

# **EP-408 (R2) Whicher Range Gas Field Care and Maintenance Environment Plan Summary Report**

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A408-EHQ-RPT-00013

**REPORT (RPT) COVER SHEET**

This RPT has been prepared by GHD on behalf of CalEnergy Resources (Australia) Ltd as the Operator of the Exploration Permit 408 (EP408).

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## **1. INTRODUCTION**

### **1.1. Overview**

CalEnergy Resources (Australia) Limited (CRA), which is part of the CalEnergy Resources Group of Companies (CER Group), will conduct care and maintenance activities on Whicher Range-1 (WR- 1) and Whicher Range-4 (WR-4) well sites within Exploration Permit 408 (R2) (EP-408).

CRA has developed the *Whicher Range-1 and Whicher Range-4 Care and Maintenance Environment Plan* (A408-EHQ-RPT-00012) (CMEP) to identify, assess and manage the potential risks and environmental impacts associated with the proposed care and maintenance activities. This Summary Document summarises the activities and mitigation / management measures in the approved CMEP.

### **1.2. Contact Details**

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## 2. OVERVIEW OF THE ACTIVITY

The care and maintenance activities will be undertaken within EP-408, in the Whicher Range, located approximately 20 km south of Busselton in south west Western Australia. The activities will occur within the CMEP Area which includes WR-1 and WR-4 suspended gas wells, associated elevated limestone gravel well pads and surrounding cleared areas, the Whicher laydown/staging area located approximately 200 m east of WR-4, and a gravel access track connecting WR-4 to the staging area and Tames Road. CRA has also defined an Inspection Area for the purpose of care and maintenance activities which extends beyond the CMEP Area. The locations of the suspended wells are provided in Table 1 and Figure 1, with the CMEP and Inspection Areas shown in Figure 2.

Well Name	Status	Zone	Latitude	Longitude
Whicher Range-1 (WR-1)	Suspended gas well	50	-33° 50' 07.99"	115° 22' 28.02"
Whicher Range-4 (WR-4)	Suspended gas well	50	-33° 50' 22.38"	115° 22' 06.49"

*Table 1 - Location of WR-1 and WR-4 wells*

### 2.1. Timing

Care and maintenance activities including planned inspections and testing will be undertaken up to six times a year. Planned activities will take approximately one to five days per well to complete. Service and maintenance will be performed as required, typically following the outcome of the inspections and testing. It is envisaged any service and maintenance would extend from one to seven days in duration.

### 2.2. Personnel and Equipment

The planned activities will be undertaken by CER Group delegates and contractors. No onsite accommodation will be required. The equipment required for the care and maintenance activities will vary but typically include one or a combination of the following:

- Light vehicles;
- A service truck which includes a crane, a grease gun, a pressure test pump, a compressor, hand tools, spares and pressure gauges;
- A “suck truck” to dewater the cellar upon arrival;
- Scaffolding;
- Self bunded light tower with integrated diesel tank and generator;
- Single bunded portable toilet;
- Bunding and liner designed to meet Australian Standard (AS) 1940. CRA intends to use a polypropylene liner that is UV resistant with volumetric capacity to meet AS 1940;
- Intermediate bulk containers (IBCs) for fluid storage or for any waste fluid storage and removal (e.g. 1 m<sup>3</sup> volume); and
- Water truck (as needed for dust suppression during planned activities).

Due to plant/equipment being left within the CMEP Area during the planned activities, CRA may also engage a security contractor to monitor the CMEP Area during non-daylight hours. Equipment required for security activities will typically include one light vehicle, self bunded light tower with integrated diesel tank and generator and single portable toilet as outlined above.

Upon completion of each care and maintenance activity campaign, the CMEP Area will be demobilised with all equipment removed. Existing infrastructure will be secured and the CMEP Area left in a stable, secure condition.

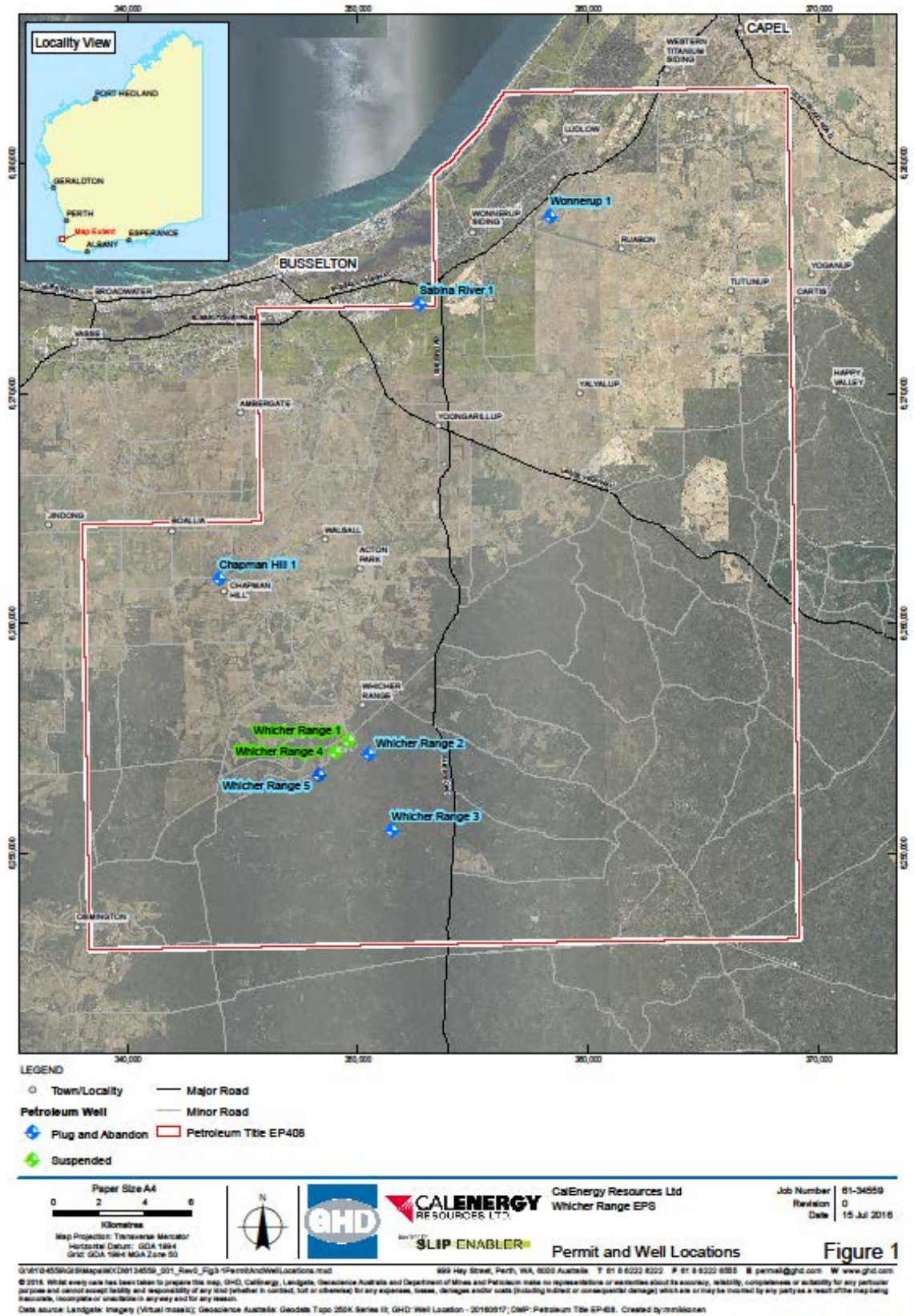
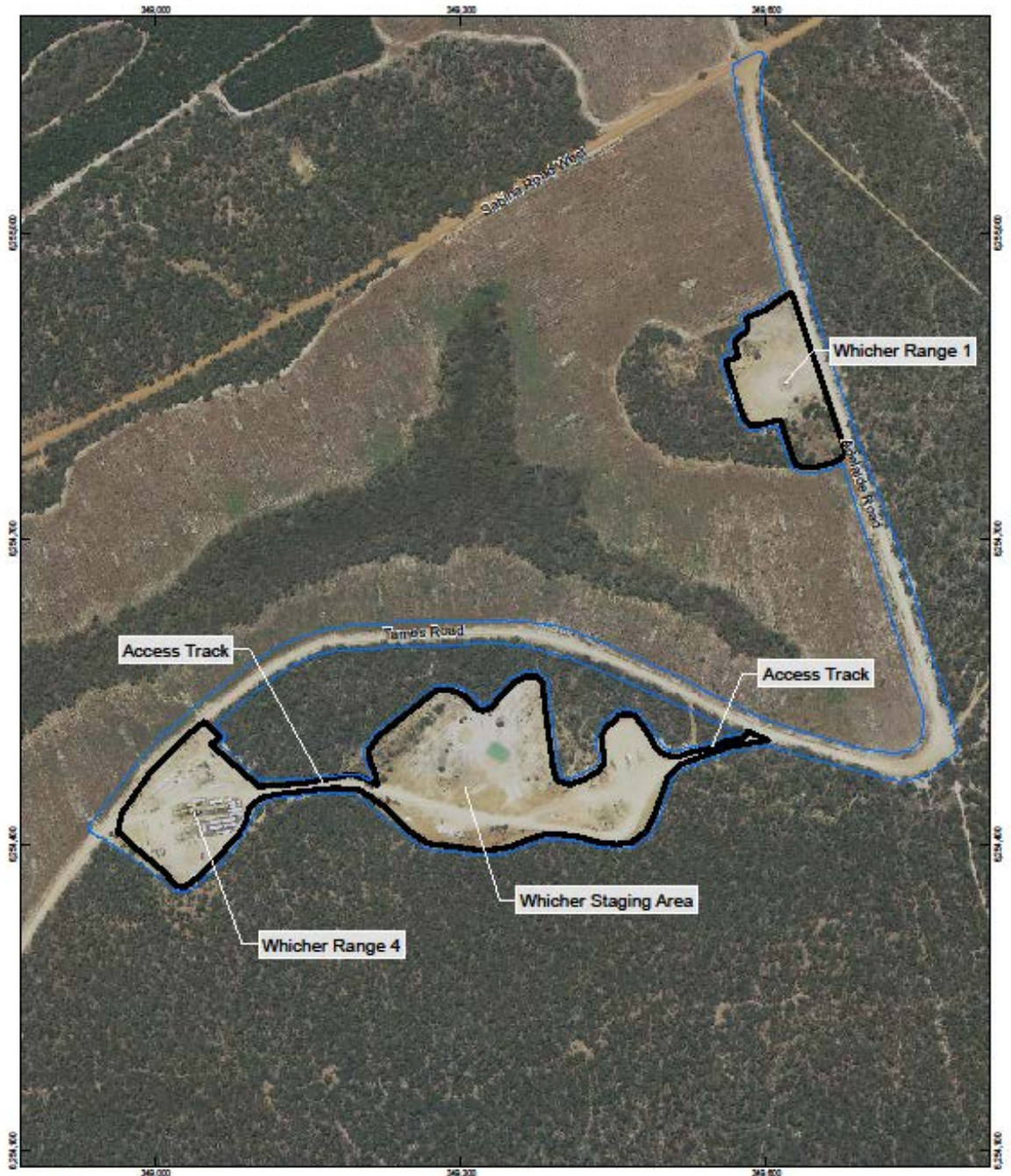


Figure 1 Permit and Well Locations



**LEGEND**  
 Approximate CMEP Area  
 Inspection Area

<p>Paper Size A4 0 50 100 150 200 Metres</p> <p>Map Projection: Transverse Mercator Horizontal Datum: GDA 1984 Grid: GDA 1984 MGA Zone 50</p>				<p>CalEnergy Resources Ltd Whicher Range EP8</p> <p><b>CMEP Area</b></p>	<p>Job Number   81-34559 Revision   0 Date   01 Sep 2016</p>
<p>© 2016. Whilst every care has been taken to prepare this map, GHD, Landgate, Geoscience Australia and Department of Mines and Petroleum make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damages) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unreliable in any way and for any reason.</p> <p>Date source: Landgate Imagery (Virtual mosaic); GHD: CMEP Area - 20160817, Inspection Area - 20160820. Created by: mtk/kanon</p>					

**Figure 2**

Figure 2 Care and Maintenance Environment Plan Area

## **2.3. Planned Activities**

### **2.3.1. Wellhead and Tree Integrity Inspections and Testing**

During wellhead integrity inspections of WR-1 and WR-4, a visual inspection of the wellhead, tree and cellar will be performed and photographs taken. Accumulated fluids (storm water run-off) may be removed from the cellar via pumping if required to provide access and allow for visual inspection. Wellhead and tree integrity checks will include greasing of valves, production tree body pressure tests, production tree valves pressure tests and production annulus pressure tests. The Back Pressure Valve in WR-1 and the Two Way Check Valve in WR-4 will not be removed. Wellhead and tree testing will not require the use of downhole chemicals, with the exception of annulus pressure test solution for the production annulus pressure tests.

### **2.3.2. Visual Inspections**

#### **Well Site Infrastructure**

Existing well site infrastructure such as the elevated limestone gravel well pads, surrounding cleared areas, fences, gates, locks and signage will be visually inspected to ensure integrity of the infrastructure. The well site areas will also be visually inspected for the presence of vegetation regrowth, weeds, dumped rubbish and erosion.

#### **Whicher Staging Area and Access Track**

The Whicher Staging Area and access track will be visually inspected for the presence of vegetation regrowth, weeds, dumped rubbish and erosion.

#### **Inspection Area**

The Inspection area will be visually inspected for the presence of dumped rubbish and off-site erosion associated with the CMEP Area.

### **2.3.3. Service and Maintenance**

Service and maintenance activities will be undertaken on an as needed basis, normally as an outcome of the planned inspections and testing works. Service and maintenance may include wellhead and/or tree repair, infrastructure repair and replacement, and general site works.

#### **Wellhead and/or tree repair**

If wellhead and tree integrity inspections and testing identify wear, corrosion or damage to the wellhead, tree or cellar, CRA will undertake appropriate servicing and maintenance to remediate or rectify identified issues.

#### **Infrastructure repair and replacement**

If visual inspections identify wear, corrosion or damage of well site infrastructure, service and maintenance operations will be undertaken, which may include repair or replacement of fences, gates, locks and signage. Signage will clearly identify the presence of the gas well, detailing the name of the well and emergency contact information.

#### **Site works – stormwater and erosion management**

CRA will undertake civil works within 12 months of approval of this EP to construct levees, drains and sediment retention basins as part of stormwater management. CRA will also undertake civil works as part of these works to rectify existing areas of erosion within the CMEP and Inspection Areas. Available in-situ materials will be utilised. In the unlikely event materials are required to be imported they will be certified seed, weed and dieback free.

**Site works – resulting from visual inspections**

If visual inspections identify the presence of vegetation regrowth and weeds within the CMEP Area and/or dumped rubbish or erosion within the CMEP and Inspection Areas then site works may be undertaken. Works may include:

- Vegetation clearing of minor regrowth to maintain existing cleared areas – Vegetation clearing will be undertaken by a licenced contractor and will be restricted to existing cleared areas within the CMEP Area, which does not constitute native vegetation under the EP Act. No clearing of new or undisturbed areas will be undertaken as part of care and maintenance activities.
- Spraying of weed growth using herbicides – Weed spraying will be undertaken by a licenced contractor to remove weed growth within the CMEP Area.
- Removal of dumped rubbish – Third party dumped rubbish or waste within the CMEP Area will be removed by a licenced contractor and disposed of at an appropriately licenced facility. Any dumped rubbish or waste within the Inspection Area will be reported to the DPaW.
- Stabilisation of eroded areas – Civil works such as grading, rolling and minor excavation may be undertaken to maintain the gradient and access within the CMEP Area. Where available in-situ materials will be utilised.

**2.4. Unplanned Activities**

Unplanned activities will constitute emergency repair works to the well head or sub-surface infrastructure as a result of accidental/malicious damage or critical equipment failure that may result in uncontained emissions to the environment.

**2.5. Chemicals and Other Substances**

Chemicals and other substances to be used during the planned activities will include diesel, grease, lubricants (e.g. hydraulic oil) and cleaning products (e.g. valve flush, inhibitor, biocide). Herbicides may also be used on an as needed basis as part of service and maintenance. These chemicals and other substances will be used above ground and will be stored in mobile tanks on light vehicles/service trucks or located in a dedicated storage area that has been designed to reduce potential impacts to the environment. There will be no bulk storage tanks of any chemicals or other substances within the CMEP Area during the planned activities.

**2.6. Waste Management**

Expected waste generated during planned activities includes:

- General/operation waste (rags, containers etc.);
- Putrescible waste (food scraps and associated rubbish); and
- Chemical and hydrocarbon waste (MEG, grease, lubricants, cleaning products).

All waste products generated will be stored in appropriate waste receptacles with fitted lids. Waste will be segregated separating hazardous and chemical wastes from general wastes. All waste will be removed from the CMEP Area and disposed of at appropriate facilities at the completion of each care and maintenance activity campaign. Recycling of appropriate materials will occur where reasonably practicable to do so.

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### **3. ENVIRONMENTAL RISKS, IMPACTS AND MANAGEMENT MEASURES**

An environmental risk assessment was undertaken by CRA to identify and assess the potential risks and environmental impacts associated with the care and maintenance activities. A summary of the existing environment within and surrounding the CMEP Area and potential environmental impacts that could result from the care and maintenance activities are outlined in Table 2. This Table also presents the mitigation and management measures that form part of the implementation strategy to minimise potential risks to the environment to an acceptable and As Low As Reasonably Practicable (ALARP) level.

Table 2 - Summary of the existing environment, potential environmental impacts and management approach associated with care and maintenance activities

Environmental Aspect	Description	Potential Impact	Key Management Measures	Residual Risk Analysis and Ranking	Implementation Strategy
Fire	<p>The CMEP Area is located within the Molloy Block of the Blackwood State Forest (F 32, Class A) managed by the Department of Parks and Wildlife (DPaW). The Vasse Pine Plantation/Timber Reserve is located north, northwest and west of the CMEP Area and is subject to active logging. Areas of the Blackwood State Forest not subject to pine plantations are areas of native Jarrah-Marri forest which has previously been logged and now is mainly regrowth. The Blackwood State Forest covers approximately 52,215 ha and, in the vicinity of the CMEP Area, borders the North East Margaret River State Forest, Rapids Conservation Park, Whicher National Park, Millbrook State Forest and a number of un-named reserves.</p> <p>The CMEP Area was previously cleared in 1968 and 1997 prior to exploration drilling by other unrelated companies. To date the CMEP Area has been retained as a cleared space with minimal regrowth observed.</p>	Fire originating from CMEP Area.	<p><u>General</u></p> <ul style="list-style-type: none"> <li>Advise relevant agencies and stakeholders prior to planned activities at CMEP Area</li> <li>Liaise with DPaW regarding prescribed burns</li> <li>Liaise with DPaW regarding regular edge burns (edging) around CMEP Area by DPaW</li> <li>Compliance with Journey Management Plan, including minimum vehicle requirement specifications</li> </ul> <p><u>Hot Works</u></p> <ul style="list-style-type: none"> <li>No hot works will be carried out on site during extreme or catastrophic fire danger ratings</li> <li>All hot works to be carried out in accordance with conditions of internal Permit to Work</li> <li>Compliance with DPaW, DFES and Shire exemption/permit conditions at all times</li> </ul> <p><u>Combustible waste / fluid stored at CMEP Area</u></p> <ul style="list-style-type: none"> <li>All waste generated from activities to be removed from CMEP Area and disposed at appropriate facilities</li> <li>Appropriate housekeeping</li> </ul> <p><u>Lightning strike at CMEP Area</u></p> <ul style="list-style-type: none"> <li>Appropriate housekeeping</li> </ul> <p><u>Malicious damage at CMEP Area</u></p> <ul style="list-style-type: none"> <li>Daily inspections during care and maintenance operations</li> <li>Quarterly visual CMEP Area inspections</li> </ul>	Medium – Through the implementation of mitigation and management measures, it is unlikely the activities will result in a bushfire originating from site resulting in an adverse impact on the environment.	<ul style="list-style-type: none"> <li>Investigation and reporting of any non-conformances with DPaW, DFES or Shire conditions</li> <li>Compliance with Journey Management Plan</li> <li>Implement appropriate waste management practices.</li> <li>Daily visual inspection checklists during care and maintenance operations</li> <li>Quarterly visual inspection checklists completed throughout the life of CMEP</li> </ul>
Hydrocarbon and Chemical Spills	<p>The CMEP Area is located within the Busselton-Capel Groundwater Area, which is proclaimed under the RIWI Act. The CMEP Area is also located within the Margaret River Catchment Public Drinking Water Source Area (PDWSA), which is listed as Priority 1 and proclaimed under the CAWS Act. The Margaret River Catchment PDWSA supplies Margaret River, Prevelly, Gnarabup and Cowaramup.</p> <p>A number of drainage lines occur in the vicinity of the CMEP Area, these include the Vasse River and associated tributaries located approximately 1.5 km to the north and west, Margaret River and associated tributaries located approximately 700 m to the south and the Sabina River and associated tributaries located approximately 10 km to the east.</p> <p>The CMEP Area is a cleared space and has a dedicated storage area that is isolated from</p>	Localised soil impacts resulting from spills <20 L	<p><u>Storage and handling of fuels and chemicals</u></p> <ul style="list-style-type: none"> <li>No bulk tank storage of fuels or chemicals on site</li> <li>Storage and handling of fuels and chemicals in accordance with Safety Data Sheets (SDS)</li> <li>Maintain a chemical register of SDS for all chemicals that are used during the planned activities</li> <li>Fuels and chemicals will be stored in mobile tanks on vehicles and service trucks or located within a dedicated bunded storage area</li> <li>Diesel will be transported and stored in maximum 200 L capacity mobile tanks</li> <li>No vehicle refuelling to occur on site</li> <li>Refuelling on site will be limited to fixed and mobile plant and equipment (e.g. light towers, diesel generators), shall be continuously supervised and only to occur on bunded liner</li> <li>Storage and handling of fuels within designated bunded area</li> <li>Use of appropriate vessel for storage and transport (as per SDS)</li> </ul>	Low – Given the mitigation and management measures that will be implemented, localised soil impacts are unlikely.	<ul style="list-style-type: none"> <li>Compliance with Journey Management Plan</li> <li>Daily visual inspection checklists during care and maintenance operations</li> <li>Quarterly visual inspection checklists completed throughout the life of CMEP</li> </ul>

Environmental Aspect	Description	Potential Impact	Key Management Measures	Residual Risk Analysis and Ranking	Implementation Strategy
	surrounding soil by a solid barrier, bunded and lined with an impermeable barrier.	Localised soil impacts resulting from spills 20- 100 L	<ul style="list-style-type: none"> <li>Inspection of vessels prior to mobilisation is to include inspection and verification that there are no leaks, and that containers are sealed and secure</li> <li>Visual inspections of mobile tanks to identify leaks</li> <li>Spill kit appropriate to the nature and scale of the activity are available on site during activities involving the storage or handling of fuels and chemicals</li> </ul> <p><u>Vehicle collision</u></p> <ul style="list-style-type: none"> <li>Compliance with Journey Management Plan, including minimum vehicle requirement specifications</li> </ul> <p><u>Unsecure loads during transport of fuels and chemicals</u></p> <ul style="list-style-type: none"> <li>Compliance with Journey Management Plan, including: <ul style="list-style-type: none"> <li>Use of appropriate vessels for storage and transport (as per SDS)</li> <li>Inspect vessels prior to mobilisation</li> <li>Secure loads</li> </ul> </li> </ul> <p><u>Overtopping of well cellar</u></p> <ul style="list-style-type: none"> <li>Quarterly visual inspections of cellar to monitor accumulated fluids</li> </ul>	Low – Given the mitigation and management measures that will be implemented, localised soil impacts are unlikely.	
		Localised soil and/or surface water impacts resulting from spills >100 L	<ul style="list-style-type: none"> <li>Removal of water from the cellar via pumping using a “suck truck” if required</li> <li>Transport and disposal of waste fluid to an appropriately licenced facility (managed as potentially oily water)</li> </ul> <p><u>Leaking plant and/or equipment</u></p> <ul style="list-style-type: none"> <li>Servicing and maintenance of plant and machinery in line with manufacturer's specifications</li> <li>Daily visual inspections of plant and equipment during operations to identify leaks</li> <li>Appropriate bunding of all plant and equipment</li> </ul> <p><u>Illegal dumping of waste by third party</u></p> <ul style="list-style-type: none"> <li>Daily visual inspections during operations to identify illegally dumped waste materials</li> <li>Quarterly visual inspections to identify illegally dumped waste materials</li> </ul>	Low – Given the limited use of bulk liquid storage on site and the mitigation and management measures that will be implemented, impacts on localised soil and surface water are unlikely.	
Soil Erosion and Transportation	<p>The CMEP Area occurs within the Blackwood Plateau soil-landscape system, and specifically the Birdella and Kingia subsystems. These subsystems are characterised by sandy to loamy gravels and deep sands.</p> <p>The CMEP Area was previously cleared in 1968 and 1997 prior to exploration drilling by other unrelated companies. To date the CMEP Area has been retained as a cleared space with minimal regrowth observed.</p>	Soil erosion resulting in transportation of soil off site	<ul style="list-style-type: none"> <li>Maintain appropriate gradient across the site to minimise erosion potential from cleared areas</li> <li>Grading of access roads as required to maintain access</li> <li>Preparation of a Stormwater Management Strategy with the objective of containing stormwater on-site as far as practicable and minimising the velocity of any off-site stormwater flows.</li> <li>Quarterly visual site inspections to monitor erosion and transportation of soil</li> <li>Liaise with DPaW to determine appropriate recovery strategies if inspections identify soil erosion and/or transportation of soil off-site</li> </ul>	Low – Given the mitigation and management measures that will be implemented, impacts on landforms or soil are unlikely.	<ul style="list-style-type: none"> <li>Quarterly visual inspection checklists completed throughout the life of CMEP</li> <li>Development of a Stormwater Management Strategy.</li> <li>Continued liaison with DPaW regarding erosion management strategies.</li> </ul>
Uncontrolled Hydrocarbon Release	The CMEP Area was previously cleared in 1968 and 1997 prior to exploration drilling by other unrelated companies. To date the CMEP Area has been retained as a cleared space with minimal regrowth observed	Uncontrolled hydrocarbon release resulting in detrimental impacts to the surrounding environment.	<ul style="list-style-type: none"> <li>Regular wellhead inspections and maintenance (as per this CMEP)</li> <li>Annual integrity testing (as per this CMEP)</li> <li>Dual barrier philosophy</li> <li>Public access restriction through fencing</li> <li>Appropriate signage advising of high pressure gas well and associated hazard</li> <li>Fire mitigation measures</li> </ul>	Low – Through the implementation of mitigation and management measures, it is unlikely an uncontrolled hydrocarbon release will impact on the surrounding environment.	<ul style="list-style-type: none"> <li>Investigation and reporting of any uncontrolled hydrocarbon release.</li> <li>Quarterly visual inspection checklists completed throughout the life of CMEP.</li> </ul>

Environmental Aspect	Description	Potential Impact	Key Management Measures	Residual Risk Analysis and Ranking	Implementation Strategy
General Waste	The CMEP Area was previously cleared in 1968 and 1997 prior to exploration drilling by other unrelated companies. To date the CMEP Area has been retained as a cleared space with minimal regrowth observed	Loss of containment of general waste generated on site resulting in release of rubbish into the environment.	<ul style="list-style-type: none"> <li>No personnel accommodated on site</li> <li>Waste streams will be segregated on site and will be disposed of, in an approved manner by contractors.</li> <li>Recycling of appropriate materials will occur where reasonably practicable.</li> <li>Use of appropriate, clearly labelled waste receptacles, with lids</li> <li>Induction of all personnel regarding appropriate waste management</li> <li>All waste generated from operations to be removed and disposed at an appropriately licenced facility at the end of each campaign</li> <li>Maintain existing fencing to minimise potential for wind-blown waste</li> </ul> <p><u>Leakage of septic waste</u></p> <ul style="list-style-type: none"> <li>Daily visual inspections during operations to identify system leaks</li> <li>Use of authorised contractor for disposal of septic waste from site</li> <li>Bunding of portable toilets</li> </ul>	Low – Given the negligible consequence and implementation of mitigation and management measures, it is unlikely the activities will impact on the environment.	<ul style="list-style-type: none"> <li>Removal of waste material off site and disposal at appropriate facility.</li> <li>Daily visual inspection checklists during care and maintenance operations</li> <li>Quarterly visual inspection checklists completed throughout the life of CMEP</li> </ul>
Fauna	<p>Desktop searches identified the presence/ potential presence of 10 conservation significant fauna taxa within a 5 km buffer of the CMEP Area.</p> <p>A fauna assessment of the broader area did not record any conservation significant fauna species, however, Black Cockatoos have been previously recorded in the area.</p> <p>No conservation significance fauna species have been observed within the CMEP Area. Furthermore, given the degree of clearing and lack of native flora and vegetation in the CMEP Area it is expected that only occasional visitation of native fauna species on the site.</p>	Detrimental impacts to native fauna	<p><u>Vehicle movements</u></p> <ul style="list-style-type: none"> <li>Inforce vehicle speed restrictions</li> <li>No driving off established tracks</li> </ul> <p><u>Inappropriate waste management practices</u></p> <ul style="list-style-type: none"> <li>All waste generated from operations to be removed and disposed at appropriate facilities</li> <li>Use of appropriate waste receptacles</li> <li>Appropriate housekeeping</li> <li>Maintain existing fencing to exclude fauna from site</li> </ul> <p><u>Fauna entrapment within site compound or enclosed infrastructure</u></p> <ul style="list-style-type: none"> <li>Maintain existing fencing to exclude fauna from site</li> <li>Daily site inspections during site operations</li> <li>Quarterly visual site inspections</li> </ul> <p><u>Fauna ingress into well cellar</u></p> <ul style="list-style-type: none"> <li>Maintain cellar grate</li> <li>Daily site inspections during site operations</li> <li>Quarterly visual site inspections</li> </ul>	Low – Through the implementation of mitigation and management measures, it is unlikely the activity will impact on native fauna.	<ul style="list-style-type: none"> <li>Compliance with Journey Management Plan</li> <li>Investigation and reporting of any incidences of fauna injury or death.</li> <li>Daily visual inspection checklists during care and maintenance operations</li> <li>Quarterly visual inspection checklists completed throughout the life of CMEP</li> </ul>
Flora and Vegetation	<p>The CMEP Area was previously cleared in 1968 and 1997 prior to exploration drilling by other unrelated companies. To date the CMEP Area has been retained as a cleared space. Minimal regrowth has been noted within the CMEP Area and includes native species such as <i>Acacia pulchella</i>, <i>A. extensa</i> and <i>Taxandria parviceps</i>. Areas adjacent to the CMEP Area include *<i>Pinus radiata</i> in plantations and <i>Eucalyptus marginata-Corymbia calophylla-Allocasuarina fraseriana</i> woodlands.</p> <p>Desktop searches identified the presence/ potential presence of 32 conservation significant flora taxa within a 5 km buffer of the CMEP Area. No conservation significance flora taxa have been recorded within the CMEP Area.</p>	<p>Clearing of vegetation outside of previously cleared areas.</p> <p>Introduction or spread of introduced species (weeds).</p>	<ul style="list-style-type: none"> <li>No driving off established tracks</li> <li>Induction of all personnel regarding environmental responsibilities and risks.</li> <li>No clearing of vegetation outside of previously cleared areas</li> <li>Consult with DPaW prior to any vegetation management along State Forest roads/tracks</li> <li>No clearing without appropriate clearing permits</li> </ul> <ul style="list-style-type: none"> <li>No driving off established tracks</li> <li>All vehicles and machinery to be clean of soil and plant material when entering State Forest during care and maintenance activities and site visits</li> <li>Certified clean fill only unless authorised by DPaW</li> <li>Visual inspections to identify any new weed infestations on site</li> <li>Implement weed management strategies as required</li> </ul>	<p>Low – Given there is no clearing outside of existing CMEP Area required and through the implementation of management measures, it is unlikely the activity will impact on flora and vegetation.</p> <p>Low – Through the implementation of management measures, it is unlikely the activity will impact on flora and vegetation.</p>	<ul style="list-style-type: none"> <li>Compliance with Journey Management Plan</li> <li>Investigation and reporting of any unauthorised vegetation damage/clearing.</li> <li>Completion of vehicle inspection checklist</li> <li>Daily visual inspection checklists during care and maintenance operations</li> <li>Quarterly visual inspection checklists completed throughout the life of CMEP</li> <li>Implement weed management strategies.</li> </ul>

Environmental Aspect	Description	Potential Impact	Key Management Measures	Residual Risk Analysis and Ranking	Implementation Strategy
	The CMEP Area is considered to occur in an area at risk of Dieback. Advice was sought from DPaW on the extent of Dieback in the CMEP Area and surrounds; it is considered the majority of the surrounding areas are severely affected by Dieback.	Introduction or spread of dieback into uninfected areas.	<ul style="list-style-type: none"> <li>No driving off established tracks</li> <li>All vehicles and machinery to be clean of soil and plant material when entering State Forest during care and maintenance activities and site visits</li> <li>Certified clean fill only unless authorised by DPaW</li> </ul>	Low – Through the implementation of management measures, it is unlikely the activity will impact on flora and vegetation.	
Air	Air emissions in the CMEP Area and surrounds are principally attributable to forestry management activities (mainly logging) and traffic on existing roads. At a regional level on an event basis air quality may be adversely impacted by prescribed controlled burns and uncontrolled bushfires.	Reduced amenity and human health impacts.	<ul style="list-style-type: none"> <li>Implement Journey Management Plan including speed restrictions</li> <li>Use of water truck or available on-site water supplies to suppress dust as needed during planned care and maintenance activities</li> <li>Regular servicing and maintenance of plant and machinery</li> <li>Review of on-site activities and controls to reduce future emissions</li> <li>Operation of fixed or mobile plant and machinery such as diesel generators will be temporary and limited to the duration of care and maintenance activities on site</li> </ul>	Low – Given the limited air emissions sources associated with the activity, distance to sensitive receptors and through the implementation of management measures, it is unlikely the activity will impact on amenity, air quality or human health.	<ul style="list-style-type: none"> <li>Compliance with Journey Management Plan</li> <li>Investigation and reporting of any stakeholder complaints relating to air emissions.</li> </ul>
		Minor deterioration of local air quality due to emissions of pollutants and greenhouse gases	<ul style="list-style-type: none"> <li>Visual inspections of CMEP Area are carried out daily during operations as per daily visual inspection checklist to identify potential sources of air emissions and opportunities to minimise</li> <li>Operation of fixed or mobile plant and machinery such as diesel generators will be temporary and limited to the duration of care and maintenance activities on site</li> </ul>		<ul style="list-style-type: none"> <li>Daily recording and monitoring of fuel use by fixed plant and equipment</li> <li>Daily visual inspection checklists during care and maintenance operations</li> </ul>
Noise	Noise levels in the CMEP Area and surrounds are principally attributable to forestry management activities (mainly logging) and traffic on existing roads.	Reduced amenity	<ul style="list-style-type: none"> <li>Implement Journey Management Plan including speed restrictions</li> <li>Regular servicing and maintenance of plant and machinery</li> <li>No night-works for routine care and maintenance activities</li> <li>Noise abatement controls on machinery if required</li> <li>Stakeholder consultation (notification prior to carrying out planned activities)</li> <li>Review of on-site activities and controls to reduce future emissions</li> </ul>	Low – Given the limited noise emissions sources associated with the activity, distance to sensitive receptors and through the implementation of management measures, it is unlikely the activity will impact on amenity.	<ul style="list-style-type: none"> <li>Compliance with Journey Management Plan</li> <li>Investigation and reporting of any stakeholder complaints relating to noise.</li> </ul>
Light	Air emissions in the CMEP Area and surrounds are principally attributable to forestry management activities (mainly logging) and traffic on existing roads.	Reduced amenity	<ul style="list-style-type: none"> <li>No night-works for routine care and maintenance activities</li> <li>Operate minimum number of light towers for safe working conditions</li> <li>Positioning of light towers to minimise off-site disturbance</li> <li>Stakeholder consultation (notification prior to planned activities)</li> <li>Review of on-site activities and controls to reduce future off-site disturbance</li> </ul>	Low – Given the temporary use of light towers for security, distance to sensitive receptors and through the implementation of management measures, it is unlikely the activity will impact on amenity.	<ul style="list-style-type: none"> <li>Investigation and reporting of any stakeholder complaints relating to light emissions.</li> </ul>

#### **4. CONSULTATION**

CRA has maintained ongoing stakeholder and community consultation as part of the Whicher Range operations. Recent stakeholder and community consultation conducted by CRA in relation to care and maintenance activities included face to face meetings with representatives of the City of Busselton and Shires of Augusta Margaret River, Capel and Nannup, the community, the Busselton-Dunsborough Environment Centre, the Busselton-Dunsborough Residents Association, Whicher Range neighbours, DPaW and DoW. CRA intends to maintain relations with stakeholders and the community throughout the activity.

## **APPENDIX A – CHEMICAL DISCLOSURE**

**A. SYSTEM DETAILS**

Operator	CalEnergy Resources (Australia) Limited
Project / Well	Whicher Range-1 and Whicher Range-4
System	Pressure test fluid
Total Volume of System	400 L

**B. PRODUCT LIST**

Product name	Supplier	Propose	Product in system fluid (%)	Toxicity and Ecotoxicity Information	SDS attached
Water	Sourced off site	Base fluid	50%	Sourced off site	N/A
Monoethylene glycol (MEG)	MinTech Chemical Industries Pty Ltd	Prevents formation of hydrates	50%	<u>Acute toxicity (MEG)</u> LD50 Oral (rat) = 4700 mg/kg LD50 Dermal (rabbit) = 9530 mg/kg LC/EC/IC50 > 100mg/l (fish, aquatic invertebrate, algae, microorganisms) <u>Chronic toxicity (MEG)</u> No known carcinogenic properties. <u>Biodegradation / bioaccumulation (MEG)</u> Biodegradable. Does not bioaccumulate significantly.	Yes
Total			~100%		

**C. CHEMICAL LIST**

Chemicals within products in Part B	CAS number	Mass fraction (%)
Water	7732-18-5	50%
MEG	107-21-1	50%
Total		~100%



# SAFETY DATA SHEET

## SECTION 1 IDENTIFICATION: PRODUCT IDENTIFIER AND CHEMICAL IDENTITY

<b>Product Identifier</b>	<b>MONO ETHYLENE GLYCOL</b>
<b>Other Names</b>	Ethylene glycol, Glycol, MEG, Ethylene diol, 1,2-Ethanediol
<b>Manufacturer's Product Code</b>	19950
<b>Recommended Use</b>	Radiator antifreeze coolant base fluid

### Details of Supplier/Manufacturer

Company:	Recochem Inc. ABN: 69 010 485 999
Address:	1809 Lytton Road, Lytton, Queensland 4178
Phone:	(07) 3308 5200 Fax: (07) 3308 5201
Website:	www.recochem.com.au


### Emergency Telephone Numbers

Business Hours:	(07) 3308 5200
After Hours:	1300 131 001
Poisons Information:	Australia: 13 11 26 New Zealand: 0800 764 766

## SECTION 2 HAZARDS IDENTIFICATION

<b>Hazardous chemical</b>	<i>according to classification by Safe Work Australia</i>
<b>Non-dangerous goods</b>	<i>according to the Australian Code for the Transport of Dangerous Goods by Road and Rail</i>

<b>Signal Word</b>	<b>WARNING</b>
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<b>Hazardous chemical classification</b>	<b>Pictogram</b>	<b>Hazard statement</b>
Acute Toxicity - Oral, Category 4	 EXCLAMATION MARK	H302 Harmful if swallowed

### Precautionary statements:

<b>GENERAL</b>	
P101	If medical advice is needed, have product container or label at hand
P102	Keep out of reach of children
P103	Read label before use
<b>PREVENTATIVE</b>	
P264	Wash thoroughly after handling
P270	Do not eat, drink or smoke when using this product

**Product: MONO ETHYLENE GLYCOL**

<b>RESPONSE</b>	
P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330	Rinse mouth
<b>DISPOSAL</b>	
P501	Dispose of contents/container in accordance with local regulations

**SECTION 3 COMPOSITION AND INFORMATION ON INGREDIENTS****Ingredients Names and Proportions**

Chemical Entity	CAS Number	Proportion (%)
Monoethylene Glycol	107-21-1	100

**SECTION 4 FIRST AID MEASURES****Description of necessary first aid measures**

Inhalation:	Keep victim calm and remove to fresh air if safe to do so. If rapid recovery does not occur, transport to nearest medical facility for additional treatment
Skin Contact:	If skin contact occurs, remove contaminated clothing and wash skin thoroughly with water and follow by washing with soap if available. If irritation persists, seek medical attention
Eye Contact:	If in eyes, hold eyes open, flood with water for at least 15 minutes. If irritation persists, seek medical attention
Ingestion:	If swallowed, do NOT induce vomiting. Have conscious person drink several glasses of water or milk. SEEK IMMEDIATE MEDICAL ATTENTION

**Symptoms caused by exposure**

Inhalation:	May include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing
Skin:	May include burning sensation, redness, swelling and/or blisters
Eye:	May include burning sensation, redness, swelling and/or blurred vision
Ingestion:	May include nausea, vomiting, abdominal cramps, diarrhoea, lumbar pain shortly after ingestion, and possibly narcosis and death. Kidney toxicity may be recognized by blood in the urine or increased or decreased urine flow

**Medical attention and special treatment**

Treat symptomatically.

**SECTION 5 FIRE FIGHTING MEASURES****Suitable extinguishing equipment**

Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. Do not use water in a jet.

**Specific hazards arising from the chemical**

Carbon dioxide and/or carbon monoxide may be evolved if incomplete combustion occurs. Material will not burn unless preheated. When heated to decomposition, emits acrid smoke and irritating fumes. Not a product presenting risks of explosion.

**Special protective equipment and precautions for fire fighters**

Wear full protective clothing and self-contained breathing apparatus.

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**SECTION 6 ACCIDENTAL RELEASE MEASURES**

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**Personal precautions, protective equipment and emergency procedures**

Avoid contact with spilled or released material. Do NOT ingest. Shut off leaks, if possible without personal risks. Isolate hazard area and deny entry to unnecessary or unprotected personnel. Remove all sources of ignition in the surrounding area. Ventilate contaminated area thoroughly.

**Environmental precautions**

Use appropriate containment to avoid environmental contamination. Prevent from spreading and entering waterways using sand, earth or other appropriate barriers.

**Methods and materials for containment and cleaning up**

For small spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow any residues to evaporate or use an appropriate absorbent material and dispose of safely.

For larger spills (> 1 drum), transfer by means such as a vacuum truck to a salvage tank for recovery or disposal. Do not flush residues with water. Retain as contaminated waste. Allow any residues to evaporate or use an appropriate absorbent material and dispose of safely.

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**SECTION 7 HANDLING AND STORAGE**

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**Precautions for safe handling**

Avoid breathing vapours. Do NOT ingest. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling. Do not eat, drink or smoke in contaminated areas. Handle and open containers with care in a well-ventilated area. Ensure that the workplace is ventilated such that the Occupational Exposure limit is not exceeded. Do not empty into drains.

**Conditions for safe storage, including any incompatibilities**

Store in a cool, well-ventilated area, away from sunlight, ignition sources and other sources of heat. Do not store near strong oxidisers.

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**SECTION 8 EXPOSURE CONTROLS AND PERSONAL PROTECTION**

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**Exposure control measures**

From National Occupational Health & Safety Commission (NOHSC) Worksafe Australia -  
Monoethylene glycol: 52mg/m<sup>3</sup> (20ppm) TWA (vapour), 104mg/m<sup>3</sup> (40ppm) STEL (vapour) and 10mg/m<sup>3</sup> TWA (particulate)

**Biological monitoring**

No biological limit allocated.

**Engineering controls**

Ensure that adequate ventilation is provided. Maintain air concentrations below recommended exposure standards. Avoid generating and inhaling mists and vapours. Keep containers closed when not in use.

**Individual protection measures**

Eye and face protection:	Wear safety goggles.
Skin protection:	Use solvent resistant gloves, nitrile for longer term protection or PVC and neoprene for incidental splashes.
Respiratory protection:	If work practices do not maintain airborne level below the exposure standard, use appropriate respiratory protection equipment. When using respirators, select an appropriate combination of mask and filter. Select a filter for organic gases and vapours (boiling point > 65°C). Respirators should comply with AS1716 or an equivalent approved by a state/territory authority.
Thermal hazards:	Not applicable.

**SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES**

Appearance:	Clear colourless viscous liquid
Odour:	None
Odour threshold (ppm):	Data not available
pH:	7.5 - 8.5 (1% in water)
Melting point/freezing point (°C):	-13
Initial boiling point and boiling range (°C):	197
Flash point (°C):	116.1 (closed cup)
Evaporation rate (Butyl acetate = 1):	0.01
Flammability:	Combustible
Upper/lower flammability or explosive limits (%):	3.2 - 15.3
Vapour pressure (mmHg @ 20°C):	0.06
Vapour density (air = 1):	2.1
Density (g/ml @ 15°C):	1.115 - 1.125
Solubility:	Soluble in water, methanol, diethyl ether
Partition coefficient: n-octanol/water:	Data not available
Auto-ignition temperature (°C):	412
Decomposition temperature (°C):	Data not available
Kinematic viscosity (mm <sup>2</sup> /s @ 20°C):	Data not available

**SECTION 10 STABILITY AND REACTIVITY**

**Reactivity**

Stable under normal conditions of use.

**Chemical stability**

Stable under normal conditions of use.

**Possibility of hazardous reactions**

Stable under normal conditions of use.

**Conditions to avoid**

High temperatures.

**Incompatible materials**

Strong oxidising agents, strong acids, strong alkalis.

**Hazardous decomposition products**

Burning can produce carbon monoxide and/or carbon dioxide.

**SECTION 11 TOXICOLOGICAL INFORMATION**

Acute toxicity:	Low toxicity in animals - LD50 Oral (rat) = 4700mg/kg LD50 Dermal (rabbit) = 9530mg/kg Note that there is a marked difference in acute oral toxicity between
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**Product: MONO ETHYLENE GLYCOL**

	animals and humans, humans being more susceptible than animals. The estimated fatal dose for humans is 100ml
Skin corrosion/irritation:	May cause skin irritation; prolonged contact may cause dermatitis
Serious eye damage/irritation:	May cause eye irritation
Respiratory or skin sensitisation:	Not expected to be a sensitiser
Germ cell mutagenicity:	No evidence of mutagenic activity
Carcinogenicity:	Not carcinogenic in animal studies
Reproductive toxicity:	Not expected to impair fertility
Specific Target Organ Toxicity (STOT) – single exposure:	May cause drowsiness or dizziness. Inhalation of vapours or mists may cause irritation to the lungs and respiratory system
Specific Target Organ Toxicity (STOT) – repeated exposure:	May cause damage to organs or organ systems through prolonged or repeated exposure. Toxic to liver and kidneys
Aspiration hazard:	Not considered an aspiration hazard

**SECTION 12 ECOLOGICAL INFORMATION****Ecotoxicity**

Acute toxicity:

Fish –	Low toxicity: LC/EC/IC50 > 100mg/l
Aquatic invertebrate –	Low toxicity: LC/EC/IC50 > 100mg/l
Algae –	Low toxicity: LC/EC/IC50 > 100mg/l
Microorganisms –	Low toxicity: LC/EC/IC50 > 100mg/l

Chronic toxicity:

Fish –	NOEC/NOEL > 100mg/l
Aquatic invertebrate –	NOEC/NOEL > 100mg/l
Algae –	No data available
Microorganisms –	No data available

**Persistence and degradability**

Biodegradable.

**Bioaccumulative potential**

Does not bioaccumulate significantly.

**Mobility in soil**

Dissolves in water. If product enters soil, one or more constituents will be mobile and may contaminate groundwater.

**Other adverse effects**

No data available.

**SECTION 13 DISPOSAL CONSIDERATIONS**

Ensure waste disposal conforms to local waste disposal regulations.

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**SECTION 14 TRANSPORT INFORMATION**

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<b>UN number:</b>	Not applicable
<b>Proper shipping name:</b>	Not applicable
<b>Australian Dangerous Goods class:</b>	Not applicable
<b>Australian Dangerous Goods packing group:</b>	Not applicable
<b>Hazchem code:</b>	Not applicable

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**SECTION 15 REGULATORY INFORMATION**

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Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP), Poisons Schedule:	6
Australian Inventory of Chemical Substances (AICS):	Listed
Dangerous Goods Initial Emergency Response Guide (SAA/SNZ HB76):	Not applicable

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**SECTION 16 OTHER INFORMATION**

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Date of preparation:	18/08/2015
Revision number:	5
Changes in this revision:	Poisons Schedule corrected

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This MSDS summarises product safety information at the date of issue, to the best of our knowledge, as a general guide. Recochem cannot anticipate or control the conditions under which the product is used, so prior to usage each user must assess and control the risks associated with their use of the product. Users should also consult the relevant legislation governing the use and storage of this product. We make no warranties, express or implied, and assume no liability in connection with any use of information contained within this document. If clarification or further information is needed, the user should contact Recochem on (07) 3308 5200.

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