Dept of the Premier and Cabinet
Mining Regulation Branch

HMCV Meeting – Coastal & Marine, Groundwater, Surface water

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SOUTH AUSTRALIA

Government of South Australia

Presentation Overview

1. Coastal and marine
2. Groundwater
3. Surface water

Coastal and marine

Environmental Outcomes from Mineral Lease:

The Tenement Holder must ensure no loss of abundance and diversity of marine flora and fauna from contaminants and dust deposition resulting from mining operations during operations and post mine completion.

Groundwater

Environmental Outcomes from Mineral Lease:

- The Tenement Holder must ensure there is no adverse change to the environmental values of water within the basement fractured rock aquifer outside of the Land as a result of mining operations.
- The Tenement Holder must ensure there is no adverse change to the environmental values of the basement fractured rock aquifer within or outside of the Land as a result of mining operations after mine completion.

Groundwater

Monitoring (Measurement Criteria) from Mineral Lease:

1. Establish representative baseline water quality data for the basement fractured rock aquifer underlying the Land.
2. Establish compliance groundwater monitoring bores adjacent to the lease boundaries that are of sufficient density and depth to detect movement of groundwater off the Land

Groundwater

Strategies from Mineral Lease for Rex to Address in PEPR:

1) The Tenement Holder must provide a calibrated ground water model in the proposed PEPR.
2) The Tenement Holder must establish a program for the establishment and ongoing calibration of the transient ground water model using data obtained from groundwater monitoring within the PEPR.
3) The Tenement Holder must provide a calibrated transient groundwater model within 1 year from the approval of the PEPR.
4) The Tenement Holder must establish a program for the ongoing calibration of the pit lake geochemistry and hydrogeological models using data obtained from operational monitoring to address any assumptions and uncertainty within the model.

Groundwater

Strategies from Mineral Lease for Rex to Address in PEPR:

The Tenement Holder must obtain approval from the Director of Mines in writing before developing any:

1) Groundwater cut-off wellfield; or
2) MAR.

Groundwater

Strategies from Mineral Lease for Rex to Address in PEPR:

Rex must include reports from suitably qualified independent experts on the effectiveness of the proposed strategies in the proposed PEPR achieving the environmental outcomes identified in the proposed PEPR, including but not limited to reports from:

- an Independent Hydrology Expert (i.e.: for Surface water management)
- an Independent Hydrogeology Expert (i.e.: for verification of predictive ground water models, ground water management and the extent of ground water mounding underneath the TSF)

Groundwater - MPL

Environmental Outcomes from MPL:

- The Tenement Holder must ensure there is no adverse change to the environmental values of the groundwater within the shallow Cainozoic age sediments outside of the Land as a result of site operations.
- The Tenement Holder must ensure there is no adverse change to the environmental values of the groundwater within the shallow Cainozoic age sediments within or outside of the Land after mine completion.

Groundwater - MPL

Strategies from License for Rex to Address in PEPR:

Design and management strategies are to be provided for pipeline leak detection which includes automation of operational controls for the monitoring and control of all pipelines on the related Mineral Lease and this Mining Tenement. This should include (but is not limited to);

1) continuous and automatic monitoring of pressures, flow rates and any other parameters for the prompt detection and resolution of abnormal operating conditions in any pipeline or processing plant equipment;
2) continuous and automatic monitoring of process plant functions, including tank levels, flow rates, pressures and fluid quantities;
3) the integration of data through a central computer-based control and monitoring system.

Surface water

Environmental Outcomes from Lease (ML & EML):

The Tenement Holder must ensure that:

1) Mining operations do not cause inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing); and
2) inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing) after mine completion is not caused by mining operations;
3) unless the Tenement Holder obtains a registered Waiver of Exemption under the Act to undertake mining activities (inclusive of inundation).

Surface water

Environmental Outcomes from Lease (ML, EML & MPL):

The Tenement Holder must:

1) Ensure no surface water contaminated as a result of mining operations leaves the Land; and
2) ensure that, apart from water contained in the pit void:
    1. no surface water contaminated prior to mine completion remains within the Land after mine completion; and
    2. no contamination of surface water occurs after mine completion as a result of mining operations within the Land.

Surface water

Strategies from Mineral Lease for Rex to Address in PEPR:

The separate extraction of NAF and PAF from the mine, and separate placement of NAF and PAF in waste rock dumps must be verified by a suitably qualified independent expert approved by the Director of Mines on a 3 monthly basis, or at a frequency as the Director of Mines may specify by notice in writing.

The expert must prepare a report of the findings of the verification and this report must be provided to the Director of Mines within 1 month of completion of the verification.

Surface water

Strategies from Mineral Lease for Rex to Address in PEPR:

1) Locate the TSF emergency spillway to ensure any overflow reports to the open pit.
2) Determine a sulphur cut-off grade for PAF material through further testing for each waste rock unit.
3) Block modelling the sulphur distribution of all waste and ore to be mined for the purpose of determining the distribution and estimating the volume of NAF and PAF using the sulphur cut-off grade.
4) Integration of the sulphur model with the geological model to provide confidence in the definition of PAF boundaries, potential zones of high neutralising capacity and potential geological controls on mineralisation.
5) Procedures for regularly updating the models with new geological and sulphur assay data collected in the course of mine production operations.
6) Procedures for ensuring PAF and NAF boundaries derived from the sulphur cutoff and the sulphur block model are included in open pit bench plans.
7) Procedures for assaying the sulphur content of drill cuttings, produced during the course of blast hole drilling, for verifying PAF and NAF information plotted on open pit bench plans to provide a final check that all PAF and NAF materials have been correctly identified.

Surface water (cont'd)

Strategies from Mineral Lease for Rex to Address in PEPR:

8) Procedures and recording systems for selective mining of the identified PAF and NAF materials and separate placement in accordance with the waste rock dump design.
9) Construction of waste rock dumps in small lifts using placement methods that prevent the separation and sorting of the larger and smaller particles of the waste rock, with each lift compacted by waste haul trucks,
10) Waste rock dumps designed and constructed for the selective placement of the total volume of PAF material with it effectively encapsulated by NAF.
11) A program for determining the erodibility of waste rock to ensure that no erodible waste rock is placed immediately underneath subsoil on external batters.
12) Waste rock dumps designed to ensure PAF material is not exposed as a result open pit wall failure post mine completion.
13) Strategies included in any guidelines provided by the Director of Mines

Note – there are additional strategies for soil and land disturbance outcomes relating to the TSF & WRD design, construction, operation and closure.

Surface water

Strategies from ML and EML for Rex to Address in PEPR:

1) No change in surface water flow across third party property that could prevent achievement of the outcome in Sixth Schedule Clause 41 unless otherwise agreed by the affected third party.
2) (ML only) A plan for establishing appropriate mechanisms to ensure effective transfer of responsibility for any maintenance of the site and control of any future development post mine completion.
3) Progressive landform stabilisation methods and utilisation of energy dissipation where necessary to minimise sediment loads in run-off from disturbed areas and landforms

Mining Regulation Web Links:

Regulatory Framework - https://sarigbasis.pir.sa.gov.au/WebtopEw/ws/samref/sarig1/image/DDD/BROCH005.pdf

Ministerial Determinations

http://minerals.statedevelopment.sa.gov.au/knowledge_centre/ministerial_determinations

Regulatory Guidelines:

http://minerals.statedevelopment.sa.gov.au/knowledge_centre/regulatory_guidelines

DPC SARIG Website – https://sarig.pir.sa.gov.au/Map

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