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WSMS RFS Report - 1-409990

TRIM

File Number: 2020/005151
Document Number:

Type

RFS Type: Safety Concerns / WHS Complaints
RFS Sub Type Safety Concerns / WHS Complaints

Reference Details

Reference Number: 1-409990
Entered By: Derek Pryce
How Received: Social Media
Status: Complete
Date Received: 6/01/2020
Managing Unit: WHS Regional - Bega WHS
Allocated Officer: Pryor Derek - Active

Categorisation

Legislation: WHS Regulation
Source: Referral Other
Industry Type: Consumer & Business Services
Category: 2 - High

Triage/Triage History

Triage Status: Inspector Response
Reason:

Create Date	Triaged By	Triage Result
06-Jan-2020 9:24 am	Galante Tracey - Active	Inspector Response

Hazard Coding

Category	Description	Explanation
Work environment (Description: Sites where work is being undertaken or is in progress.)	Other	Other or unspecified issues relating to the work environment

Acknowledgement

Receiving Unit: WHS Regional - Bega WHS
Acknowledged By:
Date Acknowledged:

WHS Event Details

Is Address Known: Yes
Address: Cooma North Reserve
COOMA NSW 2630

Landmark Description: the 4.5 million litre water tanks

Workplace Description: Water Supply

Work Activity: Water Supply

WSMS RFS Report - 1-409990

Onsite risks

Are there any risks to the Inspector attending the site?: No

Details of risk:

Risk Assessment and Response Plan details

Reference Number: 3308
Create Date: 7/01/2020 8:57:40AM
Created By: KiddS
Have risks of client or public violence or aggression been identified?: No
Contact the previous Inspector: No
Contact PCBU before visit: No
Review previous SafeWork NSW interactions: No
Non-field response: No
2 or more Inspector response required: No
Attend in the company of NSW Police: No
An agreed communication plan between the Inspector and the Manager whilst onsite is required: No
Other: No
Other details:

WHS Issue Details

Specific Location: Tanks

Date issue first became apparent to the requestor: 5/01/2020

Date issue was last apparent to the requestor: 6/01/2020

Description of Issue: A 4.5 million litre water tank has ruptured flooding streets of cooma causing [redacted] extensive property damage
The water tank is a part of the Water Services Section of Snowy Monaro Council.
The incident is notifyable under S37 a and b.
The incident has not been notified as required.

Requestor Response Information

Requestor consents to WorkCover NSW raising issue with relevant workplace parties: Yes

Requestor consents to WorkCover NSW making the parties aware that the issue was raised by the requestor: Yes

What is requestor's relationship with place to which issue relates: Other

Has the requestor raised the issue with the person conducting the business or undertaking directly: No

Outcomes if raised:

HSR

Does requestor have a direct business relationship with the activities conducted by the business/undertaking: No

Does the workplace have a health and safety representative: Unknown

HSR Name:

Has the requestor raised the issue with the Workplace Health and Safety Representative: N/A

Further information: Please return to the bega office for action.

Interested Parties

WSMS RFS Report - 1-409990

Role:	Requestor		
Party Name:	derek pryor		
Address:			
Phone:	[redacted]	**Fax:**	
Other Phone:		**E-mail:**	
Role:	Party Involved		
Party Name:	Snowy Monaro Regional Council, 72906802034		
Address:	61 Commissioner Street COOMA NSW 2630		
Phone:		**Fax:**	
Other Phone:		**E-mail:**	

Other Agencies

Is the requestor aware of any other agencies that are involved in resolving the issue: Yes

Agency	Known Action Taken
[redacted]	[redacted]
Police	emergency role

Other Persons

Requestor is aware of any other persons conducting businesses / undertakings involved in resolving the issue: No

Other persons:

Comments

Please return to the bega office for action. - [6/01/2020 9:10:06 AM by pryord - from RFS Data Entry.]

Boylek 6/1/2020 - Please note after hours incident notification was received by police and Dean sturgeon - refer to Incident Ref: 2-153021
A call has been received from a member of public (anon) identifying that there [redacted].

Actions

Source:	OHSD	**Action Date:**	7/01/2020
Type:	Allocate File	**Applies to File:**	
Job Type:		**Duration:**	0.00
Task Type:		**Completed:**	Yes
Allocated officer:	Derek Pryor		
Description:	Please follow up		
Source:	OHSD	**Action Date:**	7/01/2020
Type:	Non-field Response	**Applies to File:**	
Job Type:		**Duration:**	0.00
Task Type:		**Completed:**	Yes

Workers compensation verified:
Policy not required:
Insurer: Specialised Insurer
Policy No:
Policy Dates (from & to):
Type of business:
WIC:
Wages paid (from OMS or Certificate of currency):
Activities observed ay the workplace:
Number of Workers observed consistent with OMS or Certificate of currency:

Name and job titles of persons and date interviewed:
9-1-20 SMRC staff
Mark Rixon, Water Waste Water Manager,
David Freimanis, Water waste water Supervisor,
Dean Sturgeon, WHS Officer,
Robert McInnes, Construction Manager,

Summary of events:
On 2-1-2020 it was decided to temporarily fill the decommissioned 4.5million Lt water tank on Doondoo hill. The decision was made as it increased Cooma township's Firefighting capacity (note the southern fires of 2020).
The tank was filled to 37% capacity. A leak was observed. The leak was classified acceptable for the planned short time use of the tank. That tank was then filled to 60% no concerns related to structural failure were observed.
On 4-1-2020 the tank was filled to 98% in the morning. That afternoon a leak was reported by a member of the public. The leak was reviewed and classified as acceptable.
At approximately 21:00 on 4-1-2020 the tank suffered a major structural failure. 4.5million litres of water cascaded down the eastern side of Doondoo hill. The water damaged houses and out buildings.

Nature / extent of injury:
Major structural failed to 4.5 million Lt Water tank.
Damage to 50 homes or out buildings

Briefly describe systems of work present prior to incident:
The tank was constructed in 1958 and was last inspected by Public works in 2014 after some leak repairs, at that time is was considered to have another 10 years of service.
The tank had been decommissioned in 2017 due to a leak in the floor.
Mark Rixson, Water Manger and Engineer assessed the tank prior to filling

Current system of work:
Emergency services attended and evacuated homes.
SMRC arranged for homes and out buildings to be assessed.
Clean up of homes and grounds by SMRC
Demolition of unsafe tank structure by licensed demolition contractor.
Investigation underway
Safety alert sent the council network.

Issues and Actions taken:
Issues

WSMS Incident Notification Report - 2-153021

Structural Failure of water tank.
Town ship Fire augmentation in emergency.

Actions Taken
Site inspection, photos
Interviews of systems of work.
Investigation report and maintainice history requested.

Comments
Due to state of emergency in NSW at the time SMRC decided to fill the tank to augment townss firefighting capacity.

Recommendation
No further action recommended

[14/01/2020 11:11:29 AM constables] [20/01/2020 10:17:30 AM proved]

Outcomes

Completed Date:	20/01/2020	**Time Spent:**	0.00
Result:	No Further Action	**Priority Issue:**	Design Issues
Comments:	Noted - no injury incident, below threshold for SIRF as no injuries and distance between tanks and flooded residential areas [20/01/2020 10:18:20 AM proved]		

Prosecutions

Activities

Type:	To-Do	**Description:**	Todo - Snowy Monaro Regional Coun
Allocated Officer:	Kylie Clarke		
Notes:	finalised		
Type:	To-Do	**Description:**	Todo - Snowy Monaro Regional Coun
Allocated Officer:	Kylie Clarke		
Notes:	finalised		
Type:	To-Do	**Description:**	To-Do - Snowy Monaro Regional Cou
Allocated Officer:	Martin Constable		
Notes:			
Type:	To-Do	**Description:**	To-Do - Snowy Monaro Council - , - 4
Allocated Officer:	Helen Cleghorn		
Notes:	Only when safe to travel - please review RFS and Transport for NSW websites regarding roads		
Type:	To-Do	**Description:**	Todo - Snowy Monaro Council - , - 4
Allocated Officer:	Derek Pryor		
Notes:	Hi Derek, Incident as discussed. I have made it a cat 2 due to the media coverage and impacted public. Thanks, Katrina		

SafeWork NSW

IM006

AFTER HOURS EMERGENCY RESPONSE SERVICE – EVENT RECORD

VHA ESCALATION NUMBER / EMERGENCY SERVICES / CSC REFERENCE: # 21784

Incident notification: (YES) / NO Request for Service: YES / (NO)

Notifier's Details

Date: 05-01-2020 Time: 8.53 AM Phone:

Name: Andrew Burnell Position: Snr Constable

Event Details

Date of Event: 04-01-2020 Time: 9.30 pm

Being notified as a result of: Injury / Illness / (Dangerous Incident) / Other Fatality: YES / (NO)

Workplace address: Doonloo Place, Cooma, NSW

Specific location of event at that address:

Description of Event: A water tank owned by Cooma Council was leaking water which led to subsequent collapse of the water tank and release of 4.5 million litres of water. Damage to road, fence & cars. No one was injured.

Site Preservation Details

Current status: Disturbed because of:

Comments:

Site released: YES / NO / (Not applicable)

PCBU Details

Business Name: Coome Snowy Monaro Council.

ABN:

Registered Address: 81 Commissioners St, Cooma.

Action taken by PCBU to make the site safe after the incident:

Is the notifier the best person to contact for further information? YES / (NO)

If not, who is: Dean Stevson Phone:

NSW SafeWork NSW

IM006

AFTER HOURS EMERGENCY RESPONSE SERVICE – EVENT RECORD

VHA ESCALATION NUMBER / EMERGENCY SERVICES / CSC REFERENCE: # 26778

Incident notification: (YES) / NO Request for Service: YES / (NO)

Notifier's Details

Date: 05-01-2020 Time: 4.38 pm Phone:

Name: Dean Sturgon Position: WHS Advisor

Event Details

Date of Event: 04-01-2020 Time: 9.30 pm

Being notified as a result of: Injury / Illness / (Dangerous Incident) / Other Fatality: YES / (NO)

Workplace address: Doondoo Place, Cooma, NSW

Specific location of event at that address:

Description of Event: A water reservoir had a manual tank which was ripped. However, when water was filled up, tank started again and tank started leading to 4.5mL/h. Risk of water escaping causing damage to roads, cars & fences. No one was injured.

Site Preservation Details

Current status: Disturbed because of:

Comments:

Site released: (YES) / NO / Not applicable

PCBU Details

Business Name: Snowy Monaro Council

ABN:

Registered Address: 81 Commissioner St, Cooma.

Action taken by PCBU to make the site safe after the incident: Site has been fenced and repair works to be undertaken in the coming week.

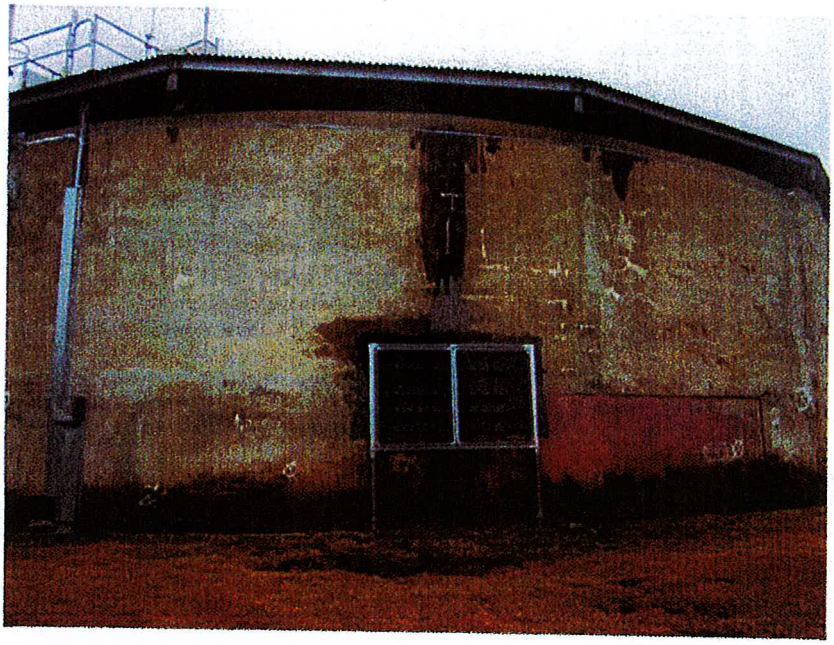
Is the notifier the best person to contact for further information? (YES) / NO

If not, who is: Phone:

NSW GOVERNMENT | Public Works Advisory

COOMA WATER SUPPLY -SNOWY RESERVOIR NO 1

STRUCTURAL CONDITION ASSESSMENT REPORT



Report No:1PWA/1PM/000876/3

May 2018

Prepared by:

Mikhail Kogan and Ram Singh

Structural Engineers

Public Works Advisory

www.publicworksadvisory.nsw.gov.au
Level 4, 66 Harrington Street, Sydney 2000
PO Box N408, Grosvenor Place NSW 1220

- The hammer tap did not show any drummy areas.
- There are signs of previous repairs (photo 18 & 19).
- The base and vertical movement joints were repaired in 2014.
- Photo 14 shows the bubbling and delamination of Maxseal applied to the movement joint where the external strands were repaired.
- The repaired crack is showing sign of failure (photo16).
- There are no observed signs of corrosion bubbles on the internal concrete surface.

BASE SLAB AND JOINTS (PHOTO 22-24)

- The base slab is considered to be in fair to good condition.
- The base slab is reinforced with light mesh only (ARC 655 is equivalent to F62).
- The joint filler and sealant is in poor condition.
- There are some hollow sounding areas located by hammer tap along the joints. The water leaking through could have washed soil out from under the floor slab.
- There is water bubbling through the concrete joints in the external concrete path around the tank. This may be either leaking through the base slab joints or through the base wall joints (movie clip -VID_20170417_085351.3gp)

STEEL COLUMNS SUPPORTING ROOF (PHOTO 13)

- The steel columns are showing sign of corrosion and require a new protective coating.

6.0 REPAIR OPTIONS

The reservoir is reaching a stage where major maintenance and refurbishment is required to achieve a design life of 75 years. The internal surface of vertical wall and base slab is subjected to a highly corrosive environment due to the treated (chlorinated) water.

The reservoir is one of the typical construction methods of that time. The vertical tank wall is provided with circumferential pre-stressing (PT) strands to resist water pressure and introduce a residual compressive stress in the wall. The vertical wall is reinforced lightly (refer original design in appendix B) and could crack in service due to loss of prestress and thermal actions. The maintenance of the capacity of the circumferential PT strands is essential to its performance.

The following repair options may be considered:

1. Short term repairs to achieve 5-10 years life

(It is assumed that all PT strands remain in serviceable condition for next 5-10 years):

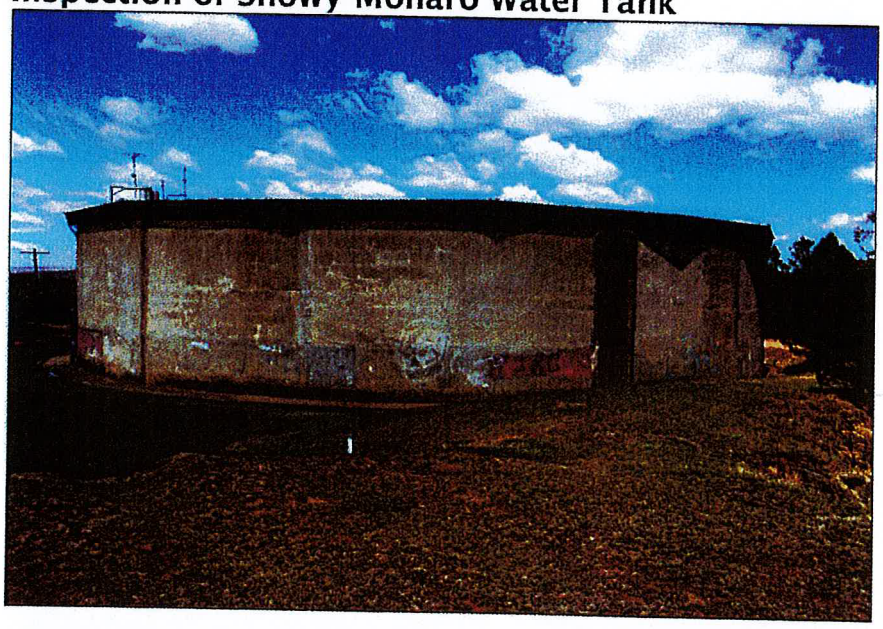
- The strands repaired in 2014 by bracket system should be replaced with new strands between anchor blocks as the effectiveness of existing bracket system is doubtful. This would require exposure of existing strands after removing render (hydro demolition of render may be required) and exposing existing dead and live end

ALS Industrial Pty Ltd
Units 1a&2, 171-175 Newton Rd
Wetherill Park NSW 2164
T +61 2 8786 3100 F +61 2 9756 3359
ABN: 21 006 353 046

Client:	Snowy Monaro Regional Council ABN 72 906 802 034
Attention:	Peter Sullivan
Purchase Order	PU017147 - 22-October-2018
Your Reference:	67890
Date:	17th December 2018

Report No: 67890 REP 01 R0 (Draft)

Inspection of Snowy Monaro Water Tank



James Rodd, BEng(Civil), MEng (Concrete)
Senior Civil Engineer – Project Manager

Haley Ma, BEng(Civil), MEng (Structure)
Civil / Structural Engineer

All work is subject to our standard terms and conditions, available on our ALS Global website via the following link ALS Terms & Conditions

Table 44: Quality risk assessment

Item	Class of repair and remediation	Probability of damage and consequence	Time of action	Priority Rating
1	Repair of Surface loss, exposed coarse aggregates and eroded floor slab (Figure 30): • Hydroblasting the slab floor to remove the minimum top 2mm of surface and to expose structurally sound, clean, and free of all contaminations such as stain, dirt, oil, grease, loose material, etc. • Hand application of minimum 4mm of Sika MonoTop®-352 or equivalent	(Occasional, Negligible)	Unlikely but possible to occur in the remaining life of the asset (optional repair)	P4
2	Repair of local deformation of tank floor (Figure 31): • Hydroblasting the slab floor to remove the minimum top 2mm of surface and to expose structurally sound, clean, and free of all contaminations such as stain, dirt, oil, grease, loose material, etc. • Hand application of minimum 4mm of Sika MonoTop®-352 or equivalent • The maximum thickness of application should not be more than 75mm in each layer.	(Occasional, Negligible)	Unlikely but possible to occur in the remaining life of the asset (optional repair)	P4
3	Repair of internal surface weathering and surface staining (Figure 32): • Hydroblasting the tank wall to remove the minimum top 2mm of surface and to expose structurally sound, clean, and free of all contaminations such as stain, dirt, oil, grease, loose material, etc.	(Frequent, critical)	Before bringing the tank to service	P0
4	Repair of poor vertical and horizontal joint repair, and patch repair (Figure 33): • The quality of recent repair inside the tank was found poor. The repair is not functional and it puts the integrity of structure at risk to rely on the remaining of previous repair. The previous repair should be removed with hydroblasting. • Hydroblasting the previous repair on the internal and external of tank wall.	(Frequent, critical)	Before bringing the tank to service	P0

Item	Class of repair and remediation	Probability of damage and consequence	Time of action	Priority Rating
	• On the external of tank wall the patch at EXW Section 1 (Figure 34) should be repaired with hand application of minimum of Sika MonoTop®-352 or equivalent.			
5	Repair of corroded inlet/outlet pipes (Figure 35). • Pressure blasting and removal of corrosion and rust from the surface of the items. • Painting the steel component with a corrosion inhibitor paint.	(Frequent, critical)	Before bringing the tank to service	P0
6	Repair of corrode installation on internal face of the tank (Figure 36): • Pressure blasting and removal of corrosion and rust from the surface of the items. • Painting the steel component with a corrosion inhibitor paint.	(Frequent, critical)	Before bringing the tank to service	P0
7	Sanitary and cleanliness (Figure 37): • Cleaning of water tank after completion of repair work from insects and organic matter, etc. • Cleaning of tank every 5 years.	(Frequent, critical)	Before bringing the tank to service, then every 5 years	P0
8	Repair of debonded old mortar or patch repair from concrete surface (Figure 38): • (Item3) Hydroblasting the tank wall to remove the minimum top 2mm of surface and to expose structurally sound, clean, and free of all contaminations such as stain, dirt, oil, grease, loose material, etc. • Hand application of minimum 4mm of Sika MonoTop®-352 or equivalent. • If a vertical crack appeared under the debonded mortar patch epoxy injection to crack is recommended (Item 18).	(Frequent, critical)	Before bringing the tank to service	P0
9	Repair of floor joints (Figure 39): • The remaining of the old sealer be removed from the joint. • The joint be cleaned and air blasted. • A self-expanding joint filler cork to be placed in the joints, and joints resealed with a water resistant flexible sealer (Fosroc® Hydrocor Type 106 / Type 3 or equivalent). The sealer can be Sikaflex® Tank N or equivalent but should be compatible with the expansion cork.	(Frequent, critical)	Before bringing the tank to service	P0
10	Possible formation of horizontal cold joints from jack lifting (Figure 40): • Hydroblasting (as explained in Item 3) over the 13 formwork marks on the internal tank wall.	(Frequent, critical)	Before bringing the tank to service	P0

Item	Class of repair and remediation	Probability of damage and consequence	Time of action	Priority Rating
	• Hand application of minimum 4mm of Sika MonoTop®-352 or equivalent			
11	Repair of exposed reinforcing steel inside the tank on floor, internal wall, columns supporting pads (Figure 41) • Removal and cut of exposed steel by power saw • Hydroblasting the surface area around the exposed bar (0.15m x 0.15m) as explained in Item 3. • Hand application of corrosion inhibitor epoxy mortar such as SikaTop Armatec 110 EpoCem 2 coats each 2mm or equivalent.	(Frequent, critical)	Before bringing the tank to service	P0
12	Repair the loss of coat and corrosion of roof columns (Figure 42): • Pressure blasting and removal of corrosion and rust from the surface of the items. • Painting the steel component with a corrosion inhibitor paint.	(Frequent, critical)	Before bringing the tank to service	P0
13	Repair the loss of sealer in the isolation/expansion joints of the pavement around the external wall (Figure 43): • The remaining of the old sealer be removed from the joint. • The joint be cleaned and air blasted. • A filling/back rod be placed in the joints, and joints resealed with a flexible sealer Sikaflex® -PRO	(Marginal, Remote)	Likely to occur in the next 5 years (optional repair)	P3
14	Decreasing corrosion rate of strand wires (Figure 44). This items should be applied to strands: o Where there is a sign of water seepage and build-up of surface salt on gunite o The bottom 1.5 m of the wall (Strand number 1 to 8) o Wall area over strand number 13 and 14 o 200mm on each side of the construction joints on the external gunite • It is required to expose the strands No 1 to 8, 13 and 14. Hydroblasting can be applied to remove the concrete from the external surface of gunite. Hydroblasting should expose strands and expose gunite in structurally sound, clean, and free of all contaminations such as stain, dirt, oil, grease, loose material, etc. • Strand wires to be painted with SikaTop® Armatec ® 110 EpoCem or equivalent	(Frequent, critical)	Before bringing the tank to service	P0

Item	Class of repair and remediation	Probability of damage and consequence	Time of action	Priority Rating
	• Mechanically applied dry shotcrete such as Sikacrete® -Gunite 103 should be applied on the top of coated wires.			
15	Repair the surface crack, water seepage , efflorescence on external surface (Figure 46): For other locations that are not conforming with the conditions of Item 13 this item is applied: • Hydroblasting should expose gunite in structurally sound, clean, and free of all contaminations such as stain, dirt, oil, grease, loose material, etc. • Large areas (>1 m 2): Mechanically applied dry shotcrete such as Sikacrete® -Gunite 103 should be applied on the top of coated wires. • Small areas (<1 m 2): Hand application of Sika MonoTop®-352 or equivalent.	(Marginal, Remote)	Likely to occur in the next 5 years (optional repair)	P3
16	Repair the peeling of external gunite (Figure 47): For other locations that are not conforming with the conditions of Item 13 this item is applied: • Hydroblasting should expose gunite in structurally sound, clean, and free of all contaminations such as stain, dirt, oil, grease, loose material, etc. • Large areas (>1 m ^{2}): Mechanically applied dry shotcrete such as Sikacrete® -Gunite 103 should be applied on the top of coated wires. • Small areas (<1 m ^{2}): Hand application of Sika MonoTop®-352 or equivalent.	(Marginal, Remote)	Likely to occur in the next 5 years (optional repair)	P3
17	Repair the softening or insufficient mortar (grout) in tie-rod inside the tank (Figure 48): • (Item3) Hydroblasting the tank wall to remove the minimum top 2mm of surface and to expose structurally sound, clean, and free of all contaminations such as stain, dirt, oil, grease, loose material, etc. • Hand application of minimum 4mm of Sika MonoTop®-352 or equivalent.	(Frequent, critical)	Before bringing the tank to service	P0
18	Repair of vertical construction joints: • The previous repair should be removed (Item 4) • Concrete on two sides of the each vertical joint should be repaired with hand application of Sika MonoTop®-352 or Sika Dur 31 or equivalent. The repair should be performed in such way that the access to vertical joint is not blocked. • The full height (6.25m) of construction joints between wall sections should be fully injected and sealed with structural epoxy such as Sika dur 52. • The finish surface should be smoothed with grinder.	(Frequent, critical)	Before bringing the tank to service	P0

Item	Class of repair and remediation	Probability of damage and consequence	Time of action	Priority Rating
	• Please see item 19 for application of SikaSeal® Tape-S or equivalent over the construction joints.			
19	Application of water proofing coat on internal wall and surface of tank • The internal surface should be hydroblasted and smoothed as discussed in Item 3. • All recommended repairs should be performed before application of the coating layers. • Where bugholes, surface irregularity or surface roughness is observed, surface should be smoothed by hand application of minimum of Sika MonoTop®-352 or equivalent • Brush, roller of mechanical spray application of two coats (1-2 mm each coat) Sikalastic® -1K or equivalent. • At vertical joints SikaSeal® Tape-S or equivalent will be applied after the first coat and then the second coat will be applied.	(Frequent, critical)	Before bringing the tank to service	P0

Inspections should be carried out at regular intervals (maximum 3 years) during the service life after completion of the repair work.

The repair methodologies discussed above are indicative only to provide guidelines for the remediation work.

The repair methodology should be undertaken in accordance with HB 84 "Guide to concrete repair and protection". Specialist contractors shall be engaged to assess, evaluate and recommend appropriate concrete repair products suitable for the water tank remediation works and install as per the relevant manufacturer's specifications.

6. REPAIR METHODOLOGY

The repair work should be conducted by a concrete repair contractor that has experience in similar concrete repair work. The repair work procedure and methodology applied by the contractor should comply with the following specifications:

- HB 84 Guide to concrete repair and protection [38]
- Field Guide to Concrete Repair Application Procedures: Spall Repair of Horizontal Concrete Surfaces [39]
- Field Guide to Concrete Repair Application Procedures: Structural Crack Repair by Epoxy Injection [40]
- Field Guide to Concrete Repair Application Procedures: Vertical and Overhead Spall Repair by Hand Application [41]
- Field Guide to Concrete Repair Application Procedures: Concrete Removal Using Hydrodemolition [42]
- Field Guide to Concrete Repair Application Procedures: Levelling and Reprofiling of Vertical and Overhead Surfaces[43]
- Field Guide to Concrete Repair Application Procedures: Concrete Repair by Shotcrete Application [44]

It is expected that the correct application of the recommended repairs will extend the tank service life for a minimum of 15 year period. However, as the petrographic examination showed the formation of ettringite in the concrete matrix, the ultimate service life of tank cannot be estimated, therefore the tank should be inspected every 3 years after the completion of the repair work.

Each observed defect was assessed for the potential risk which may have impact on the structural integrity of the asset in regards to loss of service life, failure, operational hazards and /or safety. Definitions for the priorities are presented in Table:

Table 42: Priority Definitions: Risk Matrix

Risk Ranking	Risk Level	Action	Priority Ranking
0	Extremely Critical	Address without delay, notify operator, warn personal in area, stop plant if required, etc.	P0
1	Critical	Address within 6 months	P1
2	High	Address within 12 months	P2
3	Moderate	Address within 24 months – possibly assign to maintenance, monitor or further review	P3
4	Low	Review again in 5-10 years	P4

Qualitative Consequence	
Catastrophic	Death, loss of system or plant, release to environment, such that significant public interest or regulatory intervention occurs or reasonably could occur.
Critical	Severe injury, major system damage or event which causes some loss of production, unplanned localised damage to environment, affects more than one MRU, or could have resulted in catastrophic consequences under different circumstances.
Marginal	Minor injury, major system damage, minor confined and non-damaging environmental exposure, or other event generally confined MRU.
Negligible	Less than the above.

The basis of the quality risk assessment is shown in Table 43.

Table 43: Quality risk assessment

Probability	Consequence			
	Catastrophic	Critical	Marginal	Negligible
Frequent	0	0	1	3
Probable	0	1	2	3
Occasional	1	2	3	4
Remote	2	2	3	4
Improbable	3	3	3	4

Qualitative Probability of failure or requirement of repair	
Frequent	Likely to occur in the next 6 months
Probable	Likely to occur in the next 12 months
Occasional	Likely to occur in the next 24 months
Remote	Likely to occur in the next 5 years
Improbable	Unlikely but possible to occur in the remaining life of the asset