INCIDENT INVESTIGATION REPORT

Sentinel #:

Short title: otential Asbestos Exposure

Date of incident: September / October

Time of incident: N/A

Exact location of incident: Reservoir, Rabbit Proof Fence Road

Near Miss ☐ (Tick box if applicable)

Injured Person(s) (IP) ☒ (Tick box if applicable)

Injured Person Name(s):

☐ **Employee**

☐ **Contractor**

☐ **Member of Public**

Nature of Injury sustained:

While there is no confirmed exposure of individuals to asbestos, there is the potential for health impacts in the long term.

Equipment/Property Damage ☐ (Tick box if applicable)

Description/type of property or equipment:

Nature of damage:

Environmental Impact ☒ (Tick box if applicable)

Description / type / extent of impact:
Asbestos containing material was disposed of without following asbestos disposal requirements.

Short incident Description:
On Thursday 8th October 2015 an environmental consultant arrived at the Reservoir site to update the Asbestos Asset Register. A member of the project team and a contractor representative from the I : Reservoir Refurbishment project were on site at the time. These representatives queried the work of the environmental consultant as throughout project design, planning and construction they had been advised that there were no Asbestos Containing Materials (ACM) on the site. The Asbestos Asset Register had been consulted in August 2013, and there was no entry for : Reservoir. However, the same environmental consultant had visited the Minnivale Reservoir site in September 2014, and taken samples which confirmed the presence of ACM. The Asbestos Asset Register was updated to reflect this in October 2014.

Construction works were undertaken between April and September 2015, and work methodologies had not factored in the presence of ACM. As a result of this interaction, the project team became aware that personnel attending the site during construction of the project were potentially exposed to asbestos through the grinding and handling of ACM.

REVIEW AND SIGN-OFF:

Sign-off	Name	Signature	Date
Branch Manager			

Complete this section for High Potential Incidents (HPIs) only:

General Manager GM to sign off report to approve Corrective Action controls at administrative level or lower.	[redacted]	[redacted]	[redacted]
CEO CEO to sign-off HPI event approving actions assigned at an organisational level	[redacted]	[redacted]	[redacted]

Have you adequately documented and/or attached:

Required for Completed Investigation	Mark box with X
Investigation Team Members and Roles	☒
Incident Overview	☒
Timeline	☒
Basic Cause of the Incident	☒
Contributing Factors: • Absent/Failed Defences • Individual/Team Actions • Task/Environmental Conditions • Organisational Factors	 ☒ ☒ ☒ ☒
Corrective and Preventative Actions	☒
Key Photographs/Sketches (Note: Primary ones here, others in Evidence Report - Minnivale Asbestos Exposure)	☒
Lead Investigator and RBM/Group Manager Sign-Off	☐
Filed in Correct Aqua File for Region/Group	☒
Notified *Senior OSH Analyst - Incident Management* that report is completed	☐
Optional Attachments	**Mark box with X**
PEEPO Chart (Included in evidence report)	☐

1 INVESTIGATION TEAM

Investigation Team Role	Position
Lead Investigator (LI)	A/Delivery Manager
Investigation Facilitator (IF)	Senior OSH Analyst Incidents
OSH Consultant	Team Leader Capital Works OSH Support
Subject Matter Expert (SME)	Senior OSH Consultant Occupational Hygiene
Branch Manager	Manager Project Management Branch
GM HPI Sponsor Rep	General Manager Asset Delivery Group
Safety Representative	Administration Manager

2 INCIDENT OVERVIEW

2.1 Background

Reservoir is situated approximately 180 km North East of Perth. It is east of on the Goldfields & Agricultural Water Supply "CK" main and 1 km north of the Goomalling-Wyalkatchem Road and Rabbit Proof Fence Road intersection (see Figure 1).

Operationally the Reservoir is supplied potable water from the Cunderdin 'A' Pump Station, located upstream of reservoir. The water from the reservoir then gravitates to Pump Station for transfer to downstream tanks and customers.

The reservoir has had a history of high leakage due to cracks in the existing 75 mm thick concrete lining and perished joint sealant. A structural review of the roof identified the existing roof purlins and bracing were severely corroded and the structure did not meet current design standards. A project was activated within the Goldfields and Agricultural Region in November 2008, to refurbish the reservoir. In 2013 the project was transferred to Project Management for delivery. The final scope of the refurbishment was to replace the roof structure, and install a liner on the base and sides of the reservoir. The refurbishment was completed on 30 September 2015.

During the project, the Asbestos Asset Register was consulted, and it was confirmed that there was no entry for Reservoir (refer to timeline). The project team made numerous other queries which supported the assumption that there was no ACM on site, and the project proceeded on this basis.

The Asset Asbestos Register was updated on 10th October 2014, following a site inspection and sampling on the 11th September 2014.

On Thursday 8th October 2015, a member of the project team was on site with a representative of the Stage 2 contractor. An environmental consultant approached them and advised that they were on site to update the Asbestos Asset Register. This is when the project team and contractor first became aware of the presence of ACM on the Reservoir site.

2.2 Construction

For the purposes of construction, the project was split into two stages. Stage 1 was constructed from 6 April 2015 to 1 July 2015 and included:

- Removal of the existing roof sheets and supporting structure and fascia panels;
- Supply and installation of the new roof support structure;
- Supply and installation of new roof and side panel sheeting; and
- Replacement of gutter joint sealant (external to the reservoir)

Stage 2 was constructed from 6 July 2015 to 30 September 2015 and included:

- Design, supply and installation of leak detection and under-drainage works;
- Preparation of all surfaces, including reservoir floor, walls and columns for the installation of the water proof lining system, including grinding concrete flat and removal of construction joint sealant; and
- Design, supply and install the water proof lining system.

A third contractor was engaged by the , . to carry out final cleaning and disinfection of the reservoir and to coordinate commissioning activities.

Work activities during the project where ACM was encountered were:

Stage 1 Removal of fascia panels – these were unscrewed and manually removed.

Grinding of the mastic (joint sealant) that was present in the concrete gutters.

Stage 2 Grinding of the mastic used as a sealant between the concrete sections on the flooring to achieve a level finish.

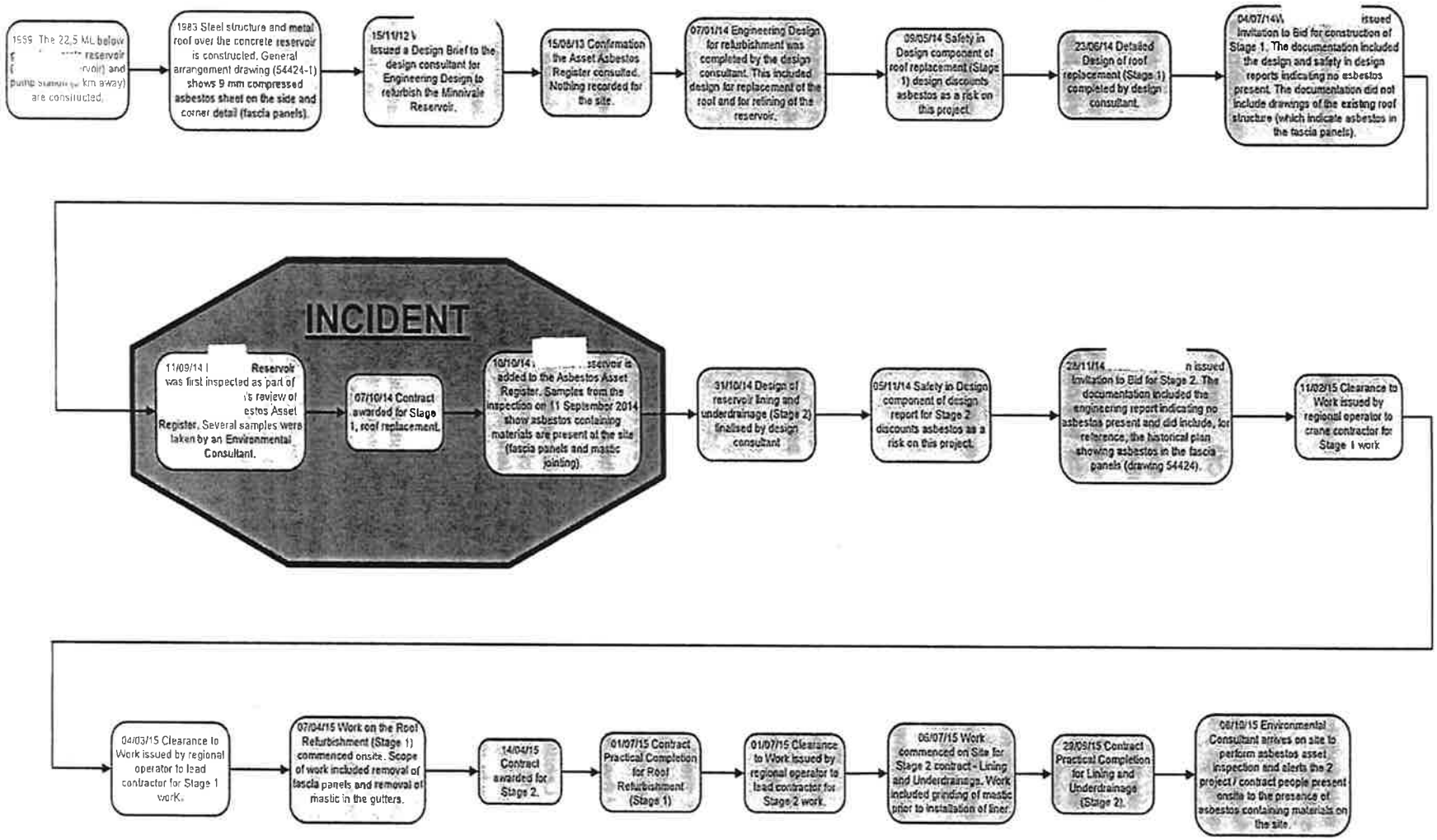
Figure 2 shows the reservoir in May 2010. The areas that are known to contain asbestos are highlighted.

2.3 Asbestos Asset Register

The Asbestos Asset Register is used to list and risk assess assets known to contain asbestos. The register is part of an overall asbestos management plan which outlines methods for managing these assets.

\ has had some form of Asbestos Asset Register in place since 1996.

3 TIMELINE OF EVENTS



4 OUTCOME/CONSEQUENCE

4.1 People

Personnel attending the site during Stage 1 and 2 of the project construction were potentially exposed to asbestos fibres.

138 employees were inducted to the site between 1 April 2015 and 30 September 2015.

Not all of these employees were subject to the same level of risk, as only certain activities within the 6 month construction period involved removal of ACM. There are therefore less than 138 people who were onsite while work on ACM was under way.

Removal of the fascia panels was a 2 day activity early in the Stage 1 contract (April 2015), and witness statements note that the panels were in good condition.

Grinding the mastic has been assessed post the event as the higher risk activity and it is estimated that 7 workers were directly involved in this across the two contracts. They were not wearing the full Personal Protective Equipment (PPE) required for working with asbestos, however witness statements indicate that 4 workers were wearing respirators appropriate for asbestos removal and 3 workers were wearing disposable masks for some of the time.

Other workers in the vicinity of the grinding work were also potentially exposed, as were workers doing some of the clean-up activities such as sweeping.

4.2 Environment / disposal

The method of disposal of asbestos can also give rise to risks through transport and ultimate containment. From the information gathered through the investigation, it can be established that the asbestos material from the Minnivale reservoir is contained. We are continuing to liaise with Department of Environmental Regulation regarding the transport and burial of the material and will take advice from them on any further action required.

Fascia Panels

In April 2015, the fascia panels were removed from the Reservoir and placed in skip bins. They were transported to the Northam Landfill Facility, which is approximately 90km by road from eservoir (figure 1). The facility is licensed to receive asbestos.

As removal of the fascia panels was completed without knowledge of ACM on site, the panels were not wrapped for transportation.

The Northam Landfill Facility has advised the fascia panels were disposed of in a general waste area. There is no single area in the tip for asbestos placement and new designated areas are opened regularly depending on which areas of the general landfill are open and in use. The facility estimate the panels are now buried beneath 2-6 metres of landfill and will ultimately be up to 19 metres deep.

Mastic and Concrete Dust

The dust from removal of mastic sealant from the gutters during Stage 1 was collected using buckets and brooms, and disposed of in the skip bins. This would then have been transferred to the Northam Landfill either with the fascia panels or in a second skip used at the site.

The dust generated from grinding the mastic floor joint sealant during Stage 2 was mixed with concrete dust and garnet and was disposed as backfill material around the under-drainage monitoring pit located at the Minnivale site. The ACM backfill material is securely contained at a depth of approximately 3 metres below ground level with clean material placed above.

Post Incident Testing

On 29 October 2015, environmental consultants collected a further 34 samples from areas across the whole site. On the basis of the results and application of DoH and DER assessment criteria and guidelines, no unacceptable human health risks were identified at the Site or its surrounds during the investigation. Results indicate there is no asbestos from the Minnivale Reservoir refurbishment works in the surface soil on the site.

5 IMMEDIATE ACTIONS TAKEN

Following the incident, an environmental consultant was engaged to test the reservoir site for the presence of asbestos. The consultant visited the site on Saturday 10 October 2015, and took two samples from the mastic sealant and two from dust around the inside of the structure. The samples from the mastic sealant confirmed the presence of chrysotile asbestos, or white asbestos. Asbestos was not detected in the samples taken from dust around the wall and roof structure, which would have been generated during the refurbishment project.

The key post-incident actions undertaken for the people impacted were:

- Identification of all people that attended the site between 1st April 2015 and 30th September 2015 and subsequent notification. This included internal notification of ' employees, as well as notification to the contracting companies.
- Conducting awareness sessions for those that attended site between the 1st April 2015 and 30th September 2015.
- Offering all people involved the opportunity to:
    - Record their exposure on th ' Asbestos Exposure Register.
    - Access the employee assistance program through (A councillor has attended all face to face awareness sessions held with the two contractors and their subcontractors)
    - Access long term health surveillance, including lung function testing

6 CAUSE OF INCIDENT

6.1 BASIC CAUSE

The had a record in its corporate systems of the presence of asbestos within the Reservoir, but failed to inform contractors of this risk.

6.2 CONTRIBUTING FACTORS

These are outcomes following conclusions gained from the completed ICAM Analysis. Please provide ICAM coding of contributing factor types where possible.

ICAM ANALYSIS				
Organisational Factors	**Task/Environment Conditions**	**Individual/Team Actions**	**Absent/Failed Defences**	**Incident**
Management Systems (MS) Lack of integration in the management systems for asbestos in assets in which did not trigger the AAR at multiple points	TE 2 – Hazard Analysis The presence of ACM was not identified on multiple occasions.	IT7 - Change management error The responsible person under Standard 131 Asbestos in the Workplace failed to review the AAR to identify and communicate any changes following the annual inspection on 11 September 2014.	DF6 - Detection Visual Warning Systems No warning signage on site warning stakeholders of the potential presence of ACM.	Failure to communicate the presence of ACM at Reservoir prior to contractors commencing Stage 1 & 2 works (between 11 September and 10 October 2014)
Organisation (OR) Inadequate governance and processes for asbestos management, including use of the Asbestos Asset Register. (Lack of designated role in the regions which is accountable for managing Asbestos Register and communicating change)	HF25 - Reliance on undocumented knowledge During the design phase ACM was not identified as there was reliance on information from the local operator that there was no ACM.		DF2 - Awareness Communication A failure to communicate the updated AAR to relevant parties.	
Management of Change (MC) There are no triggers to identify the need to install signage on site for assets that have been added to the AAR.	HF5 - Situational awareness Perception that asbestos would not be present in a mastic joint leading to use of inadequate tools for removal.		DF1 - Hazard Identification Failure to identify a requirement to transfer information indicating the presence of ACM in design drawings (Drawing No 54221 [1983 design drawing]).	

ICAM ANALYSIS				
Organisational Factors	Task/Environment Conditions	Individual/Team Actions	Absent/Failed Defences	Incident
			DF1 - Hazard Identification The ' site was not identified on the AAR leading to a failure to include ACM as a risk in the Safety in Design report.	
Training (TR) & Procedures (PR) The procedures for ACM management lack sufficient detail for works under contract and lead to a lack of knowledge and skills regarding identification and management of ACM, (e.g. Asbestos awareness training does not describe the full range of ACM - sealant would not be considered to have asbestos)	HF 25 - Reliance on undocumented knowledge During the design phase ACM was not identified as there was reliance on information from local sources.		DF5 - Awareness Work Instructions / Procedures At each stage of the project, no procedure actually stated the need to consult the asbestos register (SID, Project risk register, creation of contract, Start-up meeting agenda, Construction Risk Assessment Workshop, OSHMP desktop assessment, Clearance to Work)	
Contractor Management (CM) The process / procedures that ensure contractors are fully informed about hazards (e.g. ACM) are lacking in detail. (i.e. WC-OSH 024, S131 & WC-OSH 023)	HF5 - Situational awareness Assumption that the asbestos register is complete – i.e. that if an asset is not on the register then there are no asbestos containing materials.		DF 4 - Awareness / Supervision Unclear responsibilities and accountabilities for ownership of asset inspection process and relevant management plans.	

ICAM ANALYSIS				
Organisational Factors	Task/Environment Conditions	Individual/Team Actions	Absent/Failed Defences	Incident
			DF2 - Awareness / Communication The HSE Handbook for Contractors does not include the need to identify and manage asbestos as referred to in S131.	
			DF3 - Competence / Knowledge Limited skills and knowledge in relation to identification and management of asbestos.	
			DF2 - Awareness Communication The scope of works for asset inspection does not specifically require communication of major or critical changes in relation to ACM.	

7 CONCLUSIONS AND OBSERVATIONS

There are gaps in the asbestos management process and project delivery process, and the two are not well integrated. There were several instances through the project that ACM should have been identified.

- On 10 October 2014, when the Reservoir was added to the Asbestos Asset Register (fascia panels and mastic joints) there was no formal process for advising the project team or Regional staff of that change.

- During the planning, design and construction phases of the refurbishment project, multiple opportunities arose for ACM to be identified on the site including:
    - The 1983 drawing that identified ACM in the fascia panel;
    - Site visits by project team, design consultant and bidders;
    - Verbal and written communications with the region; and
    - Contract documentation and construction start up meetings.

8 CORRECTIVE ACTIONS

	Org Factor code	Absent Failed Defence Code	Corrective Actions	Hazard Hierarchy Control Level	By Who	By When	Sentinel Action Number
	Region/Branch/District or Section Corrective Actions						
1.	MC	DF6	Install asbestos warning signage at Reservoir site and update register as required.	Administration	GAR Regional Manager	30 Oct 2015 **(Complete)**	
2.	PR TR	DF1 DF2 DF3	Discuss the key learnings with regional lead teams to raise awareness of which assets are on the register and document discussion completion dates.	Administration	GM Operations Group	15 Nov 2015 **(Complete)**	
3.	TR,	DF2 DF3	Communicate internally that assets not on the register may still contain asbestos (and include in the OSH Alert).	Administration	All Regional Managers, General Manager Asset Delivery Group	15 Nov 2015 **(Complete)**	
4.	MS TR	DF1 DF3	Modify the current prompt list on the Clearance to Work permit. Assess implementation and compliance as part of the contractor assurance activities. Ongoing monitoring to be verified through the Operational OSH Assurance Review program.	Administration	Manager SEA Branch	17 Dec 2015 **(Complete)**	
5.	MS OR	DF1	Perform a gap analysis between current local knowledge and existing asset asbestos register to determine priorities for inspection and update Asbestos Asset Register as required.	Administration	General Manager Operations Group	17 Dec 2015 **(Complete)**	

	Org Factor code	Absent Failed Defence Code	Corrective Actions	Hazard Hierarchy Control Level	By Who	By When	Sentinel Action Number
6.	TR PR	DF3	Prepare and issue an OSH Alert to communicate the findings, actions and key learnings arising from the event	Administration	Manager SEA Branch	9 Dec 2015 **(In progress)**	
	Group Corrective Actions						
7.	OI MS	DF2	Review the project Asbestos Asset Register against the risk register for major works in progress to ensure they accurately reflect the latest version of the Asbestos Asset Register and update accordingly.	Administration	Manager Project Management Branch	6 Nov 2015 **(Complete)**	
8.	MS OR		Inspect works in progress (under construction) that are not identified on the Asbestos Asset Register to identify ACM and prioritise inspections based upon risk.	Administration	Manager Project Management Branch	31 Dec 2015 **(Complete)**	
9.	MS	DF6	Modify project management process to ensure appropriate signage is installed for asbestos encountered during projects and the asset owner is advised to include in the asbestos register.	Administration	Manager Project Management Branch	17 Dec 2015 **(Complete)**	
10.	MS	DF1 DF2 DF5	Modify the Safety in Design process and the Project Management process to explicitly reference the Asbestos Asset Registers to ensure that the most relevant information is available throughout the project lifecycle including granting of possession of site.	Administration	General Manager Asset Delivery Group	27 Nov 2015 **(Complete)**	
11.	MS	DF2	Revise and update the standard 'Special Conditions of Contract' to include specifications for the identification and management of Asbestos post possession of site, as interim whilst the Handbook for Contractors is being update with the same information.	Administration	Manager Contracts Branch	4 Dec 2015 **(Complete)**	
12.	IT7		Apply the performance and behaviour model to those involved in the incident	Administration	Manager Project Management Branch	31 Dec 2015 **(In progress)**	

	Org Factor code	Absent Failed Defence Code	Corrective Actions	Hazard Hierarchy Control Level	By Who	By When	Sentinel Action Number
	Organisational Corrective Actions						
13.	OR MC	DF4 DS6	Develop project management plan Asbestos Management Project. Aqua Dor to include: • Auditing of all sites listed on the Asbestos Asset Register to verify if they contain ACM, determine specific location of asbestos and ensure sites are appropriately and clearly labelled. • Inspecting all sites that are not on the register to verify presence or absence of ACM – to be prioritised based on asset type, age, risk, etc. • Labelling all sites clearly as either containing asbestos, or not containing asbestos. • Reviewing governance, processes and accountabilities for asbestos management. • Reviewing current and auditing previous projects and activities of a similar nature to ensure correct processes were followed for asbestos management.	Administration	Mgr Safety Environment & Aboriginal Affairs Branch	9 Nov 2015 **(Complete)**	Refer Corporate Asbestos Management Project.
14.	OR MC	DS6	Implement the project management plan in accordance with the project milestones.	Administration	Mgr Safety Environment & Aboriginal Affairs Branch	**(In progress)**	
15.	TR PR		Simulate the work activity of grinding mastic containing asbestos to quantify the risk of exposure to people and communicate the outcome to affected parties.	Administration	Manager SEA Branch	10 Dec 2015 **(Complete)**	

9 KEY LEARNINGS

The knew of asbestos at the from the original 1983 drawings and from the 10 October 2014 update to the Asbestos Register. Despite having this information in its corporate systems the failed to inform contractors of the risks on the site.

Key learnings from this ICAM investigation are:

1. Be aware that the Asbestos Asset Register can never truly capture the asbestos risk on all assets;
2. When the Asbestos Asset Register is updated the management of change process must be followed;
3. It is important for the asbestos management process to be fully integrated with project management processes;
4. Assumptions underpinning the risk assessment for major projects need to be continually re-examined during all stages of a project lifecycle.
5. When working with dust and hazardous materials it is important to ensure that the correct and approved PPE is used at all times; and
6. Be aware that constructions mastics may be ACM or contain asbestos.

As a fundamental principle, the will assume that asbestos is present on all sites unless otherwise verified.

Figure 1 – Location Plan

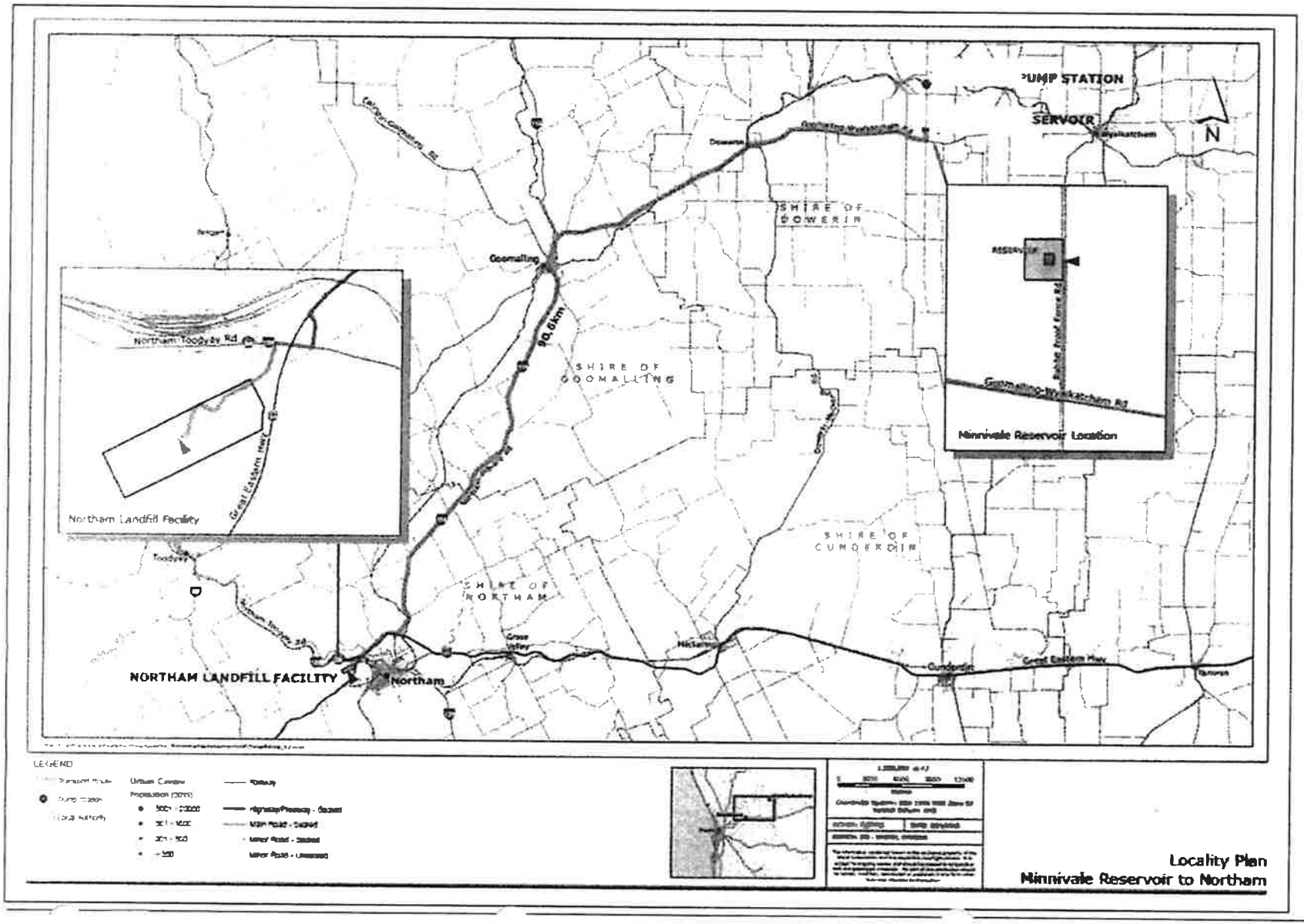


Figure 2 – I oof 2010 (prior to refurbishment)