department as Class V aquifers under Chapter 8 of the Water Quality Rules;

(ii) Have concentrations of Total Dissolved Solids:

(A) Less than 10,000 milligrams per liter; meet the definition of an “Underground Source of Water” as defined in Section 1 of this Chapter; and have been approved as an exempted aquifer by the EPA pursuant to Section 11(b) of this Chapter; or

(B) Greater than 10,000 milligrams per liter; and

(iii) Are located in a geologic and hydrologic setting in which movement of fluid, containing any contaminant into unauthorized zones can be prevented.

(b) An aquifer, or a portion thereof, which meets the criteria for an Underground Source of Water as defined in Section 1 of this Chapter may be designated as an “exempted aquifer”:

(i) If it meets the following criteria:

(A) It does not currently serve as a source of water for uses as described in Chapter 8 of the Water Quality Rules; and

(B) It cannot now and will not in the future serve as a source of drinking water as defined by the EPA by meeting standards listed in 40 CFR 146.4(b);

(ii) As demonstrated by information in the permit or Research and Development License application, including:

(A) A map and description identifying and describing in geographic and/or geometric terms (such as vertical and lateral limits and gradient) all aquifers or parts thereof which the applicant proposes to exempt;

(B) Information to document that the exemption area is commercially producible as demonstrated by:

(I) The permit boundary;

(II) A description and calculations that support the proposed distance beyond the monitor well ring boundary required to mine and to restore groundwater;

(III) General information on the mineralogy and geochemistry of the receiving strata; and

(IV) The type of mining technology used to extract the mineral; and

(C) Analysis of the amenability of the receiving strata to the proposed mining method and a timetable of planned development of the receiving strata.

(c) A request for an aquifer exemption shall be presented by the Water Quality Administrator to the EPA as a state program revision pursuant to 40 CFR 145.32.

Section 12. Permit and Research and Development License Requirements.

(a) Every permits and Research and Development Testing Licenses shall include the following provisions, either expressly or by reference:

(i) The operator has a duty to comply with all terms and requirements of the approved permit or Research and Development License.

(A) Any permit or Research and Development License noncompliance is grounds for enforcement action and any Research and Development License noncompliance is grounds for denial of a Research and Development License renewal application.

(B) The filing of a request by the operator for a permit or Research and Development License revision per Chapter 7 or Section 14 of this Chapter does not waive any permit or Research and Development License condition.

(ii) It shall not be a defense for an operator in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the requirements of this permit or Research and Development License.

(iii) The operator has a duty to take all reasonable steps to minimize, mitigate, or correct any adverse impact on the environment resulting from noncompliance with this permit or Research and Development License.

(iv) The operator shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the operator to achieve compliance with the terms and requirements of the permit or Research and Development License. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve

compliance with the terms and requirements of the permit or Research and Development License.

(v) The permit or Research and Development License does not convey any property rights of any sort or any exclusive privilege.

(vi) The operator has a duty to provide to the Administrator, within a time specified, any information which the Administrator may request to determine whether cause exists for revising or revoking the permit or Research and Development License, or to determine compliance with this permit or Research and Development License. The operator shall also furnish to the Administrator, upon request, copies of records to be kept as required by the permit or Research and Development License.

(vii) In compliance with all the provisions of Chapter 7 and Section 14 of this Chapter:

(A) The operator shall give notice to the Administrator as soon as possible of any planned physical alterations or additions to the permitted or licensed facility; and

(B) When the operator becomes aware of a failure to submit any relevant facts in a permit or Research and Development License application, or the submission of incorrect information in a permit or Research and Development License application or in any report to the Administrator, the operator shall promptly submit a correction of such facts or information to the Administrator.

(viii) Prior to requesting bond reduction for abandonment of a Class III well or wells within a wellfield area or for conversion of a Class III well to another use, the operator shall provide documentation and receive approval from the Administrator regarding the plugging of the well or wells within a wellfield area or conversion of the well.

(ix) The following are incorporated into and constitute requirements of the permit:

(A) Plans for corrective action, including injection pressure limitation, as specified in Section 20(a) of this Chapter;

(B) Monitoring requirements as specified in Section 16 of this Chapter;

(C) Schedule and methods to establish and maintain mechanical integrity as specified in Section 9 of this Chapter: and

(D) A plan for well repairs, plugging, and conversion as specified in Section 10 of this Chapter.

(x) The approved permit or Research and Development License shall include maximum injection volumes and/or pressures necessary to assure: fractures are not initiated in

the confining zone; injected fluids do not migrate into any unauthorized zone; and formation fluids are not displaced into any unauthorized zone. Operating requirements shall, at a minimum, specify that:

(A) Except during well stimulation, injection pressure at the wellhead shall be calculated to assure that the pressure in the production zone during injection does not initiate new fractures or propagate existing fractures. In no case, shall injection pressure initiate fractures in the confining zone, if confinement is present, or cause the migration of injection or formation fluids into an unauthorized zone; and

(B) Injection between the outermost casing protecting unauthorized zones and the well bore is prohibited.

(xi) No operator shall construct, operate, maintain, convert, plug, abandon, or conduct any other injection or mining-related activity in a manner that allows the movement of fluid containing any contaminant into zones or intervals other than those zones authorized in the approved permit or Research and Development License. The operator shall have the burden of showing that the requirements of this paragraph are met.

Section 13. Duration of Permits and ~~Research and Development Licenses.~~

(a) Permits shall be issued:

(i) For a period coinciding with the estimated schedules for termination of all mining and reclamation activities in conformance with the approved mining plan (Section 5(a)(ii)) and reclamation plan (Section 6(a)(i)) as provided in W.S. §§ 35-11-405(a) and (b); and

(ii) With the option for revising the mining and reclamation schedules, as provided in W.S. §§ 35-11-411(a)(iii) and 35-11-429(a)(iv).

(b) The Administrator shall review the permit at least once every five years to determine whether it should: remain unchanged; be revised in accordance with the requirements of Section 14 of this Chapter; or be revoked in accordance with the requirements of Section 23 of this Chapter.

Section 14. Revisions to Class III Well Portions of an In Situ Mine Permit or Research and Development License.

(a) A permit, license to mine, or Research and Development License may be revised to address:

(i) A permit condition per Section 12 of this Chapter;

(ii) An excursion or other aspect of noncompliance per Sections 18 and 19 of this Chapter and W.S. 35-11-429(a)(ii); or

- (iii) A corrective action or compliance schedule per Section 20 of this Chapter;
- (iv) A concern noted during the five-year review per Section 13 of this Chapter;
- (v) An objection by the Administrator to a part of the Annual Report per W.S. § 35-11-411(b); or
- (vi) A change that could jeopardize reclamation or protection of any waters of the state per W.S. 35-11-429(a)(iv).

(b) Any interested person, including the operator may request a revision provided the request is in writing and contains facts or reasons supporting the request. If the Administrator decides that a request for a permit or license revision is not justified, he or she shall send the requester a brief written response giving the reason(s) for the decision.

(c) The operator shall submit a revision upon notice from the Administrator to revise any Class III Well portions of a permit or Research and Development License.

(d) The operator shall revise the permit or Research and Development License upon the occurrence of any of the following with regards to the Class III Well portion of a permit or Research and Development License. These revisions shall be considered significant revisions and require public notice as specified in Chapter 7 of these regulations and Section 21 of this Chapter. In addition, the fact sheet will be updated for these revisions:

(i) Any material or substantial alterations or additions to the facility occurring after issuance of the permit or license, which justify additional or modified permit or license conditions, including any increase in the amount of land related to installation or operation of additional Class III wells, from that which was approved in the original in situ mining permit or Research and Development License. Such a revision shall include (if not already presented in the permit or Research and Development License) the information required in W.S. § 35-11-428 and the requirements of Sections 5 through 20 this Chapter. However, if the increase in the amount of land is for purposes unrelated to installation or operation of Class III wells, then the provisions of Section 2(b)(ii) of Chapter 7 apply;

(ii) The UIC standards or regulations on which the permit or license was based have been changed by promulgation of new or amended standards or regulations or by judicial decision after the permit or license was issued;

(iii) The Administrator determines good cause exists for modification of a compliance schedule, such as an act of God, strike, flood, or materials shortage or other events over which the permittee has little or no control and for which there is no reasonably available remedy;

(iv) Cause exists for revocation, as described in Section 23 of this Chapter, but the Administrator determines that revision is appropriate; or

(v) The Administrator determines that the activity endangers human health or the environment and can only be regulated to acceptable levels by a permit revision.

(e) A non-significant revision to any Class III Well portion of a permit or Research and Development License shall meet the requirements of Chapter 7 of these regulations, except that a non-significant revision, with operator consent, shall be for the following reasons only:

(i) To correct typographical errors;

(ii) To require more frequent monitoring or reporting by the operator;

(iii) To change an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing schedule of compliance and does not interfere with attainment of the final compliance date requirement;

(iv) To allow for a change in ownership or operational control of a facility where the Administrator determines that no other change in the permit or Research and Development License is necessary provided that a written agreement is submitted in a format and on forms required by the Administrator containing a specific date for transfer of permit or Research and Development License responsibility, coverage, and liability between the current operator and new operator;

(v) To change quantities or types of fluids injected which are within the capacity of the facility as permitted or licensed and would not interfere with the operation of the facility or its ability to meet conditions described in the permit or Research and Development License and would not change its classification;

(vi) To change well construction requirements approved by the Administrator pursuant to Section 8 of this Chapter, provided that any such alteration complies with the requirements of Section 8;

(vii) To amend a well plugging/conversion plan which has been updated under Section 10 of this Chapter; or

(viii) To submit a wellfield data package that conforms to the specifics of the permit document.

(f) Suitability of the Class III well location will not be considered at the time of permit revision unless new information or standards indicate that a threat to human health or the environment exists which was unknown at the time of permit issuance.

(g) Only those conditions to be revised shall be reopened when a revision is necessary. All other aspects of the existing permit shall remain in effect for the duration of the unrevised permit.

(h) Reviews and decisions on a permit revision application shall be conducted according to the provisions in Chapter 7.

Section 15. Reporting Requirements.

(a) All chemical analyses submitted to the Administrator in accordance with a valid permit or Research and Development License shall include:

- (i) A description of, or reference for, the procedures and methods used for sample collection, preservation, and quality control;
- (ii) The name, address, and telephone number of the laboratory performing the analyses, and the laboratory identification number; and
- (iii) Signatures as required by Section 2(g) of this Chapter.

(b) Quarterly monitoring reports shall include, at a minimum:

- (i) The results of monitoring required per Sections 16(a)(ii) and (iii) of this Chapter.
- (ii) The results of all mechanical integrity testing conducted during that quarter, including the following information identified by Class III, Production, or Monitor well;
 - (A) Date of mechanical integrity testing;
 - (B) Identification of the method by which mechanical integrity was established;
 - (C) Verification of whether the mechanical integrity was or was not established in a well, including:
 - (I) Identification of a well which failed to have mechanical integrity established and consequently required repair; and
 - (II) A description of the method of plugging or repair.
- (iii) The status of corrective action on defective wells, required per Section 20 of this Chapter.
- (iv) The results of well repair and plugging required by Section 10 of this Chapter, including:
 - (A) A statement that wells were plugged in accordance with the approved permit or Research and Development License or, where different plugging procedures were used, documentation that prior to approval was obtained from the Administrator. This

documentation shall be included in the report and contain a description of the procedure used, specifying the difference between the permit or Research and Development License approved method and the alternative method; and

(B) Documentation that the volume of material placed in the well at least equals the volume of the empty hole, to ensure that the well is filled and there has been no bridging of the sealing material.

(c) Annual reports shall include, at a minimum:

(i) All information required by W.S. § 35-11-411;

(ii) Map(s) showing the location of all wells installed in conjunction with the mining activity and showing all areas where:

(A) Groundwater restoration has been achieved, is actively taking place and is expected to commence during the next year; and

(B) Mining is expected to commence during the next year;

(iii) The total quantity of recovery fluid injected and the total quantity of recovery fluid extracted during the reporting period for each well-field area including a description of how these quantities were determined;

(iv) Monitoring program results pursuant to Section 5(a)(xvii) and Section 16 of this Chapter, which have not been previously reported;

(v) Updated potentiometric surface map(s) for all aquifer(s) that are or may be affected by the mining operation, if requested at the Administrator's discretion; and

(vi) Supporting data sufficient to demonstrate groundwater restoration in accordance with Section 6(a)(xiii) of this Chapter.

(d) During excursions, results from excursion-related monitoring shall be reported in accordance with the requirements of Section 19 of this Chapter.

(e) Well abandonment reports shall be made to the Land Quality Division and the State Engineer's Office:

(i) Within sixty days after the abandonment of any well which has artesian or gassy flow at the surface. The report, set forth in affidavit form, should contain the location of the well, depth of the well, estimated rate of flow, and the facts of the plugging technique.

(ii) Within twelve months after the abandonment of any other well. The report should include the location of the well to the nearest 40-acre legal subdivision (quarter, quarter, section), survey locations utilizing decimal Latitude and Longitude coordinates, the

depth of the well, and the facts of the plugging technique.

Section 16. Monitoring Requirements.

(a) A detailed monitoring program shall be approved by the Administrator and included in the permit or Research and Development License application, as required by Section 5(a)(xv) of this Chapter, and shall constitute a requirement of the permit or license. The program shall describe the procedures for monitoring the quantity and quality of waters that may be affected by the operation before mining through reclamation and shall, at a minimum, specify:

(i) Requirements for:

(A) The proper use, maintenance, and installation, when appropriate, of monitoring equipment or methods (including biological monitoring methods);

(B) The intervals and frequency of monitoring, sufficient to yield data which are representative of the monitored activity, including continuous monitoring when appropriate; and

(C) Tests and methods used to generate monitoring data.

(ii) Monitoring of:

(A) The nature of the injected fluids, at least monthly, to yield representative data on the characteristics of the fluid. Whenever the injection fluid is modified to the extent that the previous analysis is incorrect or incomplete, a new analysis shall be provided to the Administrator; and

(B) The injection pressure and either flow rate or volume at least weekly or metering and daily recording of injected and produced fluid volumes as appropriate.

(iii) Requirements for:

(A) Semi-monthly monitoring of the fluid level in the production zone, where appropriate;

(B) Semi-monthly monitoring of the water levels and parameters chosen to measure the water quality in monitoring wells;

(C) Quarterly monitoring of the water levels and parameters chosen to detect any movement of injected fluids, process by-products, or formation fluids in the monitoring wells where the injection wells penetrate an Underground Source of Water in an area subject to subsidence or catastrophic collapse (Section 8(h)(iii) of this Chapter); and

(D) Periodic monitoring of pressure changes or other physical parameters if such monitoring provides for more rapid detection of excursions.

(iv) A description of procedures and schedules used to:

(A) Detect and confirm excursions; and

(B) Monitor excursions and excursion control efforts.

(b) Samples and measurements taken for the purpose of monitoring shall be representative of the permitted activity.

(c) Class III injection wells may be monitored for the parameters required by subsections (A) and (B) on a field or project basis rather than an individual well basis by manifold monitoring. Manifold monitoring may be used in cases of facilities consisting of more than one injection well operating with a common manifold. Separate monitoring systems for each well are not required provided the operator demonstrates that manifold monitoring of injection pressure is comparable to individual well monitoring.

Section 17. Maintenance and Retention of Records.

(a) The operator shall maintain records at the mine site in accordance with W.S. § 35-11-430(b), including, for any laboratory analyses that an operator is allowed to retain on site for inspection rather than submit to the Administrator:

(i) A description of, or reference for, the procedures and methods used for sample collection, preservation, and quality control; and

(ii) The name, address, and telephone number of the laboratory performing the analyses, and the laboratory identification number.

(b) The operator shall:

(i) Retain records of all monitoring information, including the following:

(A) Records of all data used to complete permit and license applications and any supplemental information submitted under Sections 3, 4, 5 and 6 of this Chapter;

(B) Calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation;

(C) Copies of all reports required by the permit or Research and Development License;

(D) The nature and composition of all injected fluids; and

(E) Information requested by the Administrator for inclusion in the Annual Report as required by W.S. § 35-11-411.

(ii) Retain the records listed in Section 17(b)(i)(A) through (D) at the mine site until termination of the permit or Research and Development License, unless otherwise authorized by the Administrator. However, the operator shall maintain these records no less than three years after the date of the sample, measurement, report, or application. The Administrator may require the operator to deliver the records to the Administrator at the conclusion of the retention period.

Section 18. Noncompliance.

(a) The operator shall:

(i) Verbally report to the Administrator any noncompliance which may endanger public health or the environment, within 24 hours of the time the operator becomes aware of the occurrence, including:

(A) Any monitoring or other information which indicates that any contaminant may endanger an Underground Source of Water (USW) or unauthorized zone; and

(B) Any noncompliance with a permit or Research and Development License or malfunction of the injection system which may cause fluid migration into, or between USWs or unauthorized zones.

(ii) Provide a written report to both the Administrator and the Water Quality Division within five days of the operator becoming aware of the noncompliance occurrence. The written report shall describe:

(A) The noncompliance and its cause;

(B) The period of noncompliance, including exact dates and times;

(C) If the noncompliance has not been corrected, the anticipated time it is expected to continue;

(D) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and

(E) The procedures for mitigating or controlling the excursion.

(iii) Report all instances of noncompliance, not reported under Sections 18(a)(i) and (ii), at the time monitoring reports are submitted. The reports shall contain the information listed in Sections 18(a)(i) and (ii), as applicable.

Section 19. Excursions

(a) “Confirmation” of an excursion occurs when an excursion detected in a regularly scheduled sampling event is subsequently detected in a second or third sampling event conducted in accordance with the following requirements:

(i) The second sampling event shall be conducted within 24 hours of the receipt of the results from the first sampling event in which the excursion was initially detected. If the results from the first and second sampling event both indicate an excursion has occurred, then the excursion will be considered confirmed for the purpose of meeting the reporting requirements of W.S. § 35-11-429(a)(i).

(ii) If the results from the first and second sampling events provide conflicting information about whether or not an excursion has occurred, then a third sampling event must be conducted within 24 hours of the receipt of the results from the second sampling event. However, if the results of the confirmatory sampling are not complete within thirty days of the initial sampling event which indicated an excursion might be present, then the excursion will be considered confirmed for the purpose of meeting the reporting requirements of W.S. § 35-11-429(a)(i).

(b) The operator shall:

(i) Verbally report any confirmed excursion to the Administrator within 24 hours of confirmation of the excursion; and

(ii) Submit a written report to both the Administrator and the Water Quality Division within five days of the confirmation of the excursion detailing the procedures for mitigating or controlling the excursion.

(c) An excursion is controlled when it can be demonstrated through water quality and groundwater gradient or if applicable, pressure measurements, that recovery fluid in unauthorized areas is declining.

(i) If an excursion is not controlled within 30 days following confirmation of the excursion, a sample must be collected from each of the affected monitoring wells and analyzed. The parameters to be analyzed shall be site specific and based on baseline data.

(ii) If an excursion is not controlled within 60 days following confirmation of the excursion, the Administrator may, after consultation with the Director, terminate the mining operation and revoke the permit or Research and Development License or modify the mining operation and require modification of the permit or Research and Development License. Modifying the operation may include: sampling of additional wells for the parameters in Section 19(c)(i); installation of additional monitor wells; termination of injection in the portion of the well field in which the excursion originated; or a combination of approaches to assure control within the necessary time frames.

(iii) If the excursion is controlled, but the fluid which moved out of the production zone during the excursion has not been recovered within sixty days following confirmation of the excursion (i.e., the monitor well is still "on excursion"), the operator shall submit, within ninety days following confirmation of the excursion, a plan and compliance schedule, acceptable to the Department, for bringing the well(s) off excursion. The plan and

compliance schedule can be submitted as part of the monthly excursion report required in Section 19(d) of this Chapter. The compliance schedule shall meet the requirements of Section 20(b) of this Chapter.

(d) In addition to the excursion notifications and control plan required above, a monthly report on the status of an excursion shall be submitted to the Administrator beginning the first month the excursion is confirmed and continuing until that excursion is over. The monthly report shall be a requirement of the compliance schedule and shall include, at a minimum:

(i) Concentrations of UCL parameters and groundwater elevations in all monitoring wells on excursion and, as necessary, surrounding wells;

(ii) Such information deemed necessary by the Administrator to show that the excursion is being controlled and that the bond amount for groundwater restoration remains sufficient; and

(iii) Information on steps taken to control the excursion.

Section 20. Corrective Actions and Compliance Schedules.

(a) Corrective actions are required when a well is improperly sealed, completed, or abandoned, in which case operators shall provide the well information, as required in Sections 4(a)(xi) and (xii) of this Chapter, and the corrective action plan as required in Section 5(a)(xvii) of this Chapter. Where the Administrator's review of the plan indicates that the operator's plan is inadequate (based on the factors presented below), the Director may require the operator to revise the plan, prescribe a plan for corrective action as a term and condition of the permit, or deny the application.

(b) In determining the adequacy of corrective action proposed by the operator and in determining the additional steps needed to prevent fluid movement into an unauthorized zone, the Administrator shall consider the following criteria and factors:

(i) Nature and volume of injected fluid;

(ii) Chemical nature and volume of native groundwater;

(iii) Compatibility of injected fluid and native groundwater;

(iv) Potentially affected population;

(v) Geology;

(vi) Hydrology;

(vii) Proposed method of operation as required by Section 5(a)(x) of this

Chapter or history of the injection operation if the corrective action is needed in response to amending new wells into an existing operation;

- (viii) Completion and plugging records;
- (ix) Plugging procedures in effect at the time the well was abandoned; and
- (x) Hydraulic connections with unauthorized zones.

(c) Corrective action is also required if any water quality monitoring of an Underground Source of Water or unauthorized zone indicates the movement of any contaminant into an Underground Source of Water or unauthorized zone, except as specifically authorized in the approved permit or license, in which case, the Administrator shall prescribe such additional requirements for construction, corrective action, operation, monitoring, or reporting (including closure of the injection well and limitation of injection pressure) as are necessary to prevent such movement. The Administrator may impose these additional requirements by requiring the operator to revise the permit or license, by recommending the revocation of the permit or license, or by taking other appropriate enforcement action for violations of the permit or license.

(d) The status of corrective action on defective wells shall be reported in accordance with the requirements of Section 15 of this Chapter.

(e) When appropriate, a permit or license may include, or be revised to include, a compliance schedule leading to compliance with the applicable statutes and regulations. The schedule shall be applicable whether the operator is continuing or ceasing regulated activities.

(i) Any compliance schedule shall require compliance as soon as possible, and in no case later than three years after the date the schedule is put into effect. In addition:

(A) The schedule shall set forth interim requirements, the dates for their achievement, and a projected date of compliance with all the requirements;

(B) The time between interim dates shall not exceed one year; and

(C) The schedule shall specify dates for the submission of progress reports, no later than thirty days following each interim date and the final date of compliance.

Section 21. Public Notice, Public Hearing, Comment, and Decision Requirements.

(a) In addition to the requirements of W.S. §§ 35-11-406(g), (j), and (q) and Chapter 7, public notice for actions related to in situ permits or Research and Development Licenses, except permit or license revocation, shall be given by the following methods. Public notice for permit or license revocation shall be given by the methods in Section 23 of this Chapter.

- (i) All public notices issued under this Section shall contain the following:

(A) Name and address of the office processing the permit action for which notice is being given;

(B) Name and address of the operator and, if different, of the facility or activity regulated by the permit;

(C) A brief description of the business conducted at the facility or activity;

(D) Name, address and telephone number of a person from whom interested persons may obtain further information;

(E) A brief description of the comment procedures, including a statement of procedures to request a hearing or, if a hearing has already been scheduled, the time and place of that hearing, and other procedures by which the public may participate in the final permit decision; and

(F) Any additional information considered necessary or proper.

(ii) The Administrator shall mail a copy of the notice to the following persons (any person otherwise entitled to receive notice under this paragraph may waive his or her rights to receive notice for any classes or categories of permits):

(A) Any other agency (including EPA when the draft permit is prepared by the State) which the Administrator knows has issued or is required to issue a permit for the same facility or activity under the following programs: Resource Conservation and Recovery Act (RCRA); UIC; Prevention of Significant Deterioration (or other permit requirement under the Clean Air Act); National Pollution Discharge Elimination System (including sludge management permits); and Section 404 of the Clean Water Act.

(B) Federal and State agencies with jurisdiction over fish, shellfish, and wildlife resources, the Advisory Council on Historic Preservation, State Historic Preservation Officers, including any affected Indian Tribes, and the Wyoming Oil and Gas Commission.

(C) Persons on a mailing list developed by including:

(I) Those who request in writing to be on the list;

(II) Soliciting persons for "area lists" from participants in past permit proceedings in that area; and

(III) Persons notified of the opportunity to be put on the mailing list through periodic publication in the public press. The Administrator may update the mailing list from time to time by requesting written indication of continued interest from those listed. The

Administrator may delete from the list the name of any person who fails to respond to such a request.

(D) Any unit of local government having jurisdiction over the area where the facility is proposed to be located.

(E) Each State agency having any authority under State law with respect to the construction or operation of such facility.

(iii) In addition to mailing a copy of the public notice, the Administrator shall mail or electronically transfer a copy of the fact sheet, permit application or draft permit to the following persons:

(A) The applicant;

(B) Any other agency (including EPA when the draft permit is prepared by the State) which the Administrator knows has issued or is required to issue a permit for the same facility or activity under the following programs: Resource Conservation and Recovery Act (RCRA); UIC; Prevention of Significant Deterioration (or other permit requirement under the Clean Air Act); National Pollution Discharge Elimination System (including sludge management permits); and Section 404 of the Clean Water Act; and

(C) Federal and State agencies with jurisdiction over fish, shellfish, and wildlife resources, the Advisory Council on Historic Preservation, State Historic Preservation Officers, including any affected Indian Tribes.

(iv) To supplement the required methods of public notice listed above, public notice can also be given by any other method reasonably calculated to give actual notice of the action in question to the persons potentially affected by it, including press releases or any other forum or medium to elicit public participation.

(b) Objections may be filed in accordance with W.S. § 35-11-406(q).

(c) A decision on the application will be made by the Director after reviewing the report and recommendations on the objections received provided by the Administrator. The Director shall issue to the applicant and to any objector a final written decision issuing or denying the permit or license within thirty days of the deadline to file objections.

(d) The applicant or objector may appeal the Director's written decision to the Environmental Quality Council. If a hearing is held the Environmental Quality Council shall issue findings of fact and make a decision on the application within sixty days after the final hearing; and

(e) The Administrator will publish a summary of the decision in a newspaper of general circulation in the general area of the proposed operation.

Section 22. Confidential Records.

(a) Information submitted to satisfy the requirements of this Chapter may be held confidential pursuant to W.S. § 35-11-1101.

Section 23. Revocation.

(a) A permit, license to mine, or Research and Development License may be revoked by the Administrator to address one or more of the following:

(i) Revocation may be necessary to address:

(A) An excursion or other aspect of noncompliance per Sections 18 and 19 of this Chapter; or

(B) One of the items listed in Section 23(b).

(ii) Any interested person, including the operator, may request revocation provided the request is in writing and contains facts or reasons supporting the request. If the Administrator decides that a request for revocation is not justified, he or she shall send the requester and operator a brief written response giving the reason(s) for the decision. Denials of requests for revocations are not subject to public notice and comment;

(iii) If the Administrator revokes any Class III Well portions of a permit or Research and Development License, he or she shall prepare a letter to the operator specifying the needed changes and additional information.

(b) The Director or Administrator may revoke a permit, License to Mine, or Research and Development License:

(i) If an excursion cannot be controlled or mitigated per W.S. § 35-11-429(a);

(ii) For failure to comply with permit terms and conditions per W.S. §§ 35-11-412(b) and (c);

(iii) For the operator's failure in the application or during the issuance process to disclose fully all relevant facts or for misrepresenting any relevant facts at any time, as provided in W.S. §§ 35-11-409(a) and 412(a); and

(iv) Per the provisions of W.S. §§ 35-11-109(a)(xiii) and 35-11-110(b);

(c) A revocation requires public notice as specified in Noncoal Chapter 7, Section 3 and Section 21 of this Chapter.