



**Costerfield Operations**

**GROUNDWATER MANAGEMENT PLAN**

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PLAN**

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## Table of Contents

1. Objective .....	3
2. Environmental Aspects and Risks .....	4
3. Regulatory Requirements .....	7
4. Monitoring .....	7
5. Recording .....	7
6. Auditing and Reporting .....	8
7. Other Reference Documents .....	8

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## 1. Objective

This plan shall identify management and operational requirements to ensure groundwater is managed to a standard consistent with or exceeding project approvals and relevant State and Federal Acts of Law and associated Regulations. Adherence to this plan shall minimize risk to employees, neighbouring communities, groundwater, surface water and sensitive receptors.

The plan is applicable to all site personnel and contractors at the Costerfield Mine site and any other project areas operated by the Management group.

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## 2. Environmental Aspects and Risks

Environmental risks have been assessed using the Costerfield Mine risk matrix and consequence/likelihood criteria:

Business Area	Risk	Impact	Current Control	Conseq.	Frequency	Risk Rank
Drilling	Drilling creates aquifer interconnection	Groundwater flow changes; Groundwater quality;	All drill holes are grouted	Minor	Unlikely	Medium D2
	Use of drilling muds and polymers	Groundwater quality;	Supervision, waste disposal, use of biodegradable polymers	Minor	Highly unlikely	Low D1
Processing	Hydrocarbon spills/leaks	Groundwater quality	Spill kits, contaminated soils removed and disposed of, above ground self-contained fuel storage tanks, bunded oil & fuel storage areas, oil/water interceptor for collection of run-off water in workshop, major servicing/repairs in contained facility, maintenance program in place to ensure ongoing integrity of fuel & lube storage facilities.	Minor	Unlikely	Medium D2
	Seepage from TSF	Groundwater quality, Compliance	TSF engineering design (ANCOLD), engineered clay liners, TSF Operations Manual, ground water monitoring, seepage detection, groundwater level below base of TSF, operating inspections	Major	Highly unlikely	Medium B1

	Seepage from Augusta evaporation dams (mine water)	Groundwater quality,	Groundwater seepage monitoring program, mine water of similar quality to groundwater, HDPE liners at Augusta evap dams and Splitters Creek storage dam, engineered clay liners	Minor	Highly unlikely	Low D1
	Seepage from Splitters Creek evaporation dams (mine water)	Groundwater quality,	Groundwater seepage monitoring program, HDPE liner in storage dam, engineered clay liners	Moderate	Highly unlikely	Medium C1
	Seepage from brine storage dams	Groundwater quality,	Engineering design, HDPE liners, seepage detection monitoring, ground water monitoring	Minor	Highly unlikely	Low D1
	Seepage from Brunswick pit (mine water storage dam)	Groundwater quality,	Groundwater monitoring, mine water of similar quality to groundwater, pit falls within dewatering cone of depression	Minor	Highly unlikely	Low D1
Mining	Groundwater extraction under licence	Groundwater quality Groundwater flow changes	Metering, water balance, independent hydrogeological review, ground water monitoring program,	Moderate	Highly unlikely	Medium C1
	Leaching of metals & salts from waste rock stockpiles (AMD)	Groundwater quality	Ground water monitoring program, waste rock testing program to confirm non-acid generating properties.	Minor	Highly unlikely	Low D1

	Seepage from Augusta mine dam	Groundwater quality	Dam contains high quality RO treated water, underground working will intercept seepage (if any)	Minor	Highly unlikely	Low D1
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Table 1: Risks to Groundwater

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### 3. Regulatory Requirements

- *Environment Protection Act 2017 – General Environmental Duty*
- *Water Act 1989*
- *Approved Work Plans & Variations*
- *Groundwater Extraction Licence*
- *Bore construction licences*

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### 4. Monitoring

An environmental monitoring program has been implemented to ensure adequate monitoring is undertaken to demonstrate exploration, mining and processing operations comply with regulatory requirements and prevent adverse impacts to ground water.

The site's monitoring program will continually evolve to remain relevant to the type of works being undertaken and sites being worked at any point in time.

The ground water monitoring program involves the monitoring of standing water levels and water quality elements including TDS, pH, major cations, antimony, arsenic and other metals. The program includes monitoring of remote groundwater bores to provide context for seasonal changes in ground water levels in the region.

Interpretation of ground water monitoring results is generally done internally on a quarterly basis, and annually by an independent consulting hydrogeologist. The program assesses the impact of mine dewatering activities and the resulting cone of depression, as well as checks for seepage from water storage facilities, and any interaction with the broader regional aquifer systems and surrounding environment.

The details of the environmental monitoring program can be found in the *Environmental Monitoring Plan & Schedule*.

### 5. Recording

All data recorded in field onto data collection sheet (refer to technical procedure). Data is then entered into site environmental monitoring database:

P:\ENVIRONMENTAL\1. Environmental Monitoring\Water\WATER QUALITY RESULTS.xls

and

P:\ENVIRONMENTAL\1. Environmental Monitoring\Water\WATER LEVELS.xls

## 6. Auditing and Reporting

Ground water monitoring results are reported quarterly to the Environmental Review Committee (including relevant regulatory authorities).

Ground water monitoring data is reviewed annually by an independent hydrogeological consultant prior to preparation of an Annual Report.

## 7. Other Reference Documents

- Water Monitoring Procedure
- Water Monitoring Quality Control Procedure
- Costerfield Environmental Monitoring Plan & Schedule
- Costerfield Environment Management System Manual
- ENV\_EMP\_007 – Surface water Management Plan
- ENV\_EMP\_008 – Tailings Management Plan

## 8. Revision History

Revision Date	Ver	Section	Revision Description	Prepared by	Reviewed by	Approved By	Critical Change <sup>1</sup> Y/N
16/06/2023	8.0			K. Else	K. Brauns	R. Laity	N

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<sup>1</sup> The document owner/reviewer is responsible to identify any critical changes of the procedure in this document and is required to notify employees of any change.



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