



# Borrow Pit and Quarry Management Procedure

## Environmental

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## 1 Purpose and Scope

This procedure specifies the operational environmental requirements relating to borrow pit (BP) and quarry management at the Roy Hill Project. This procedure applies to all personnel involved in activities at the Mine, Rail and Port operations that affect BP and quarry management.


## 2 Procedure

### 2.1 Management Actions

#### 2.1.1 Legislation, Approvals and Guidelines

1. Undertake all extraction activities within approved *Mining Act 1978* tenure and in accordance with the applicable project management plan and Mining Proposals.
2. Undertake all extractive activities located on all lands, other than crown land (except *Mining Act 1978* tenure), in accordance with the approved extraction licence and planning approval from the applicable local government authority.
3. Ensure that any groundwater is extracted in accordance with the relevant section 5C Department of Water (DoW) Licence to Take Groundwater, where groundwater is required to be extracted as part of the BP works.
4. Undertake any material extraction activities within water courses in accordance with a Bed and Banks Permit from the DoW as required.
5. Construct all crushing and screening activities in accordance with the applicable works approval.
6. Operate all crushing and screening facilities in accordance with the relevant operating licence.
7. Conduct all blasting in compliance with the relevant Roy Hill blasting procedures.
8. Manage topsoil and subsoil in accordance with the 'Clearing and Soil Management Procedure' (OP-PRO-00187).
9. Undertake all BP and quarry rehabilitation in compliance with the appropriate Operating Principal Requirement (OPR) documents (i.e. 'Mine Closure Plan' (OP-PLN-00031), 'Rehabilitation Plan' (OP-PLN-00044) and 'Rehabilitation Management Procedure' (OP-PRO-00101)).
10. Undertake all material extraction activities (construct, operate, rehabilitate) in accordance with the 'Weed Management Procedure' (OP-PRO-00010).
11. Construct, operate and rehabilitate all BP and quarries in accordance with the 'Ground Disturbance Permit Procedure' (OP-PRO-00193) and 'Rehabilitation Permit Procedure' (OP-PRO-00287).

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Rev	Document Number	Author	Approver / BFO	Approver Signature	Issue Date	Page
3	OP-PRO-00150	M Hobson	Manager - Environment		20/12/2017	1 of 8

# Borrow Pit and Quarry Management Procedure

## Environmental

### 2.1.2 Borrow Pit Management Plans (BPMP)

1. Develop and implement a BPMP in accordance with the requirements of this procedure.
2. Ensure that BP development does not commence without a BPMP that has been reviewed and approved by the relevant site Environmental Superintendent and/or the Superintendent Rehabilitation.
3. Ensure that the BPMP aligns with the 'Borrow Pit Management Plan template' (OP-TEM-00124), which is located in the SageSURPASS form library.
4. Ensure that BPMPs address the following points, which are not limited to:
  - a) Details of BP (name, location, proposed materials and volumes to be extracted, usage);
  - b) Proposed BP specifications as per the table below;

PROPOSED SPECIFICATIONS	
Item	Proposed Specifications
Area:	m <sup>2</sup>
Size:	m x m
Proposed Depth of Borrow Pit:	m
Proposed volume:	bcm
Spread Depth of Topsoil / Overburden:	TBA
Batter Angle:	H:V

- c) Proposed drainage design (pit slope direction, pit floor to have a minimum slope);
  - d) Details of BP construction (including traffic management, survey, clearing and topsoil management, weed management, impacted stakeholders);
  - e) Proposed rehabilitation (rehabilitated drainage plan, backfill management etc.);
  - f) General arrangement on orthophotos;
  - g) Cross sections; and
  - h) Geotechnical reports.
5. Design, construct and rehabilitate BPs to be to a minimum standard to:
    - a) Minimise ponding of water following rainfall events by ensuring they are free draining and do not form permanent water bodies;
    - b) Ensure that groundwater is not intercepted;
    - c) Allow fauna to have easy egress from borrow pits;
    - d) Ensure weed cover is less than 10%;
    - e) Ensure pit slopes are constructed to a 1V:5H or gentler;
    - f) Ensure that no surface or batter slumping or collapse occurs that impacts on local hydrology; and
    - g) Minimise risk of injury to people and animals.

THIS DOCUMENT IS UNCONTROLLED IN HARD COPY FORMAT

Rev	Document Number	Author	Approver / BFO	Issue Date	Page
3	OP-PRO-00150	M Hobson	Manager - Environment	20/12/2017	2 of 8

# Borrow Pit and Quarry Management Procedure

## Environmental

---

6. Ensure that all BPMPs address the requirement for a Rehabilitation Permit to be issued prior to Rehabilitation works commencing and the BPMP include rehabilitation requirements, and site plans showing the intended final landform design and drainage of the rehabilitated pit.
7. Ensure that all impacted stakeholders are aware of BP activities - this is the responsibility of the BP Project Manager.

### 2.1.3 Design and Construction

Ensure that all Borrow Pits are constructed within an approved GDP footprint and in compliance with the relevant GDP conditions.

1. Source borrow material from open existing areas in preference to developing a new BP, where practical.
2. Source borrow material preferentially from future mine pit disturbance footprints, where available.
3. Undertake testing of the materials in the proposed extraction area to confirm the suitability and extent of materials, prior to the development of a BP.
4. Implement drainage control measures, where necessary.
5. Manage erosion issues arising from channelled runoff from the extraction areas.
6. Construct the BP floor with a fall of approximately 1:300 to allow for drainage.
7. Avoid locating extraction areas within significant flora and fauna habitat, where possible.
8. Utilise surplus rocks and boulders for creation of artificial habitat and adhere to specifications outlined in the rehabilitation permit and advice from Biological Sciences.
9. Backfill extraction areas with suitable material, prior to contouring, so that a safe landform that blends in with the surrounding landscape is achieved.
10. Locate all borrow pits a minimum of 50 m away from any water course unless permitted under a DoW Bed and Banks Permit.
11. Treat water emanating from disturbed areas to ensure discharge from these areas is non-polluting and consistent with naturally occurring water quality from nearby creeks.
12. Redistribute any diverted surface water into remnant sections of the natural water courses downstream of the Project.
13. Install erosion and sediment control structures downstream of disturbance areas.
14. Construct sedimentation controls prior to the clearing of any large areas at risk of generating runoff.
15. Inspect and clean all debris and sludge regularly from sedimentation basins/ponds to maintain the facilities effective volume.
16. Avoid locating proposed borrow pit sites in areas with high levels of weed infestations or within declared weed locations, where possible.
17. Consider the visual amenity from any public vantage points when selecting extraction areas.
18. Locate extraction activities behind screens of vegetation or terrain, where possible.
19. Maintain a buffer of 50 m between the extraction area and public or private roads, where possible.
20. Avoid extraction activities below the water table.

### 2.1.4 Sand Mining

Ensure that all Sand Mining are undertaken within an approved GDP footprint and in compliance with the relevant GDP conditions.

THIS DOCUMENT IS UNCONTROLLED IN HARD COPY FORMAT

Rev	Document Number	Author	Approver / BFO	Issue Date	Page
3	OP-PRO-00150	M Hobson	Manager - Environment	20/12/2017	3 of 8

# Borrow Pit and Quarry Management Procedure

## Environmental

---

1. Schedule sand mining activities within water courses to occur when there are no water flows.
2. Utilise dry methods of sand extraction.
3. Select machinery used in carrying out sand mining that achieves minimal disturbance of the site while being fit for purpose.
4. Clearly mark safe and stable entry and exit access points, prior to the commencement of sand extraction activities.
5. Orientate the entry and exit access points perpendicular to the watercourse (i.e. ensure that site access roads are not parallel to the watercourse).
6. Locate access ramps so that they are slightly orientated downstream and located on a relatively straight section of the watercourse (i.e. not on watercourse bends).
7. Access tracks and crossings shall not interrupt the natural contour of watercourse (i.e. access tracks and crossings shall not be built up or create low points in the watercourse).
8. Retain trees associated with the bed and banks of a watercourse and/or cut near ground level to retain the root mass.
9. Maintain a minimum 2 m of undisturbed profile between the likely future maximum water table and the base of the sand extraction.
10. Avoid stockpiling material within the watercourse.
11. Rehabilitate the watercourse to its pre-extraction state and contour so that no holes or dips are visible to avoid pooling post inundation, where possible.
12. Return any surface rocky materials that were removed and stockpiled prior to sand extraction.
13. Remove any foreign materials and pollutants from any works associated with activities from the watercourse as quickly as possible.
14. Store, refuel and maintain all machinery used in the activities outside the outer banks of the watercourse.

### 2.1.5 Noise Management

1. Regularly inspect, maintain and replace mobile equipment so that noise levels are minimised during the equipment life.

## 2.2 Training and Awareness

1. Familiarise all personnel associated with borrow pit and quarry management activities with the requirements of this procedure.
2. Include information on borrow pit and quarry management requirements in site inductions or site communications where relevant.
3. Conduct toolbox talks and develop environmental site notices and environmental awareness posters periodically highlighting borrow pit and quarry management requirements – this is the responsibility of the Superintendent Environment Mine or Port and Rail (or delegate where required).
4. Display the 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.

THIS DOCUMENT IS UNCONTROLLED IN HARD COPY FORMAT

Rev	Document Number	Author	Approver / BFO	Issue Date	Page
3	OP-PRO-00150	M Hobson	Manager - Environment	20/12/2017	4 of 8

# Borrow Pit and Quarry Management Procedure

## Environmental

---

### 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.

### 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).
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 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.

### 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. Inspect all BP following significant rain events for signs of pooling which is likely to result in a permanent water body and erosion.
5. Remediate the BP to ensure that further pooling likely to result in a permanent water body does not occur.

### 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 as-cleared, rehabilitation and topsoil data in dxf, dwg or other electronic format in accordance with the 'Ground Disturbance Permit (GDP) Procedure' (OP-PRO-00193) and GDP conditions.

THIS DOCUMENT IS UNCONTROLLED IN HARD COPY FORMAT

Rev	Document Number	Author	Approver / BFO	Issue Date	Page
3	OP-PRO-00150	M Hobson	Manager - Environment	20/12/2017	5 of 8

# Borrow Pit and Quarry Management Procedure

## Environmental

---

### 3 Accountabilities

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

Table 1: Accountabilities

Role	Responsibility
Environment Team	Responsible for review and update of this procedure
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

### 4 Abbreviations

Table 2: Abbreviations

Abbreviation	Definition
AER	Annual Environment Report
BP	Borrow pit
BPMP	Borrow pit management plan
CER	Contractor Environmental Report
DER	Department of Environment Regulation
DMP	Department of Mines and Petroleum
DoW	Department of Water
EP Act	<i>Environmental Protection Act 1986</i>
EP Regs	<i>Environmental Protection Regulations 1987</i>
GDP	Ground Disturbance Permit
HSE	Health, Safety and Environment
OPR	Operating Principal Requirement
PPR	Principle Project Requirement (PPR)

THIS DOCUMENT IS UNCONTROLLED IN HARD COPY FORMAT

Rev	Document Number	Author	Approver / BFO	Issue Date	Page
3	OP-PRO-00150	M Hobson	Manager - Environment	20/12/2017	6 of 8

# Borrow Pit and Quarry Management Procedure

## Environmental

### 5 Definitions

Table 3: Definitions

Term	Definition
Bed and Banks Permit	To interfere with the bed or banks of watercourses a permit under the <i>Rights in Irrigation and Water Act 1914</i> is required.
Commissioning	The process of operation and testing that verifies the works and all relevant systems, plant, machinery and equipment have been installed and are performing in accordance with the design specification set out in the works approval application
Environment Team	The Roy Hill Environment Team
Extraction area	Incorporates any area where material is extracted from, including quarries and borrow pits alike. Where the requirement is required for a specific action or infrastructure this will be stipulated eg sand mining or borrow pit
Extraction Licence	Is a licence granted by the local government authority for the extraction of material (stone, gravel, sand, clay, limestone) from a quarry.
Extractive industry	Quarrying and excavating for stone, gravel, clay, limestone loam and other materials. This includes activities associated with the extraction process, such as: <ul style="list-style-type: none"><li>• Stripping vegetation and top soil;</li><li>• Stockpiling, excavating and earthworks;</li><li>• Loading of trucks and vehicle movements associated; and</li><li>Blasting rehabilitation.</li></ul>
Ground disturbance	Work that will in any way cause any change or disturbance to the ground surface including (but not limited to): clearing of vegetation, placement of survey pegs, placement of water bore lines, excavations, geotechnical investigations, water bore drilling and release of water, bulk earthworks installation of buildings and infrastructure, construction of roads, access tracks, laydown areas and any work associated with the construction and operation of the project.
Licence to Take Groundwater	A licence to Take Water under the <i>Rights in Irrigation and Water Act 1914</i> allows the extraction of a specified amount of water from a proclaimed groundwater or surface water areas.
Mining Proposal	Is an application required under the <i>Mining Act 1978</i> to be assessed and written approval by the Executive Director Environment before mining operations can begin. A Mining Proposal should address the potential environmental impacts and the environmental management of a proposed mining operation. The environment management commitments within the Mining Proposal also become conditions of approval. The title of the document becomes a condition so that all commitments made in the Mining Proposal become legally binding.
Operating Licence	A licence is required under <i>Environmental Protection Act 1986</i> (EP Act) to permit the operation of a facility prescribed in Schedule 1 of the <i>Environmental Protection Regulations 1987</i> (EP Regs). Works approvals are assessed and approved by the DER.
Operational Environmental Requirements	A plan, procedure or work instruction that must be complied with.

THIS DOCUMENT IS UNCONTROLLED IN HARD COPY FORMAT

Rev	Document Number	Author	Approver / BFO	Issue Date	Page
3	OP-PRO-00150	M Hobson	Manager - Environment	20/12/2017	7 of 8

# Borrow Pit and Quarry Management Procedure

## Environmental

Term	Definition
Operator	Personnel who drives and is qualified and deemed competent to operate a machine or vehicle.
Shall	It must be undertaken and is not negotiable.
Should	It must be undertaken, however if it cannot be undertaken or will significantly impact on time or cost then modification to the requirement may be considered by Manager Environment and Approvals.
Site Environment Advisor	Roy Hill Site Environment Advisor.
Superintendent Environment	The Superintendent of the Roy Hill Environment Team
Superintendent Rehabilitation	The Superintendent of the Roy Hill Rehabilitation and Closure Team
Works Approval	An approval required under the EP Act to permit construction of a facility prescribed in Schedule 1 of the EP Regs. Works approvals are assessed and approved by the DER.

## 6 References

Table 4: References

Document number	Title
OP-PLN-00031	Mine Closure Plan
OP-PLN-00044	Mine Rehabilitation Plan
OP-PRO-00010	Weed Management Procedure
OP-PRO-00101	Rehabilitation Management Procedure
OP-PRO-00187	Clearing and Soil Management Procedure
OP-PRO-00193	Ground Disturbance Permit Procedure
OP-PRO-00702	Incident Non-Conformance and Action Management Procedure
OP-TEM-00124	Borrow Pit Management Plan template

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.

THIS DOCUMENT IS UNCONTROLLED IN HARD COPY FORMAT

Rev	Document Number	Author	Approver / BFO	Issue Date	Page
3	OP-PRO-00150	M Hobson	Manager - Environment	20/12/2017	8 of 8