1 Essential Elements

Essential Elements - A summary of key requirements described in this document, for quick-reference.

<table>
<thead>
<tr>
<th>Step</th>
<th>Requirement</th>
<th>Reference</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Define the scope of works</td>
<td>6.1.1</td>
<td>Supervisor</td>
</tr>
<tr>
<td>2.</td>
<td>Conduct a risk assessment</td>
<td>6.1.2</td>
<td>Supervisor</td>
</tr>
<tr>
<td>3.</td>
<td>Classify the isolation</td>
<td>6.1.3</td>
<td>Responsible Person or Team Leader (in case of works under contract)</td>
</tr>
<tr>
<td>4.</td>
<td>Assign roles and conduct the isolation planning meeting</td>
<td>6.1.4, 6.1.5</td>
<td>Responsible Person</td>
</tr>
<tr>
<td>5.</td>
<td>Request the isolation</td>
<td>6.2</td>
<td>Responsible Person</td>
</tr>
<tr>
<td>6.</td>
<td>Conduct isolations</td>
<td>6.3, Appendix J, Appendix K, Appendix L</td>
<td>Person conducting the isolation</td>
</tr>
<tr>
<td>7.</td>
<td>Lock and Tag out isolation points</td>
<td>6.4</td>
<td>Person conducting the isolation</td>
</tr>
</tbody>
</table>

Key Points

**DO's**
- Lock out/Tag out isolation must be performed whenever maintenance or servicing is required on systems, plant or equipment with potential energy sources, that is released could cause harm to personnel.
- Isolations must only be performed personnel who have been trained in accordance with the requirements of this procedure.
- Isolations must pass a confirmed in place test prior to LOTO being applied and works commencing.
- Employees must only use approved LOTO hardware. LOTO devices must indicate the identity of the employee who attached the device.
- Undertake the work in accordance with the risk assessment.
- Stop work if safe conditions cannot be maintained/achieved.

**DON'Ts**
- Perform maintenance or work on live plant or equipment.
- Perform work before isolation testing confirm the systems, plant or equipment has been made safe to carry out work on near to the isolated system.
- Remove a LOTO device or attempt to start, operate or interfere with any system, plant or equipment that has been locked/tagged out, unless authorised (in accordance with this procedure) to do so and it is safe to proceed.
- Remove someone else's lock or tag.
- Work without a valid risk assessment.
- Accept unsafe conditions.
2 Purpose

This procedure sets out the requirements for conducting Lock Out Tag Out (LOTO) processes to provide a safe system of work to protect people from potential hazards associated with uncontrolled energy release.

More specifically it details the LOTO process to be applied when working on equipment connected to hazardous energy sources inclusive of stored or residual energy, which if not properly managed, may result in equipment damage or personal injury.

The purpose of this procedure is to explain:

- The roles and responsibilities in the LOTO process.
- The process for achieving isolation.
- The process and management of isolations.
- The locks and tags that apply to the LOTO process.
- How to achieve a zero energy state.
- The process for managing tasks where a zero energy state cannot be achieved.
- The process for taking equipment out of service.

**Note:** This document must be read in conjunction with LOTO training and it is not intended to be read in isolation or as stand-alone.

3 Scope

This Procedure applies to all Water Corporation Employees, Contractors, Contractors’ employees and visitors at all Water Corporation owned facilities.

The term LOTO applies to activities that involve the isolation of energy from a system to make that system safe for work to be carried out.

Whilst LOTO is usually considered to cover electrical and mechanical energy; some other sources of energy must not be over looked.

These include:

- Hydraulic and pneumatic systems such as accumulators.
- Stored sources of electrical energy such as batteries.
- Spring loaded systems such as valve actuators.
- Other types of systems that can be driven by liquid heads, wind drafts or other outside influences.

**Note:** This procedure excludes the isolation of high voltage electrical systems (HV) for the purposes of working on high voltage components. This is managed through [High Voltage Switching Practice (ME2)](WC-OSH 118).
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### 4 Roles and Responsibilities

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorised Person (AP)</td>
<td><strong>Complex Isolations</strong></td>
</tr>
<tr>
<td></td>
<td>• Confirm the work scope to identify necessary isolation points.</td>
</tr>
<tr>
<td></td>
<td>• Evaluate the operational impact on asset infrastructure if the isolations were</td>
</tr>
<tr>
<td></td>
<td>conducted, and obtain approval from others if needed.</td>
</tr>
<tr>
<td></td>
<td>• Represent the Region/Alliance at the Complex Isolation Planning Meeting.</td>
</tr>
<tr>
<td></td>
<td>• Arrange isolations, and provide an on-site handover to the Responsible Person.</td>
</tr>
<tr>
<td></td>
<td>• Determine the alternate means of securing the isolation point, where</td>
</tr>
<tr>
<td></td>
<td>compactible lockout hardware is not available for it to be locked.</td>
</tr>
<tr>
<td></td>
<td>• Respond to the Isolation Request Form and provide an Isolation Handover Form</td>
</tr>
<tr>
<td></td>
<td>as a means of work permit.</td>
</tr>
<tr>
<td>SEAA Branch Manager</td>
<td>• Ensure that this document together with supporting documentation (i.e. forms</td>
</tr>
<tr>
<td></td>
<td>templates, guidelines etc.) is maintained.</td>
</tr>
<tr>
<td></td>
<td>• Ensure associated training and the range of lockout hardware in support of the</td>
</tr>
<tr>
<td></td>
<td>safe execution of this procedure is available for works as required.</td>
</tr>
<tr>
<td>Contract Manager</td>
<td>• Ensure that contractors working under this procedure are appropriately trained.</td>
</tr>
<tr>
<td>Designated Person</td>
<td>• Authorise the removal of a nominated person’s isolation hardware and associated</td>
</tr>
<tr>
<td></td>
<td>tags in accordance with Section 6.5.2</td>
</tr>
<tr>
<td>Line Manager</td>
<td>• Ensure that employees working under this procedure are appropriately trained.</td>
</tr>
<tr>
<td>Branch / Regional / Alliance</td>
<td><strong>Complex Isolations</strong></td>
</tr>
<tr>
<td>Manager</td>
<td>• Appoint APs, develop and maintain a list of approved APs for Complex Isolation.</td>
</tr>
<tr>
<td></td>
<td>This list will be regularly reviewed and readily available, on request.</td>
</tr>
<tr>
<td>Isolation Control Coordinator</td>
<td><strong>Complex Isolations</strong></td>
</tr>
<tr>
<td>(ICC)</td>
<td>• Mentoring and coach the Authorised Person and/or the Responsible Person,</td>
</tr>
<tr>
<td></td>
<td>as appropriate to their level of experience with the role and/or the number</td>
</tr>
<tr>
<td></td>
<td>of parties involved in the isolation. This may include identifying necessary 'stop</td>
</tr>
<tr>
<td></td>
<td>points' in the LOTO process, at which to carry out appropriate checks.</td>
</tr>
<tr>
<td></td>
<td>• Convene an isolations planning meeting.</td>
</tr>
<tr>
<td></td>
<td>• Coordinate and control isolations when multiple Authorised Persons are</td>
</tr>
<tr>
<td></td>
<td>involved.</td>
</tr>
<tr>
<td></td>
<td>• Ensure there is a satisfactory contingency plan in place, in event of a change</td>
</tr>
<tr>
<td></td>
<td>in the scope of work, or a change to the appointed Authorised Person or</td>
</tr>
<tr>
<td></td>
<td>Responsible Person.</td>
</tr>
</tbody>
</table>
## Role Responsibilities

### Responsible Person (RP)

#### Simple Isolation
- While work is in progress, ensure each ‘at risk’ person working on isolated plant is fitting appropriate locks and tags.
- Agree alternate means of securing the isolation point, where compatible lockout hardware is not available for it to be locked.
- Ensuring that the simple isolation is conducted and tested in accordance with this procedure and workers use locks and tags correctly

#### Complex Isolations:
- Liaise with the Authorised Person to have them arrange necessary isolations.
- Receive a hand-over from the Authorised Person.
- Agree alternate means of securing the isolation point, where compatible lockout hardware is not available for it to be locked.
- While work is in progress, ensure each ‘at risk’ person working on isolated plant is fitting appropriate locks and tags.
- When work is completed, ensuring all ‘at risk’ persons have removed locks and tags prior to a hand-back to the Authorised Person.

### Training

The following table shows the roles that may be performed as part of the Isolations process and the training that is required.

<table>
<thead>
<tr>
<th>Roles / Activities</th>
<th>Course</th>
<th>Comment</th>
<th>Period of Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persons working on isolated plant without performing isolation themselves.</td>
<td>LOTO 1 (SAP Q#15326), (BET 12901) Pre-Requisite: N/A</td>
<td>General course covering correctly using and interpreting locks and tags, or function as the RP in case of complex isolation.</td>
<td>3 years.</td>
</tr>
<tr>
<td>Complex Isolation Responsible Person</td>
<td>LOTO 1 (SAP Q#15326), (BET 12901) Pre-Requisite: N/A</td>
<td>General course covering correctly using and interpreting locks and tags, or function as the RP in case of complex isolation.</td>
<td>3 years.</td>
</tr>
<tr>
<td>Designated Person</td>
<td>LOTO 1 (SAP Q#15326), (BET 12901) Pre-Requisite: N/A</td>
<td>General course covering correctly using and interpreting locks and tags, or function as the RP in case of complex isolation.</td>
<td>3 years.</td>
</tr>
<tr>
<td>Persons who would physically perform isolations and their immediate supervisor (e.g. Simple isolation RP).</td>
<td>LOTO 1 (SAP Q#15326), (BET 12901) Pre-Requisite: N/A</td>
<td>General course covering correctly using and interpreting locks and tags, or function as the RP in case of complex isolation.</td>
<td>3 years.</td>
</tr>
<tr>
<td></td>
<td>LOTO 2 (SAP Q#15327), (BET 12902) Pre-Requisite: LOTO 1</td>
<td>Course covering the process for safely performing the isolation and test.</td>
<td>3 years.</td>
</tr>
</tbody>
</table>
6 Isolation Process
The flowchart in Appendix A provides an overview of the lock out and tag out process.

6.1 Planning the isolation

6.1.1 Determine the scope of work
Scope of works must be planned by applying the following tools:

- Water Corporation/Aroona: WC-OSH 007 Safe Job Planning.
- PRA: Internal Safe Job Planning process.
- Contractors: Contractor or other party who is not responsible for the day-to-day operation of the asset must follow the requirements outlined within the Clearance to Work on Water Corporations Assets (Health Safety and Environment (HSE) Handbook for Contractors, section 6.7).

6.1.2 Risk Assessment
The Supervisor of the works must conduct a risk assessment on the work to be carried out. This risk assessment must:

- Assess the need to undertake isolation
- Identify the required isolation points for every energy potential energy source, including stored energy
  - The following Appendices outline specific requirements for isolation and testing:
    - Sewer Isolation Devices (Appendix I).
    - Electrical Isolation and Testing (Appendix J).
    - Isolation of Gas and Pneumatic Systems (Appendix K).
    - Fluid Systems Isolation and Test (other than sewer schemes) (Appendix L).
- Assess the risk of working on or near the asset, plant, machinery and/or equipment and the impact of ineffective isolations

The tools that must be used to conduct the Risk Assessment:

- **Water Corporation/Aroona:** WC-OSH 007 Safe Job Planning.
- **PRA:** Internal Safe Job Planning process.
- **Contractors:** As per Contractors risk-based Risk Assessment process (e.g. JSEA) detailed within their approved Project HSE Management Plan.

If during the Risk Assessment process, it is identified that lock out of an isolation point cannot be achieved then alternative controls to demonstrate risks have been managed to As Low As Reasonably Practicable (ALARP) must be identified and accepted by the Responsible Person (RP) before the work can proceed.

**Note:** Refer to Section 7.6 where compatible hardware is NOT available.

### 6.1.3 Classify the isolation

Each isolation must be planned and classified as either ‘Simple’, ‘Complex’ or controlled by a ‘Third Party’, as per the following table:

<table>
<thead>
<tr>
<th>Complex Isolation</th>
<th>Simple Isolation</th>
<th>Third Party Isolation</th>
</tr>
</thead>
</table>
| Involves a handover between parties, and **HAS ONE** (1) of the following:  
  - Seven (7) or more isolations points,  
  **OR**  
  - Three (3) or more parties involved,  
  **OR**  
  - Use of a lockbox,  
  **OR**  
  - Isolations performed by two (2) or more occupational streams (i.e. operator and electrical worker). | Doesn’t involve a handover between parties (same work party establishing, working on and de-isolating LOTO).  
**OR**  
Involves a handover between parties but **DOES NOT** have **ANY** of the following:  
  - Seven (7) or more isolations points,  
  **OR**  
  - Three (3) or more parties involved,  
  **OR**  
  - Use of a lockbox.  
**OR**  
Isolations performed by two (2) or more occupational streams (i.e. operator and electrical worker). | Where work is reliant on isolation of a scheme or asset controlled by a third party  
Examples:  
- Prolonged work adjacent a privately owned electric fence.  
- Temporarily ceasing an authorised discharge to sewer.  
- Isolation of power to a point of attachment pole by the Supply Authority. |

### 6.1.4 Assign Roles and Responsibilities

**Simple isolation**

The RP is responsible for ensuring that the isolation is conducted and tested in accordance with this procedure and workers use locks and tags correctly.
Complex isolations

Branch / Regional / Alliance Managers must ensure the appointment of approved Authorised Person/Responsible Person/Isolation Control Coordinator for Complex Isolation (Appendix D) is maintained via the Permit Appointments Register (maintained by HR Training).

- This list must be regularly reviewed and readily available, on request.
- The Team Leader is to assign an Authorise Person (AP) from this list for a particular scope of work in consultation with the Operations Manager, or equivalent.

Each independent working party working in a complex isolation must assign a RP; this role must be a site supervisor of the work group conducting the work.

An Isolation Control Coordinator (ICC) must be appointed when two (2) or more APs are involved in Complex Isolations that represent different operational areas.

- The ICC must have conducted a minimum of three (3) complex isolations prior to appointment (Appendix D).

Third Party Isolations

- When work requires isolation of an asset that is controlled by a third party, the RP must negotiate with that party the planned means of isolation, test, tagging and locking.
- The RP must be satisfied that the standard of isolation, test, tag and locking will reduce the risks to As Low As Reasonably Practical (ALARP).
- This may require additional controls as appropriate.
- The RP must record the agreed means of isolation, test, tagging and locking under part A of the Isolation Handover Form (Appendix C) and attach to the Risk Assessment for the reference by the work team.

6.1.5 Planning Meeting

An Isolations Planning Meeting must be conducted for all ‘Complex Isolations’. The meeting is to be convened by:

- The Contract Manager for works under contract; or
- The AP (or the ICC, if appointed) for in-house works (i.e. not under contract).

The AP (or the ICC, if appointed) must ensure:

- Attendance by the Contract Manager, AP, RP as a minimum.
- Relevant matters are discussed and minuted using the template/agenda (Appendix E); and
- The outcomes of the meeting align with the requirements of this Procedure.

6.2 Request Isolation

6.2.1 Simple isolation by Water Corporation or Alliance team with Day to day control

For simple isolations where the work on the isolated plant and the isolation will be carried out by the same Water Corporation or Alliance work team that HAS day-to-day control of the plant, a request for isolation must form part of the Safe Job Planning process.

6.2.2 Simple isolation required by Water Corporation Alliance team or Contractor WITHOUT Day to day control

Contractors or other Water Corporation teams NOT having day-to-day control of the plant may only work on isolated plant with written authorisation from the operations team with day-to-day control of the asset.

- A request to arrange a simple isolation must be made to the relevant Water Corporation business area in charge of the day-to-day operation of the plant using a
Clearance to Work Permit (refer to WC-OSH 023 Clearance to Work on Water Corporation Assets).

- Water Corporation or Alliance work team arranging the isolation must advise once the isolation is in place through issue of the approved Clearance to Work Permit.

**Note:** A Clearance to Work Permit does not provide the written authority required to operate or isolate the Water Corporation’s plant, unless the Clearance to Work specifically states that this has been authorised (under Part 2 section of Permit).

### 6.2.3 Complex Isolation Request

The RP must request an isolation by submitting the Isolation Request Form (Appendix B) to the AP.

- The form must contain enough detail on the scope, timing and duration of the works to enable the AP to assess the isolation request and identify the isolation points required.
- Where required by the AP, attach diagrams or other detail to the form to assist in the assessment.
- The AP must assess the isolation request in consultation with other operations personnel appropriate to the circumstances. This must include obtaining approval form the Operations Manager.
- This may also include further communications (e.g. submitting a Scheme Operations System Change Request Form for access to the Integrated Water Supply Scheme), or confirming the status of simultaneous work and the potential impact on effective isolation of the asset.
- The AP must complete ‘Part B’ of the Isolation Request form to indicate whether the request for isolation has been accepted or declined and return a completed copy to the RP, as early as possible before the noted ‘Required date and time of Isolation’.
- The completed form must be filed in accordance with Section 9 by the Team Leader.
- The RP must retain their copy of the approved form for reference on site during works.

### 6.3 Conducting and testing isolations

The person performing the isolation must conduct or arrange for a test, without exposing the tester or others to risk, to confirm the isolation is effective and all potential energies, including stored energy, have been controlled.

The person who performed and tested the isolation must ensure it is appropriately locked and tagged.

Where an Isolated Tag is fitted (i.e. an isolation on behalf of others), the person conducting the isolation must record the type of test performed on the tag (using the field ‘Tests carried out’).

**Note:** In the event of a test demonstrating that the isolation **HAS NOT** been effective, locks and tags must not be affixed and the work **MUST NOT** proceed.

The person performing the isolation must conduct or arrange for a test, without exposing the tester or others to risk, confirming that the isolation is effective and all stored energies have been dissipated.

In the event of a test demonstrating that the isolation has not been effective, locks and tags **MUST NOT** be affixed and the work **MUST NOT** proceed.

Where an Isolated Tag is fitted (i.e. an isolation on behalf of others), the person conducting the isolation must record the type of test performed on the tag (using the field ‘Tests carried out’).
The person who performed and tested the isolation must ensure it is appropriately locked and tagged. The following table describes the type of tag and lock required at each isolation point.

<table>
<thead>
<tr>
<th>Who is the isolation being performed for?</th>
<th>Type of tag</th>
<th>Type of Lock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>Personal Danger Tag</td>
<td>Personal Danger Lock (Red)</td>
</tr>
<tr>
<td>Work team who is present when the isolation occurs</td>
<td>Personal Danger Tag</td>
<td>Personal Danger Lock (Red).</td>
</tr>
<tr>
<td>Others (no lockbox)</td>
<td>Isolated Tag</td>
<td>Isolated Lock (Orange).</td>
</tr>
<tr>
<td>Others (using lockbox)</td>
<td>Isolated Tag</td>
<td>Lock Box Lock (Green).</td>
</tr>
</tbody>
</table>

When applying an isolated tag:

- Affix a separate Isolated Tag (and Isolated Lock or Lockbox Lock) for each working party at each Isolation Point when the plant is being isolated for more than one party to work on and the parties are working independent of each other.
- Apply a hasp to each isolation point
- Where an Isolated Tag is fitted (i.e. an isolation on behalf of others), the person conducting the isolation must record the type of test performed on the tag (using the field ‘Tests carried out’).

The details of the isolation and tests performed must also be recorded on:

For simple Isolations:
- The JSEA of the party performing work on the isolated equipment.

For complex isolations:
- On Part A of the Isolation handover form. Also include the Isolation Request Form number (recorded in the comments section of the form).

6.3.1 Handover of Complex Isolations

An Isolation Handover Form (Appendix C) is used to document and facilitate a formal hand-over of complex isolations from the AP to the RP prior to commencement of work, and hand-back to the AP once work is complete.

- The Isolation Handover Form:
  - Identifies the individual items of equipment that have been isolated.
  - Records the attachment of Isolated Tags and Tag numbers at each Isolation Point.
  - Records the acceptance of the isolation by the RP.
  - Provides for a formal hand-back when work is completed and all persons are no longer ‘at risk’.

Prior to work commencing, the AP must undertake a formal onsite handover with the RP. During this handover the RP must review the original forms, and inspect the isolations undertaken to the extent necessary that they are satisfied the isolations performed will control the associated hazards identified in the risk assessment for their scope of work.

- The RP must then either:
  - Request further isolation or testing if not satisfied that the isolation will control the risk, or
Accept the Isolation by completing ‘Part B’ of the original Isolation Handover form.

After acceptance of the handover, the RP must manage access to the isolated asset, ensuring ‘at risk’ persons have either fitted their Personal Danger Lock and Tag (PDL/T) to each isolation point, or, when using a lockbox, fitted their PDL/T to the lockbox holding the keys to locks at the isolation points in accordance with Section 6.4.

6.4 Working on isolated plant

6.4.1 Prior to conducting work

The RP must ensure the following documents are available at site throughout the duration of work:

- JSEA (for all isolations).
- Isolation Request form (for complex isolations), and
- Isolation Handover form (for complex isolations).

Changes to the documented and approved scope of work must only occur if the adequacy of the isolation and planning documentation is reviewed and updated as required by the AP (or the RP for simple isolations).

The review must include:

- Documenting the new scope or new work.
- Conducting a risk assessment of the new scope.
- Confirming the adequacy of existing isolations and identifying any new isolation required.
- Determining the impact of the change on existing or planned isolations and operational requirements.

The RP must manage access to the isolated asset, ensuring that each ‘at risk’ person attach their PDL/T to each isolation point / lockbox.

6.4.2 Isolations – multiple shifts

- Where work is not completed before the end of the shift, each person must remove their own PDL/T from each isolation point or lockbox.
- When all PDL/T have been removed an Out Of Service (OOS) Tag must be attached to each isolation point to indicate that the isolation must remain in place even though no workers are presently at risk.
  - The OOS tag must be logged on the Active Tag Register (Refer Section 7.7).
- Prior to the recommencement of work on the isolated asset:
  - Isolation points in unsecured areas should be checked each day to ensure they have not been interfered with.
  - Each person must re-attach their PDL/T to each isolation point or lockbox.

6.4.3 Suspension of work on an isolated asset

The Water Corporation or Alliance responsible for the day-to-day operation of the asset, may suspend work on an isolated asset at any point where it is deemed necessary for operational reasons or to ensure the safety of personnel.

- The AP must be notified of the suspension of work.
- Once notified, the AP must:
Validate that the asset is fit for service.

Where the asset is not fit for service (e.g. Maintenance incomplete) an OOS lock/tag must be attached to EACH isolation point.

Verify that the RP has:
- Withdrawn all personnel from the isolated equipment.
- All PDL/T and or OOS tags/locks (if they have been attached by their work party) removed.
- Returned the lockbox and associated keys (where applicable).
- Completed and returned the Isolation Handover Form (Complex Isolation only), and
- Returned the Clearance to Work Permit to issuing party.

6.5 Completion of work
At the completion of work on an isolated asset the RP must ensure:

- Each person has removed their PDL/T from each isolation point/lockbox and withdrawn from the work area.
- Ensure OOS tags and lock are removed (if they have been attached by their work party)

The RP must then:

- For simple isolations:
  - Notify the person nominated on the isolation tag that work is complete and the isolation can be removed.
  - Where an OOS tag and lock has been fitted notify the person nominated on the tag that the work is complete and the tag maybe removed.
  - Where a lockbox has been used, the RP removes the black RP Lock and returns the lockbox to the issuer (or the person responsible for returning the asset to service).
  - Update the Active Tag register.

- For complex isolations:
  - Where an OOS tag and lock has been fitted notify the person nominated on the tag that the work is complete and the tag maybe removed.
  - Where a lockbox has been used, the RP removes the black RP Lock and returns the lockbox and associated keys to the issuer (or the person responsible for returning the asset to service).
  - Complete ‘Part C’ of the Isolation Handover Form and return the form to the AP.
  - Isolated tags/locks (or lockbox locks if applicable) are removed.
  - Update the Active Tag register.

6.5.1 Removal of lock and tags
The requirements for removing locks are listed in the table below. The person removing the tag must ensure that it is also removed from the Active Tag Register, where applicable.
<table>
<thead>
<tr>
<th>Lock and Tag combination</th>
<th>Who May remove the lock</th>
<th>When is it removed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Lock and Danger Tag</td>
<td>Must only be removed by the person who attached it.</td>
<td>At the end of each shift At the completion of work.</td>
<td>Refer to Section 6.5.2 if the person is not available to remove their personal lock and danger tag.</td>
</tr>
<tr>
<td>Isolated Lock and Tag</td>
<td>The person or team nominated in the &quot;This tag may be removed by&quot; field on the tag. Where practical nominate individuals within the 'This tag may be removed by' field on the tag.</td>
<td>Only after: All other locks and tags have been removed and the person or team has checked the work has been completed and it is safe to reinstate the isolated plant. This may require a walk around the worksite and/or a discussion with the Responsible Person.</td>
<td>Refer to Section 6.5.2 if the person is not available to remove the lock and tag.</td>
</tr>
<tr>
<td>Lockbox Locks and Isolated Tags</td>
<td>The person or team nominated in the &quot;This tag may be removed by&quot; field on the tag. Where practical nominate individuals within the ‘This tag may be removed by’ field on the tag.</td>
<td>After the RP has removed the RP lock from the lock box and returned the lockbox set along with any completed documentation.</td>
<td>Refer to Section 6.5.2 if the person is not available to remove the lock and tag.</td>
</tr>
<tr>
<td>RP Lock (on lockbox)</td>
<td>The RP</td>
<td>Only after all PDL/T have been removed and all personnel have withdrawn from the site.</td>
<td>The RP is to complete any documentation and return the lockbox set to the issuing party</td>
</tr>
<tr>
<td>OOS Tag</td>
<td>The person or team nominated in the “This tag may be removed by” field on the tag. Where practical nominate individuals within the ‘This tag may be removed by’ field on the tag.</td>
<td>On return to work but prior to completion of the job. All PDL/T will need to be re-instated to re-commence work.</td>
<td>Refer to Section 6.5.2 if the person is not available to remove the lock and tag.</td>
</tr>
<tr>
<td>OOS Tag and Lock (only)</td>
<td>The person or team nominated in the “This tag may be removed by” field on the tag. Where practical nominate individuals within the ‘This tag may be removed by’ field on the tag.</td>
<td>Only after the RP (or AP) has ensured the required work has been completed to safely return the system into service.</td>
<td>Refer to Section 6.5.2 if the person is not available to remove the lock and tag.</td>
</tr>
</tbody>
</table>

6.5.2 Removal of a Lock and Tag by someone other than the named party on the Tag

If the person(s) authorised to remove a lock and tag is unavailable the plant must remain isolated until the person is able to return to site and remove the lock and tag.

Where the person is unable to return to site verification and approval process must be followed.
• A Designated Person (DP) must contact the person whom attached the lock and tag to obtain their agreement that the lock and tag can be safely removed.
  o Once this has been agreed, the DP must then authorise the removal of the lock and tag by another person.
  o This must be logged on Sentinel as an incident (evidence of conversation) detailing:
    ▪ Lock and Tag owner contacted (date and time).
    ▪ DP authorising the removal of the lock/tag; and
    ▪ Person authorised to remove lock/tag.

• Where the DP was unable to contact the person whom attached the lock and tag;
  o The DP must arrange an inspection of the plant and subsequently determine, to the satisfaction of the DP, that:
    ▪ the reason for the tag and lock being attached has been addressed, and
    ▪ all required tasks are completed and the plant can be operated safely, and
    ▪ the removal of the tag and lock will not place ANY person at risk.
  o Upon completion, the DP must then authorise the removal of the lock and tag by another person.
  o This must be logged in Sentinel as an incident (evidence of investigation) detailing:
    ▪ Investigation outcomes.
    ▪ DP authorising the removal of the lock/tag; and
    ▪ Person authorised to remove lock/tag.

Where the lock and tag were affixed to plant under the day-to-day control of the Water Corporation or Alliance Contractor, the DP is a Section Leader who directly reports to the relevant Region/Branch/Alliance Manager (e.g. Service Delivery Manager). Where the lock and tag were affixed by an external contractor, the DP must consult the relevant Contractor Representative before authorising the removal of the lock and tag by another person.

Where the lock and tag were affixed to plant under the day-to-day control an external contractor, the DP is the ‘Contractor Representative’ for the contract under which the work is undertaken (or delegated manager).

The functions of the DP must not be delegated to another person (but may be escalated to the Branch Manager or Regional Branch Manager).

7 LOTO Hardware

The Water Corporation’s standard range of isolation hardware is illustrated in the pictorial catalogue.

Isolation points must be locked where compatible isolation hardware is available to the party performing the isolation.

Note: Plugs used in sewer system are not required to be locked where alternative controls are in place (Refer Appendix I). For information on the purchasing of sewer plugs please contact the SEAA Branch.
The isolation hardware must involve a range of five (5) lock types:

a. Personal Danger Lock - coloured red, uniquely keyed (within a set of such locks assigned to the individual).
b. Isolated Lock – coloured orange, keyed alike.
c. Out of Service Lock – coloured yellow, keyed alike.
d. Lockbox lock – green, uniquely keyed set (with keys within that specific set and assigned to one (1) lockbox being keyed alike).
e. RP Lock – coloured black, uniquely keyed (and assigned to one (1) lockbox).

Note: Contractors are required to provide their own isolation hardware in accordance with the Water Corporation's colour and key requirements (i.e. Personal Danger Locks must be coloured red and uniquely keyed to not less than 10,000 keying combinations).

Locks used for applications outside the scope of this procedure (e.g. security locks) must not be coloured red, orange, yellow, green or black.

Four (4) distinctive types of tags are made available by the Water Corporation to identify the status of plant. Only tags approved by the Water Corporation as part of this procedure must be used. The approved tags are:

- Personal Danger Tag.
- Isolated Tag.
- Out of Service Tag.
- Information Tag.

The person affixing the tag must legibly and permanently complete all fields on the tag. Tags must be affixed in a manner whereby the tag can be clearly seen by a person approaching the point to which it is affixed. Where a lock is affixed to an isolation point, the corresponding tag must be attached to the lock (i.e. by inserting the shackle of the lock through the eyelet of the tag).

Where the information recorded on any affixed tag is unclear, clarification must be sought from the person who affixed the tag before affixing any additional tag.

Contractors may obtain the appropriate tags from their contracts manager.

7.1 Personal Danger Lock and Tag

A Personal Danger Lock and Tag must be used by each person who is at risk of injury if an isolation point is operated or energised.

The Personal Danger Lock and Tag must be affixed by each ‘at risk’ person prior to the commencement of work either:

- directly to each isolation point, or
- one (1) lock and tag affixed to a lockbox prior to the commencement of the task.
### 7.2 Isolated Tag and associated Locks

An Isolated Tag/Lock is used to identify that plant has been isolated on behalf of others and is not to be operated (i.e. it is not used when conducting an isolation only for yourself). This includes where equipment must remain “on” or valves (or similar) be kept in the “open” position for safety reasons.

The isolated tag is not required to be fitted where:

- The job involves a Simple Isolation, AND
- The isolation is performed by a member of the work party, AND
- All members of the work party were present when the isolation and test were performed.

The isolated tag is used with either:

- An orange isolated lock where a lockbox will not be used by the work party
- A green lockbox lock when a lockbox will be used by the work party

An Isolated Lock and tag **MUST NOT** be used in any circumstance as a substitute for a Personal Danger tag.

---

<table>
<thead>
<tr>
<th>Isolated Tag (MMR 19910)</th>
<th>Isolated Lock (MMR 21775)</th>
<th>Lockbox Lock (MMR 21782)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour: Orange Background</td>
<td>Colour: Orange</td>
<td>Colour: Green</td>
</tr>
<tr>
<td>Front</td>
<td>Back</td>
<td></td>
</tr>
</tbody>
</table>
When using an isolated lock you must:

- Fit a hasp to the isolation point unless it is known no other locks will be fitted to the isolation point.
- Record the following details on the tag:
  - The contact details of the person performing the isolation.
  - The type of test performed to verify that the isolation was effective (using the field ‘Tests carried out’).
  - For Complex Isolations, record the Isolation Handover Form number on all associated Isolated Tags (using the ‘Dangers, defects and limitations’ section).
  - For work performed under a Clearance to Work (CTW) Permit, record the CTW permit number (using the ‘Dangers, defects and limitations’ section).
- Use a separate Isolated Tag (and Isolated Lock or Lockbox Lock) for each working party, at each isolation point, when the plant is being isolated for more than one party to work on and the parties are working independent of each other.

When applying an isolated tag:

- Apply a hasp to each isolation point (in the event there is more than one (1) party working simultaneously).
- Affix a separate Isolated Tag (and Isolated Lock or Lockbox Lock) for each working party at each Isolation Point when the plant is being isolated for more than one (1) party to work on and the parties are working independent of each other.
- Where an Isolated Tag is fitted (i.e. isolation on behalf of others), the person conducting the isolation must record the type of test performed on the tag (using the field ‘Tests carried out’).

The details of the isolation and tests performed must also be recorded as follows:

For simple Isolations:

- JSEA of the party performing work on the isolated equipment

For complex isolations:

- Part A of the Isolation handover form; and
- Isolation Request Form number (recorded in the comments section of the form)

### 7.3 Out of Service Lock and Tag

The Out of Service tag/lock is affixed at isolation points or control points when the plant or equipment is not to be operated.

For example:

- Equipment is faulty and would be dangerous to use.
- Work is suspended and operating the equipment could cause damage or flooding.

Plant or equipment must not be operated or energised when it is fitted with an Out of Service tag (other than for fault finding or testing by a competent person authorised to carry out repairs).

An OOS tag affixed to plant denotes the plant is not to be operated or energised but does not necessarily mean the plant has been isolated.

For all instances where an OOS tag is affixed to protect people a yellow OOS lock must also be fitted. *NB: An OOS Tag is NOT to be used as a PDL/T.*
In all other cases the use of the lock is discretionary.
The OOS Lock is not required where the tag is affixed to an item that is not an isolation point (e.g. where affixed to a faulty chair).

<table>
<thead>
<tr>
<th>Out of Service Tag (MMR 7997)</th>
<th>Out of Service Lock (MMR 21839)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour: Yellow background</td>
<td>Colour: Yellow</td>
</tr>
</tbody>
</table>

"Don’t touch, for any other reason (e.g. The equipment is faulty or work is suspended)."

Where an OOS Tag has been affixed to Water Corporation infrastructure and will remain in place for more than one (1) shift, the person affixing the tag must register it on the appropriate Active Tag Register in accordance with Section 7.7.

7.4 Information Tag

The Information Tag is used to provide information of a nature where it is NOT the intent of the tag to prevent operation of the plant or equipment.

<table>
<thead>
<tr>
<th>Information Tag (MMR 20683)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour: Blue on White background</td>
</tr>
</tbody>
</table>

“"I’m not saying don’t touch, I’m saying something else””

Information tags convey a message of a temporary nature, and typically should not be in place longer than one (1) month. Depending on the nature of the information to be conveyed, tags may be applied to the plant itself or its point of isolation or control.

Details of Information Tags are not required to be recorded on an Active Tag Register.
7.5 Lockbox

A lockbox set consists of a lockbox, a dedicated set of uniquely keyed green lockbox locks (keyed alike within that specific set), and a uniquely keyed black RP Lock.

<table>
<thead>
<tr>
<th>Lockbox (MMR 21781)</th>
<th>RP Lock for lockbox (MMR 21783)</th>
<th>Lockbox Lock (MMR 21782)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour: Red</td>
<td>Colour: Black</td>
<td>Colour: Green</td>
</tr>
</tbody>
</table>

Note: The RP lock is assigned to the lockbox, and is not a permanent issue to persons who may function as a RP.

Note: Lockbox set (MMR 21838) includes – 1 x lockbox, set of 10 x green locks, 1 x black RP Lock

A lockbox must be used where it is determined it is not practicable for each ‘at risk’ person to affix their own PDL/T directly to all isolation points (and remove/reinstate these as each day finishes or starts).

The use of a lockbox process is as follows:

- Isolations are conducted, fitting a green lockbox lock with an Isolated Tag at each isolation point.

- A handover occurs between the person isolating or AP to the RP.
  - The key to the set of green lockbox locks is placed in the lockbox (including any spares).
  - The Lockbox is held by the RP for the duration of the work at the job/task location.
  - The RP ensures documentation is held with the lockbox that lists the isolation point (e.g. JSEA, or Isolation Handover Form).

- The RP affixes the black RP Lockbox Lock to the lockbox, with an OOS Tag attached.
  - The black RP lock and OOS tag remains on the lockbox for the duration of the work, which may span multiple days.

- Each ‘at risk person’ fits their one (1) PDL/T to the lockbox prior to commencing work.
  - Each person’s PDL/T is removed at the end of their day (or earlier). (Note: overnight, the black RP Lock and OOS tag remains on the lockbox).

- Isolation points in areas accessible to the public should be checked each day to ensure they have not been interfered with.

When work is finished, all PDL/T are removed from the lockbox. When the RP is satisfied that the team has finished and withdrawn the RP will remove their black RP lock from the lockbox (this will
be the last lock removed from the lockbox), and complete any documentation required (e.g. Section C of the hand over form).

The green lockbox locks are then removed from isolation points by a person authorised on the Isolated Tag for their removal. The lockbox lock and responsible person lock is returned to the lockbox and the complete lockbox set is stored for future use.

7.6 Where compatible hardware is NOT available

- Alternative controls to demonstrate risks have been managed to ALARP must be identified and accepted by the RP before the work can proceed. This must be recorded on Safe Job Planning documents.

- In the case of Water Corporation personnel, the person conducting the isolation must enter a hazard report into Sentinel (except below ground valve spindles) to ensure a lockout capability is achieved for future work. This report is to be actioned by:
  - The Line Manager if the necessary hardware is already included in the pictorial catalogue
  - Senior OSH Advisor - Critical Risk if the necessary hardware is NOT in the pictorial catalogue.

**Note:** Lockout devices are not available for all below ground valve spindles. A Sentinel report is not required for these. Lock out solutions are currently being investigated to rectify this issue.

7.7 Active Tag Register

Where Isolated or OOS tags are affixed and will be active for more than one (1) shift, the tag details must be logged on an Active Tag Register. This must involve using the Operations Centre Active Tag Register service (or equivalent registers in the case of Aroona Alliance treatment facilities).

The person who affixed the tag must arrange for tag details to be logged on the Active Tag Register. The person who removes the tag must arrange for the status of the tag to be updated on the register. This process applies equally to contractors. Contractors can contact the operations centre for updating the tag register by phone (phone number can be provided by the Water Corporation /Alliance contract manager).

Each Active Tag Register must have a custodian who provides a two-monthly report of logged active tags to the Operations Manager (or equivalent in Alliances). The Operations Manager must review this report and:

- Identify tagged equipment that can be returned to service or tags that are no longer required.
- Arrange for these tags to be removed in accordance with section 6.5.1 and 6.5.2 and the register updated.

8 Self-Assessment

A LOTO - Self Assessment form is available to help business areas evaluate their current compliance with key requirements of this procedure. Completed forms must be retained in accordance with Section 9.
9 Records

Contractor records associated with tagging and isolation must be available for the duration of the task and then stored in an easily retrievable manner.

Water Corporation records must be available for the duration of the task and then filed in accordance with the Water Corporation Records Retention and Disposal Schedule, with the filing convention, retention period and disposition type outlined below:

<table>
<thead>
<tr>
<th>Record</th>
<th>To be retained by</th>
<th>Filing convention</th>
<th>Retained for (time period)</th>
<th>Disposition Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Tag Register</td>
<td>Operations Centre</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Alliance Manager</td>
<td>INFORMATION MANAGEMENT – Control – Registers and Registration</td>
<td>Interim 2 years after last action</td>
<td>Destroy 7 years after last action</td>
</tr>
<tr>
<td>Clearance to Work (CTW) Permits</td>
<td>Section Manager of the relevant Authorised Person / Work Area</td>
<td>OSH – Risk Management – Work Permits</td>
<td>Interim 2 years after last action</td>
<td>Destroy 7 years after last action</td>
</tr>
<tr>
<td>Fluid System Isolation Plan</td>
<td>Section manager of the relevant Authorised Person / work area</td>
<td>OSH – Planning – Fluid System Isolation</td>
<td>Interim 2 years after last action</td>
<td>Destroy 10 years after last action</td>
</tr>
<tr>
<td>Approved LOTO Complex Isolation Nomination Form</td>
<td>HR Training</td>
<td>STAFF DEVELOPMENT – Training</td>
<td>Interim 2 years after last action</td>
<td>Destroy 7 years after last action</td>
</tr>
<tr>
<td>Completed Isolation Planning Meeting Template</td>
<td>Section manager of the relevant Authorised Person / work area</td>
<td>OSH – Risk Management – Work Permits</td>
<td>Interim 2 years after last action</td>
<td>Destroy 7 years after last action</td>
</tr>
<tr>
<td>Isolation Control Documents</td>
<td>Section manager of the relevant Authorised Person / work area</td>
<td>OSH – Risk Management – Work Permits</td>
<td>Interim 2 years after last action</td>
<td>Destroy 7 years after last action</td>
</tr>
<tr>
<td>• Isolation Request Form</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Isolation Handover Form</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOTO – Self Assessment form</td>
<td>Section manager of the relevant work area</td>
<td>OSH – Compliance – Self Assessment – [Region – District]</td>
<td>Interim 2 years after last action</td>
<td>Destroy 10 years after last action</td>
</tr>
<tr>
<td>Training and competency records</td>
<td>SAP</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Branch Manager</td>
<td>STAFF DEVELOPMENT – Training</td>
<td>Interim 2 years after last action</td>
<td>Destroy 7 years after last action</td>
</tr>
</tbody>
</table>
### 10 Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Tag Register</td>
<td>This register is used to record the details of Isolated or Out of Service tags that are active for more than one shift.</td>
</tr>
<tr>
<td>Air Gap</td>
<td>A deliberate physical break in a circuit or system that has been created by the disconnection or removal of plant components or equipment. Examples are removal of electrical wiring, fuses, de-contacts, plugs and sockets, piping or valves or the operation of a rated electrical isolating switch, but not the operation of a valve.</td>
</tr>
<tr>
<td>At risk persons</td>
<td>Persons working on plant or equipment who may be exposed to a potential uncontrolled release of energy if an isolation were not conducted or if an in place isolation was to fail or be tampered with.</td>
</tr>
<tr>
<td>Authorised Person (AP)</td>
<td>A person who is competent to identify potential hazards, risks and control measures for the work to be performed. The ‘Authorised Person’ is the person in charge of the day-to-day operation of a Water Corporation asset, or their delegate. The ‘Authorised Person’ can be an employee of an Alliance Contractor, if the Alliance Contractor has day-to-day control of the asset.</td>
</tr>
<tr>
<td>Barrier</td>
<td>An item of equipment installed such that it forms a complete physical obstruction to the flow of energy within a circuit or system.</td>
</tr>
<tr>
<td>Break</td>
<td>The same as Air Gap.</td>
</tr>
<tr>
<td>Competent Person</td>
<td>A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform a specified task correctly.</td>
</tr>
<tr>
<td>Complex isolation</td>
<td>Refer to section 6.1.3</td>
</tr>
<tr>
<td>Contractor</td>
<td>An individual, company or organisation engaged under a contract with the Water Corporation to perform work or supply goods or services in connection with the Water Corporation.</td>
</tr>
<tr>
<td>Control Point</td>
<td>A physical location designated by the Responsible Person where Isolation Control Documentation is kept for the duration of the work being carried out. Examples are: Isolation Hand-over Form, Isolation Control Form, Confined Space Entry Permit and all associated attachments.</td>
</tr>
<tr>
<td>Controlled Access Cabinet</td>
<td>A cabinet or cubicle that has access restricted by means of a locking device. Access to keys for the locking device must be restricted to personnel authorised by the Water Corporation.</td>
</tr>
<tr>
<td>Designated Person</td>
<td>A management representative who would authorise the removal of another person’s Lock and Tag in accordance with Section 6.5.2.</td>
</tr>
<tr>
<td>Double ‘D’ Plug</td>
<td>A plug with three (3) metal plates with layers of a compressible membrane in-between. A bolt that runs through the plug can be tightened, compressing the membrane against the pipe and creating a tight seal.</td>
</tr>
<tr>
<td>Employees</td>
<td>A person who is conducting work covered by the Enterprise Agreement or an individual common law contract with the Water Corporation or Alliance, or who meets the definition of an employee under the <em>Fair Work Act 2009</em>.</td>
</tr>
<tr>
<td></td>
<td>This includes:</td>
</tr>
<tr>
<td></td>
<td>• Consultants or contractors working within water corporation business units or regions.</td>
</tr>
<tr>
<td></td>
<td>• Alliance personnel performing the services under an alliance contract.</td>
</tr>
<tr>
<td>Energised</td>
<td>The presence, or restoration, of energy to the plant, equipment or apparatus. Types of energy include, but are not restricted to, electrical, potential, kinetic, thermal and chemical.</td>
</tr>
<tr>
<td>Extra Low Voltage (ELV)</td>
<td>Not exceeding 50 volt AC or 120 Volt ripple free DC (refer AS 3000).</td>
</tr>
<tr>
<td>Fluid system</td>
<td>A fluid system is one in which a liquid material flows from one point to another; this may include a looped system where the liquid recirculates. This does not include a sewer scheme.</td>
</tr>
<tr>
<td>Flumed plug</td>
<td>A plug that enables ongoing flow by an attached hose, thereby preventing the build-up of flow behind the plug.</td>
</tr>
<tr>
<td>Geographically Distributed Isolations</td>
<td>A grouping of isolation points that are remote from the plant to be worked on.</td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
</tr>
<tr>
<td></td>
<td>• Pipeline section five (5) kilometres in length with multiple valves located within or outside metropolitan areas.</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hazardous Plant</td>
<td>Plant and or equipment with a potential for uncontrolled release of energy.</td>
</tr>
<tr>
<td>High Voltage (HV)</td>
<td>Above 1000 volt AC or 1500 volt DC (refer AS 3000).</td>
</tr>
<tr>
<td>Inflatable Plug</td>
<td>A plug made of polyethylene or rubber compounds that rely on internal pressure exerted by compressed air to expand the plug and hold it in place</td>
</tr>
<tr>
<td>Information Tag</td>
<td>An approved Water Corporation tag that is used to provide information of an operations nature, where it is not the intent of the tag to prevent operation of plant.</td>
</tr>
<tr>
<td>Isolated</td>
<td>The state of plant, or in the case of electrical or pressure services, where all potential hazards and energy sources have been disconnected, de-energised, released, isolated and checked to control inadvertent operation, ensuring that work can be carried out in a safe manner. Rendered incapable of being operated without premeditated and deliberate manual operation.</td>
</tr>
<tr>
<td>IL</td>
<td>Isolated Lock</td>
</tr>
<tr>
<td>Isolated Tag</td>
<td>An approved Water Corporation tag that is used to identify that plant has been isolated on behalf of others and is not to be operated</td>
</tr>
<tr>
<td>Isolations Control Coordinator (ICC)</td>
<td>A competent person appointed (where necessary) to mentor, coach, and oversee the functions of the Authorised Person(s) and Responsible Person(s) in Complex Isolations.</td>
</tr>
<tr>
<td>Isolation Point</td>
<td>A position where there is an interruption in the circuit or system which intentionally prevents the uncontrolled release of energy.</td>
</tr>
<tr>
<td>Lockout</td>
<td>The utilisation of a locking device for the purpose of Isolating that positively prevents a change in state of the device.</td>
</tr>
<tr>
<td>LOTO</td>
<td>Lock out Tag out</td>
</tr>
<tr>
<td>Low Voltage (LV)</td>
<td>Exceeding extra low voltage, but not exceeding 1000 volt AC or 1500 volt DC.</td>
</tr>
<tr>
<td>Main sewer</td>
<td>Sewer pipes equal to or greater than 300mm in diameter</td>
</tr>
<tr>
<td>OOSL</td>
<td>Out of Service Lock</td>
</tr>
<tr>
<td>Out Of Service Tag</td>
<td>An approved Water Corporation tag that is used to indicate that the plant must not be operated or energised, in circumstances other than those requiring the use of a Personal Danger Tag or Isolated Tag.</td>
</tr>
<tr>
<td>PDL</td>
<td>Personal Danger Lock</td>
</tr>
<tr>
<td>Personal Danger Tag</td>
<td>An approved Water Corporation tag that is used where there is a risk of injury to the person affixing the tag in the event that the isolation point (to which the tag is affixed) is operated or energised.</td>
</tr>
<tr>
<td>Plant</td>
<td>Plant includes all machinery, equipment and systems, components of such systems or any other asset requiring isolation, e.g. mechanical, electrical, pneumatic or hydraulic operated pumps, valves, motors, actuators, switch gear or pipe systems.</td>
</tr>
<tr>
<td>Pochadyla Plug</td>
<td>A cone shaped plug that due to its shape is self-reinforcing and can withstand a high level of back pressure. A release valve (flap) allows for holding waste to be released before removal.</td>
</tr>
<tr>
<td>Pulling frame</td>
<td>A frame attached to a ‘D’ plug or double ‘D’ plug, which allows the plug to be removed from the surface by an attached rope. When inserted in the direction of flow, the pulling frame also acts as a brace to prevent the plug being pushed under pressure into the pipe.</td>
</tr>
<tr>
<td>Responsible Person (RP)</td>
<td>Supervisor of workers undertaking the work. Authorised, qualified, trained and competent person for the on-site aspects of the work to be undertaken. The Responsible Person must identify and control hazards/risks arising from the work itself.</td>
</tr>
<tr>
<td>Reticulation Sewer</td>
<td>Sewer pipe less than 300mm in diameter</td>
</tr>
<tr>
<td>Must</td>
<td>The words ‘must’ is to be understood as mandatory, non-negotiable requirement that is to be followed. There will be no deviation from this requirement</td>
</tr>
<tr>
<td>Simple Isolation</td>
<td>Refer to section 6.1.3</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Shift</td>
<td>A single continuous work period encompassing normal working hours and any approved additional overtime work hours forming a continuous work period.</td>
</tr>
<tr>
<td>Should</td>
<td>The word ‘should’ is to be understood as recommended but non-mandatory. Deviation from the requirement is permissible provided there is a sound and valid reason for it. ‘Should’ allow the reader to make a judgement and decide whether or not to follow the recommendation.</td>
</tr>
<tr>
<td>Switch</td>
<td>Also known as a “circuit isolation switch”, a device that provides full current electrical isolation and includes circuit breakers, isolators, and disconnectors.</td>
</tr>
<tr>
<td>Switch; Control</td>
<td>Selector Is a switch capable of selecting the “mode” or “required status” of the control wiring in an electrical circuit. It is NOT part of main current path of the electrical circuit, and therefore does NOT provide full current electrical isolation.</td>
</tr>
<tr>
<td>Tankering</td>
<td>Removal of wastewater from an upstream chamber by a tanker, reducing the head pressure behind the isolation device and/or avoiding an overflow.</td>
</tr>
<tr>
<td>Tested</td>
<td>The completion of a test process by a competent person, to prove or disprove the presence of the energy source/hazard, using an instrument or method suited to the purpose.</td>
</tr>
<tr>
<td>Third Party</td>
<td>A third party is defined as any entity that is not the Water Corporation or Alliance party or any contractor(s) working on behalf of the Water Corporation or its Alliances.</td>
</tr>
<tr>
<td>Voltage</td>
<td>A difference of potential normally existing between conductors and between conductors and earth as defined in AS/NZS 3000.</td>
</tr>
<tr>
<td></td>
<td>• ‘Extra-low voltage’ not exceeding 50 V AC or 120 V ripple free DC.</td>
</tr>
<tr>
<td></td>
<td>• ‘Low voltage’ exceeding extra low voltage, but not exceeding 1000 V Ac. Or 1500 V DC.</td>
</tr>
<tr>
<td></td>
<td>• ‘High voltage’ exceeding low voltage.</td>
</tr>
<tr>
<td>Worker</td>
<td>A person who carries out work in any capacity for or on behalf of the Water Corporation. A worker agrees to perform work at Water Corporation’s direction, instruction or request (whether express, implied, oral or in writing). These includes employees, contractor, subcontractors, employees of contractors and subcontractors, labour hire employees, apprentice and trainees, work experience student, outsider, or volunteer.</td>
</tr>
</tbody>
</table>

11 References

11.1 Referenced policies, standards, procedures, and work instructions

<table>
<thead>
<tr>
<th>Document Number</th>
<th>Title</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC-OSH 023</td>
<td>Clearance to Work Procedure</td>
<td>SEAA MS</td>
</tr>
<tr>
<td>WC-OSH 007</td>
<td>Safe Job Planning</td>
<td>SEAA MS</td>
</tr>
<tr>
<td></td>
<td>HSE Handbook for Contractors</td>
<td>SEAA MS</td>
</tr>
<tr>
<td>WC-OSH 118</td>
<td>High Voltage Switching Practice (ME2) (#365378)</td>
<td>SEAA MS</td>
</tr>
</tbody>
</table>

11.2 Supporting documents, templates and forms

<table>
<thead>
<tr>
<th>Document Number</th>
<th>Title</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active Tag Register</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td>(waternet.watercorporation.com.au/applications/tagregister/)</td>
<td></td>
</tr>
<tr>
<td>HSEAA-F-157</td>
<td>Isolation request Form</td>
<td>App, SEAA MS</td>
</tr>
<tr>
<td>HSEAA-F-156</td>
<td>Isolation handover Form</td>
<td>App, SEAA MS</td>
</tr>
</tbody>
</table>
## 12 Compliance Mapping

<table>
<thead>
<tr>
<th>Task</th>
<th>Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lock Out and Tag Out</td>
<td>Occupational Safety and Health Act 1984</td>
</tr>
<tr>
<td></td>
<td>Environmental Protection Act 1986</td>
</tr>
<tr>
<td></td>
<td>Electricity Act 1945</td>
</tr>
<tr>
<td></td>
<td>Occupational Safety and Health Regulations 1996</td>
</tr>
<tr>
<td></td>
<td>Electrical (Licensing) Regulations 1991</td>
</tr>
<tr>
<td></td>
<td>Electricity Regulations 1947</td>
</tr>
<tr>
<td></td>
<td>Code of Practice: Safeguarding of Machinery and plant</td>
</tr>
<tr>
<td></td>
<td>Code of Practice: Safe Low Voltage Work Practices by Electricians</td>
</tr>
<tr>
<td></td>
<td>AS 1319 Signs for the Occupational Environment</td>
</tr>
<tr>
<td></td>
<td>AS/NZS 3000 – Wiring Rules</td>
</tr>
<tr>
<td></td>
<td>AS 3012 Electrical Installations – Construction and demolition sites</td>
</tr>
<tr>
<td></td>
<td>AS 3017 Electrical Installations – Verification Guidelines</td>
</tr>
<tr>
<td></td>
<td>AS 4024.1 Safety of machinery</td>
</tr>
</tbody>
</table>

## 13 Document Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 Nov 2015</td>
<td>The following documents were corrupt:</td>
</tr>
<tr>
<td></td>
<td>• Tagging and Isolation – Task Specific Instruction Record – Short-term Contractors form</td>
</tr>
<tr>
<td></td>
<td>• Complex Isolation – Planning Meeting – Sample Agenda</td>
</tr>
<tr>
<td></td>
<td>New documents created and linked into this document.</td>
</tr>
<tr>
<td>23 Dec 2015</td>
<td>Amended section 7.2.1 – changed dot points to letters to correlate with table in this section.</td>
</tr>
<tr>
<td>20 Dec 2016</td>
<td>Lock Out process and lockout range of hardware introduced, including new training package, S407 Sewer Isolation Devices Standard incorporated into this Procedure. Refer to MOC #14878937</td>
</tr>
</tbody>
</table>

To provide feedback about this procedure, please email the SEAAB Management System Team on SEAABManagementSystems@watercorporation.com.au or visit the SEAAB WaterNet.
Appendix A  Lock out and Tag out – Quick Reference Sheet

Steps for COMPLEX Isolations only

1. Work planning determines if an Isolation is required
2. Define scope of work
3. Conduct a risk assessment
4. Determine type of isolation
   - Complex

Steps for SIMPLE AND COMPLEX Isolations

5. Request Isolation Form from the party in control of the asset
6. Is the request from the party in day to day control of the asset?
   - YES
   - NO

Steps for SIMPLE Isolations only

7. Is the isolation to be performed by a party in control of the asset?
   - YES
   - NO

PLANING

- Authorised Person is
  - Responsible Person appointed where required. (Sec 6.1.4)
  - Isolations Control Coordinator appointed (Sec 6.1.5)
- Isolation Request Form
  - Responsible Person completes Part A & sends to Authorised Person (Sec 6.2.2, App E)
  - Authorised Person validates as required to confirm isolation requirements. (Sec 6.2.3)
  - Isolation request accepted?
    - YES
    - NO

- Requested Person arranges isolation, test, and tags and locks. (Sec 6.3, Appendix J, K, L)
- Isolation Handover Form
  - Authorised Person arranges isolations & records on isolation handover form.
  - Provides to Reasonable Person at on-site handover (Sec 6.4.3)

ISOLATE

- Responsible person determines if Personal Danger Locks and Tags are affected to each isolation point by all personnel working on isolated plant. (Sec 6.4.1)

LOCKOUT TAGOUT

- Isolation Handover Form
  - Responsible Person signs-off at completion of works and hands form back to Authorised Person. (Sec 6.4.4)
  - Complete

- Each person to remove Personal Danger locks and tags when no longer at risk (Sec 6.4.5)
  - Complete

- Each at risk person affixes their Personal Danger lock and tag to a lockbox. The lock box holds the keys to locks on isolation points. (Refer Note 2)

- At the start of the next shift each PDU and Tag is to be revalidated
### Personal Danger Lock and Tag (PDLT)

**Personal Danger Tag (MMR 7998)**  
Colour: Red and Black on White  

**Personal Danger Lock (MMR 21774)**  
Colour: Red

**Purpose**  
Use to indicate that there is a risk of injury to the person affixing the tag in the event that an isolation point is operated or energised, or the keys within the lock box are accessed.

**Who applies?**  
Each at risk person must affix their own PDLT.

**When and where is it applied?**  
Prior to starting work on an isolated asset.  
Applied either directly to each isolation point, or one (1) PDLT (per person) to a lockbox.

**Who removes?**  
The person who affixed the lock and tag.

**When is it removed?**  
When the persons work on the isolated asset is completed, or at the end of their shift, whichever is sooner.

### Isolated Lock and Tag

**Isolated Tag (MMR 19910)**  
Colour: Orange Background  

**Isolated Lock (MMR 21775)**  
Colour: Orange

**Purpose**  
Use to identify that plant has been isolated on behalf of others and is not to be operated.

**Who applies?**  
The person conducting the isolation.

**When and where is it applied?**  
When plant is isolated.  
Applied to each isolation point.

**Who removes?**  
The person nominated (individual or team) in the “this tag may be removed by” field on the tag.

**When is it removed?**  
When work on the isolated asset is completed and all other associated tags and locks have been removed.

### Out of Service Tag and Lock

**Out of Service Tag (MMR 7997)**  
Colour: Yellow Background  

**Out of Service Lock (MMR 21839)**  
Colour: Yellow

**Purpose**  
Use to indicate that plant or equipment must not be used, operated or energised, in circumstances other than those requiring the use of a Personal Danger Lock and Tag or Isolated Lock and Tag.  
For example:  
- Equipment is faulty and would be dangerous to use.  
- Work is suspended and operating the equipment could cause damage or flooding.

**Who applies?**  
Any person may apply an Out of Service tag to any equipment which they believe may cause harm or damage if operated.

**When and where is it applied?**  
To out of service, faulty or unsafe equipment to warn persons of the potential to cause harm or further damage to equipment.  
Applied to isolation points (or control points, or access points where the plant or equipment is not isolated).

**Who removes?**  
The person nominated in the “this tag may be removed by” field.

**When is it removed?**  
When the reason for affixing the tag no longer applies (e.g. after repair).
## Approved Locks and Tags

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lockbox (MMR 21781) Colour: Red</td>
<td>A lockbox must be used where it is determined it is not practicable for each ‘at risk’ person to affix their own PDL/T directly to all isolation points (and remove/reinstate these as each day finishes or starts).</td>
<td>Use where it is determined it is not practicable for each ‘at risk’ person to affix their own Personal Danger lock and Personal Danger tag directly to all isolation points (and remove/reinstate these as each day finishes or starts).</td>
<td>Green lockbox locks and Isolated tag are applied to each isolation point. The lockbox lock keys are deposited in the lockbox. Each ‘at risk’ person fits their PDL/T to the lockbox prior to commencing work. A RP lock secures the lockbox for the duration of the work, which may span multiple days Each person’s PDL/T are removed at the end of their day (or earlier if leaving worksite). (NB overnight, the RP Lock remains on the lockbox).</td>
<td>The person conducting the isolation.</td>
<td>The RP</td>
<td>After the work is completed or suspended and the RP is satisfied that the team has withdrawn from the workplace and equipment is deemed safe to be returned to service.</td>
<td>The person nominated (individual or team) in the “this tag may be removed by” field on the isolated tag. (NB: Only after the RP lock has been removed.</td>
<td>The person who placed it or their Supervisor.</td>
<td>Once the need for the information is no longer required.</td>
</tr>
</tbody>
</table>

### Information Tag

<table>
<thead>
<tr>
<th>Information Tag (MMR 20683) Colour: Blue on White background</th>
<th>Purpose</th>
<th>Who applies?</th>
<th>When is it applied?</th>
<th>Who removes?</th>
<th>When is it removed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use to provide information of a nature where it is not the intent of the tag to prevent operation of plant or equipment.</td>
<td>Anyone</td>
<td>Anytime there is a need to relay any kind of information.</td>
<td>The person who placed it or their Supervisor.</td>
<td>Once the need for the information is no longer required.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B  Isolation Request Form

Form is available via Procurement, Product Code: #87201748.
Appendix C  Isolation Handover Form

Form is available via Procurement, Product Code: # 87201751
Appendix D  **LOTO Complex Isolation Position Nomination Form**

**Section 1. Nomination:** To be completed by the person making the nomination (i.e. Operations Manager or similar)

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Date</th>
</tr>
</thead>
</table>

Details of the person being nominated

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
</table>

**Isolation role to be performed:**
- [ ] Responsible Person
- [ ] Authorised Person
- [ ] Isolations Control Coordinator

**Region/Branch/Alliance (or contract) this applies to:**

**Section 2. Training Requirements:** Verify that the person who has been nominated has completed the required training.

<table>
<thead>
<tr>
<th>Role</th>
<th>Training Requirements</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Person</td>
<td>☐ LOTO 1 (SAP Q#15326)</td>
<td>(include date when the course was completed, attach evidence where required)</td>
</tr>
<tr>
<td>Authorised Person</td>
<td>☐ LOTO 1 (SAP Q#15326)</td>
<td>☐ LOTO 2 (SAP Q#15327)</td>
</tr>
<tr>
<td></td>
<td>☐ LOTO 3 (SAP Q#15328)</td>
<td>☐ OSH Permits (SAP Q#12326)</td>
</tr>
<tr>
<td>Isolations Control Coordinator</td>
<td>☐ LOTO 1 (SAP Q#15326)</td>
<td>☐ LOTO 2 (SAP Q#15327)</td>
</tr>
<tr>
<td></td>
<td>☐ LOTO 3 (SAP Q#15328)</td>
<td>☐ OSH Permits (SAP Q#12326)</td>
</tr>
<tr>
<td></td>
<td>☐ Acted as an Authorised Person for a minimum of three complex isolations (attach evidence)</td>
<td></td>
</tr>
</tbody>
</table>

**Section 3. Approval**

- [ ] Accepted
- [ ] Accepted with comments
- [ ] Rejected

Approver No. 1 (Service Delivery Manager or Contractor’s Representative)
Name: 
Position: 
Signature: 
Date: 

Comments or reason for rejection

- [ ] Accepted
- [ ] Accepted with comments
- [ ] Rejected

Approver No. 2 (HR Training or Contractor’s Training Administrator)
Name: 
Position: 
Signature: 
Date: 

Comments or reason for rejection

**Note:** Once completed, *Water Corporation’s employees and Alliance* must scan and email to HR training (Training@watercorporation.com.au) for inclusion in the register.

*Contractors* must scan and email the form to the appropriate Contracts Manager.
### Appendix E  Complex Isolation – Planning Meeting – Agenda Template

**Meeting date:**

**Description of job/works:**

<table>
<thead>
<tr>
<th>Attendees</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Responsible Person</td>
<td>☐ Authorised Person</td>
</tr>
<tr>
<td>Name:</td>
<td>Name:</td>
</tr>
<tr>
<td>☐ Contract Manager</td>
<td>☐ Isolation Control Coordinator (where applicable)</td>
</tr>
<tr>
<td>Name:</td>
<td>Name:</td>
</tr>
</tbody>
</table>

| Other key roles:                                                        |  |

<table>
<thead>
<tr>
<th>Item of discussion</th>
<th>Comment/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Planning</strong></td>
<td></td>
</tr>
<tr>
<td>Scope of Works</td>
<td>Confirm scope of works, listing plant and systems that require isolation.</td>
</tr>
<tr>
<td></td>
<td>Ensure energy sources to be isolated have been identified.</td>
</tr>
<tr>
<td></td>
<td>Determine the time/date/duration that access to plant and/or system is required.</td>
</tr>
<tr>
<td><strong>Risk Assessment</strong></td>
<td>Confirm risk assessment (Safe Job Planning) has been conducted.</td>
</tr>
<tr>
<td></td>
<td>Ensure controls are in place to manage the identified risks.</td>
</tr>
<tr>
<td></td>
<td>Communicate to everyone who is involved in the isolation.</td>
</tr>
<tr>
<td><strong>Roles and Responsibilities</strong></td>
<td>Confirm that roles are clarified and defined, including deputy where required.</td>
</tr>
<tr>
<td></td>
<td>Ensure responsibilities associated with each role are understood.</td>
</tr>
<tr>
<td><strong>Training and Competency</strong></td>
<td>Confirm that all parties and/or personnel hold the required training and qualifications depending on their role in the Isolation process. Otherwise, arrangements must be made to ensure competency of all personnel prior to conducting the isolation.</td>
</tr>
<tr>
<td><strong>Hardware</strong></td>
<td>Lockbox will be used</td>
</tr>
<tr>
<td></td>
<td>☐ YES</td>
</tr>
<tr>
<td></td>
<td>☐ NO</td>
</tr>
<tr>
<td></td>
<td>Confirm whether or not a lockbox will be used.</td>
</tr>
<tr>
<td></td>
<td>Depending on the duration of the works, confirm whether or not there is a need to have an Active Tag Register.</td>
</tr>
<tr>
<td>Requesting the Isolation</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Notification</strong></td>
<td></td>
</tr>
<tr>
<td>Ensure that the Asset Manager/Operations Manager or delegate is aware of the required isolation.</td>
<td></td>
</tr>
<tr>
<td><strong>Authorisation</strong></td>
<td></td>
</tr>
<tr>
<td>An Isolation Request Form must be completed to request the isolation</td>
<td></td>
</tr>
<tr>
<td>Confirm if a Clearance to Work Permit is also required.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conducting the isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Methodology</strong></td>
</tr>
<tr>
<td>Confirm Standard of isolations proposed (e.g. single, double) and isolation points proposed (if known at this stage)</td>
</tr>
<tr>
<td><strong>LOTO</strong></td>
</tr>
<tr>
<td>If it is anticipated an isolation point cannot be locked, the Responsible Person must agree alternative means of securing the isolation</td>
</tr>
<tr>
<td><strong>Management Process</strong></td>
</tr>
<tr>
<td>Confirm proposed management process (if isolations will involve multiple operations groups, or if isolations are for access by multiple independent parties)</td>
</tr>
<tr>
<td><strong>Contingency</strong></td>
</tr>
<tr>
<td>Confirm that there is a Contingency Plan in case of changes in the scope of works, roles and responsibilities, duration or other significant matter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Further Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure all matters relevant to meet and achieve the outcomes of the LOTO Procedure have been discussed.</td>
</tr>
</tbody>
</table>
Appendix F  Clearance to Work Permit

CLEARANCE TO WORK PERMIT

NOTE

1. REQUEST FOR CLEARANCE TO WORK. (To be completed by Contractor Supervisor)
   Name of Contractor Completing Work: __________________________ Date Submitted: __________
   Physical Location of Works: ____________________________________
   Title of Works: ______________________________________________
   Scope of works for this Permit: _________________________________
   Duration of work: Start date: __________ Finish date: __________ Days of work: ______
   Start time: __________ Finish time: __________ Hours of work: ______
   Revised dates: Revised finish date: __________ Authorised Person: __________________________ Date: __________
   Revised finish time: __________________ Signature: __________ Date: __________

THE FOLLOWING DOCUMENT(S) HAVE BEEN ATTACHED (Refer Procedure)

   □ Description of Works* □ Other: ____________________________

CONTRACTOR SUPERVISOR PERSON RESPONSIBLE FOR SUPERVISING WORKS FOR THE DURATION OF THIS PERMIT
   Name: __________________ Contact Number: __________________ E-mail: __________________
   I have completed water Corporation OSH Permit training: □ Yes □ No

WATER CORPORATION CONTRACT MANAGER FOR THE ABOVE WORKS
   Name: __________________ Contact Number: __________________ E-mail: __________________

FORWARD THIS PERMIT TO THE AUTHORISED PERSON (AND COPY TO CONTRACT MANAGER)

2. AUTHORIZATION. (To be completed by Authorised Person)
   Applicable Permits, Forms & Additional Requirements (please tick)
   □ Isolation Handover / Request Form □ Confined Space Entry Permit □ Hot Work Permit
   □ Catchment Checklist for CTW □ Reinstatement of Grid Mesh Panels Permit □ Asset Protection Risk Assessment
   □ Asbestos — if yes, check relevant Asbestos Asset Register

THE CONTRACTOR IS HEREBY ADVISED OF THE FOLLOWING ADDITIONAL SITE SPECIFIC HAZARDS / CONDITIONS

   ATTACH ADDITIONAL INFORMATION AS REQUIRED

3. WORK COMPLETION. (To be completed by Contractor Supervisor)
   I confirm the items listed in Section 1 & 2 have been implemented and the above works are completed.
   Name: __________________ Contact Number: __________________ Signature: __________ Date: __________

RETURN PERMIT TO CONTRACTOR SUPERVISOR (AND COPY TO CONTRACT MANAGER)

4. FINAL SIGN OFF & CLOSE OUT. (To be completed by Authorised Person or Nominee)
   I confirm completion of the above work and all associated permits have been closed. This permit is now closed out.
   Inspection of this asset has been completed prior to bringing the asset back into service: □ YES
   Name: __________________ Signature: __________ Date: __________

RETURN PERMIT TO CONTRACTOR SUPERVISOR. RETAIN AND FILE COPY AS A RECORD.

Date: 15/12/2015  
WC—OSH 023—Clearance to Work on Corporation Assets  
Water Corporation
Appendix G  Fluid System Isolation Plan Template

Refer to instructions in HSEAA-P – 150 Lock Out and Tag Out (LOTO) Appendix L, for the planning and undertaking of fluid system isolations.

| Plan prepared by: | (name) | (signature) | / / (date) |
| Plan reviewed by: | (name) | (signature) | / / (date) |

1. Define the work scope
Description of work for which isolation is needed (to do what, by whom, on what):

| Work Order No: | Proposed start date: | / / (date) |

If applicable:
Clearance to Work
Permit number:  
Isolation Request Form number:

2. Risk Assessment (if isolations not done, or isolations were ineffective)
Risk description:
Assessed level of initial risk:
Is there is risk to workers from an uncontrolled release of water held by vacuum in the top of a pipe section ('hung water')?
☐ Yes  ☐ No

3. Proposed standard of isolation
☐ Create an air gap or break by disconnection or removal of plant components, or apply a suitably rated flanged dead-plate
☐ A purpose made, suitably rated ‘double block and bleed’ isolation valve, bleed open
☐ Double valve isolation - either two or more valves (or equivalent) “in series” with the section between fully drained and vented where practicable, or depressurised where draining is impracticable
☐ Purpose engineered and good condition gate
☐ Single valve isolation or penstock
☐ Plugs installed in a sewer system, selected and installed and regularly monitored in accordance with Appendix I Sewer Isolation Devices, refer to HSEAA-P-150 Lock Out and Tag Out Procedure.
☐ Stop logs

4. Proposed standard of system draining
☐ Fully drain and vent the system between all isolation points (including adjacent sections forming a ‘double isolation’).
☐ Fully drain and vent the section of the system (for which the isolation is required), depressurise and vent adjacent sections forming a ‘double isolation’.
☐ Drain only a section of the system between isolation points (the section for which the isolation is required).
☐ Depressurise the system between isolation points.

5. Equipment needed for isolation of the system
☐ Pump unit  ☐ Tags (type:    )
☐ Suction hoses  ☐ Two way radios
### 6. Isolations Schedule

<table>
<thead>
<tr>
<th>Item description (e.g. valve, scour, air valve, decontactor)</th>
<th>Item location</th>
<th>Required state (e.g. open, closed, on, off)</th>
<th>Locked (Y/N)</th>
<th>Completed (initial)</th>
<th>Isolated Tag No.</th>
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</tbody>
</table>

### 7. Tests to confirm the isolation(s) were effective

<table>
<thead>
<tr>
<th>What is to be tested?</th>
<th>Type of test (or observation) required?</th>
<th>Completed (initial)</th>
</tr>
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<tbody>
<tr>
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### 8. Periodic monitoring required (such as sewer levels or plug condition):

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</table>

### 9. Other (e.g. bypass tankering arrangements, reference to a Flow Management Plan):

<p>| |</p>
<table>
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</table>
Appendix H Guidelines for Management of Multiple APs or RPs

Where work on plant involves a mix of isolation points under the day-to-day control of separate operations groups, there may be a requirement to appoint multiple Authorised Persons. Where Isolations involve more than one work group functioning independent of each other, there may be a requirement to appoint multiple RPs.

Where there are multiple appointed Authorised Persons and or multiple appointed RPs an ICC should be appointed. A planned, coordinated approach of the work tasks must be agreed at the Isolations Planning meeting.

The following scenarios outline common ways to manage multiple parties. The scenarios should be used as a guide and adjusted to suit the particular circumstances.

**Scenario A - One party carrying out isolations for multiple independent groups to work on plant (i.e. Multiple RPs)**

a) Consider appointing an ICC to support the process.

b) One Authorised Person is appointed, and a separate RP is appointed for each independent work team that is working on isolated plant.

c) A separate set of Isolation Control Documents are utilised for each work team that will be working on isolated plant.

d) At each point of isolation, a separate Isolated Lock and Tag is affixed for each independent work team working on plant. Isolated Tags are linked to the respective Isolation Handover form by recording the form number on the Tag.

e) The Authorised Person is the person nominated on the Isolated Tag as authorised to remove it.

**Scenario B - Multiple operations groups will conduct isolations for one party to work on plant (i.e. Multiple Authorised Persons)**

a) An Isolation Control Coordinator (ICC) is appointed.

b) One RP is appointed.

c) An Authorised Person is appointed from each of the operations groups.

d) The RP forwards the Isolation Request Form to the ICC.

e) The ICC coordinates with each Authorised Person, and provides them a written scope of work, including any diagrams, to confirm the request can be accepted. The ICC returns the Isolation Request Form to the RP, confirming acceptance.

f) Each Authorised Person arranges their respective isolations and completes separate Isolation Handover forms. The Isolation Handover form number is recorded on the individual Isolated Tags. The Authorised Person recorded on the Isolation Tags as the only person delegated to remove Isolated Tags.

g) The ICC consolidates all Isolation Handover forms onto a ‘master’ Isolation Handover form. In the ‘Additional Information’ field of the form, the form numbers of all subsidiary Isolation Handover forms are recorded.

h) An on-site handover occurs between the ICC and the RP. The Authorised Person(s) is in attendance, where required.

i) Work commences. Personnel sign on/off the relevant work area Isolation Control Form until work is completed.

j) The RP returns the ‘master’ Isolation Handover form to the ICC.
k) The ICC returns all subsidiary Isolation Handover forms to the respective Authorised Persons. Each Authorised Person verifies work is complete, and removes their locks and Isolated Tags prior to returning the plant into service.

Note: Authorised Person(s) who are responsible for carrying out the Isolations, communicate with the RP who is responsible for the group of work teams carrying out the work on the isolated plant via the ICC. The RP only needs to receive the consolidated ‘master’ Isolation Handover Form from the ICC.

Scenario C - Multiple operations groups conduct isolations for multiple independent groups to work on plant (i.e. multiple Authorised Persons and multiple RPs).

a) An Authorised Person is appointed from each of the operations groups.
b) An Isolation Control Coordinator (ICC) is appointed.
c) A separate RP is appointed for each independent party that will be working on the isolated plant.
d) Separately, for each independent party working under a RP conduct steps d) to k) from Scenario B.
e) The RP forwards the Isolation Request Form to the ICC.
f) The ICC coordinates with each Authorised Person, and provides them a written scope of work, including any diagrams, to confirm the request can be accepted. The ICC returns the Isolation Request Form to the RP, confirming acceptance.
g) Each Authorised Person arranges their respective isolations and completes separate Isolation Handover forms. The Isolation Handover form number is recorded on the individual Isolated Tags. The Authorised Person recorded on the Isolation Tags as the only person delegated to remove Isolated Tags.
h) The ICC consolidates all Isolation Handover forms onto a ‘master’ Isolation Handover form. In the ‘Additional Information’ field of the form, the form numbers of all subsidiary Isolation Handover forms are recorded.
i) An on-site handover occurs between the ICC and the RP. The Authorised Person(s) is in attendance, where required.
j) Work commences. Personnel sign on/off the relevant work area Isolation Control Form until work is completed.
k) The RP returns the ‘master’ Isolation Handover form to the ICC.
l) The ICC returns all subsidiary Isolation Handover forms to the respective Authorised Persons. Each Authorised Person verifies work is complete, and removes their locks and Isolated Tags prior to returning the plant into service.
Appendix I  Sewer Isolation Devices

Isolation of sewers must be effective in:

- Protecting persons working downstream in the scheme, and
- Preventing overflows

Plan the Isolation

Isolations must be planned, with the following being considered and documented on the JSEA:

- The minimum isolation requirements for the asset class involved (section 1 below)
- Characteristic of the scheme as shown on Lite Spatial or other medium (e.g. pipe size, anticipated flow levels, sewer depths, property connections between access chambers, rising main discharge points).
- Avoiding overflows and avoiding excessive head pressures on inflatable plugs through a combination of:
  a) Use of bypass lines, or tankering, or flumed plugs, or
  b) Scheduling of work to occur in periods of low flows where practicable (e.g. main sewer or pump station tank cleaning), or
  c) Monitoring levels at upstream points, either by observation or through installation of temporary alarm systems
- The accessible points at which isolations could be installed, and the advantages and disadvantages/limitations of the different types of plugs or other isolation devices (section 2 below)
- The need to conduct a prior on-site check or on-site flow monitoring, to confirm the scheme characteristics and access to intended isolation locations.

1. Minimum isolation requirements, by asset type

a) Entry to a reticulation access chamber (other than a discharge access chamber) – pipe diameters less than 300mm

Isolation is not normally required, for safety purposes. Where isolation is performed to stop or limit flow to carry out the task the requirements of this appendix to the procedure apply to control risks that could then potentially occur through a plug failure or interference with the plug.

Permitted plugs include:

- A single inflatable plug, inserted in the direction of flow (i.e. in the upstream access chamber), or
- A D plug with pulling frame, inserted in the direction of flow (i.e. in the upstream access chamber), or
- A double D plug with pulling frame, inserted in the direction of flow (i.e. in the upstream access chamber), or
- A Pochadyla plug, inserted in the direction of flow (i.e. in the upstream access chamber), or
- An inflatable flumed plug, inserted in the upstream spigot of the work task access chamber and extending to the downstream spigot, or
- A flumed D plug inserted in the upstream spigot of the work task access chamber and extending to the downstream spigot.
(Note: In effect, use of a flumed plug is a diversion of flow through the access chamber, rather than an isolation of the flow)

b) Entry to a main sewer access chamber (other than a discharge chamber) – pipe diameters 300 to 600mm

Isolation is not normally required, for safety purposes. Where isolation is performed to stop or limit flow to carry out the task the requirements of this appendix to the procedure apply to control risks that could then potentially occur through a plug failure or interference with the plug.

Permitted means of isolations include:

- A Pochadyla plug, inserted in the direction of flow (i.e. in the upstream access chamber), or
- an inflatable plug in the downstream spigot of the upstream access chamber, combined with another inflatable plug in the upstream spigot of the work task access chamber. The lower plug must be braced within the access chamber to prevent it being dislodged, or
- A gate valve, or bricked up and plastic welded spigot, in conjunction with a bypass of the upstream flow. This option would typically only apply to a long term isolation.

c) Entry to a main sewer access chamber – pipe diameter greater than 600mm, or travel into the sewer pipe – applicable to the Perth Region Alliance

Due to the highly variable circumstances of entry to sewer systems greater than 600mm diameter, a Fluid System Isolation Plan must be prepared by the Team Leader, and approved by the Operations Manager on each occasion.

Typically this may involve either:

- For a long term isolation, installation of a gate valve or bricked up and plastic welded spigot, in conjunction with a bypass of the upstream flow, or
- For a short-term isolation, a reduction of incoming flows by isolating, tagging and locking pumps at upstream pump stations (combined where necessary by an isolation of some or all incoming gravity flows less than 600mm diameter, by use of plugs at adjacent access chambers).

d) Discharge access chamber (reticulation sewer, or main sewer)

Flows from the incoming pressure main must be prevented by isolating, tagging and locking the pumps at the upstream pump station.

Isolation of the incoming gravity lines is not normally required, for safety purposes. Where isolation of the gravity lines is performed to stop or limit flow to carry out the task, the requirements of this appendix to the procedure apply to control risks that could then potentially occur through a plug failure or interference with the plug.

e) Entry to a wet well

Pumps at the wet well must be isolated, tagged and locked.

Incoming flows must be isolated by use of either:

- A gate valve at the wet well, together with a penstock at the inlet chamber, or
- A gate valve at the wet well, together with an inflatable plug in the downstream spigot of the inlet chamber, or
- A penstock in the inlet chamber, together with a plug in the upstream access chamber/s (an inflatable plug inserted in the direction of flow)
Inflatable plugs must not be applied to the T piece on the incoming line of a wet well.

f) Separation of new (developer delivered) works from the live sewer scheme

Isolation must involve either:

- A physical separation (break) between the live scheme and the Developer’s scheme, or
- A bricked up spigot with plastic welded membrane, or
- A double D plug

2. Isolation device selection

Where an inflatable plug is used, the upstream flows must be managed to limit the head of wastewater against the plug to a depth of 1.5 metres or less (unless the manufacture’s rated head pressure of the specific plug had been confirmed to exceed 1.5 metres).

Enquiries regarding the supply of various plugs should be directed to the OSH Advisor Critical Risk (SEAA Branch)

The selection of plugs or other devices must take into account the characteristics of each, as described below.

<table>
<thead>
<tr>
<th>Plug or other isolation device</th>
<th>Characteristics</th>
</tr>
</thead>
</table>
| **Single D plug with pulling frame** | Typical Applications:  
- Short term isolations, inserted in the direction of flow (i.e. installed in the upstream access chamber)  
- Entry to a reticulation access chamber  
Advantages:  
- Can normally be removed without entry  
- Bracing not required (as the pulling frame forms a brace)  
- No limit to head pressure  
Disadvantages/limitations:  
- Requires entry to install  
- Not suited to inserting against the direction of flow  
- To be pulled from the surface, requires a rope to be tied off to a ladder or spreader bar or equivalent (not always readily available) |
| ![Single D plug with pulling frame](image1)  
(Note: Single D plugs without a pulling frame are not recommended, as they are prone to dislodging) |
| **Double D plug with pulling frame** | Typical Applications:  
- Short or long term isolations, inserted in the direction of flow (i.e. installed in the upstream access chamber)  
- Entry to a reticulation access chamber  
Advantages:  
- No limit to head pressure  
- Can often be removed without entry (but where it cannot be removed from the surface, the chamber will require pumping out prior to entry to remove the plug)  
Disadvantages/limitations:  
- Requires entry to install  
- Not suited to inserting against the direction of flow. |
| ![Double D plug with pulling frame](image2) |
## Single D plug with fluming

**Characteristics**
- **Typical Applications:**
  - In low flow conditions where it is preferred to maintain the flow through the access chamber or wet well (connecting the upstream spigot to the downstream spigot within the same access chamber or wet well) (e.g., repair of an access chamber channel)
  - Can be used as a temporary repair to a pipe section between access chambers (in this application, it is not being used as an ‘isolation’)

**Advantages:**
- Reduces or removes the need for tankering, or checking of upstream levels
- Avoids the need to enter upstream access chambers specifically to fit a plug

**Disadvantages/limitations:**
- Requires entry to install and to remove
- Not suited where it would cause any upstream rise in levels (i.e., where the aperture of the flume may not be large enough to prevent rising upstream levels) – upstream monitoring of levels will often be required

## Double D plug

**Characteristics**
- **Typical Applications:**
  - Sub-division isolation (to prevent the transfer of sewer gases, and where no flows anticipated)

**Advantages:**
- No limit to head pressure

**Disadvantages/limitations:**
- Requires entry to install and to remove
- Requires a brace where installed against the direction of flow. Brace may be difficult to fit, depending on the shape of the access chamber channel.
- Requires a secondary isolation, where installed against the direction of flow
- Not recommended for installation in the direction of flow, as it would require pumping out of an access chamber before it can be removed
<table>
<thead>
<tr>
<th>Plug or other isolation device</th>
<th>Typical Applications:</th>
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<tbody>
<tr>
<td>Inflatable plug</td>
<td><strong>Characteristics</strong></td>
</tr>
<tr>
<td></td>
<td>Short term or medium term works</td>
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<tr>
<td></td>
<td>Not suited to pipe sizes greater than DN600, except where used in conjunction with a bypass</td>
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<tr>
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<td><strong>Advantages:</strong></td>
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<td></td>
<td>When installed in the direction of flow, can normally be installed and removed without entry</td>
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<tr>
<td></td>
<td>When installed in the direction of flow, the plug can be partially deflated from the surface to temporarily lower upstream levels</td>
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<td></td>
<td>Can be applied to a range of pipe diameters, within limits</td>
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<tr>
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<td><strong>Disadvantages/limitations:</strong></td>
</tr>
<tr>
<td></td>
<td>When installed in the direction of flow, requires the plug to be secured to prevent it’s loss downstream</td>
</tr>
<tr>
<td></td>
<td>When installed against the direction of flow, needs an upstream isolation to be installed first, involves entry, and requires bracing.</td>
</tr>
<tr>
<td></td>
<td>Requires the plug’s pressure to be monitored</td>
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<td>Requires compressed air to inflate</td>
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<td>Not suited to high head pressures, particularly with PVC or other smooth pipe</td>
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<td>the upstream flows must be managed to limit the head of wastewater against the plug to a depth of 1.5 metres (unless the manufacture’s rated head pressure of the specific plug had been confirmed to exceed 1.5 metres)</td>
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<td>An inflatable plug (without fluming) must not be used as a single point of isolation in a main sewer</td>
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<table>
<thead>
<tr>
<th>Inflatable plug with fluming</th>
<th>Typical Applications:</th>
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<tbody>
<tr>
<td></td>
<td><strong>Characteristics</strong></td>
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<tr>
<td></td>
<td>Where it is preferred to maintain wastewater flow through the access chamber or wet well (connecting the upstream spigot to the downstream spigot within the same access chamber or wet well)</td>
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<tr>
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<td><strong>Advantages:</strong></td>
</tr>
<tr>
<td></td>
<td>Reduces or removes the need for tankering, or checking of upstream levels</td>
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<tr>
<td></td>
<td>Can be applied to a range of pipe diameters, within limits</td>
</tr>
<tr>
<td></td>
<td>Avoids the need to enter upstream access chambers specifically to fit a plug</td>
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<td><strong>Disadvantages/limitations:</strong></td>
</tr>
<tr>
<td></td>
<td>Requires entry to install and to remove</td>
</tr>
<tr>
<td></td>
<td>Requires the plug’s pressure to be monitored</td>
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<tr>
<td></td>
<td>Requires compressed air to inflate</td>
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<td>Not suited where it would cause any upstream rise in levels (i.e. where the aperture of the flume may not be large enough to prevent rising upstream levels) – some upstream monitoring of levels may be required</td>
</tr>
<tr>
<td>Plug or other isolation device</td>
<td>Characteristics</td>
</tr>
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<td>-----------------------------------------------</td>
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</table>
| **Pochadyla plug**                            | **Typical Applications:**  
  - Where high head pressures are anticipated  
  - For isolations in the direction of flow (i.e. installed in the upstream access chamber)  
  - Where it would be preferred to intermittently lower levels, without the need for entry  
  **Advantages:**  
  - Bracing not required (self-bracing)  
  - Very reliable (the greater the head pressure, the greater the seal)  
  - Can temporarily allow flow to pass by operation of a ‘gate’ from the surface  
  **Disadvantages/limitations:**  
  - Can ONLY be inserted in the direction of flow  
  - Requires entry to install, and may require entry to remove  
  - The plug can get jammed, with force required to remove it  
  - The shape of the channel may prevent the fitting of this type of plug in some access chambers (due to the depth/thickness of the plug)  
  - Does not provide a 100% watertight seal  
  - ‘Gate’ in the plug needs to be operated to clear wastewater upstream of the plug prior to its removal. This can be time consuming. |
| **Steel Gate with Cheescutter**                | **Typical Applications:**  
  - Long term isolation (at an access chamber upstream of the access chamber or wet well at which work is planned)  
  - High flow sections of the scheme  
  **Advantages:**  
  - Once installed, can be opened/closed from the surface  
  - Flow can be regulated through use of the cheescutter  
  **Disadvantages/limitations:**  
  - Gate installation is time consuming and involves entry to the Access Chamber  
  - The gate may jam |
| **Brick filled spigot with plastic welded plate** | **Typical Applications:**  
  - Long term isolation of a main sewer  
  **Advantages:**  
  - reliable  
  **Disadvantages/limitations:**  
  - time consuming to install  
  - Cannot be temporarily removed or adjusted to allow flows |
Plug or other isolation device | Typical Applications: | Characteristics
--- | --- | ---
Pump station gate valve | Installed at time of construction at certain wet wells | Operated from the surface
Advantages: | Disadvantages/limitations: |
• Operated from the surface | • Require maintenance to prevent jamming, and to provide an adequate seal

Prior to isolating

Prior to installing plugs or other isolation devices:

• inspect plugs for damage. In the case of inflatable plugs, partially inflate the plug to check for leaks.
• Confirm the isolation plan is compatible with the scheme characteristics and flows. Adjust the plugs selection and/or positioning where needed and document on the JSEA.

Conduct isolations

Isolate the scheme as planned.

**Note:** Depending on the isolation device, plug installation may involve a Confined Space Entry

Where inflatable plugs are used, disconnect the plugs from pressure gauges once in place to reduce the likelihood of a leak from the hose fittings.

Locking/securing of isolations

For entry to wet wells, pumps must be isolated, tagged and locked in accordance with this procedure.

Gate valves and penstocks used as an isolation device must be tagged and locked in accordance with this procedure.

Plugs used as an isolation must be either:

• Locked and tagged in accordance with this procedure
• Secured to prevent access by persons whom are not a member of the immediate work party, or
• Attended by a member of the work party (with line of sight to the gate valve, or to the access chamber with plug fitted).

Monitor isolations

While work is in progress, monitor the pressure of inflatable plugs.

• Check the pressure 20 minutes after the initial plug installation.
• If there were no loss in pressure, the interval of further pressure checks may extend to 60 minutes while work is in progress.
• If any loss in pressure were detected, depending in the rate of pressure loss:
  o Maintain pressure checks every 20 minutes while work is in progress, or
  o Re-inflate the plug to its intended pressure and resume pressure checks at not more than 20 minute intervals, or
  o Suspend the work requiring the isolation and replace the plug.
Check the wastewater levels upstream of the isolation at planned intervals to ensure overflows or excessive head pressures on inflatable plugs are prevented.

The monitoring of the plug pressure, or of the upstream levels must not involve a Confined Space standby person while performing standby duty.

Remove isolations
When work requiring the isolations is completed, remove the isolations.

Where double isolation is in place, the downstream isolation points should be removed prior to the isolations further upstream. However, where an inflatable plug is installed in the downstream position, the upstream isolation point may be removed first to assist dislodging the downstream plug.
Appendix J Electrical Isolation and testing

The following requirements apply when isolating electrical systems and conducting tests to confirm the effectiveness of these isolations.

This procedure applies to the isolation and testing of high voltage systems where NO work will be conducted on the high voltage components.

Where work will be conducted on the high voltage components (such as busbars or high voltage motors), this procedure DOES NOT apply. In those circumstances, the procedure WC-OSH 118 High Voltage Switching Practice (ME2) will apply.

Electrical Systems Isolation and testing

A person conducting an electrical system isolation and test must wear personal protective equipment as required by S022 Personal Protective Equipment and Clothing.

Isolation of electrical systems must be conducted by electrical workers except when the isolation is of:

- Low Voltage (i.e. Mains Voltage) plug-in systems (e.g. 3-pin plug into a power outlet; decontactor).
- Low Voltage (i.e. Mains Voltage) hard-wired systems (e.g. through a 240 V or 440 V switch or circuit breaker), where work on electrical components is not required.
- Extra low voltage power circuits (i.e. not exceeding 50V a.c. or 120V ripple free d.c.).

There are two methods of isolating electrical systems:

- Isolation of Mains Voltage Hard-Wired System Isolations using a physical break by component removal
- Mains Voltage Hard-Wired System Isolations without removing a circuit component

Mains Voltage Hard-Wired System Isolations (physical break by component removal)

This method of isolation is used on Low voltage non plug-in systems.

The isolation is achieved by creating a physical break in the circuit by the removal of a component within that circuit.

If it is determined that the best method of isolation is by disconnecting and removing electrical wiring this must be performed by a licenced Electrical Worker. The full current device upstream of the disconnection point must be in the ‘Off’ position and tagged before any disconnection of wiring.

The person conducting the isolation must perform the steps in the table below for the method that best achieves isolation on the electrical system.
## HSEAA-P-150 Lock out and Tag out (LOTO)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Steps to achieve a physical break</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fuses are protected by a Controlled Access Cabinet</strong></td>
<td>• Remove the fuse link holders from the fuse base</td>
</tr>
<tr>
<td></td>
<td>• Tie the fuse link holders together and place inside the cabinet</td>
</tr>
<tr>
<td></td>
<td>• Test the isolation to confirm that the energy source has been de-</td>
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<tr>
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<td>energised using an electrical testing instrument or other suitable method</td>
</tr>
<tr>
<td></td>
<td>(Refer Section <strong>Testing of electrical isolations</strong>)</td>
</tr>
<tr>
<td></td>
<td>• Fit a lockout device to the fuse base that prevents reinstatement of the fuse links.</td>
</tr>
<tr>
<td></td>
<td>• Apply a hasp to the lockout device.</td>
</tr>
<tr>
<td></td>
<td>• Attach the appropriate lock and tag.</td>
</tr>
<tr>
<td><strong>Fuses are not protected by a Controlled Access Cabinet</strong></td>
<td>• Remove the fuse links from the fuse holders wearing electrical rated gloves.</td>
</tr>
<tr>
<td></td>
<td>• Place the fuse links inside the switch room, enclosure or cabinet.</td>
</tr>
<tr>
<td></td>
<td>• Wear electrical rated gloves if the fuse carrier was live</td>
</tr>
<tr>
<td></td>
<td>• Test the isolation to confirm that the energy source has been de-</td>
</tr>
<tr>
<td></td>
<td>energised using an electrical testing instrument or other suitable method</td>
</tr>
<tr>
<td></td>
<td>(Refer Section <strong>Testing of electrical isolations</strong>)</td>
</tr>
<tr>
<td></td>
<td>• Fit a lockout device to the fuse base that prevents reinstatement of the fuse links.</td>
</tr>
<tr>
<td></td>
<td>• Apply a hasp to the lockout device.</td>
</tr>
<tr>
<td></td>
<td>• Attach the appropriate lock and tag.</td>
</tr>
<tr>
<td><strong>The internal mechanism of the switch being utilised for</strong></td>
<td>• Complete the rack-out to the “racked out” position.</td>
</tr>
<tr>
<td>the purpose of isolation can be isolated through a rack-out mechanism</td>
<td>• Test the isolation to confirm that the energy source has been de-</td>
</tr>
<tr>
<td></td>
<td>energised using an electrical testing instrument or other suitable method</td>
</tr>
<tr>
<td></td>
<td>(Refer Section <strong>Testing of electrical isolations</strong>)</td>
</tr>
<tr>
<td></td>
<td>• Attach the appropriate type of Lock and Tag to the racked-out mechanism</td>
</tr>
<tr>
<td></td>
<td>• Attach a hasp to the lockout device.</td>
</tr>
<tr>
<td></td>
<td>• If the switch has a key mechanism associated with an alternate power source, remove the key.</td>
</tr>
<tr>
<td></td>
<td>• Where only one person will be working on the plant, the key is retained by that one person.</td>
</tr>
<tr>
<td></td>
<td>• Where multiple persons would be working on the plant, the key must be retained in a lockbox</td>
</tr>
<tr>
<td></td>
<td>for the period of the work (with each ‘at risk’ person affixing their Personal Danger Lock</td>
</tr>
<tr>
<td></td>
<td>and Personal Danger Tag to the lockbox). (Refer to section 7.5)</td>
</tr>
<tr>
<td><strong>The internal mechanism of the switch being utilised for</strong></td>
<td>• Ensure that live terminals will not be left exposed by the removal of the mechanism.</td>
</tr>
<tr>
<td>the purpose of isolation can be isolated through a removal mechanism</td>
<td>• Complete the removal of the mechanism in accordance with manufactures guidance, where necessary</td>
</tr>
<tr>
<td></td>
<td>• Test the isolation to confirm that the energy source has been de-</td>
</tr>
<tr>
<td></td>
<td>energised using an electrical testing instrument or other suitable method</td>
</tr>
<tr>
<td></td>
<td>(Refer Section <strong>Testing of electrical isolations</strong>)</td>
</tr>
<tr>
<td></td>
<td>• Attach the appropriate type of Lock and Tag, preventing reinstatement of the removal mechanism.</td>
</tr>
<tr>
<td></td>
<td>• Attach a hasp.</td>
</tr>
<tr>
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</tr>
</tbody>
</table>
Mains Voltage Hard-Wired System Isolations (without removal of a circuit component)

The physical removal of a device which prevents plant from being energised is not always reasonably practicable.

Where it is not reasonably practicable to remove a component in order to provide a visible Air Gap, the following must be carried out:

- Identify a reliable full current electrical isolation switch or circuit breaker. The switch or circuit breaker must not rely on the following:
  - SCADA
  - Control selector switches (or other switches that are not part of main current path of the electrical circuit)
  - Emergency stops
  - Push button devices
  - Devices controlled by a touch panel, or
  - Switches that use a domestic toggle mechanism (as the inherent design limitations may make these unreliable for full current isolation).

**Note:** Such devices may be utilised to provide a secondary protection, applied in addition to isolation in the full current circuit.

- Switch the circuit breaker or switch being utilised for the purpose of isolation to the ‘Off’ position.
- Test that the energy source has been de-energised using an electrical testing instruments or method other suitable method.
- Attach the appropriate type of lock and tag to the switch or circuit breaker
- Record the type of test on the isolation tag
- If a key mechanism is present, remove the key and attach it to the appropriate tag.

Testing of electrical isolations

The effectiveness of electrical system isolations must be proven prior to work commencing on the isolated asset. The testing of High Voltage electrical isolations must be in accordance with WC-OSH 118 High Voltage Switching Practice (ME2).

The testing of Low Voltage or Extra Low Voltage electrical systems must be achieved through one of the following test methods to confirm the isolation, and in the following order of preference:

**Method 1: ‘Visible break’**

This method requires the power circuit to be isolated through use of a power outlet, de-contactor, fuses or similar item.

The test must be conducted in the following sequence:

- Trace the power supply cable/conduit from the isolation point to the plant to be worked on (or confirm a match between the labelling of the isolation point and the plant to be worked on)
- Conduct the isolation by forming a clearly visible break in the power circuit (e.g. disconnecting the power at a power outlet or de-contactor, or withdrawal of fuses from a fuse base in the power circuit).
- The test equipment and test method must comply with S487

**Method 2: Use of a Multimeter or other voltage tester**

This method must only be used if:
• The person conducting the test is an Electrical Workers or persons with a Restricted Electrical License.
• The person undertaking the test is has read, understands and is able to comply with the requirements of S487 Safe Work on Low Voltage LV Electrical Equipment and Installations.
• The test equipment and test method must comply with S487

The test must prove the absence of voltage to the electrical system using a Multimeter or other voltage tester.

When conducting the test, all electrical equipment, terminals and conductors must be treated as live until proven to be isolated.

The person conducting the test must comply with Section 5.3.1 of S487 Safe Work on Low Voltage LV Electrical Equipment and Installations for ‘live’ testing, commissioning.

The test equipment and test method must comply with S487 including that the test be conducted in the following sequence:

• Test the voltage tester on a known voltage source for correct operation.
• Test between all conductors and a known earth.
• Test between all conductors.
• Re-test the voltage tester on a known voltage source for correct operation.

**Method 3: ‘Attempt to run’ (bump test)**

This method involves operating the local control device that would normally cause the plant to run, to confirm the isolated plant cannot run, or is not ‘attempting’ to run and using a local control device to provide a secondary level of protection.

The test must be conducted in the following sequence:

• Confirm the identity of the plant to be worked on through labelling or bump testing.
• Confirm the equipment is capable of running.
  o If the plant is running, no action is required.
  o If the plant is not running, bump test the plant to confirm it is capable of running by operating the local control device (e.g. through observation of the ammeter, sound of a contactor opening or closing, noise or vibration in the motor or pump, or change in flows).

**Note:** If the plant cannot run [or should not be run for reasons such as a risk of significant damage to the plant], the attempt to start is only to confirm the isolated plant is not attempting to run after isolation.

• Turn the equipment off using the local control device/s (e.g. Auto/Off/Manual selector switch).
• Conduct the power circuit isolation (e.g. circuit breaker or isolation switch in the main current path).

**Note:** The primary isolation must be in the main current path. Operation of the local control device that does not achieve full current isolation and is a secondary precaution only, and must not be considered adequate isolation.

• Attempt to start the plant using the local control device/s to confirm the plant will not run and is not attempting to run (i.e. the isolation were effective). If the plant did run, or was attempting to run, the isolation must be deemed ineffective – contact an Electrical Worker for further investigation.
• Return the local control device to ‘off’.
Finally, no work must commence on a cable requiring isolation until it is positively identified by visual tracing, suitable test equipment or other conclusive means, and then isolated.

Suitable test equipment may include:

- a tong tester for a single core unscreened cable under load,
- a modiewark (or similar electric field detecting device) for an energised multicore unscreened cable,
- a screen connected signal generator and detector unit (ie a cable locating device) for a screened cable, or
- a multimeter if there were an exposed conductor to test.

Where it is not practicable to apply any of the above test methods, the cable may be cut with a ‘cable severance tool’ used in accordance with the manufacturer’s instructions.

**Note:** a cable severance tool is a remote operated shot fired tool, specifically designed for severing cables by propelling a metal chisel or blade through a range of cables, shorting all phase conductors and Earth conductors together during severance.
Appendix K  Isolation of Gas and Pneumatic Systems

The following requirements apply when isolating gas and pneumatic systems and testing the effectiveness of these isolations.

For gas and pneumatic systems, pressure in the isolated section must be relieved and maintained before work is commenced and during the period of work.

Where a potential harmful environment is present (e.g. flammables, biogas, chlorine, etc.) appropriate PPE must be utilised in accordance with S022 Personal Protective Equipment and Clothing. For example where residual chlorine may be present an appropriate chlorine respirator must be worn.

Isolation of Gas and Pneumatic Systems

For gas and pneumatic system isolations, the operations person planning the isolation must undertake the following steps:

- Confirm the scope of work for which isolations will be required.
- Determine the level of initial risk that would be posed if isolations were ineffective – e.g. exposure to hazardous substances or flammable gas. (see section 6.1.2 Risk Assessment)
  - Where the isolated section may contain potentially harmful levels of hazardous gaseous substances or flammable materials, the isolated section of the system must be cleaned and purged in accordance with WC-OSH 123 Cleaning and Purging.
  - In the case of intentional venting of biogas or other flammable gas, the requirements of WC-OSH 135 Working in a Flammable Gas Area must be met.
- Determine the proposed standard of isolation using the scope of work, risk assessment, and type, number, location and condition of available isolation points (valves, dead-plates, etc.).
  - The following order of preference for isolation methods are:
    - Create an air gap or break by disconnection or removal of plant components, or apply a suitably rated flanged dead-plate or spade, or
    - Double valve isolation – either two or more valves (or equivalent) “in series” and with the section between vented, or
    - Single valve isolation.

Isolations must not rely on Non return valves or remotely operated solenoid valves.

Testing of Gas System Isolation

When purging with Nitrogen Gas the following must be carried out:

- This should be from the start point to beyond the section to be worked on.

In the case of an isolated biogas system

- The isolated vessel or the length of the isolated pipeline section will be purged with Nitrogen gas.
- Ensure all vent points will not direct escaping biogas and or nitrogen towards other persons or at any ignition sources.
- Test at the closest bleed or scour point within the isolated section.
  - Using a suitable gas detection instrument, confirm flammable gas and hydrogen sulphide levels are within safe limits (Hydrogen sulphide less than 10 ppm, flammable gas less than 5% LEL).
  - Ensure gas detection instrument is used together with the remote sensing tool so that the instrument itself is not placed in the direct path of the releasing gas stream, as this may damage the sensor.
Allow the purged system to stand for a minimum of 20 minutes prior to retesting with the gas detection instrument to confirm effectiveness of the isolation and that levels are still within safe working limits.

Ensure bleed points remain open for the duration of the works.

**NB**: Before entering a confined space that has been purged with nitrogen allow the vessel/pipeline to ventilate through natural or forced means. Conduct atmospheric monitoring of the structure including in accordance with S467 Confined space.

Following de-isolation & commissioning post intrusive work will require the system to be purged with Nitrogen gas again in the case of systems where there is a requirement for an anaerobic environment (i.e. free from the presence \( \text{O}_2 \)).

In the case of chlorine systems after isolating

- Allow the chlorinator to continue to draw down chlorine until negative pressure reads on the system gauge
- Connect Nitrogen gas supply onto a pigtail valve (at the start of the manifold, in the case of a manifolded system) and purge Nitrogen through the system using the chlorinator
- Turn of the Nitrogen supply and allow to depressurise through the Chlorinator
- At the moment of breaking the connections on the isolated sections use the ammonia puffer bottle to confirm no chlorine is present in the line. SCBA will be worn during this step
- If Chlorine is detected re purge the system with nitrogen and re-test

In the case of Pneumatic systems

- Remove stored energy
- Depressurise to system via a suitable release point (e.g. bleed point on a pressure regulating valve)
Appendix L  Fluid Systems Isolation and Test (other than Sewer schemes)

Refer to Appendix I for isolation and test of sewer schemes.

Planning
For fluid system isolation, the operations person planning the isolation must undertake the following steps:

1. Confirm the scope of work for which isolations will be required. No change in the work scope (or work elsewhere on the same system which could potentially compromise the isolation) is permitted without a prior review of the adequacy of isolations proposed/ conducted by the Authorised Person or other operations person arranging the isolation.

2. For the scope of work, determine the level of initial risk that would be posed if isolations were ineffective – e.g. engulfment, water pressure jet impact, effects of mixing water with electricity, and exposure to hazardous substances.

3. For the assessed level of risk and with regard to the type, number, location and condition of available isolation points (valves, gates, penstocks, etc.), determine the proposed standard of isolation in consideration of the following order of preference and the table below:

   a. Create an air gap or break by disconnection or removal of plant components, or apply a suitably rated flanged dead-plate.
   b. A purpose made, suitably rated ‘double block and bleed’ isolation valve, bleed open.
   c. Double valve isolation – either two or more valves (or equivalent) “in series” with the section between fully drained and vented where practicable, or depressurised where draining is impracticable.
   d. Purpose engineered and good condition gate.
   e. Single valve isolation or penstock.
   f. Plugs installed in a sewer system, selected and installed and regularly monitored in accordance with Appendix I Sewer Isolation Devices.
   g. Stop logs.

Note. Valves which are not specifically designed for fluid isolation (e.g. pressure/flow control, non-return) MUST NOT be used as a single isolation barrier, or as a secondary barrier for High Risk isolations. However, the valves below may form a secondary barrier for Medium Risk and Low Risk isolations, with the following guidance:

- Pump non-return valve (NRV) - where practical the integrity of the NRV must first be tested, by isolation of the suction valve and scouring, prior to closure of the discharge valve.
- Electrically actuated control valves – where the actuator can be electrically isolated in the closed position. Pilot-operated diaphragm-driven control valves should not be relied upon.
### Initial Risk

<table>
<thead>
<tr>
<th>Initial Risk</th>
<th>Typical Example</th>
<th>Method of Isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High / Extreme</td>
<td>Work involving entry to a live main or confined space – with potential for sudden inflow rapidly consuming the space. e.g. Trunk main or surge vessel entry</td>
<td>In priority order: a, b, c or d</td>
</tr>
<tr>
<td>Medium</td>
<td>Work in a confined space but with potential for only moderate inflow consuming the space, and sufficient time for egress. e.g. Wastewater treatment plant operation tank.</td>
<td>In priority order: a, b, c or d (or e, preferably in conjunction with f)</td>
</tr>
<tr>
<td>Low</td>
<td>Repair of a DN80 water service to commercial premise</td>
<td>In priority order: a to g.</td>
</tr>
<tr>
<td></td>
<td>Work not involving confined space, only moderate risk associated with isolation failure:</td>
<td>In priority order: a, b, c, d, or e</td>
</tr>
<tr>
<td></td>
<td>e.g. Repair of a DN 150 above-ground water main Removal of a pump from a water pump station. General minor reticulation repairs.</td>
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</tbody>
</table>

4. **determine how the isolated section of the system is to be depressurised and/or drained and vented by applying the following order of preference:**
   - Fully drain and vent the system between all isolation points (including adjacent sections forming a ‘double isolation’), or
   - Fully drain and vent the section of the system (for which the isolation is required), depressurise and vent adjacent sections forming a ‘double isolation’, or
   - Drain only a section of the system between isolation points (the section for which the isolation is required), or
   - Depressurise the system between isolation points.

5. **Identify equipment/plant involved in the method of isolation and planned draining / venting of the system, including:**
   - Section valves and associated air valves and scour s.
   - Valve actuators that will need to be isolated from their energy source (electric, pneumatic or hydraulic).
   - Upstream and downstream potential pressure or flow sources that will require isolating (e.g. pumps, chemical injectors, reservoirs, tanks, surge vessels, cross connections and all connected piping systems).

6. **Consider the risk of the isolation and the size and complexity of the system being isolated. For all isolations which are part of a significant piping system and considered Medium, High or Extreme risk:**
   - Consult engineering drawings, Field Books, Geospatial Information Systems (e.g. LiteSpatial), operations and maintenance manuals, and the Drawing Management System to ensure that all isolation points are identified and that all potential pressure/flow sources are appropriately isolated and recorded.
   - Use pipeline profile drawings and for larger piping systems develop a system profile (e.g. MS Excel chart) showing the Relative Levels (RLs) and positioning of components in the scheme.

7. **Consider the need for communication, including back-up to mobile phones (e.g. radio), between all parties directly involved or responsible for the isolation throughout the isolation process for geographically distributed fluid system isolations (i.e. where isolation points, air valves and scour s are remote).**
8. The planned sequence of conducting isolations, air valve checks/removals and opening of scours should be documented as a Fluid System Isolation Plan Template. (Appendix G). The Fluid System Isolation Plan must be signed by operations person planning the isolation method where either:
   - The assessed level of initial risk for the scope of work is High or Extreme, or
   - More than four points of isolation are proposed, or
   - The work is to be managed as a Complex Isolation.

The documented Fluid System Isolation Plan should be reviewed and counter-signed by the relevant Team Leader or nominee. This plan will also be available at site for the duration of the works.

**Carry out planned isolations**
9. Where the uncontrolled release of water / wastewater held by vacuum in the top of a pipe section could represent a risk to personnel (i.e. a release of ‘hung water’), all sections of the pipe above the work area must be vented to atmospheric pressure. Working from highest air valves to lowest air valves in the part of the system to be drained:
   - Remove the air valve (preferred), and visually confirm the isolation valve (immediately below the air valve) is open, or
   - Visually and audibly confirm that the valve has vented (noting that some valves may function as ‘discharge only’) then crack the air-valve flange and leave the flange wedged open to break the seal. Ensure the isolation valve is open.

10. Drain or depressurise the main in accordance with the decision made at Step 3.

   - **Where scours are available**, confirm scours are open to atmosphere (not under water). This can be achieved by:
     - Where the scour point is above the surrounding ground level, draining the system until the scour ceases to run, or
     - Where the scour is in a pit, draining and pumping out the pit until the scour ceases to run, or
     - Where the scour point consists of a below ground valve and riser pipe, pumping out the riser (using a self-priming pump) then removing the pump and visually confirming that the riser is empty.

   If the scour continues to run, either:
   - Re-assess isolations, or
   - Monitor the running of the scour until the flow is at a low and steady rate.
   - Work must not proceed until it is determined:
     - The low flows are attributed to an isolation point passing water, and
     - The on-site supervisor of the work party to work on the isolated plant is notified and is satisfied the low flow rate and volume will not represent a risk to the work crew.

   - **If there are no scours available** (e.g. on a minor water reticulation system), either:
     - Connect a hydrant, or
     - Open a flushing point, or
     - Hot tap, to prove the main is effectively isolated.

**Testing of Fluid System Isolations**
Tests include observations of air valves and scours (as per Steps 9 and 10), additionally consider, and where necessary apply, the following additional tests:
- Test isolation points (e.g. valves, penstocks, gates, and including those used in ‘double isolation’) under conditions which are more arduous (i.e. involve higher system pressures, higher gravity system fluid levels) than those which will be present during the isolation. This may be achieved by:
  - Check the isolation effectiveness of single or each ‘double isolation’ valve individually by isolating, scouring and checking scour flows. Higher system pressures should be used (e.g. by pump station operation), where practical, during the verification process than during the isolation.
  - Checking the effectiveness of non-return valves, where these form part of a double isolation, prior to closing the (secondary) isolation valve.
Verifying the performance of gates and penstocks with the highest practical gravity sewer level (i.e. close to overflow), then ensuring lower levels are maintained during the isolation (e.g. by bypass pumping).

Where there are two adjacent mains of the same or similar size, prior to work on the intended main confirm which is the correct main to be worked on, by suitable means which may include:

- Hot tapping the main to be worked on.
- Noting the different pipe material or age that distinguishes them.
- Walking the length of the pipe between isolation points.
- In the case of a repair of a leak, sighting the damaged section of pipe.

Where fluids present in the isolated section may contain potentially harmful levels of hazardous substances or flammable materials, the isolated section of the system must be cleaned and purged in accordance with WC-OSH 123 Cleaning and Purging.

Lock and Tag the isolation points in accordance with Section 7 LOTO Hardware.