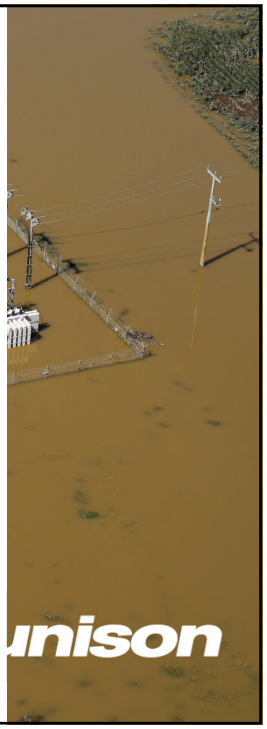
Cyclone Gabrielle

Health & Safety Learnings

August 2023



Cyclone Gabrielle's Impact

Regional Impact

450 Millimetres of water
¼ of the usual annual rainfall

18 Bridges Destroyed

MOST Telco towers down
Comms lost to the region

SH5 & SH2
Roads Closed

900+ Homes
Red or Yellow Stickered

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Customer Impact

25k Customers without power
Immediately following cyclone

75k Customers without power
following loss of transmission supply to Hawke's Bay

3135 SAIDI Minutes
System Average Interruption Duration Index

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Unison + Transpower Asset **Impact**

500 Unison Pole structures
Damaged or destroyed

10 Transpower Tower structures
Damaged or destroyed

2 Unison Fibre Links
Damaged / Destroyed

2 Transpower Substations
Flooded and out of service

3 Unison Substations
Flooded and out of service

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Bridges **Destroyed**

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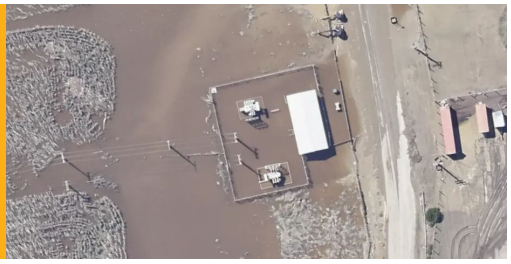
Unison Substations **Flooded + Out of service**

Before

Awatoto Substation

After



Before

Esk Substation

After

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Unison Esk Substation **Flooded + Out of service**

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Transpower Substation **Flooded + Out of service**

Before

After

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Fibre Link between Napier + Hastings **Destroyed**

Waiohiki / Redclyffe Bridge

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Fibre Link between Napier + Hastings **Destroyed**

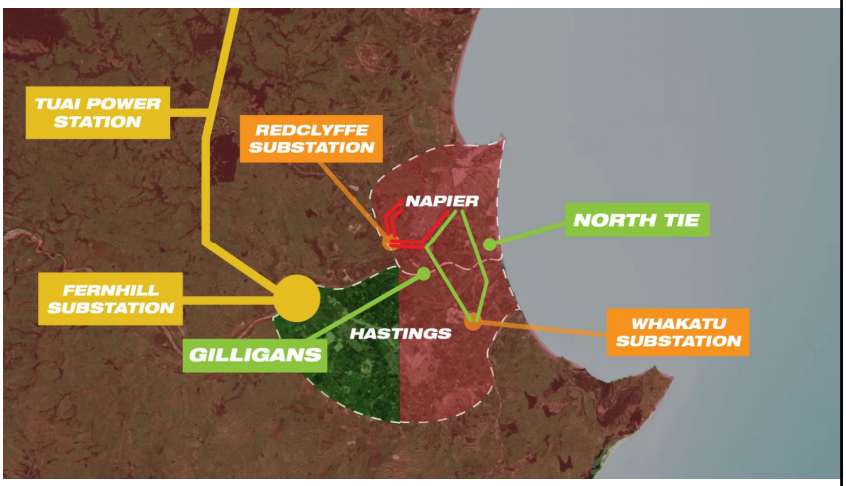
Response **Phases**

Phase 1
Restore Hastings

Phase 2
Restore Napier

Phase 3
Rural Restoration

Phase 4
Rebuild



Focus

- Keep our people healthy and safe
- Ensure public property was not damaged by our network assets
- Our People:
  - Workers (includes employees & contractor workers (approved & external)
    - Unison Network
    - Unison Contracting Services
    - Unison Fibre
  - Public

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Initial H & S Priorities

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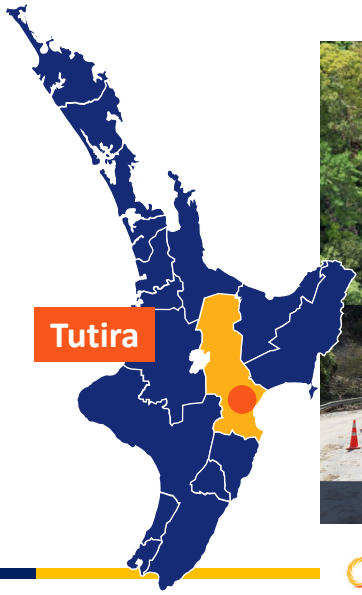
6 Line Mechanics Isolated – Tutira SH2

What Happened

- Weather Warning Hawkes Bay – **Orange** rain and wind warning
- Monday 13th February normal heavy rain event (nothing significant)
- Feeder trip (Tutira area) – weather no different to normal weather event, minimal faults – team left 3pm
- Tutira – rugged terrain with 3 ways in/out – 1-way safest route SH2
- 5:00pm onwards the cyclone arrived!
- 6-line mechanics attempted to leave remote rural area – weather worsened
- First crew stuck due to a slip, picked up by the second crew, travelling together got stranded on SH2
  - Camp out in their vehicles overnight
  - 2 hourly welfare check ins with NOC
  - Confirm their next of kin aware of the situation
  - Team – wet, cold
  - Rescued truck driver



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6 Line Mechanics Isolated – Tutira SH2

Evacuation Response

- Contact made via RT – seek shelter with a local farmer – make contact once at farmers property
- Tuesday mid-morning – cell & communication networks failed
- Team left RT's in vehicles – **no way to communicate with the team**
- Helicopter arranged – unbeknown pilot commandeered by FENZ rescues
- Difficulties communicating with next of kin
- Helicopter provider picked up another pilot (lived in Esk Valley) – team got home later the afternoon

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6 Line Mechanics Isolated – Tutira SH2

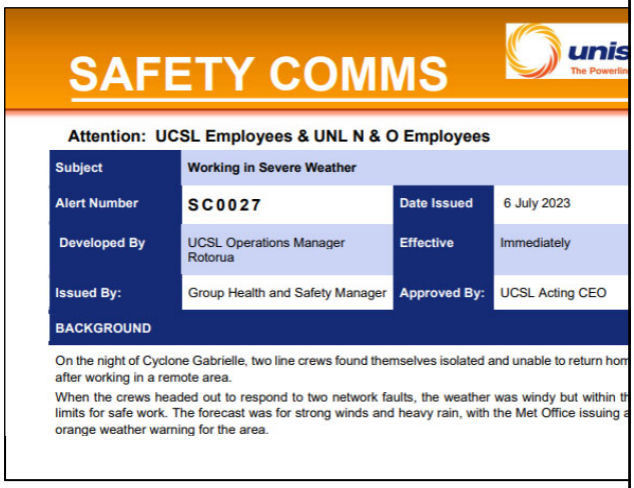
Learning?

Organisational Failure (Root Cause)

- Lacked a clear & formalised decision making & escalation processes during extreme & adverse weather warning events to:
  - Determine when operational workers should be dispatched to rural/remote areas,
  - When they should reasonably be requested to evacuate, and
  - If unable to evacuate move to a safe location until weather permits safe evacuation

What have we done?

- Established a working group with UCSL operational and UNL NOC representations – formalise a process:
  - Safety Comms – Immediate approach
  - Formalising a process



SAFETY COMMS

Attention: UCSL Employees & UNL N & O Employees

Subject	Working in Severe Weather		
Alert Number	SC0027	Date Issued	6 July 2023
Developed By	UCSL Operations Manager Rotorua	Effective	Immediately
Issued By:	Group Health and Safety Manager	Approved By:	UCSL Acting CEO

BACKGROUND

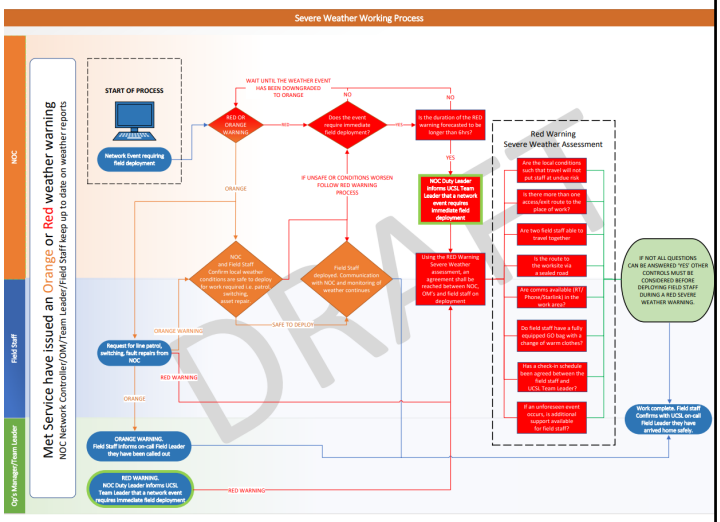
On the night of Cyclone Gabrielle, two line crews found themselves isolated and unable to return hom after working in a remote area.

When the crews headed out to respond to two network faults, the weather was windy but within th limits for safe work. The forecast was for strong winds and heavy rain, with the Met Office issuing a orange weather warning for the area.

6 Line Mechanics Isolated – Tutira SH2

What have we done?

- Simple flow process (draft)
- Utilise Unison weather stations real time weather updated (33 units over network)
- Grab and Go Bags
- Community Collaboration
- More RT comms (star link & satellite)
- Other EDB's have
- Rejected:
  - Individual feeder risk scores to link to ADMS
  - Advanced weather forecasting cost prohibited 3.5K month



Initial Key Project Health & Safety Risk Assessments

Napier Power on!

1) North Tie:

Stringing new 33kV conductor and restringing existing double conductor circuit 33kV, installing new 33kV poles, tubbing of existing 33kV pole.

Area is within a flooded river catchment area:

Abnormal Hazards:

- Flood water – unknown depth/contaminated?
- Untried installation method – 20 tonne digger
- Unseen damage to existing structures – pole failure
- Mobile cranes – worker cages.

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Types of minimisation controls key – S – Substitution, E – Engineering, I – Isolation, A – Administration, PPE– Personal Protective Equipment

Date:	17 February 2023	**Version:**	1.0	**Risk Assessment Team:**	Kevin Corkery (Operations Manager), Tracey Campbell (Group Health and Manager)
Reviewed By:				**Approved By:**	Toby Davis (UCSL CEO)

Task/Area	Hazards What can cause harm	Potential Outcome What can happen	Likelihood	Consequences	Risk Rating (Pre-Controls)	Required Control Measures	Freq of Monitoring	Personnel Responsible	Eliminate	Type of Minimisation	Likelihood
Flood Project – North Tie - Stringing new 33kV conductor and restringing existing double conductor circuit 33kV - Installing new 33kV poles - Stubbing of existing 33kV pole **Note:** This area is within a river catchment area	Conductor weight causing poles to break falling on a worker(s)	Major injuries or fatality	D	1	E	Work on one conductor at a time Stabilize poles with temporary blocks Controlled strain on conductor Poles anchored by diggers	All times All times All times All times	Site Supervisor Site Supervisor Site Supervisor Site Supervisor	X	A E E E	D
	Unseen damage to existing poles resulting pole failure falling on worker(s)	Major injuries or fatality				Pole inspection Ground crew to staff clear – establish no worker zone	Prior starting All times	Site Supervisor Site Supervisor Workers		A I	
	Flood water – depth and contaminated water	Potential drowning, illnesses				Controlled method and rescue plan of persons required to enter flood water areas to access assets Wet suits Shower at work before going home Trench installed to drain water	Prior starting All times When in water After work Prior starting	Site Supervisor Workers Workers		A PPE A E	
	Untried installation method using 20 tonne digger – digger making contact with worker or digger roll over/tip over	Major injuries or fatality				Engage an experienced forestry operator – health and safety inducted Under electrical supervision	Prior starting All times	Civils OM Site Supervisor		A A	
	Failure of stubbed pole due to damage to pole contacting worker(s)	Major injuries or fatality				Holding pole with digger Workers stand clear while lifted or straightened	All times All times	Site Supervisor Site Supervisor Workers		E I	
	Crane overturns or collapses while worker inside cage	Major injuries or fatality				Approved mobile crane operator – Diacks Certified cage Fall restraint system Ground stabilized by diggers to ensure legs are supported	All times All times All times Prior starting	Omahu OM Diacks Cranes Site Supervisor Site Supervisor		A E PPE E	

Initial Key Project Health & Safety Risk Assessments

Napier Power on!

1) North Tie:

Key Controls:

- Trench installed drain flood water, wet suits, rescue plan
- Engaged experienced forestry excavator operator – under supervision
- Work on 1 conductor at a time, stabilize poles with temporary blocs, controlled strain on conductor, poles anchored with diggers
- Approved mobile crane operator, certified cages, lift plan etc

Key Health & Safety Risk Assessments

2) Increasing the load on 33kV Feeder with 11kV Feeder & LV underneath:

Hazards Managed:

- Increase in conductor sag resulting in 33kV conductor clashing with 11kV feeder or LV underneath.

Hazards Managed:

- Confirm status of asset – Aerial + ground feeder patrol
- Site specific design – ensure no excessive sag on 33kV will affect 11kV below
- Gradual livening process – feeder specific inspections
- Visual ground feeder patrol once livened – no excessive sag or debris/obstacles.

UNL & UCSL HEALTH & SAFETY RISK ASSESSMENT

Types of minimisation controls key = S = Substitution, E = Engineering, I = Isolation, A = Administration, PPE= Personal Protective Equipment

Date:	17 February 2023	**Version:**	1.0	**Risk Assessment Team:**	Clayton McCullough (Planner), Tracey Campbell (Group H Mark Cozens (Asset Analysis and Solutions Engineer – Tec
Reviewed By:	Jamie Provines (Designer), Wayne Leyser (Asset Analysis and Solutions Engineer)			**Approved By:**	Mark Chatterton (UNL Strategic Asset Manager) Toby Davis (UCSL CEO)

Task/Area	Hazards What can cause harm	Potential Outcome What can happen	Likelihood	Consequences	Risk Rating (Pre-Controls)	Required Control Measures	Freq of Monitoring	Personnel Responsible
Flood Project – Increasing the load on the Gilligan's 33kV Feeder with Pakawai 11kV Feeder or LV underneath	Increase in conductor sag resulting in energised 33kV conductor clashing with 11kV feeder or LV underneath **Note:** It is unclear whether the 11kV feeder is energised Only 2 spans of 11kV installed under Gilligans 33kV	Accidental livening of the 11kV feeder or LV or both resulting in flashover resulting in conductor falling to the ground Worker working on the deenergised 11kV receiving an electrical shock	D	1	E	Aerial feeder patrol to visually confirm status of the 33kV conductor and poles (associated equipment) integrity	Completed	Clayton McCullough
						Ground feeder patrol via vehicle and on foot to visually confirm: - status of the 33kV conductor and poles (associated equipment) integrity - check conductor was tied into the insulators, sags are compliant and no debris/obstacles were on or in the vicinity of the conductor, and - poles were visually structural sound	Completed	Clayton McCullough
						Site specific design completed for 1.5 km of small conductor on feeder to ensure no excessive sag on 33KV will affect 11kV below	Completed	Jamie Provines
						Gradual livening process which includes feeder specific asset inspections	Livening process	NOC
						Conduct a visual ground feeder patrol once increased load is flowing to confirm no excessive sag or any debris/obstacles that could blow into or onto the conductor	Once increased load is flowing	Clayton McCullough
						Any workers working on the de energised 11kV feeder – must adhere to Electrical Worksite Safety Rules (key controls isolation, access permit, earthing, insulated gloves)	All times	NOC UCSL Clayton/ Walsh Pau

Key Health & Safety Risk Assessments

3) Back feed 33kV from Whakatu to Redcliff via Transpower 220 line:

Running 33kV cables under and around energised 220kV Transpower assets and installing poles underneath or around energised 220kV Transpower assets.

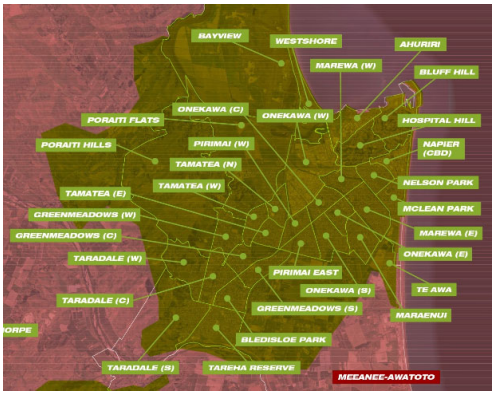
Abnormal Hazards:

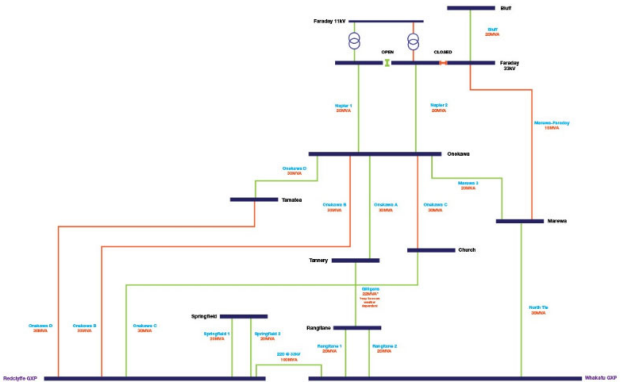
- Pole accidental contacts energised 220kV above/on sides (installation)
- Unburied energised cables exposed in Transpower privately owned farmland.

Key Controls:

- Partnership with Transpower (TP) contractor Ventia overall site management
- Written permission from Transpower
- Site specific design – ensure MAD's not compromised – 2.2 metres
- Unburied cables – protected – any joints buried
- Normal de energised, isolation, earthing, PPE, EPZ controls
- Connection of Unison's 33kV to Transpower 220 Lines (Whakatu & Redcliff) – made by Transpower workers
- Unison to leave cable disconnected TP contractor to connect.

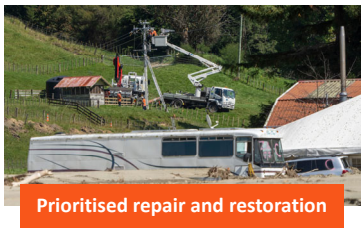
220 at 33kV – 99% of Urban Napier Restored





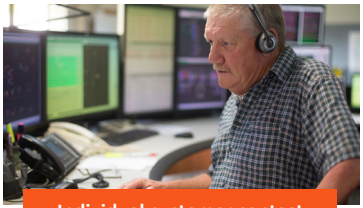
Rural Response

Generation

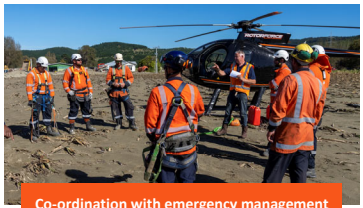


Prioritised repair and restoration

Engagement on the ground



Individual customer contact



Co-ordination with emergency management

Other - Key Health & Safety Risks

1. Contaminated silt/soil/flood water
2. Non approved contractor engagement
3. New Napier Depot (beside a container storage facility, no running water, no toilet facilities)
4. Aggressive customers (in field & reception)
5. Traumatic situations (in field)
6. Fatigue management (6-day weeks, 12-hour days)
7. Mental Wellbeing
8. Awatoto Napier City Council Contaminated Cordon Site
9. Livening of flood damaged ICP's
10. Contaminated Customer Equipment Arrived at Depot

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Learnings

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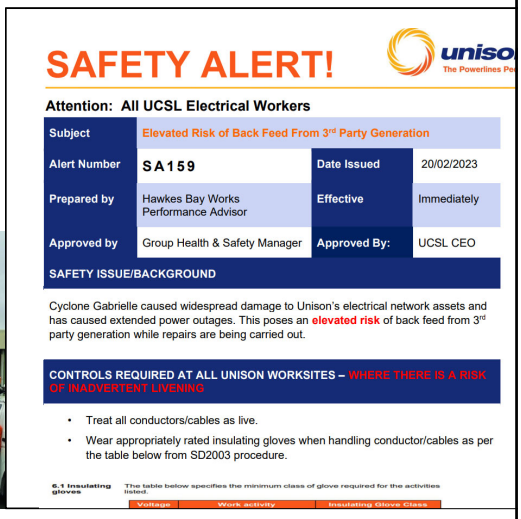
Health & Safety Resources

- Spilt across Hawkes Bay Depots & Unison Companies
- Assigned to specific tasks based on skill sets:
  - Contractor pre-qualification & competency assessment
  - Contractor inductions
  - Worksite/compliance (not audits) – support, coach & mentor style approach
  - Wellbeing support
  - Fatigue management (tracking hours)
- Onsite monitoring required (abnormal hazards) – contaminated site

Communication

- Initially safety alerts via email – wasn't getting to workers
- In person Toolbox Meetings (daily, 3 times a week, weekly) – standard agenda
- Contractors – via email



SAFETY ALERT!

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The Powerlines Pe

Attention: All UCSL Electrical Workers

Subject	Elevated Risk of Back Feed From 3rd Party Generation		
Alert Number	SA159	Date Issued	20/02/2023
Prepared by	Hawkes Bay Works Performance Advisor	Effective	Immediately
Approved by	Group Health & Safety Manager	Approved By:	UCSL CEO

SAFETY ISSUE/BACKGROUND

Cyclone Gabrielle caused widespread damage to Unison's electrical network assets and has caused extended power outages. This poses an elevated risk of back feed from 3rd party generation while repairs are being carried out.

CONTROLS REQUIRED AT ALL UNISON WORKSITES – WHERE THERE IS A RISK OF INADVERTENT LIVENING

- Treat all conductors/cables as live.
- Wear appropriately rated insulating gloves when handling conductor/cables as per the table below from SD2003 procedure.

6.1 Insulating gloves — The table below specifies the minimum class of glove required for the activities listed.

Voltage	Work activity	Insulating Glove Class

Example Toolbox Meeting Agenda

Flood Response -Tool Box Meeting Topics

DATE:	27th February 2023
Weather Forecast	TUE 28 FEB 22° 14° Overnight Morning Afternoon Evening Rain, easing to a few showers early evening. Light southwesterlies turning south-easterly for a time in the afternoon.
Potential Security Risks/Areas	**Areas were the police have had the most calls:** • Bayview • Esk Valley • Clive • Puketitiri Police have advised they will include the Esk Zone Substation in their patrols. Reminder to all staff if Police are required phone: IF IT'S HAPPENING NOW CALL 111 ➢ **111** Emergency situation ➢ **105** –for crimes that pose no immediate danger to the public, such as burglary, vandalism, suspicious behaviour and general inquiries IF IT'S ALREADY HAPPENED USE 105 ➢ **Please also advise a member of the health and safety team to log event**
Current Health Risks	**Dust from silt, mud, soil** – **can damage your health if you don't take it seriously.** One of the main concerns is little bits of silt, mud and soil in the air getting into your lungs and airways. This can damage your lungs. Coughing, lots of mucus and shortness of breath are all signs to watch out for. **If you can't avoid it – wear a P2/N95 mask (preference), a surgical mask will still help.** Replace masks when needed so they keep working properly. **Wear tightly fitted safety glasses** • Large increase in RSV, Gastro and COVID spreading in community (no outbreaks declared yet)

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Example Toolbox Meeting Agenda

Flood Response -Tool Box Meeting Topics

Industrial Areas – Caustic Chemicals in Flood Water Risk	**Awatoto Industrial Area – do not enter until health & safety advice is sought.** **Work Safe have advised that this area is of considerable safety concern with readings well above safe levels.** Unison is waiting on the risk assessment and exclusion zone boundaries from civil defence and will develop a site specific risk assessment for entering the Awatoto Zone Substation and surrounding areas.
Near Misses	Thick mud/silt build up on gum boots, slipped off the bottom rung of ladder when climbing **Key learnings:** • Scrap thick mud/silt off gumboots/boots with stick or equivalent tool before climbing ladders
	A UCSL employee went to liven an installation (Napier Golf Course Building). The UCSL employee completed the required tests up to the transformer. They sighted the COC completed by the electrician and inspector but had a gut feeling something wasn't quite right. The UCSL employee completed a test from the transformer to the switch board which failed. They DID NOT LIVEN the property and told the property owner to engage an electrician to fix the issues. **Key Learnings –** UCSL employee followed the required process as listed below

#	Topic	Key Points
Health, Safety, Wellbeing		
1	**Assessment and livening of ICP's after cyclone Gabrielle**	**Key Controls** • If there is any indication of gas smell exit property and contact gas network owner • **If the property has a red or yellow sticker applied – do not liven** • Assess whether the property has sustained **flood damage** by confirming the water level mark on the property and whether any electrical fittings or fixed appliances have been under water including in outside sheds, pump sheds, ground mounted heat pumps and power points etc • If the property has sustained flood damage – **do not liven** • If there has been prescribed electrical work carried out sight and review the Certificate of Compliance (COC) or Electrical Safety Certificate (ESC) • If there has been no prescribed electrical work complete a reconnection form authorised (signed) by the home owner

Learning:

Formal "toolbox" meeting structures for both field workers and other **operational staff i.e. NOC**.

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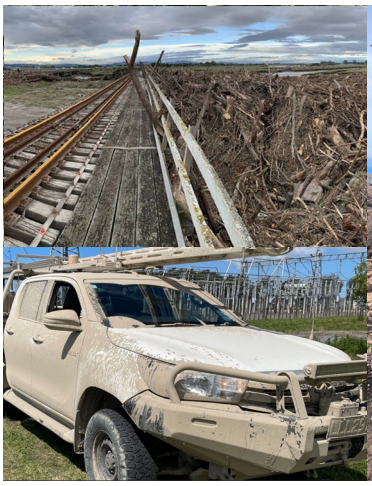
Expect the unexpected

- Logs
- Vehicles
- Dead animals
- Flood waters
- Car's upside down
- Deceased bodies?
- Mud/Silt/Debris Build Up – unknown depth?
- Never assume that damaged structures or ground are stable
- Sharp objects – tin
- Leaning unstable trees



Contaminated Silt/Flood Water

Hazards: Harmful contaminants inhaled, ingested or absorbed through skin

Examples: What could our workers be exposed to?		
Biological	**Chemical Contaminants**	**Dust/Fibres/Vapours**
• Human waste (sewage)/ wastewater • Animal blood, offal & bone, rotting animals • Untreated trade waste	• Petrol, oil, lubricants, • Pesticides • Corrosive acids • Oxidizers • Fertilisers • Heavy metals (lead, arsenic, mercury	• Asbestos • Inhalable dust • Harmful bacteria • Solvents, pesticides etc • Fungi • Heavy Metals
Communicable disease related to bacteria **(Leptospirosis)**, virus (**norovirus**) , protozoa, skin infections & rashes	• Chemical injury • Skin & respiratory irritation • Carcinogens • Sensitisation	Asbestosis, Mesothemlioma Respiratory irritation

Contaminated silt/flood water

Seek Advice! - MOH, Work Safe NZ, Unison's Occupational Physician

Key Controls:

- Encourage vaccinations (tetanus, Hep A)
- Covering open wounds, grazes etc. (deep wounds not permitted to work in these areas)
- Well stocked first aid kits (saline, eye wash, waterproof coverings)
- Clean areas – workers can eat, drink & have breaks
- Hand washing facilities (water & soap)
- PPE: P2/N95 masks & eye protection (dust uncontrollable), gloves
- Check surrounds & search for items that look different (broken building material, chemicals, rotten animals, discoloured silt, smells etc.)
- Wash & disinfect contaminated items
- Shower before going home

Contaminated silt/flood water

Seek Advice! - MOH, Work Safe NZ, Unison's Occupational Physician

Key Controls: Excavation to remove silt/sludge

- Use an excavator with doors and windows closed and air recycled (preference)
- Where this is not possible, excavator operator to wear P2/N95 mask, tightly fitted safety glasses or googles and work gloves.
- Avoid removal of silt or other flood deposits by hand. Where unavoidable, wear cut resistant long sleaved gloves over nitrile gloves.
- Avoid or minimise splash and/or dust protection (water)
- Monitor weather e.g. Wind can disturb surrounding areas and create a dusty contaminated environment.

Contractor Management

Non approved contractor onboarding process (external contractors)

1. **Competency Assessment** (network or non network)
2. **Workers Inducted –** cyclone specific induction
3. **Workers Come Equipped: i.e.** WSP, Standard PPE & Additional PPE, Certified PPE & plant, first aid kits etc
4. **Workers Out & Managed To Work**

Key Processes:

- Unison designated relationship Manager
- External crews with Hastings based crew, under their supervision along designed Field Leader
- Compare current network competencies to Unison network competencies & only approve like for like
- Master spreadsheet (emergency contact details, last 24 hour break, competencies)
- Daily time sheet – track hours
- Accommodation & food
- Check WSP & confirm compliance to Unison safety rules

Contractor Management - Learnings

- Inducting external contactor workers prior to arriving to Hawkes Bay.
- Designating H & S team roles specific to onboarding, pre qualifying and inducting contractor workers.
- Cyclone specific health and safety induction
- Collecting contractor workers hours in a timely fashion to monitor fatigue.
- Identify local contractors being engaged to induct into flood specific health and safety requirements and monitor fatigue risks
- Keep Intergroup as an approved contractor for any future contaminated sites specialised clean-up work.
- Multiple parities working together (Unison & contractors) – Unison Site Supervisor in Charge
- External contractors having different safety and PPE requirements specifically relating to EPZ, electrical hazard boots/dielectric boots, lift plans when short jacking truck mounted crane stabiliser legs, earthing & bonding, safety helmets for working at height.
- Apply additional PPE exemptions – excavator operators
- External contractors – limited exposure and experience with helicopter operations – buddy up with Unison staff!
- Worker change overs (14 days) – some workers slipped through the process and were not initially inducted or their hours tracked until identified by H & S during site visits

New Napier Depot

- Rural Restoration Area – North or inland from Napier
- External Contractors & Rotorua/Taupo Unison Teams (18 lines crews, 40 additional heavy vehicles)
- Open yard: Needed water, toilet facilities, cooking facilities (breakfast), offices, store 5L diesel tank
- Container stack in close proximity
- Quick change management & risk assessment process

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Aggressive Customers/ Members of the Public

- Onsite (UNL Reception): Security guards engaged office hours
- Offsite (Worksites): Guidance:
- Verbal abuse (non-threatening)
- Verbal threat, violence
- What to do if you didn't feel safe

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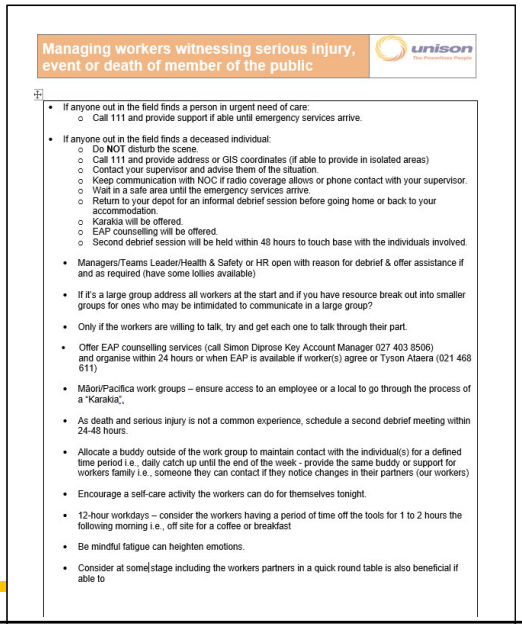
Traumatic Situation Support & Guidance

- In field someone finds:
  - Person in urgent need of care
  - Deceased individual
- Debrief(s)
- EAP counselling services
- Other support
- Māori/Pacifica work groups
- Buddy systems
- Self care activities
- Workers partners involvement/debriefs



Managing workers witnessing serious injury, event or death of member of the public

- If anyone out in the field finds a person in urgent need of care:
  - Call 111 and provide support if able until emergency services arrive.
- If anyone out in the field finds a deceased individual:
  - Do **NOT** disturb the scene.
  - Call 111 and provide address or GIS coordinates (if able to provide in isolated areas)
  - Contact your supervisor and advise them of the situation.
  - Keep communication with NOC if radio coverage allows or phone contact with your supervisor.
  - Wait in a safe area until the emergency services arrive.
  - Return to your depot for an informal debrief session before going home or back to your accommodation.
  - Karakia will be offered.
  - EAP counselling will be offered.
  - Second debrief session will be held within 48 hours to touch base with the individuals involved.
- Managers/Teams Leader/Health & Safety or HR open with reason for debrief & offer assistance if and as required (have some lollies available)
- If it's a large group address all workers at the start and if you have resource break out into smaller groups for ones who may be intimidated to communicate in a large group?
- Only if the workers are willing to talk, try and get each one to talk through their part.
- Offer EAP counselling services (call Simon Diprose Key Account Manager 027 403 8506) and organise within 24 hours or when EAP is available if worker(s) agree or Tyson Ataera (021 468 611)
- Māori/Pacifica work groups – ensure access to an employee or a local to go through the process of a "Karakia",
- As death and serious injury is not a common experience, schedule a second debrief meeting within 24-48 hours.
- Allocate a buddy outside of the work group to maintain contact with the individual(s) for a defined time period i.e., daily catch up until the end of the week - provide the same buddy or support for workers family i.e., someone they can contact if they notice changes in their partners (our workers)
- Encourage a self-care activity the workers can do for themselves tonight.
- 12-hour workdays – consider the workers having a period of time off the tools for 1 to 2 hours the following morning i.e., off site for a coffee or breakfast
- Be mindful fatigue can heighten emotions.
- Consider at some stage including the workers partners in a quick round table is also beneficial if able to

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Fatigue Management

- Initially tracked hours via spreadsheet – moved to our timesheet software (One Energy)
- Track field staff hours via One Energy as soon as practicable – some staff hours were not tracked for approx. 1 week
- New fatigue individual assessment tool and risk assessment (staff working 6-day weeks up to 12-hour days)
  - A new fatigue individual assessment tool was developed to assess individuals
    - Fatigue at accumulated 70 hours or when showing signs/symptoms.
    - The employee's GM was required to approve this assessment.
- 24-hour break after 70 hours, 48-hour break after 4 weeks (scheduled)
- Stronger monitoring (and recording) of office-based staff fatigue. Explore appropriate processes to track (record) office-based staff (UNL, UCSL) hours to pick up earlier staff that have worked 70 accumulated hours and exceeded 16 hours etc.
- Regions that provide resources i.e., Rotorua and Taupo – consider how standby rosters will be affected and additional fatigue management requirement.

Fatigue Management

Task/Area	Hazards What can cause harm	Potential Outcome What can happen	Likelihood	Consequences	Risk Rating (Pre-Controls)	Required Control Measures	Freq of Monitoring	Personnel Responsible	Eliminate	Type of Minimisation	Likelihood	Consequences	Risk Rating (Post Controls)
Flood Project – Worker fatigue management during cyclone Gabrielle restoration – • **6 day weeks and/or** • **Up to 12 hour work days**	Sudden change in work hours and/or work demand Extended work hours and/or work demand (physical or mental) Lack of sleep Lack of family time or conflicting demands i.e. work verses family demands Repetitive work (potentially)	Fatigue state – unable to function (physically &/or mentally) = **mentally or physically exhausted reducing the workers ability to perform work safely & effectively** Excessive yawning, fall asleep while at work or driving i.e. nodding off or micro sleeps Lack of concentration, no energy or motivation Rubbing or closing eyes Irritable and aggressive behaviour Impaired decision making & judgement Prone to make an error, mistake or have an accident Reduced hand eye coordination or slow reflexes Short term memory loss	C	2	H	HS3201 Fatigue Management Standard i.e. key requirements: • 70 hours cannot be exceeded for class 2 or above drivers • Maximum 16 hours in one 24 hour shift – stand down rules apply • Section 5.1 emergency situations unless approved by employees General Manager prior to exceeding **On Call/Shift Rosters** • Continue with standard roster patterns • Worker self-reports if unable to be on call due to fatigue concerns • UCSL: – Limit 12 hour work days during on call roster – Monitor weather forecasts and either reduce daily hours or organise additional resources for covering the on call hours – No planned work during the weekend – Monitor on call hours, finish times & total hours – Employees total hours are getting near 60 hours or call out times are repetitively after mid night – complete a **Unison Fatigue Assessment Tool** • UNL NOC: o NOC operator who complete 3 night shifts – a **Unison Fatigue Assessment Tool** is completed prior to being rostered on a 4th night shift **Day Shift** • Workers total hours worked is at or near 70 hours - complete a **Unison Fatigue Assessment Tool** • Maximum 12 hour days – approval required by workers leader if more than 12 hours required • **48 hour break every 4 weeks** • External contractors and UCSL Rotorua/Taupo – 2 week rotation – 24 hour breaks must be scheduled • Self-report fatigue signs, symptoms or concerns – undertake a **Unison Fatigue Assessment Tool** • **Unison Fatigue Assessment Tool** – Fatigue Control Guidance	All times All times All times As practicable All times Where possible As required As practicable Regular All times As required All times As required Scheduled Scheduled All times As required	Workers, Leaders Workers, Leaders Workers, Leaders General Managers UCSL, UNL Workers, Leaders Standby Leaders Standby Leaders Standby Leaders Standby Leaders Standby Leaders NOC Manager/ Leader Leaders Workers, Leaders Leaders Leaders Workers, Leaders Workers, Leaders	X	A A A A A A A A A A A A A A A A A	D	3	M

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Fatigue Management

FATIGUE ASSESSMENT TOOL – For Prolonged Work at 70 Hours

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Fatigue Assessment Risk Categories	
Green – *majority answers*	Stand down within the next 3 days – monitor for signs of fatigue no additional controls
Orange – at least one answer	Stand down within 48 hours & establish fatigue management control plan
Red – at least three answers	Standdown immediately or within 24 hours.

Employee:		**Manager/Leader:**	
Assessment Completed By:		**Total Hours:**	

Does the employee assessment themselves to be fit for duty? Yes ( ) Unsure ( ) No ( )
If Yes or Unsure – complete this Fatigue Risk Assessment
If NO – *put in place immediate controls measures to support employee (alternative travel home, 24 hour break etc)*

Fatigue Assessment		Answer
1. Last 24-Hour Break	How long has it been since your last 24-hour break?	
	In the last 6 days	Yes ( )
	More than 8 days	Yes ( )
	More than 10 days: *Action: Organise a 24 hour break immediately*	Yes ( )
2. Sleep/ Wake Pattern **Note:** Sleep doesn't need to be continuous	How much sleep have you had in the last 24 hours?	
	8-9 hours	Yes ( )
	6-7 hours	Yes ( )
	Less than 5 hours (which is not normal)	Yes ( )
	How much sleep have you had in the last 48 hours?	
	16-18 hours	Yes ( )
	13-14 hours	Yes ( )
	Less than 12 hours - (which is not normal)	Yes ( )
3. Work Hours	How many hours are you rostered on to work today?	
	8 hours	Yes ( )
	10 hours	Yes ( )
	12+ hours – If question 2 above is red then consider reducing shift time	Yes ( )
	What was your average shift break time duration over the last 7 days? Example: An employee on average finished at 1 am and started at 7 am they only got 6 hours break between shifts	
	13-16 hours	Yes ( )
	9-12 hours	Yes ( )
	Less than 8 hours	Yes ( )
4. Sleep Quality	How would you rate the quality of your sleep?	
	Good – *Action monitor for changes*	Yes ( )
	Average	Yes ( )
	Poor	Yes ( )
5. Fit for Work	How are you feeling now?	
	Extremely alert	Yes ( )
	Very alert	Yes ( )
	Alert	Yes ( )
	Rather alert	Yes ( )
	Neither alert nor sleepy	Yes ( )
	Some signs of sleepiness	Yes ( )
	Sleepy, but some effort to stay awake – *Action: Standdown & arrange alternative transport home*	Yes ( )
	Very sleepy, great effort to keep away, fighting sleep – *Action:*	Yes ( )

8. Fatigue Controls Guidance

- Caffeine (recommended short period fatigue management tool), scheduled rest breaks, napping (20-30 minutes maximum with 10 minutes to recover from sleep inertia).
- Increase food (specifically protein food) and hydration.
- Task reassignment, non-safety critical tasks, no working alone – team up/buddy system
- Task rotation – rotate high risk task, mundane, and physically demanding tasks between workers
- Consider no driving of vehicles, operating heavy plant or machinery or carrying out live work
- 24 hour stand down (full rest)
- Full reset break of 48 hours (full rest)
- Change hours of work i.e. if finish times are late, consider late starts for the next shift to maximise sleep opportunity
- Seek further advice from a Health & Safety Advisor

- Welfare person assigned to carry out scheduled welfare checks on the following symptoms (if any symptoms are identified, the employee is to have a 24 hour stand down).
  - Excessive yawning or falling asleep at work such as nodding off or microsleeps
  - Hard to concentrate , no energy/motivation, finding it harder than usual to communicate well with others
  - Rubbing or closing eyes
  - Irritable
  - Impaired decision making and judgement
  - Reduced hand-eye coordination or slow reflexes
  - Short term memory problems

9. Agreed Fatigue Management Control Plan

Welfare Person : Frequency of Welfare Checks:

Health & Safety Advisor Review or Advice Sought: Yes ( ) No ( )

Control	Responsibility	When?

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Mental Wellbeing

- Sought advice from Leading Safety
- Developed a mental wellbeing support intervention plan
- Key interventions included:
  - Individual cards daily check in for staff on how staff were feeling & key support contact details
  - Leaders Guide: Managing workers witnesses serious injury, traumatic event
  - EAP available if required
  - Support person – ex employee– attended morning BBQ's and walked around offices
  - New wellbeing noticeboards
  - Wellbeing regular check ins with leaders/managers
  - Onsite Gym – continued
  - Onsite massages

Mental Wellbeing

- Consider whether staff i.e. faults staff that deal with distressed customers when reconnecting and livening properties should have more frequency welfare checks ins.
- Seek external advice on mental health support services and interventions before implementing Unison intervention plans.
- More welfare check ins with field staff on how they and their families are coping given the work demand/hours expectations.
- Morning BBQ's provide workers with a good start to the day, a way to socialise and connect with other workers and discuss health and safety matters
- Post traumatic scene managers guide – debriefs

Napier City Council Contaminated Cordon Area – Awatoto Industrial

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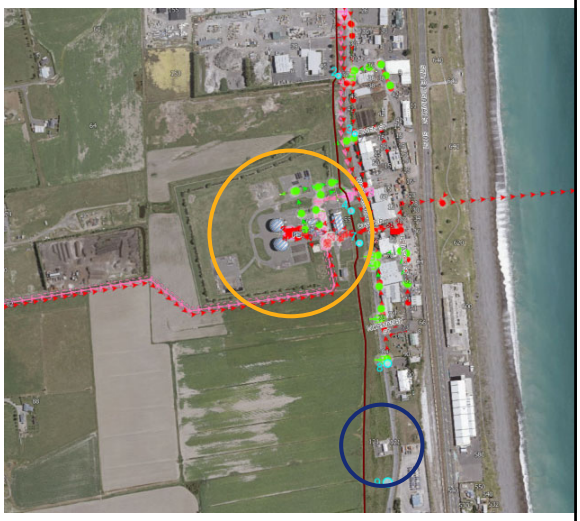
Contaminated Cordon Site

- Limited/no formal information, guidance from NCC.
- Industrial plants, fertilizer production, wool processing, animal by product, wool processing, NCC wastewater treatment plant (sewage plant)
- Significant flooding – large spillage of hazardous substances, silt deposition, raw sewage waste overflow
- Initially – caustic chemical biological risks – no access
- Army/police refused to access and manage the cordon – NCC needed to do this
- Wait for the contaminated flood water to reside
- 27 February – 9 samples sites provided indication of heavy metals, pesticides & very high levels of biological contaminants i.e. e coli, faecal coliforms – results until 3 March



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Contaminated Cordon Site

- Identify (quickly) an external specialist contactor required to clean up a contaminated site (not a Unison core business process) unknown to Unison.
- Engage SQEP Environmental Scientist – understand Unisons site health risks.

Client:	Napier City Council	**Lab No:**	3182089	SPv3	
Contact:	Emily Frost	**Date Received:**	24-Feb-2023		
	C/- Napier City Council	**Date Reported:**	08-Mar-2023	**(Amended)**	
	Private Bag 6010	**Quote No:**			
	Napier 4140	**Order No:**	148206		
		Client Reference:	Awatoto Sediment Samples 21/02		
		Submitted By:	Emily Frost		

Interim Report

This is an interim report, prepared before all test results are completed. As all final Q.C. checks may not have been possible, it is not regarded as an official certificate of analysis. The final, official report will be issued upon completion of all tests.

Sample Type: Sediment

Sample Name:		Site 1 21-Feb-2023 3:50 pm	Site 2 21-Feb-2023 4:08 pm	Site 3 21-Feb-2023 4:15 pm	Site 4 21-Feb-2023 4:30 pm	Site 5 21-Feb-2023 5:05 pm
Lab Number:		3182089.1	3182089.2	3182089.3	3182089.4	3182089.5
Individual Tests						
Dry Matter	g/100g as rcvd	44	55	59	49	63
Heavy metals screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	8	7	7	8	5
Total Recoverable Cadmium	mg/kg dry wt	0.13	0.15	0.23	0.14	0.82
Total Recoverable Chromium	mg/kg dry wt	22	23	23	25	21
Total Recoverable Copper	mg/kg dry wt	10	10	10	12	22
Total Recoverable Lead	mg/kg dry wt	15.2	14.8	15.6	17.4	42
Total Recoverable Nickel	mg/kg dry wt	16	16	17	18	13
Total Recoverable Zinc	mg/kg dry wt	64	124 #1	71	74	134
Asbestos in Soil						
As Received Weight	g	In Progress	In Progress	In Progress	In Progress	In Progress
Dry Weight	g	In Progress	In Progress	In Progress	In Progress	In Progress
<2mm Subsample Weight	g dry wt	In Progress	In Progress	In Progress	In Progress	In Progress
Asbestos Presence / Absence		In Progress	In Progress	In Progress	In Progress	In Progress
Description of Asbestos Form		In Progress	In Progress	In Progress	In Progress	In Progress
Multiresidue Pesticides in Sediment samples by GCMS						
Acetochlor	mg/kg dry wt	< 0.015	< 0.012	< 0.010	< 0.012	< 0.010
Alachlor	mg/kg dry wt	< 0.008	< 0.006	< 0.006	< 0.006	< 0.006
Atrazine	mg/kg dry wt	< 0.015	< 0.012	< 0.010	< 0.012	< 0.010
Atrazine-desethyl	mg/kg dry wt	< 0.015	< 0.012	< 0.010	< 0.012	< 0.010

Contaminated Cordon Site

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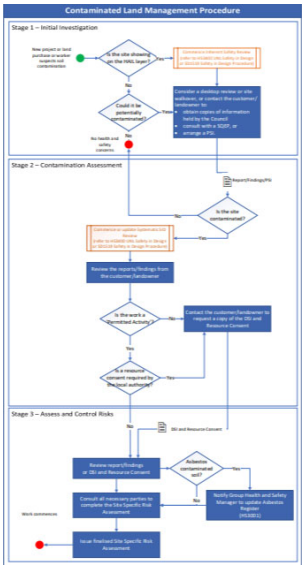
The Powerlines People

HS3001
Contaminated Land Management Procedure
Health and Safety Element 5.0

Stage	
1	Initial investigation
2	Contamination assessment
3	Assess and Control Risks



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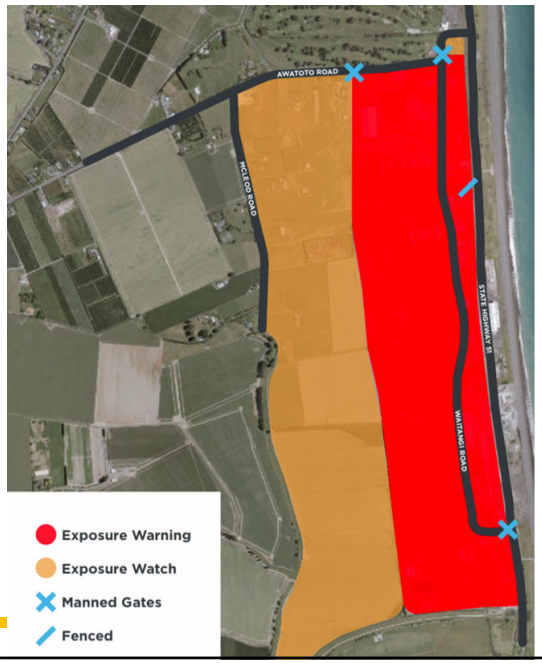
Contaminated Cordon Site

- NCC cordon – entry & exit requirements
- PPE requirements: Protective coveralls, P2/N95 masks, gloves, eye protection, enclosed footwear
- Vehicle washdown process



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Contaminated Cordon Site

9 March 2023

- SQEP (Stantec) & Cleaning Contractor (Intergroup) & Unison reps – visit our site
- Site specific risk assessment & silt sampling SQEP:
- Pesticides (OCPs), total petroleum hydrocarbons, polycyclic aromatic hydrocarbons, seven heavy metal suite (arsenic, cadmium, chromium, copper, lead, nickel and zinc), and presence/absence of asbestos, microbiological bacteria
- SQEP provide health and safety work practices – establish Unison site specific risk assessment

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Contaminated Cordon Site

- **27 February** - 9 samples sites provided indication of heavy metals, pesticides & very high levels of biological contaminants i.e., e coli, faecal coliforms – results until 3 March
- **9 March** - Unison proactive – engage enivro scientist & specialised cleaning company – samples taken
- **9 March** - NCC also took samples of residential & industrial sites – missed Unison site?
- **17 March** - NCC provide results

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Contaminated Cordon Area

- Untreated waste from WWTP discharged via drain – west of our zone substation site
- Unison samples = pesticides, heavy metals & TPH all below human health guidelines
- No asbestos
- **High microbiological (e coli, faecal coliform) counts > 6000 counts (NCC recommending < 100 counts)**

Contaminated Cordon Area

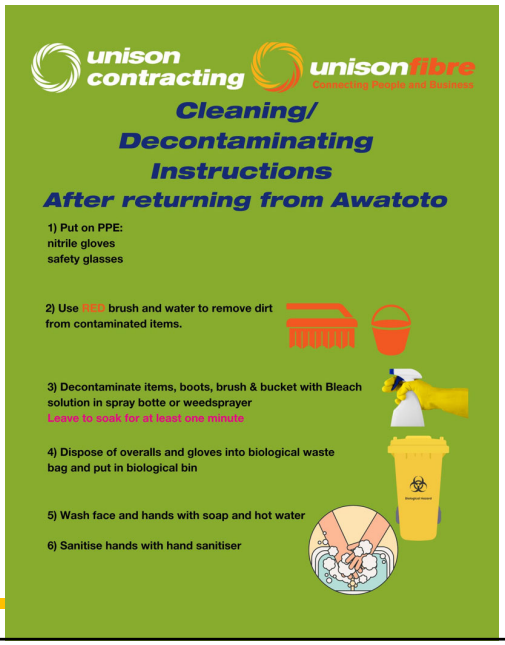
Site specific risk assessment to cover:

- Silt removal and cleaning of our zone substation switch yard & switch room – Intergroup – priority test transformers, switch room, switch yard
- Cleaning inside & outside of our ground mounted assets (RMU's, TX)
- Switching & livening assets
- Livening LV installations
- Construction of new pole structures
- Open trenching and above ground new cable installation & jointing
- Extending the earth grid

Contaminated Cordon Area

Key Control Measures:

- Onsite health & safety advisor RA inductions, coaching & monitoring
- Entry and exit requirements (Full Disposable Cover PPE)
- Clean shaven & no facial hair – until risk reduced
- Hygiene practices – hand washing
- Isolation of equipment & tools for cleaning after use or disposal of items i.e. PPE
- Coveralls (not breathable) – 2-hour limit before break in designated clean zone
- Isolate staff & tools/equipment from contaminated silt – stand on planks – tables etc
- Alcohol disinfectant
- Switching de-energised & remote livening inside cordon – live switching outside cordon – enable FR PPE
- Dispose silt at NCC designated area
- Switch room – hot wash, clean & disinfect
- Intergroup onsite supervision – switch yard
- Restrictions – additional controls – cable troughs in switch room
- Avoid standing in pooled water



Awatoto Substation

- Before & After Cleaning Photos

Awatoto Substation

- Before & After Cleaning Photos

Awatoto Substation

- Before & After Cleaning Photos

Awatoto Substation

- Before & After Cleaning Photos

Site Specific Risk Assessments

- Evolved = cleaned site
- Created a clean zone – reduce PPE requirements
- 5 versions
- BAU works - live work, switching
- NCC Mid April – biological counts degraded at fast rates but not yet at < 100 counts
- Liven zone substation!
- Unison – additional sampling to understand current micro biological risks

E.Coli Samples in surrounding area

Table 1: Summary of E. coli in sediment and surface water samples

Sample ID	Lab ID	Sample type	Location	E.coli	Units
S1	3260435.1	sediment	on Site - 11kv trench inside switchroom	350	MPN / g
S2	3260435.2	sediment	on Site - LV trench inside switchroom	540	MPN / g
S4	3260435.4	sediment	off Site - north of the yard	1,600	MPN / g
S5	3260435.5	sediment	off Site - to rear of the yard	23	MPN / g
S7	3260435.7	sediment	off Site - outside NCC WWTP on Waitangi Rd	240	MPN / g
S8	3260435.8	sediment	off Site - on Awatoto Road	8	MPN / g
S9	3260435.9	sediment	off Site - field to rear of the Site	> 1,600	MPN / g
W3	3260435.3	water	on Site - outside cable trench	< 18	MPN / 100ml
W6	3260435.6	water	off Site - Waitangi Road, to north of site	< 18	MPN / 100ml

Contaminated Cordon Area

Key Learnings:

- Contaminated land procedure & process
- Pre approve a SQEP – environmental scientist – don't rely on councils
- Consider/pre approve specialist cleaning contractor & large excavators – contaminated land
- Establish JSA's & chemicals used
- Additional PPE:
  - Coveralls
  - RPE including half face respirators
  - Alcohol based disinfectant
- Hep A vaccination programme

Livening of Flood Damaged ICP's

Hazards:

- Livening an unsafe installation
- Frustrated or concerned customers interactions

Key Controls:

- Tasks specific risk assessment
- Buddied UCSL staff with livening agent contractor – worked as pairs

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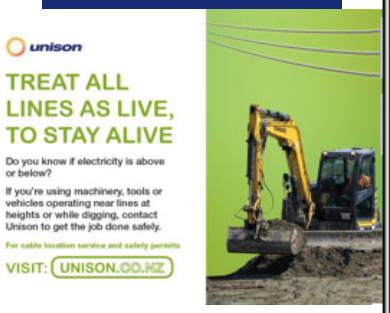
Public Safety Messaging

- Public safety messaging was included in key messages distributed via email and social media from 16 February and radio from 17 February.
- From 10 March specific cyclone safety messaging via radio and social media platforms was initiated.
- No increase in incidents during the clean-up period following the cyclone.

Print Advert Example



Social Media Example

Onsite Observations – Issues Addressed

- Short jacking truck mounted crane stabiliser legs (no lift plans),
- Some misperception that downed conductors didn't require earthing,
- Some lack of appreciation for inadvertent livening from back feed,
- Permitting process required permits to be issued for several days (rather than daily as per BAU requirements) – signing on and off permits not always completed as per BAU requirements in some cases there wasn't an induction onto the permit to understand the safety measures for the site,
- PPE complacency i.e. safety helmets and eye protection (lack of appreciation for the dust risk),
- WSP standard and how this was applied for multi gang shut down.

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Health & Safety Performance

- No injuries/illnesses
- Some incidents – vehicle damage
- Limited near misses – learning reflection time post response
- Public safety – silt deposited under OH conductors
- 2 HPI's
  - Helicopter weight (conductor stringing) made contact with MEWP bucket
  - An energised LV overhead line was discovered wrapped around a transformer pole and stay wire.

H & S Risk Management – Key Learnings

- Buddy up (no lone working) until you understand the situation
- Empower staff to do thorough dynamic risk assessments – recognise hazards are and will be abnormal.
- Emergency accommodation solutions for key staff, if they are displaced or cannot return to home.
- Backup communication solutions when traditional comms mediums are reduced and/or unavailable.

H & S Risk Management – Key Learnings (continued)

- Access permit processes ensuring normal SMEI requirements are followed in particular signing on and off not verbally and ensuring everyone is inducted onto the permit before signing.
- Coordinated risk management of re-livening following damage, predominately flooding.
- Engage a security guard for office receptions early
- Customer team have a training programme to deal with aggressive members of the public.
- Good stock levels of additional PPE (masks, gloves) & hygiene equipment (sanitiser).

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External Specialist Resources Engaged

- Unison's Occupational Physician – advise on health risks.
- SQEP/Environmental Scientist – Napier City Council Awatoto contaminated cordon area – microbiological health risks, silt sampling and recommended controls.
- Counsellor – mental health support initiatives.
- Onsite peer to peer support
- WorkSafe NZ – contaminated silt/flood water control guidance.
- MOH – health risks.
- Specialised contractor engaged to clean up a contaminated site (Awatoto zone substation)

MINISTRY OF HEALTH
MANATŪ HAUORA

WORKSAFE
NEW ZEALAND | MAHI HAUMARU AOTEAROA

NAPIER CITY COUNCIL
Te Kaunihera o Ahuriri

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Questions

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