

[PROJECT NAME] [SITE NAME] [SITE TAG]

**COMMISSIONING PLAN**

DISCLAIMER: The content in this commissioning plan version has been developed to assist with the tender process and meet the requirements of the Watercare Code of Practise for Commissioning (ESF-700-STD-801).

This Template is intended to be modified to suit each project.

Sections which cannot yet be completed shall be marked as TBC.

This plan is to be created during the Preliminary Design phase, updated and approved PRIOR to the commissioning phase.

Disclaimer markers have been placed within this document and are to be removed upon finalisation of the plan.

Document Control and File Location

Document Control List

The following table lists the details of document alterations.

|  |  |  |  |  |
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| Rev No. | Date | Description | Prepared by | Reviewed by |
| 1 |  | Draft for inclusion in tender package |  |  |
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File Location

The following table lists the details required to locate the file on the Watercare Computer Network.

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Document Approval for Tender Package

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| Draft Prepared by | Role |
|  | [Design Consultant] Project Manager |
| Further Developed by | Role |
|  | Watercare Commissioning Engineer |
| Reviewed by | Role |
|  | Nominated Watercare Lead Commissioning Engineer |
|  | Nominated Watercare Operations Liaison |
|  | Nominated Watercare Water Quality Scientist |
|  | Nominated Watercare Environmental Care Scientist |

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|  | [Construction Contractor] Project Manager |  |  |
|  | [Construction Contractor] Commissioning Manager |  |  |
| Approved For Use By | [Business Unit] | Date | Sign |
|  | Watercare [Area] Production / Network Manager |  |  |

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1. Introduction

This Commissioning Plan agrees the strategy, methodology, roles and responsibilities, communication and risk mitigations required for testing and commissioning the [Facility Name].

The approach ensures a project is delivered in a safe and systematic manner, compliant with Watercare’s standards, with agreed system process functionality and conforming with business case objectives before it is handed over to Watercare for operation.

The commissioning framework at Watercare is described in the Code of Practice for Commissioning (ESF-700-STD-801). A number of templates are available to assist with efficient commissioning.

1.1 Plant Overview

Location of site.

Description of existing plant or greenfield site.

How plant fits into existing network, supply areas.

Water quality requirements e.g. UV disinfection used for protozoal and bacterial barrier (sections 4.10.1.4 and 4.10.2.13 of the Drinking Water Quality Assurance Rules).

* 1. Project Overview

From basis of design/project brief summarise:

* Why is the project necessary (growth/development etc)? Greenfield or upgrade? Issues with any existing infrastructure.
* For multistage projects describe the scope of this commissioning plan and how it fits into the other stages.

Plan of site showing works

*Figure 1: Project Title overview (Image from reference).*

* 1. Project Description

Summary of scope of works (overview of assets to be delivered).

Design flows.

Relevant dates.

Details of any project staging or linkages to other projects.

[Plant Name] [Plant tag] will be fed from a new/existing LV/HV transformer owned by Vector.

Detail and upgrade requirements and when this will be commissioned.

Is power continuity required throughout the upgrade?

Include statement on decommissioning of redundant plant.

Process/Plant Flow Diagram before project upgrade

***Figure 2****:* ***Project Title*** *Process/Plant Flow Diagram before project upgrade (Image from reference).*

Process/Plant Flow Diagram after project upgrade or at each relevant stage

*Figure 3: Project Title Process/Plant Flow Diagram after project upgrade (Image from reference).*

# 

1. Commissioning Overview

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Items/Project Phase** | **Installation & Pre-Commissioning**  **(individual assets)** |  | **Cold Commissioning**  **(systems)** |  | **Hot Commissioning**  **(systems on process fluid)** | | | | **Provisional takeover** | **Performance Proving Period** | **Final Handover** | |  | |
| **Health and Safety Management** | [Contractor] responsible | | | | | **Acceptance to Service** | WSL-O responsible | | | | | | | |
| **Operation of equipment** | [Contractor] responsible to lead testing except for I/O testing where WSL Control System Engineer will lead | **Handover** | WSL-C responsible to lead testing.  [Contractor] to provide support as required. | | | WSL-O responsible for routine operation &.on call alarms with support from Commissioning.  WSL-C responsible to lead testing and monitor.  WSL-Maint responsible for instrument calibration  [Contractor] and WSL-Maintenance delivery to provide support. | **Handover** | | WSL-O responsible for operation.  WSL-C responsible for monitoring performance and support with troubleshooting as required.  WSL-Maintenance delivery to provide first response for Pump Station faults. | | **Handover** | | WSL-O responsible for operation |
| **Maintenance of equipment** | WSL-P responsible for maintenance | | | | | | | **Handover** | | WSL-O responsible for maintenance | | | | |
| **Project related** | ITR Documentation to be submitted and accepted by Watercare | **Handover** | Test records submitted for each system. Approval to introduce process fluids to specific systems. | **Operationally Ready** | Ready to tie in to operational plant.  If the whole site is not ready for health and safety hand over, a site delamination plan to be agreed with WSL-O. | **Practical Completion** | Completion of system testing and tie-ins.  If provisional takeover is not ready to be achieved due to documentation status, advancement to performance proving period will start. |  | | Decommissioning of existing equipment  Landscaping  Scheduled works snags | | | | |

Installation completion, Pre-commissioning and Cold Commissioning stages will be completed by Construction Contractor. The Watercare Commissioning Team will lead hot commissioning with support (labour and equipment) from Construction Contractor.

The commissioning stages are outlined below.

2.1 Factory Acceptance Testing (FAT)

Assets subjected to FAT prior to delivery include switchboards, software and other major assets as described in Watercare standards.

* 1. Site Acceptance Testing (SAT)

All major packaged equipment and software is subject to SAT once installed at site. Dependant on complexity, a SAT is likely to encompass both Mechanical Completion and Pre-commissioning.

* 1. Installation Completion and Pre-Commissioning (IC / PC) stages

Test records (ITRs) completed for all individual assets to confirm that installation is in accordance with Watercare requirements. Assets may then be livened and pre-commissioned using Watercare approved PC ITRs.

* **Internal WSL Milestone and Hold Point – Completions Dossier updated.**

* 1. Cold commissioning

Using a safe fluid, test the trips/interlocks and control loops. Each system is separately confirmed ready for hot commissioning.

* **Internal WSL Milestone and Hold Point – Ready for Hot Commissioning.** 
  1. Hot commissioning

Plant will be started-up and operated in automatic mode on process fluid. All remaining functionality testing is completed. Acceptance to service will be applied for when the project is ready to receive wastewater *OR* when water quality requirements have been met*.*

* **Internal WSL Milestone and Hold Point – acceptance to service.**

After acceptance to service, the remaining ties ins and any last functionality checks to demonstrate stable, reliable and safe operation with no critical faults or alarms. The Watercare site operations team WSL-O are responsible for routine operation and on-call alarms with support from the Commissioning Team.

* **Internal WSL Milestone – provisional takeover**

WSL-O will be responsible for normal operation and maintenance of the assets.

* 1. Performance proving period

Project specific continuous operation performance proving period.

* **Internal WSL Milestone – final handover**

1. Performance Requirements

This version of the commissioning plan has been developed to assist with the tender process. Performance indicators described in this section are to be reviewed and updated before commissioning. Any additional agreed performance requirements can be added to this section.

Specific performance requirements have been set for each process area, assuming that the incoming Raw Water/Wastewater meets a series of requirements:

*Table 1: Performance Requirements*

|  |  |
| --- | --- |
| **Parameter** | **Performance Specification** |
| Inlet Water | Assumptions that have been made about inlet water quality |
| Plant Parameters including periphery plant such as biofilters, recycled water, ventilation, compressed air | Requirement Reference (a contract)  Value/Values (Max/Min/Hourly Peak/etc. A Percentage is not acceptable as a performance parameter, if value is a percent then write actual values here and ensure they are achievable.)  Duration (Always/Min 1 hour/Min 24 hours)  Is a test of this parameter required (Y/N)  Is it feasible to test within 1 year of completion (Y/N)  Is there a methodology provided for this test (Y/N)?  What parameters are limits/constrained during the test?  Does the test require external instrumentation/sampling?  Does the design include suitable sampling points for the test?  What is the Pass/Fail Criteria  Upstream Water Quality Constraints |
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1. Commissioning Team

4.1 Roles and Responsibilities

The commissioning team communication structure, contact details and roles and responsibilities are included below. Detailed role descriptions are in the Watercare Commissioning Code of Practice (ESF-700-STD-801).

*An example is shown below. Important to include the key operations roles to encourage inclusion within the project team.*



*Figure 4: [Project Name] commissioning team and communication structure.*

*Table 2: Roles and Responsibilities*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Role** | **Company** | **Name** | **Title** | **Contact number** | **Email address** |
|
| *[Project delivery lead, etc.]* | *[Watercare, etc.]* | *[Joe Blogs]* | *[Project manager, etc.]* |  | *[*[*j.blogs@email.nz]*](mailto:j.blogs@email.nz) |
| Construction Project Manager | Watercare |  |  |  |  |
| Operations Commissioning Manager | Watercare |  |  |  |  |
| Project Manager | [Contractor] |  |  |  |  |
| Commissioning Manager | [Contractor] |  |  |  |  |
| Commissioning team Lead | Watercare |  |  |  |  |
| Commissioning - mechanical | Watercare |  |  |  |  |
| Commissioning - electrical | Watercare |  |  |  |  |
| Commissioning - instrumentation | Watercare |  |  |  |  |
| Control System Engineer | Watercare |  |  |  |  |
| Commissioning Engineer | [Contractor] |  |  |  |  |
| Design Consultant | [Design Consultant] |  |  |  |  |
| Production Manager | Watercare |  |  |  |  |
| Operations Controller | Watercare |  |  |  |  |
| Operations Engineer | Watercare |  |  |  |  |
| Maintenance Controller | Watercare |  |  |  |  |

* WSL Project team (WSL-P)
* WSL commissioning team (WSL-C)
* WSL [Area] Operations team (WSL-O)
* [Contractor] (XX)
* [Design Consultant] (XX)
  1. Specialist Suppliers

The specialist product suppliers will liaise with the [Contractor] commissioning engineer to achieve the following:

* supervising the installation, orientation, testing and commissioning of their equipment as detailed in the contracts.
* Technical support and advice as required
* As-built drawings and manual
* Declaration of Conformity (DOC) where applicable
* Training for personnel as part of the commissioning process.

*Table 3: [Project Name] Specialist Suppliers*

|  |  |
| --- | --- |
| **Name** | **Item** |
| [Insert supplier] | Submersible pumps |
| [Insert supplier] | VSD |
| [Insert supplier] | Flow and level instrumentation |
| [Insert supplier] | Switchboard |
| [Insert supplier] | Switch room power factor system |
| [Insert supplier] | Security system |
| [Insert supplier] | Fire system |
| [Insert supplier] | [equipment] |

1. Commissioning Staging

This version of the commissioning plan has been developed to assist with the tender process. The information used in this section is based on available design information at time of writing (date). Content is to be updated for commissioning use.

*Include a high-level commissioning philosophy including sequencing of the works. This section can be further developed as the design is firmed up. Describe options for operating existing plant and switching to new plant. Include any temporary arrangements required for each option.*

*Include:*

* *any statutory testing required for external certification i.e. site certificates for chemical systems.*
* *any integrity testing required for chemical bunds and outlet valves.*
* *chemical bulk tank and dosing pumps.*

5.1 Commissioning System

The commissioning systems and subsystems have been identified in the table below. An Inspection Test Plan (ITP) will be produced for each system. System boundary drawings are included in Appendix A.

*In addition to process areas, auxiliary systems must also be included. The table below is for a wastewater pump station, please contact Watercare for a comprehensive list if required. These process groups are also used in the P&ID’s and tag numbering etc. and located in ProjectWise.*

*Table 4: Commissioning Systems and Sub-Systems*

|  |  |  |
| --- | --- | --- |
| **System** | **Sub-System** | **Description** |
| 00 | 00-xx | Site General – buildings (civil/electrical/mechanical) and roads etc. |
| 01 |  | Control Systems (DCS, SCADA, Telemetry RTU’s, PLC’s etc.) |
| 03 |  | Site Services – e.g. Compressed Air |
| 04 |  | Service Water/Potable Water - used in the process e.g. chemical flushing, site amenities etc. |
| 05 |  | Fire & Security (includes fire main and hydrants) |
| 06 |  | Low voltage Electrical Reticulation |
| 07 |  | High voltage Electrical Reticulation |
| 08 |  | Heating Venting and Air Conditioning (HVAC) |
| 14 |  | Electrical Generation |
| 35 |  | Odour Control |
| 80 |  | Wastewater Pumping (Wastewater Pump Stations - Networks/Transmission) |
| 81 |  | Wastewater Storage (Networks/Transmission) |
| 82 |  | Gravity Sewer including Manholes (Networks/Transmission) |
| 83 |  | Sewer, inverted siphon (Networks/Transmission) |
| 84 |  | Rising Main (Networks/Transmission) |
| 85 |  | Overflow (Networks/Transmission) |
| 86 |  | Wastewater Grit Collection (Networks/Transmission) |
| 87 |  | Pressure vacuum system |
| 88 |  | Pressure wastewater line valve |
| 89 |  | Boundary connection for pressure wastewater |
| 90 |  | Flow measurement / metering |
| 99 |  | Cathodic Protection System |

5.1.1 Flush Waste and Commissioning Discharges

The following temporary discharges to trade waste/stormwater/waterway have been identified:

*Table 5: Temporary Discharges*

|  |  |  |
| --- | --- | --- |
| **Discharge** | **Type** | **Consent requirement** |
|  |  |  |

* + 1. Pump Performance Verification

To enable the operation of the [plant equipment] pump using water a dedicated recirculation line will be installed as shown below. The valve and/or orifice plate will be installed to simulate the pressure expected in the rising main. The recirculation pipe size has been designed to supplement the pressure simulation required.?

Describe where the recirculation line will be tied in (include tag numbers), where the flow will be measured and where it will discharge. Ensure sufficient straight length for flow meter accuracy. The flowmeter supplier may need to be consulted.

Detail instrumentation required e.g. discharge pressure, suction head, discharge flow measurement.

Include tie-in steps required for reinstatement of permanent route including isolation steps.

*Plan of area showing temporary lines and instruments*

*Figure 5: E.g. Recirculation line setup for [plant equipment] pump performance verification [from drawing no. ?? issue ??].*

* + 1. Testing on Process Water (Temporary works)

After completing cold commissioning there may be an opportunity to use the same recirculation line to test the pump station with process water for hot commissioning.

Describe methodologies, risks, controls and alternatives if any.

* + 1. Commissioning Resources Requirement

*List resources required for commissioning especially long lead items. Might include supplier personnel, sampling equipment.*

*Table 6: Resources Required*

| **Resources/Setup** | **Purpose** | **Quantity** |
| --- | --- | --- |
| **Equipment** | | |
|  |  |  |
| **Transportation Arrangement** | | |
|  |  |  |
| **Temporary Connection or Pipeline** | | |
|  |  |  |

* 1. Tie-Ins

Tie-in work affecting any existing treatment plant, piping or control system is summarised in the Table below, identified in the project programme and a CSRP approved.

Each critical tie-in activity requires a methodology (text and drawing) and a risk assessment prepared by [Contractor].

Critical tie-ins are defined as interfaces to the existing plant or network as follows:

* An operational shutdown is required.
* Interface connection to existing plant/network even if it can be achieved offline.
* Health and safety risk to construction workers, WSL-O and/or commissioning team (e.g. confined space entry, construction near a live asset).

Each critical tie-in point will require a risk assessment, and a detailed methodology (text and drawings) prepared by [Contractor] which shall include the following:

* Equipment tag numbers.
* Prerequisite activities,
* Temporary works,
* Requirement for isolations including double isolations.
* Requirement for Watercare AA/JSA and permits

*Table 7: Tie-in List*

| **Tie-in No** | **Tie-in Description** | **Drawing No Ref. No.** | **Description of Criticality** |
| --- | --- | --- | --- |
| **Process Tie - Ins** | | | |
| T-01 | [Insert description] | [Insert description] | [Insert description] |
| T-02 | [Insert description] | [Insert description] | [Insert description] |
| Electrical and Control Tie - Ins | | | |
| E-01 | [Insert description] | [Insert description] | [Insert description] |
| E-02 | [Insert description] | [Insert description] | [Insert description] |
| Security and Fire System Tie - Ins | | | |
| S-01 | [Insert description] | [Insert description] | [Insert description] |
| S-01 | [Insert description] | [Insert description] | [Insert description] |

1. Environmental Considerations

6.1 Consents

*List current and new discharge consents. Ensure that consents are in place for discharges identified above as required. Are special consent conditions required for the commissioning period?*

1. Commissioning Process

Commissioning shall be completed as per the Watercare Code of Practice for Commissioning (ESF-700-STD-801). All definitions and requirements for each stage shall be taken as per the Code of Practice for Commissioning unless identified below.

Installation completion, Pre-commissioning and Cold Commissioning will be completed by Construction Contractor. The Watercare Commissioning Team will lead hot commissioning with support (labour and equipment) from Construction Contractor.

Each stage must be successfully completed, and milestones signed off by Watercare operations and commissioning teams prior to moving to the next stage.

7.1 Factory Acceptance Testing (FAT)

Assets subjected to FAT prior to delivery include switchboards, software and (list any other equipment that reaches Watercare standards for FAT).

FAT procedures are created by the supplier and approved by WSL-P prior to testing and include checklists and witness points as required. Outstanding issues found during the FAT are managed as a defect as agreed by the project team.

Integrated factory acceptance testing (IFAT) ensures that the control and protection systems hardware and software are both tested in the factory. Robust FAT testing will save commissioning time later in the project.

* 1. Site Installation and Site Acceptance Testing (SAT)

The following vendor asset packages are subject to SAT prior to cold commissioning *(list these)*. SAT documents will include completed test sheets and additional supporting documentation e.g. diagnostic software.

SAT procedures shall be created by the supplier and approved by WSL prior to testing including checklists and witness points as required. The SAT report shall include the completed procedures, vendor O&M manuals, software backups, any snag lists, settings and parameters, any software and licenses required for operation and maintenance including diagnostic software.

* 1. Installation Completion and Pre-Commissioning (IC / PC)

Completed for individual assets on a system-by-system basis to confirm that equipment has been installed in accordance with all the approved drawings, specifications, manufacturer’s instructions, and regulatory requirements. This includes pressure testing as required using a suitable medium.

Once Installation is confirmed complete, individual discrete elements are livened and tested (including leak testing). The process control system software is installed. Instruments are set-up and calibrated, electrical circuits are livened and tested, actuated valves and gates are tested, and limits and indications set, VSD’s are livened, and electrical protection settings tested, motors and pumps bump tested, and test runs completed.

Completed ITRs and supporting documentation are collated into a completion dossier before moving to the next stage.

* 1. Cold commissioning

Using a safe fluid, each system/sub-system is tested to validate operational interfaces and system interdependencies. Confirm that trips/interlocks and control loops are operational (where possible) including control system functionality testing and that the system is ready to be Hot Commissioned.

*If this is to be staged, give high level summary of staging.*

* **Internal WSL Milestone and Hold Point – Ready for Hot Commissioning.**

* 1. Hot Commissioning

Plant will be started-up and operated in automatic mode on process fluid. All remaining functionality testing is completed. *List any exceptions.*

*If this is to be staged, give high level summary of staging.*

WSL-C will be monitoring plant performance (Refer to Section 3 for performance criteria) and fine-tuning the process control as required. The Watercare site operations team WSL-O are responsible for routine operation and on-call alarms with support from the Commissioning Team.

Hot commissioning checks to be undertaken shall include but not limited to the following:

* ??

Note any biological processes that require time prior to testing e.g. biofilter performance will be assessed four weeks after start-up.

* **Internal WSL Milestone and Hold Point – acceptance to service.**

* 1. Acceptance to Service Milestone

Acceptance to service will be applied for when the project is ready to receive wastewater *OR* when water quality requirements have been met prior to connection to an operational Watercare asset. The timing of Acceptance to service is project specific and may be applied for on a systems basis or for the plant as a whole. The acceptance to service memorandum shall be approved once Watercare operations is satisfied that the [plant] is ready to be put into service under the management of WSL-O, and WSL-O is ready to operate the plant without risk of consent breach or non-compliant water.

The Watercare Template for the Acceptance to service shall be used, this template identifies the signatories and requirements to be met before acceptance is granted.

While under the acceptance to service the project assets are still owned by the Project team.

* **Internal WSL Milestone – provisional takeover**

* 1. Provisional Takeover Milestone

To achieve the provisional takeover milestone, the plant needs to have demonstrated stable, reliable and safe operation with no critical faults or alarms. The provisional takeover certificate (PTC) shall be completed and approved. This certificate represents the acceptance of the WSL-O to manage the new asset.

The Watercare Template for the Provisional Takeover shall be used, this template identifies the signatories and requirements to be met before acceptance is granted.

After provisional takeover, WSL-O will be responsible for operation and maintenance of the [plant]. If WSL-O are unable to resolve any issue or there are potential contractual implications the affected equipment will be left out of service if it is safe to do so. If it is not possible to leave the equipment out of service, the WSL-C on-call personnel will be contacted.

* 1. Performance Proving Period

The following project specific performance proving has been agreed:

*e.g. 5 days continuous automatic operation.*

*Define who will monitor results.*

*Define the process for non-conformances. Will the test restart from scratch?*

[Responsible party often WSL-C] will be responsible for analysing the [plant] performance during this stage. WSL-O will be responsible for the [plant] operation including attending to issues, keeping records and communicating with WSL-C as agreed. [Contractor] will be available to assist as required. If WSL-O are unable to resolve any issue or there are potential contractual implications, the affected equipment will be left out of service if it is safe to do so. If it is not possible to leave the equipment out of service, the WSL-C on-call personnel will be contacted.

* **Internal WSL Milestone – final handover**

Each stage must be successfully completed, and milestones signed off by Watercare operations and commissioning teams prior to moving to the next stage.

* 1. Lessons Learnt Session

Opportunities for lessons learnt will be identified throughout the commissioning phase. These will be used in the lessons learnt workshop at the completion of the project prior to final handover.

1. Communication Plan

8.1 Progress Updates

The aim is to ensure regular communication will be held with relevant parties as described in the sections below.

* + 1. Daily Briefings

Daily briefing sessions will take place every morning at [Insert time]. [Contractor] will lead the meeting during installation completion and pre-commissioning stages with Watercare Commissioning team (WSL-C) taking over for cold and hot commissioning stages. *(Project specific)*

The daily briefing session describes the work plan for the day ahead, confirms permissions are in place, identifies any clashes in scope, health and safety impacts and upcoming key dates.

Key elements of the briefing session will be recorded on the white board situated in the [Insert location]. The whiteboard shall be located in a prominent location (such as the break-out area). If there is a major change or significant risk introduced, it is expected that the site will have a stop work meeting and re-complete the daily briefing. Any minor changes should be added to the board through the day.

Anyone who is not present for the briefing must be given a quick briefing / induction when they arrive on site.

* + 1. Weekly Commissioning Progress Meeting

Weekly progress meeting will be coordinated by WSL-P and to be attended by the [Contractor], WSL-C and WSL-O. The meeting will be held on site or at an alternative location as agreed.

The purpose of this meeting is to review the commissioning planning, risk and progress. This also acts as a forum to raise and resolve any commissioning related issues.

Note that the weekly commissioning progress meeting is not a substitute for any routine weekly project progress meeting. A commissioning update will be incorporated in the agenda of these meetings. The project progress meeting will continue to cover the project related health and safety, risk, programme and other related matters.

* + 1. [Contractor] Weekly Report

Weekly reports will be sent by [Contractor] to all nominated persons but as a minimum to the WSL project manager, the WSL commissioning manager and the WSL operations manager. The report will identify health and safety issues, a brief of works completed, planned works for the weekly look ahead and items of concern and opportunities.

1. Health and Safety

9.1 Transfer of Control of Works *(for current operational sites only)*

The Watercare TOPC (transfer of premises control) procedure and form template will be followed for the transfer of control of work sites. Work areas that can be adequately isolated from site operations will be signed over by the [Area] production manager to the WSL-P and be controlled by the [Contractor] Health and Safety Management Plan during installation complete, pre-commissioning, and cold commissioning. All personnel must undertake a site-specific induction run by [Contractor] unless it has been arranged that they are escorted around site by a site-inducted individual.

If the area cannot be handed over to the infrastructure team, WSL-O will manage Health and safety using the Watercare Control of Works processes.

The [plant] health and safety management will be transferred from [Contractor] to WSL-O when acceptance to service has been achieved. If there is any area which cannot be handed over to WSL-O due to construction work, a demarcation plan must be agreed defining the handover area - sufficient to allow site access for day-to-day operation and maintenance. The remaining area will be transferred to WSL-O once *[define detail of requirements for demobilisation etc]*.

*Site plan showing area delineations.*

***Figure 6****: Site plan with area delineations*

The documentation and items noted in the table below are required on handover of the health and safety management.

*Table 8: Health and safety management handover requirements*

| Documentation | Items | SOPs | Certifications | WSL Systems |
| --- | --- | --- | --- | --- |
| * Site specific induction slide show * Hazard register * Confined space register * Site emergency response plan * Sign-in register * Site induction video for current plant situation | * Level 1 entry sign * Plant wide signage * First aid kit * Defibrillator * Fire extinguishers | * Fire and security | * Cranes * Pressure vessels | * ICARE / EAM |

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* 1. Isolations

Production Critical boundary isolations are to be applied and controlled by WSL-O using the Watercare isolation procedure at the start of the project or from an appropriate tie-in milestone.

Production Critical isolations are defined below:

* Points adjacent to the water supply distribution network. Double isolation or other controls required to prevent the discharge of uncertified water into supply.
* Points where unconsented discharge to waterways could occur.
* Point adjacent to live gas/biogas pipelines. Double isolation or other controls required.

Non-production critical isolations and work control will be managed by [Contractor] during construction, pre-commissioning, cold commissioning and hot commissioning. The work area will be fenced off and project activities kept separate from the operations team activities as per the drawing below. (*Project Specific*)

Drawing showing delineated work area.

The WSL [Area] operations team (WSL-O) will be responsible for all isolation and work control after acceptance to service has been successfully achieved.

For activities and tie-in work which requires isolation of current operational assets, an isolation permit will be submitted to WSL-O. WSL-O will put the isolations in place and remove them upon confirmation that the work is completed.

* Only people that have been trained in the Watercare Isolation procedure and designated by Watercare as Authorised Persons are able to apply isolations.
* An Authorised Person must have knowledge and understanding of the planned works and equipment. They must understand the context of the isolation and the effects and the purpose.
* Isolation procedures / permits shall identify equipment requiring isolation including tag numbers and describe why the work is necessary and how it will be completed.
* Isolations shall involve lock out and tag out to ensure that an isolation cannot be inadvertently or intentionally removed without prior approval.
* Lock out keys and isolation register shall be securely managed by the Site Lead (or nominated person).
* Consider which livened equipment not under isolation will also need to be tagged to raise awareness.

* 1. Control System Change Request (CSCR) Application

A Control System Change Request (CSCR) application is to be submitted to the WSL controls system engineer prior to any modifications to the control system and networks hardware or software.

An Approved Document Register (ADR) must be attached to the application with reviewed and approved versions of relevant documents which demonstrate the proposed control system changes, associated risks and mitigation actions, implementation methodology and the commissioning test plan and may include:

* Approved Functional Description
* FAT test and snags completed and approved
* Approved implementation plan and check sheets
* Risk assessment and including controls
* Approved SAT schedule

The initiator submits the ADR to the WSL commissioning engineer, who signs off confirming that the proposed changes and documents have been reviewed and approved by the required parties.

* 1. Risk Assessment

A risk assessment workshop shall be completed before at least 10 days prior to planned commissioning work starting. This workshop shall create the initial commissioning Risk register (it can be combined with, or be a section of, the project risk register). The risk assessment will document commissioning risks and mitigation measures based on this commissioning plan and the proposed work methodologies. The level of scrutiny and detail applied during these sessions will correspond to the level of risk present.

Commissioning risks will be reviewed at least weekly or when there are changes to the proposed work methodology. The Project engineer will update the project risk register after each review.

1. Site Constraints

10.1 Working Hours

No lone working is permissible, at least two workers must be onsite when physical works are ongoing. Normal working hours are to be between [Insert time].

* 1. Parking

[Insert content]

* 1. Site Access

[Insert content including sign-in procedures]

1. Documentation

Documentation is generated during the commissioning process to record that:

* All equipment, cables and instrumentation have been installed, tested and commissioned and is safe to operate.
* The information required to safely operate and maintain the equipment is accurate and readily available, such as manuals, drawings, set-points, ranges etc.

The individual testing, Mechanical Completion and pre-commissioning dossiers will be provided by [Contractor] as part of their work plan and presented on a system basis in Completions Dossiers. The dossiers will be compiled using the Watercare templates for the dossier and ITR’s.

Cold and Hot commissioning shall be completed using the Watercare CTP Template including the completions dossier.

1. Training

The Design Consultant {xxxxxxxx} will provide classroom training on the Basis of design, detail design, POD, SOPS and FD.

The following equipment has been identified as being novel to the operating area and hence training will be provided as per the requirements of Watercare’s Code of Practice for Commissioning.

*Table 9: Training register*

|  |  |  |  |
| --- | --- | --- | --- |
| **Equipment / Process** | **Supplier of equipment and training** | **Training Proposed**  **i.e. practical / classroom/ online/** | **Location and time** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |