



# Groundwater and Storage Facility Management Procedure Environment

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## 1 Purpose and Scope

This procedure specifies the operational environmental requirements relating to the management of water storage facilities (e.g. turkeys nests, evaporation ponds, production water dams) and groundwater production/dewatering bores at the Roy Hill Project. This procedure applies to all personnel involved in activities at the Mine, Rail and Port operations that affect water storage facilities and groundwater production/dewatering bores management.

The management and monitoring requirements for monitoring bores is outlined in the 'Mine Environmental Monitoring Manual' (OP-MAN-00007) and the 'Port and Rail Environmental Monitoring Manual' (OP-MAN-00011).

## 2 Procedure

### 2.1 Management Actions

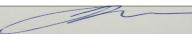
#### 2.1.1 Water Storage Facilities

1. Design turkey's nests, where practicable, so that excess water from tanker fill points drains back into the turkeys nest.
2. Line all turkeys' nests with a High Density Polyethylene plastic liner and repair any holes or tears as required.
3. Install at least one fauna egress device in each open water storage area (e.g. turkeys nests and evaporation ponds).
4. Ensure that fauna egress devices extend to the bottom of the open water storage area.
5. Fence evaporation ponds and turkeys nests to prevent access by fauna (including feral animals and cattle).
6. Install mechanisms to deter birds from evaporation ponds and the tailing storage facility (e.g. reflectors, flagging, rotating beacons etc.).
7. Provide adequate freeboard within water storage facilities at all times to ensure overflow does not occur.
8. Install and maintain cut-off switches to prevent over filling of turkeys nests, containment structures and water tanks.
9. Cover and seal all water storage tanks to exclude fauna access.

#### 2.1.2 Abstraction Bores

1. Ensure that all necessary licences and permits have been obtained under the *Rights in Water and Irrigation Act 1914* prior to abstraction of groundwater and construction of any additional bores.

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2. Ensure that all bore drilling complies with 26D licence conditions and the relevant Groundwater Operating Strategy.
3. Install concrete block headwork and bore flanges on each bore to prevent ingress of animals and contaminated material.
4. Construct water supply bores using a poly vinyl chloride casing and clean inert gravel.
5. Undertake groundwater abstraction or dewatering in accordance with the Groundwater Operating Strategy and 5C licence.
6. Fit a cumulative water meter of a type approved under the *Rights in Water and Irrigation (Approved Meters) Order 2009* to all production bores, and any other water draw points, prior to operation.
7. Install and maintain cumulative water meters in accordance with the provisions of the document entitled 'Guidelines for Water Meter Installation 2009' before any water is abstracted from the bore.
8. Calibrate all water meters in accordance with the manufacturer's requirements.
9. Review water meter and abstraction data quarterly to assist leak detection and ensure compliance with licences.
10. Install dip tubes of at least 25 mm diameter to all production bores prior to operation to allow monitoring of standing water levels.

### 2.1.2.1 Drinking Water Abstraction Bores

1. Purge and flush drinking water supply bores sufficiently prior to water entering the potable water treatment facility after initial installation.
2. Surround drinking water supply bores with lockable gates and fences, and keep them closed and locked at all times.
3. Bury raw water supply bore lines to drinking water treatment facilities where practicable.
4. Ensure that pesticides are not used in proximity to drinking water supply bores.

### 2.1.2.2 Dewatering Bores

1. Limit dewatering to the minimum required for safe mining of mineralised areas below the pre-mining water table
2. Conduct dewatering in accordance with the Mine site water supply, hydrology and dewatering strategy (RHI-001-10-WW-REP-0931, prepared by MWH)
3. Ensure that any temporary dewatering is undertaken in accordance with the *Rights in Water and Irrigation Exemption (section 26C) (Dewatering) Order 2010*.
4. Manage all dewatering abstraction in such a way to ensure there is no uncontrolled discharge to the environment that may have an adverse impact.

### 2.1.3 Contaminated Groundwater

1. Collect, contain and treat groundwater that has potentially been contaminated.

### 2.1.4 Water Efficiency

1. Maximise water use efficiency and where practical use water collected in mine pits and surface water diversion structures following heavy rainfall events.
2. Refer to the 'Minesite Water Use Efficiency Guidelines' (OP-GUI-00026) for guidance on the efficient use of the available water supplies across the project.

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### 2.2 Training and Awareness

1. Familiarise all personnel associated with water storage facilities and groundwater production/dewatering bores management activities with the requirements of this procedure.
2. Include information on water storage facilities and groundwater production/dewatering bores management requirements (e.g. water use efficiency and the need to conserve resources in a water constrained environment) in site inductions or site communications where relevant.
3. Conduct toolbox talks and develop environmental site notices and environmental awareness posters periodically highlighting water storage facilities and groundwater production/dewatering bores management requirements – this is the responsibility of the Superintendent Environment Mine or Port and Rail (or delegate where required).
4. Display relevant environmental site notices and environmental awareness posters at prominent workplace locations.
5. Update the training records of personnel in the Learning Management System once registered training has been completed (with the exception of toolbox talks).
6. Maintain records of toolbox training attendance onsite for audit and inspection purposes.

### 2.3 Monitoring Actions

1. Undertake monitoring in accordance with approval conditions and commitments, and ensure that all data required for regulatory reporting is captured.
2. Store all monitoring records within the Roy Hill Document Management System.
3. Monitor standing water levels in groundwater abstraction bore casings on a monthly basis via dip tubes.
4. Record the abstraction bore starting meter reading prior to the first abstraction from the bore.
5. Record the final reading of the old meter, initial reading of the new meter and date of changeover when a cumulative flow meter is changed.
6. Record groundwater abstraction volumes monthly and compare against groundwater licence requirements.
7. Undertake monthly field testing of all abstraction bores in accordance with the 'Mine Environmental Monitoring Manual' (OP-MAN-00007) and the 'Port and Rail Environmental Monitoring Manual' (OP-MAN-00011).
8. Undertake 6-monthly laboratory production bore sampling in accordance with the above manuals – this is the responsibility of the Roy Hill Site Superintendent Environment.
9. Review water quality monitoring and abstraction results using a qualified hydrogeologist (this is the responsibility of the Roy Hill Manager Water) to identify:
  - a. Potential for any adverse impacts on the aquifer system and environment;
  - b. The sustainability of abstraction; and
  - c. Exceedances to trigger values, or trends to suggest potential exceedances.

### 2.4 Incidents, Audits and Inspections

1. Undertake regular inspections of the active work area against the requirements of this procedure.
2. Undertake regular compliance audits against the requirements of this procedure in accordance with the 'Environmental Audit Procedure' (OP-PRO-00018).

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3. Schedule inspections and audits against the requirements of this procedure in accordance with the approved HSE Integrated Inspection and Audit Schedule.
4. Store copies of all audits and inspections within the Roy Hill Document Management System.
5. Undertake an investigation into the cause(s) of incidents reportable to regulators in accordance with the 'Incident Investigation Specification' (OP-SPC-00156) and develop actions to prevent recurrence of the incident.
6. Enter corrective and preventative actions from incidents, audits and inspections into the Roy Hill Incident Management System.
7. Undertake minimum monthly inspection of all water storage facilities and bores to ensure that requirements outlined in this procedure are being met.

### 2.5 Contingency Actions

1. Implement contingency actions in accordance with this procedure where deficiencies are identified during inspections, audits and incident reporting.
2. Implement the 'Management of External Complaints Procedure' (EA-PRO-00002), where relevant.
3. Conduct a risk assessment to determine the most effective mitigation measures should additional contingency actions be required, and follow the change management process.
4. Reduce the abstraction rate at the bore(s) or request an amendment to the operating strategy/groundwater licence through the Roy Hill Manager Water should abstraction volumes be extrapolated to exceed the licence limit.
5. Contact the Roy Hill Site Superintendent Environment or qualified fauna handler for assistance should fauna be trapped within a water storage facility.
6. Investigate measures to avoid adverse impacts in the event that a review of groundwater monitoring and abstraction data indicates an adverse trend – this is the responsibility of the Roy Hill Manager Water.

### 2.6 Reporting Requirements

1. Report all non-compliances with this procedure, all regulatory exceedances and all community complaints as an incident in the Roy Hill Incident Management System.
2. Close out all incidents and corrective actions in accordance with the 'Incident, Non-Conformance and Action Management Procedure' (OP-PRO-00702).
3. Complete all reporting required within the relevant EnviroSys data entry forms or in the 'Contractor Environmental Report' (CER) (OP-FRM-00305).
4. Report laboratory results from bore sampling to the Roy Hill Site Superintendent Environment as soon as the results are received.
5. Report locations of water storage facilities to the Roy Hill Perth Manager Geographic Information Systems so that the locations can be included in reporting to government authorities.
6. Prepare and submit an aquifer review report to the Department of Water at the end of the RH Project water year, in October – this is the responsibility of the Roy Hill Perth Manager Water.
7. Submit monitoring reports to the Office of the Environmental Protection Authority annually – this is the responsibility of the Roy Hill Perth Manager Environment.
8. Inform the Roy Hill Perth Manager Water immediately where a change in water quality is identified.

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### 3 Accountabilities

Unless otherwise specified, the following roles are accountable or responsible for the activities outlined in this procedure.

Table 1 – Accountabilities

Role	Responsibility
General Managers	Accountable for ensuring that resources are available to support the implementation of this procedure where it is relevant to their area of responsibility
Managers	Accountable for the implementation of this procedure where it is relevant to their area of responsibility
Superintendents	Responsible for the implementation of this procedure where it is relevant to their area of responsibility
Environment Team	Responsible for review and update of this procedure

### 4 Abbreviations

Table 2: Abbreviations

Abbreviation	Definition
mm	Millimetres

### 5 Definitions

Table 3 – Definitions

Term	Definition
Operational Environmental Requirements	A plan, procedure or work instruction that must be complied with.

### 6 References

Table 4 – References

Document number	Title
OP-MAN-00007	Mine Environmental Monitoring Manual
OP-MAN-00011	Port and Rail Environmental Monitoring Manual
OP-FRM-00305	Contractor Environmental Report
	Groundwater Operating Strategy
	<i>Rights in Water and Irrigation Act 1914</i>
	<i>Rights in Water and Irrigation (Approved Meters) Order 2009</i>
	<i>Rights in Water and Irrigation Exemption (section 26C) (Dewatering) Order 2010</i>

Note that up-to-date environmental documents should be accessed from the e-Care Roy Hill intranet portal to ensure that the current version is being used.

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### 7 Review

This Procedure is to be reviewed as follows:

- Following the grant of or modification to relevant approvals;
- Annually; or
- As a result of findings or actions identified through inspections, audits and incident reporting.

Reviews are to examine the appropriateness of this Procedure, taking into consideration corporate, system and compliance requirement changes since the last review was undertaken.

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