SECTION D - SPECIFICATION

The Specification sets out Seqwater's requirements for the Holts Hill Fluoride Dosing Overhaul project and includes:

Part 1: Scope of Works – Holts Hill Fluoride Dosing Overhaul Rev 1.0

Part 2: Specification Attachments

HOLTS HILL FLUORIDE DOSING OVERHAUL

SCOPE OF WORKS

Revision 1.0

DOCUMENT CONTROL

Date	Rev	Issued For	Description	Author
4 Dec 2015	A	Review	Draft for review by Seqwater	Beca Pty Ltd
23 Feb 2016	0.1	Construction	Construction issue	Beca Pty Ltd
14 Apr 2016	0.2	Construction	Reissued for construction	Beca Pty Ltd
16 Jun 2016	0.3	Construction	Revised for tender. Comments from Legal, Procurement, WH&S and Environmental incorporated.	W. Smith
20 July 2016	1.0	Construction	Revised for tender	W. Smith

CONTENTS

Abbreviations

Term / Abbreviation	Description
FAT	Factory Acceptance Test
ITP	Inspection and Test Plan
JSEA	Job Safety and Environmental Analysis
O&M	Operating and Maintenance
P&ID	Piping and Instrumentation Diagram
PCP	Process Control Philosophy
PLC	Programmable Logic Controller
POP	Process Operating Philosophy
PPE	Personal Protective Equipment
SCADA	Supervisory Control And Data Acquisition system
UPS	Uninterruptible Power Source
WUC	Works Under Contract
WMS	Work Method Statement
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

1 INTRODUCTION

The scope of works under this Contract is for the overhaul of the Holts Hill Fluoride Dosing System that provides fluoridation for water produced at the Mt Crosby East Bank WTP and West Bank WTP.

Note: Any reference to “Seqwater” in this document means “Principal”.

1.1 BACKGROUND

Mt Crosby East Bank and West Bank Water Treatment Plants have a nominal combined capacity of 1000 mega litres a day (ML/d) and are a major supply source of drinking water for the South East Queensland (SEQ) region. They are commonly referred to as the Mt Crosby Water Treatment Plants (WTPs).

The Holts Hill Fluoride Dosing System provides fluoridation for water produced at the Mt Crosby WTPs. The fluoride dosing system is a sodium fluorosilicate powder dosing facility, originally commissioned in 2009 as a constant volume / variable concentration system.

This project involves the supply, installation, construction, testing and commissioning of the overhauled Holts Hill Fluoride Dosing System.

This document details the scope of works associated with the Holts Hill Fluoride Dosing System Overhaul project and provides reference to key design, construction and technical requirements documents.

The Mt Crosby WTPs is an operational facility and is required to remain in continuous operation, including for the duration of the construction of the Works.

1.2 PROJECT OBJECTIVES

The project is intended to provide improvements to the current operation of the fluoride dosing system, with an emphasis on delivering improved robustness and reliability.

This Contract is for the construction of the Works, inclusive of structural, mechanical, electrical and controls works; the supply and installation of all plant and equipment; the configuration, testing and commissioning of the overhauled fluoride dosing system; and the provision of documentation and training regarding the operation of the overhauled fluoride dosing system.

1.3 SCOPE OF WORKS

The scope of works for this Contract is detailed in the following sections and includes:

Supply, installation, construction and commissioning of all equipment and works to provide a fully functioning fluoride batching and dosing system capable of meeting all design criteria specified in the Technical Specifications.

The scope of works includes, but is not limited to:

- Cleaning and preparation of the fluoride dosing system building for construction works. The shutdown of the existing fluoride dosing system will be managed by Seqwater.
- Decommissioning, demolition, removal and disposal of all redundant equipment
- New fluoride dosing service water pump system
- Replacement of existing volumetric feeder gearboxes
- New elevated East Bank and West Bank batching tanks and associated equipment
- New elevated East Bank and West Bank dosing tanks and associated equipment
- New fluoride dosing pumps, including cooling fans

- New support structures and access to new equipment
- Modification of existing electrical and controls equipment to accommodate additional motors and instrumentation.
- Upgrading of controls system including software programming for integration of the overhauled fluoride dosing system with the existing site wide controls system
- Upgrade existing fluoride dosing building lighting
- Review the site maximum demand at the main switchboard
- Commissioning of the overhauled fluoride dosing system
- Provision of training and documentation relating to the ongoing operations and maintenance of the overhauled fluoride dosing system

1.3.1 PRELIMINARY WORKS

1.3.1.1 Site Establishment

The Contract shall complete all site establishment activities, including the following;

- Mobilisation and Demobilisation
- Demarcating working area
- Supply and erection of on-site signage
- Identification and protection of existing services
- Implementation of environmental controls
- Supply and erection of temporary security fencing around work location perimeters

1.3.1.2 Fluoride Dosing Building Cleaning

The Contractor shall clean and prepare the fluoride dosing building for construction works, including the removal, disposal and/or isolation of all sodium silicofluoride powder and residuals from the walls, ceilings, floor areas, machinery and equipment, such that no personal protective equipment is required to worn inside the building.

1.3.1.3 Dilapidation Survey

The Contractor shall carry out a dilapidation survey and prepare a detailed digital photographic record of all areas that will be affected by construction including stockpile areas, storage areas and access tracks. Details shall include, but not be limited to, structures, roads, pavements, reserves, kerb and gutter, fences, drains and pits. Special attention shall be given to all existing improvements adjacent to, and which may be affected by, the WUC.

The Contractor shall also provide a record of notable details and existing damage or faults relating to improvements in the vicinity of the Works.

This record may be used in the resolution of disputes between third parties and the Contractor and/or the Principal and accordingly must be comprehensive in its coverage of the areas affected by construction activities.

The record shall be completed and submitted to the Superintendent prior to commencing work on the site. This is a Hold Point for the Contract.

The Contractor shall add to the record as work proceeds if additional areas will be affected by construction activity and the condition has not been previously recorded or if site conditions change.

The dilapidation survey shall be a pdf word document, and photographs shall be digital images submitted on a CD displaying the date of photography.

The dilapidation survey and photography shall be grouped in packages representing each section of the Works. Each package shall be indexed such that particular properties and/or chainages can be examined. Each package shall carry notation indicating:

- Chainage at start and finish
- Comments on any existing damage or faults, particularly where the damage or faults are not obviously visible in the photographs.

1.3.1.4 Temporary Works:

The Contractor shall design and construct any temporary works required for the construction of the WUC. The Contractor shall engage a RPEQ Engineer to undertake and prepare any temporary works designs.

1.3.1.5 Decommissioning, Demolition and Disposal Works

The Contractor shall decommission, demolish and dispose of the following:

- Existing East Bank and West Bank mixing tanks and associated equipment
- Existing service water pumps
- Existing service water pumps control panel
- Existing fluoride dosing pumps
- All other redundant equipment and materials

The disposal of equipment shall be in accordance with Section 7.13 Waste management.

1.3.2 STRUCTURAL AND BUILDING WORKS

The supply, installation and commissioning of:

1.3.2.1 Service Water Pumps Building

- Cutting and reinstatement of service water pumps slab

1.3.2.2 Fluoride Dosing Building

- Dosing tank plinths (suitable for tank hold down which is to be confirmed by tank manufacturer)
- Dosing tanks access ladders
- Dosing tanks handrailing (Note that as the dosing tank is located underneath the batch tank, the handrailing beneath the batch tank shall close the gap between the two tanks, rather than be at full height)
- Batching tanks support structures
- Batching tanks handrailing (Note that as the dosing tank is located underneath the batch tank, the handrailing beneath the batch tank shall close the gap between the two tanks, rather than be at full height)
- Pipe supports where required
- Bund coating repair work
- Adjustment to fluoride dosing pump plinths as necessary to accommodate new dosing pumps

- Extension to existing elevated platform to enable safe access to roof of new batching tanks
- Extension to existing elevated platform to enable safe access to roof of existing screw feeder motors
- Extension to existing ground floor pipe gallery
- Two (2) x Xtirpa davit system base plates on existing platform
- Two (2) x Xtirpa davit systems base plates on new batching tank support structure

1.3.3 MECHANICAL WORKS

The supply, installation and commissioning of:

1.3.3.1 Service Water Pump System

- Service water pump set

1.3.3.2 Fluoride Batching System

- East Bank and West Bank batching tanks including mixers, valves and associated pipework and equipment
- Replacement of existing East Bank and West Bank volumetric screw feeder gearboxes to achieve 104kg/hr
- East Bank and West Bank wetting cones and ejectors and associated valves and pipework
- 2 x self-contained eyewash stations on the elevated platform
- East Bank and West Bank batching tanks drain pipework to existing sump
- East Bank and West Bank batching tanks overflow pipework to existing sump
- East Bank and West Bank batching tanks service water fill pipework and associated equipment

1.3.3.3 Fluoride Dosing System

- East Bank and West Bank dosing tanks including mixers, valves and associated pipework and equipment
- New West Bank dosing pumps to achieve required turndown, as detailed in dose pump datasheets.
- New West Bank independent dosing pump cooling fans.
- New East Bank dosing pumps to achieve required turndown, as detailed in dose pump datasheets.
- New East Bank independent dosing pump cooling fans.
- Dosing tank drain pipework to existing sump
- Dosing tank overflow pipework to existing sump
- East Bank and West Bank service water flow meters
- East Bank and West Bank interconnection dosing pipework and associated manual valves
- East Bank and West Bank dosing pumps discharge lines inline conductivity meters flange connections

1.3.3.4 Compressed Air System

- Standby air compressor and receiver set

- Associated pipework and equipment

1.3.3.5 Davit Systems

- Two (2) x modified Xtirpa 1200mm davit systems
- Two (2) x standard Xtirpa 1200mm davit systems

1.3.3.6 Safety Equipment

The Contractor shall supply and install all safety equipment required for the safe operation and maintenance of the overhauled fluoride dosing system including (but not limited):

- Machine guards
- Railings
- Platforms

1.3.3.7 Labelling

The Contractor shall supply and install all labelling required for the safe operation and maintenance of the overhauled fluoride dosing system including (but not limited to):

- Chemicals
- Tanks
- Stores
- Pipes

1.3.4 ELECTRICAL, INSTRUMENTATION AND CONTROLS WORKS

The supply, installation and commissioning of:

1.3.4.1 General

- All wire numbers, wire colours and cable numbers shall be identified. For circuits that pass through junction boxes (JB) each JB must be clearly identified on the termination diagram, and cores/pairs within multi-core cables be identified. Label all new/altered wiring inside control panels according to the drawings and to Seqwater standards. Where the drawings indicate blanks then the Contractor shall identify suitable numbering (next available unique numbers) within the panels and label each device.
- Document all wire, pair, terminal and equipment numbering on the drawings, including where there are blanks or question marks.
- Confirm all MCB and thermal overload device settings and document these on the drawings.
- Re-label all equipment and instrumentation with new tags as per the P&IDs.

1.3.4.2 Main Switchboard

- Upgrade the existing MCCB to DB03 in the main switchboard to 100A as per the single line diagrams and Power System Analysis and Fault Protection Study.
- Investigate and review the Holts Hill site maximum demand and confirm that the switchboard will operate within design limits.

1.3.4.3 Pre-Fluoride Analyser Building

- New East and West Bank pre-fluoride analyser low flow switches.

1.3.4.4 Service Water Pump Building

- New Danfoss FC202P37K VSDs, suitable for new service water pumps, installed on wall opposite DB03 in service water building.
- Power cabling between DB03 and new service water pump VSDs, between new service water pump VSDs and new service water pump motors (including thermistors) according to the drawings and cable schedule.
- Pump control panel including relays and analogue signal splitters
- Replace pressure transmitter and cabling between instrument, control panel and VSDs.
- Connect new control panel to existing JB. Signals according to drawings to be connected to existing fluoride control panels.
- Air-conditioning to service water pump building.

1.3.4.5 Fluoride Dosing Building

- Supply and install all new instrumentation as per instrument schedule and the P&IDs.
- Relocate isolator for sump pump to near personnel door so that it is accessible without entering room and allows the sump pump to be switched on without entering the room.
- Supply and install new cabling to instruments and motors according to the drawings and cable schedule.
- Supply and install new electrical equipment (including relays, terminals, isolators, surge protection, current/load switches and circuit breakers).
- Replace the existing power outlets in both East and West control panels with a RCD protected outlets.
- Adjust all thermal overload and VSD settings as required for new motors.

1.3.4.6 Fluoride Dosing Building Lighting Upgrade

- Where noted on drawing E-DWG-THH-008 all existing luminaires shall be removed and replaced with new luminaires, and connected to the existing sub circuit cabling, with the exception of the emergency luminaires in the dry store area and lower ground area below the dry store area - these luminaires shall remain.
- Unless otherwise noted on drawing E-DWG-THH-008, luminaires in the process area shall be wall mounted at approximately 3000mm above the finished floor level. The Contractor shall determine the co-ordinates of the exact locations on site.
- Where noted on drawing E-DWG-THH-008 luminaires on the north and south wall shall be located below the existing cable ladder trays.
- Where noted on drawing E-DWG-THH-008 existing luminaires and final sub circuit cabling in the process area ceiling shall be disconnected and removed. The Contractor shall make good the ceiling by installing new ceiling panels to match the existing panels. Where it is not possible to remove redundant cabling the Contractor shall make safe the redundant cabling. The Contractor shall prepare and submit a “make safe plan" to the Superintendent for approval. For example the Contractor may recommend that remaining cables are terminated in labelled junction boxes.
- All new luminaires installed in the process area shall be connected to the existing distribution board with new final sub circuit cabling.
- Where noted on drawing E-DWG-THH-008 luminaires above the upper platform and the batching tanks shall be ceiling mounted.

- Where noted on drawing E-DWG-THH-008 luminaires in the process area shall be strapped to steel beam approximately 2600mm above the finished floor level using stainless steel straps to avoid drilling beam. Straps shall incorporate self-locking to prevent being loosened by vibrations, with "bandit" brackets and lock washers.
- An un-switched active shall be installed to each new emergency luminaire and connected to the existing emergency lighting test system. The existing emergency lighting logbook shall be revised to include the emergency lighting changes.
- For existing lighting the switching arrangements shall be retained, however the existing light switches shall be replaced with new IP65 switches.
- For further details, including the Luminaire Schedule, refer to drawing E-DWG-THH-008.

1.3.4.7 Control System

- Replace both Allen Bradley (AB) PLC Controllers located in the East Bank and West Bank control panels with AB MicroLogix 1500 RS-232 Processor Units (Model 1764-LRP - 2 serial ports).
- Install 2 off AB PanelView 800 HMIs (Model 2711R-T10T), one in each of the East Bank and West Bank control panel doors. Remove and blank all mimic panel indications according to the I/O drawings.
- Modify the existing AB PLC system configuration to accommodate the changes to the overhauled fluoride dosing system operation according to the Project Operating Philosophy (POP) & Process Control Philosophy (PCP). Although not all areas of the fluoride dosing system are being modified the Contractor shall also modify the existing AB PLC system configuration to functionally align with the POP & PCP.
- Modify the existing Honeywell Experion SCADA system configuration to accommodate the changes to the overhauled fluoride dosing system operation according to the POP & PCP. Although not all areas of fluoride dosing system are being modified the Contractor shall also modify the Honeywell Experion SCADA system configuration to functionally align with the POP & PCP.
- Factory acceptance test, site test and re-commission the entire overhauled fluoride dosing system, taking responsibility for the configuration of the entire overhauled fluoride dosing system.

1.3.5 SPARE PARTS

1.3.5.1 Required Critical Spare Parts

The Contractor shall supply the following critical spare parts and deliver to a location on-site nominated by the Superintendent:

- One (1) x mixer gearbox and motor
- One (1) x dosing pump gearbox and cooling fan
- One (1) x 250NB valve and actuator (refer Tag 871-HSV-003)
- One (1) x flow meter (refer Tag 871-FIT-001)
- One (1) x PLC processor

1.3.5.2 Recommended Critical Spare Parts

The Tenderers shall recommend additional critical spare parts and include, in its tendered pricing schedule, the pricing to supply and deliver these spare parts to a location on-site nominated by the Superintendent. Seqwater will determine prior to the award of the Contract if it requires the recommended additional critical spare parts and if so required those items will be included in the Contract as part of the lump sum.

1.3.5.3 Recommended Non-Critical Spare Parts

The Tenderers shall recommend additional non-critical spare parts and include, in its tendered pricing schedule, the pricing to supply and deliver these spare parts to a location on-site nominated by the Superintendent. Seqwater will determine prior to the award of the Contract if it requires the recommended additional non-critical spare parts and if so required those items will be included in the Contract as part of the lump sum.

1.3.6 COMMISSIONING

1.3.6.1 Commissioning Workshop

The Contractor shall convene, facilitate and document a Commissioning Workshop at the Mt Crosby WTPs between the Contractor's commissioning team, the Principal, and Superintendent's Representative, a minimum of four (4) weeks prior to the commencement of any testing or commissioning. The duration shall be a minimum of one (1) day and shall include but not be limited to the following:

- Agree on the plant and systems testing and commissioning objectives.
- Agree on the format of the plant and systems testing checklists and commissioning procedures.
- Develop the general level of detail and structure of the documents.
- Develop an organisational chart and communications protocols.
- Review the "For Commissioning" version of the Operation and Maintenance Manuals.
- Develop methodology and tests which will be implemented during the testing, commissioning, trial and POPTs to prove the plant operates in accordance with the Scope of Work. This shall include but not be limited to, fault simulation, plant shutdown, flow variations, set point variations, process monitoring, and water quality monitoring etc.
- Complete a Commissioning Plan Risk Assessment to identify key risks and risk mitigation measures.
- Agree on the classification system for ranking plant faults and failures.
- Agree on the roles of the Contractor's commissioning team, Principals personnel, and the Superintendent's Representative during the plant and systems testing and commissioning.

1.3.6.2 Commissioning Plan

On the completion of the Commissioning Workshop, the Contractor shall prepare and submit a Commissioning Plan a minimum of three (3) calendar weeks prior to the commencement of any testing or commissioning. It shall include but not be limited to the following information:

- Overview
- Commissioning Team Organisational Structure and Resourcing
- Communications Protocols

- Commissioning Program and Timeline
- Commissioning Risk Management Plan
- Plant Commissioning Areas
- Factory Acceptance Testing
- Site Acceptance Testing
- Process Commissioning
- Proof of Performance Testing (POPT)
- Appendix A – All testing, commissioning, and POPT checklists and procedures in accordance with the Scope of Work and outcomes from the Commissioning Planning Workshop.

1.3.6.3 Commissioning Activities

The Contractor shall perform all testing, pre–commissioning, commissioning, trial operation and proof of performance test activities.

1.3.7 TRAINING

The Contractor shall provide comprehensive training of the Principal's operations and maintenance staff over three shifts (non-consecutive) on the operation and maintenance of the overhauled fluoride dosing system, including all existing equipment and all equipment installed as part of the Works.

The Contractor shall submit a Training Plan at least 4 weeks prior to the commencement of any proposed training activity to the Superintendent for review and comment. The Training Plan shall outline the topics to be covered as well as the duration for each, in order to ensure that the Principal's staff and any maintenance personnel are fully trained in all aspects of the fluoride dosing system and its operating systems. In addition the Contractor shall provide the name and background of the person responsible for the training sessions. For specialist equipment and systems, the Contractor shall engage manufacturers' representatives, at the Contractor's cost, to conduct the training.

All training shall be completed prior to the date for practical completion.

1.3.8 OTHER WORKS

The Works shall also include all other works not specifically stated but would be reasonably required to complete the Works. All other works shall include design documents (where the Contractor is required to undertake design) which meet the design criteria, the design service life requirements in Section 2.5 and the Principal's operational requirements as specified in this scope of works.

1.3.9 SCOPE ITEMS TO BE CONFIRMED BY THE CONTRACTOR

There are no works that need to be confirmed by the Contractor.

1.4 PERMITS AND APPROVALS

The Contractor shall prepare and submit of all documentation required to obtain Permits and any other Approvals associated with the Works that are required by all and any relevant authorities and land holders.

1.5 BATTERY LIMITS

The Contract battery limits shall be the tie in locations as defined in M-LST-THH-004. The Contractor shall be responsible for the supply and installation of all parts and equipment required to return systems back to working order after the integration of all Works.

1.6 EXCLUDED WORKS

The scope of works excludes the following:

- Any upgrades to the existing sodium fluorosilicate powder handling system
- Any upgrades to the existing air conditioning and ventilation systems

However, the recommissioning of all systems is required, including the powder handling, air conditioning and ventilation systems.

1.7 SITE LOCATION

The Holts Hill site, as shown in Figure 1, is located approximately 1km from the Mt Crosby West Bank WTP on Lake Manchester Rd, Mt Crosby, Queensland, 4306. Access to the site is restricted and prior approval from the Principal is required before entering the site.

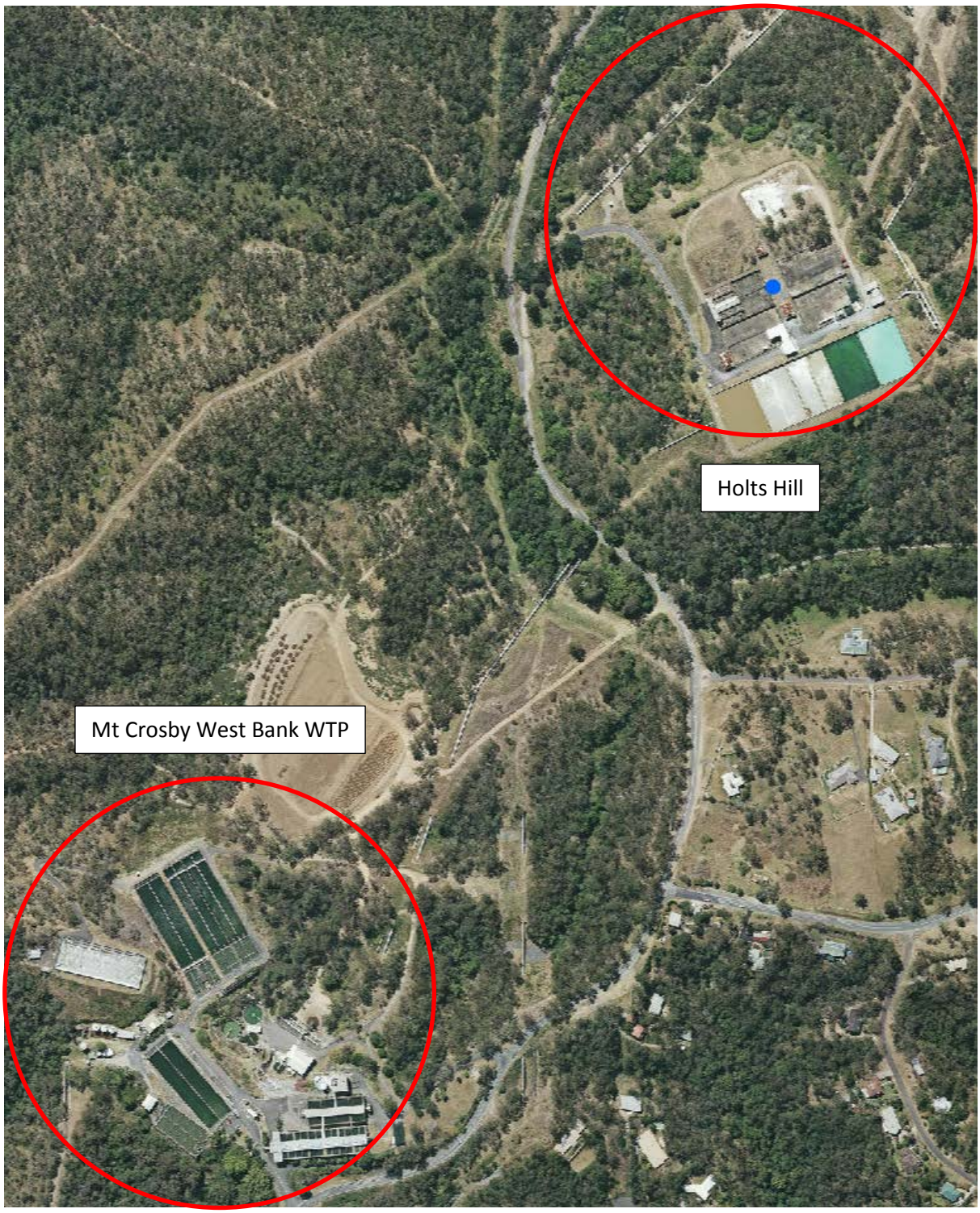

Figure 1 Holts Hill Site Location

The majority of the Works will take place in the following four discreet areas at the Holts Hill site, as shown in Figure 2:

- Pre-Fluoride Analyser Building
- Fluoride Dosing Service Water Building
- Fluoride Dosing System Building
- Main LV Switchboard

Two proposed laydown areas are also shown in Figure 2.

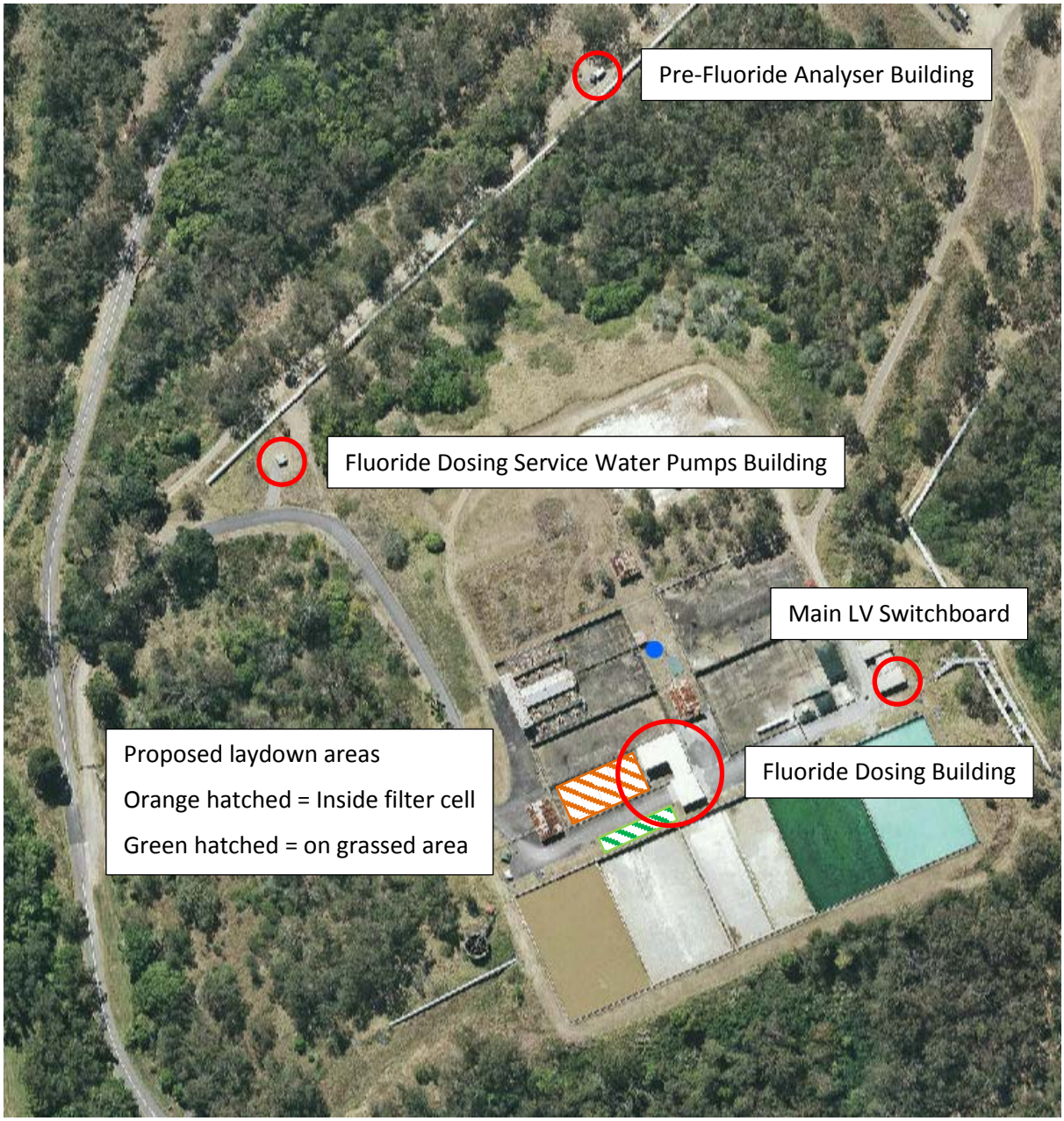

Figure 2 Holts Hill Site Project Work Areas

2 CONTRACT DOCUMENTATION

2.1 INFORMATION PROVIDED

The following information is provided to assist Contractors in their understanding of the requirements of the project.

All work shall be carried out in accordance with the drawings, specifications, schedules and datasheets listed in Section 2.2 of this document.

In case of conflict between the following documents or standards they shall be interpreted in the below order of precedence, with those documents higher in the list taking precedence:

(1) Drawings

(2) Datasheets

(3) Specifications

(4) Industry Standards.

In addition to the Contractor's obligation to notify the Superintendent under Clause 8.1 of the Contract, the Contractor shall at the same time inform the Superintendent's Representative of any such issues, ambiguity, inconsistencies or discrepancies between the above documents.

2.2 RELIANCE DRAWINGS AND DOCUMENTS

The drawings, specification schedules and lists set out in this Section 2.2 are the specification documents referenced in Item 9A of Annexure Part A to the Contract.

2.2.1 DRAWINGS

The following drawings form part of this Contract:

Table 1 Drawings

Title	Drawing Number	Rev
Site Electrical Single Line Diagram	E-DWG-THH-001	0
East Bank Control Panel Electrical Single Line Diagram (Sht 1 of 2)	E-DWG-THH-002	1
East Bank Control Panel Electrical Single Line Diagram (Sht 2 of 2)	E-DWG-THH-003	0
West Bank Control Panel Electrical Single Line Diagram (Sht 1 of 2)	E-DWG-THH-004	1
West Bank Control Panel Electrical Single Line Diagram (Sht 2 of 2)	E-DWG-THH-005	0
East Bank Control Panel; Panel Layout	E-DWG-THH-006	0
West Bank Control Panel; Panel Layout	E-DWG-THH-007	0
Fluoride Building Process Area Lighting Layout	E-DWG-THH-008	0
Holts Hill W.T.P, Site Plan - Electrical	E-DWG-THH-010	0
East Bank 3 Phase Motors; Electrical Schematic 1	E-DWG-THH-012	0
East Bank 3 Phase Motors; Electrical Schematic 2	E-DWG-THH-013	1
East Bank 3 Phase Motors; Electrical Schematic 3	E-DWG-THH-014	0
Fluoride Bulk Bag Unload; Electrical Schematic	E-DWG-THH-015	0
East Bank Fluoride Dosing; Electrical Schematic 1	E-DWG-THH-016	0
East Bank PLC Supply; Electrical Schematic 1	E-DWG-THH-017	0
East Bank PLC Supply; Electrical Schematic 2	E-DWG-THH-018	0
East Bank Load Cells; Electrical Schematic	E-DWG-THH-019	0
East Bank Cooling and Heating; Electrical Schematic	E-DWG-THH-020	0

Title	Drawing Number	Rev
East Bank Main Stop Circuit; Electrical Schematic	E-DWG-THH-021	0
East Bank Extension Panel ; Electrical Schematic	E-DWG-THH-022	0
West Bank 3 Phase Motors; Electrical Schematic 1	E-DWG-THH-032	0
West Bank 3 Phase Motors; Electrical Schematic 2	E-DWG-THH-033	1
West Bank 3 Phase Motors; Electrical Schematic 3	E-DWG-THH-034	1
Spare Drawing; Electrical Schematic	E-DWG-THH-035	0
West Bank Fluoride Dosing; Electrical Schematic 1	E-DWG-THH-036	0
West Bank Fluoride Dosing; Electrical Schematic 2	E-DWG-THH-037	0
West Bank Load Cells; Electrical Schematic	E-DWG-THH-038	0
West Bank Cooling and Heating; Electrical Schematic	E-DWG-THH-039	0
West Bank Main Stop Circuit; Electrical Schematic	E-DWG-THH-041	0
Plant Supply; Power Electrical Schematic	E-DWG-THH-042	0
Plant Supply; Power Electrical Schematic	E-DWG-THH-043	0
Service Water Pumps Control Panel Layout	E-DWG-THH-051	0
Fluoride Service Water; Pump Control Power Distribution	E-DWG-THH-052	1
Service Water Pump 1;Electrical Schematic	E-DWG-THH-053	0
Service Water Pump 2;Electrical Schematic	E-DWG-THH-054	0
East Bank PLC Digital Input Card 0; Termination Diagram	I-DWG-THH-001	0
East Bank PLC Digital Output Card 0; Termination Diagram	I-DWG-THH-002	0
East Bank PLC Digital Input Card 1; Termination Diagram	I-DWG-THH-003	0
East Bank PLC Digital Input Card 2; Termination Diagram	I-DWG-THH-004	0
East Bank PLC Digital Input Card 3; Termination Diagram	I-DWG-THH-005	0
East Bank PLC Analogue Input Card 4; Termination Diagram	I-DWG-THH-006	0
East Bank PLC Digital Output Card 5; Termination Diagram	I-DWG-THH-007	0
East Bank PLC Digital Output Card 6; Termination Diagram	I-DWG-THH-008	0
East Bank PLC Digital Output Card 7; Termination Diagram	I-DWG-THH-009	0
East Bank PLC Analogue Output Card 8; Termination Diagram	I-DWG-THH-010	0
East Bank PLC Digital Input Card 9; Termination Diagram	I-DWG-THH-011	0
East Bank PLC Digital Output Card 10; Termination Diagram	I-DWG-THH-012	0
East Bank PLC Analogue Input Card 11; Termination Diagram	I-DWG-THH-013	0
East Bank Bulk Bag Unload Level Sensor; Instrument Schematic	I-DWG-THH-016	0
East Bank Fluoride Dosing; Signals to West Bank PLC	I-DWG-THH-017	0
East Bank Level Instrument Connection Diagram	I-DWG-THH-018	0
West Bank PLC Digital Input Card 0; Termination Diagram	I-DWG-THH-021	0
West Bank PLC Digital Output Card 0; Termination Diagram	I-DWG-THH-022	0
West Bank PLC Digital Input Card 1; Termination Diagram	I-DWG-THH-023	0
West Bank PLC Digital Input Card 2; Termination Diagram	I-DWG-THH-024	0
West Bank PLC Digital Input Card 3; Termination Diagram	I-DWG-THH-025	0
West Bank PLC Analogue Input Card 4; Termination Diagram	I-DWG-THH-026	0
West Bank PLC Digital Output Card 5; Termination Diagram	I-DWG-THH-027	0
West Bank PLC Digital Output Card 6; Termination Diagram	I-DWG-THH-028	0
West Bank PLC Digital Output Card 7; Termination Diagram	I-DWG-THH-029	0
West Bank PLC Analogue Output Card 8; Termination Diagram	I-DWG-THH-030	0
West Bank PLC Input Card 9; Termination Diagram	I-DWG-THH-031	0
West Bank PLC Digital Output Card 10; Termination Diagram	I-DWG-THH-032	0

Title	Drawing Number	Rev
West Bank PLC Analogue Input Card 11; Termination Diagram	I-DWG-THH-033	0
West Bank PLC Relay Connections; Termination Diagram	I-DWG-THH-034	0
West Bank Bulk Bag Unload Level Sensor; Electrical Schematic	I-DWG-THH-035	0
West Bank Level Instrument Connection Diagram	I-DWG-THH-036	0
Fluoride Dosing System Control System Architecture	I-DWG-THH-040	0
Fluoride Service Water Pumps Pressure Instrument Connection Diagram	I-DWG-THH-041	0
Common Equipment P&ID	B-DWG-THH-870	0
East Bank Dosing System P&ID	B-DWG-THH-871	0
West Bank Dosing System P&ID	B-DWG-THH-872	0
Dosing Pumps P&ID	B-DWG-THH-873	1
Dosing P&ID	B-DWG-THH-874	0
Service Water and Compressed Air System P&ID	B-DWG-THH-970	0
Mechanical Plan - Batching - Ground Floor	M-DWG-THH-001	0
Mechanical Plan - Batching - Upper Level Floor	M-DWG-THH-002	0
Mechanical Section - Section A	M-DWG-THH-003	0
Mechanical Section - Section B	M-DWG-THH-004	0
Mechanical Plan - Dosing - Ground Floor	M-DWG-THH-005	1
Mechanical Sections - Sections C and D	M-DWG-THH-006	1
Tank Nozzle Orientation - East Bank Batch Tank	M-DWG-THH-010	0
Tank Nozzle Orientation - East Bank Dosing Tank	M-DWG-THH-011	0
Service Water Building - General Arrangement	M-DWG-THH-015	0
Batch Tanks Support Structures - Plans and Elevations	S-DWG-THH-001	0
Batch Tanks Support Structures - Details	S-DWG-THH-002	0
Batch Tanks Access Structures - Upper Platform Extension	S-DWG-THH-003	0

2.2.2 SCHEDULES AND DATA SHEETS

The following schedules and data sheets form part of this Contract:

Table 2 Schedules and Datasheets

Title	Document Number	Rev
ELECTRICAL SCHEDULES		
East Bank DB01 Electrical Load List	E-LST-THH-001	1
West Bank DB02 Electrical Load List	E-LST-THH-002	1
Service Water DB03 Electrical Load List	E-LST-THH-003	0
Cable Schedule	E-LST-THH-004	0
INSTRUMENTATION SCHEDULES		
Instrument List	I-LST-THH-001	0
East Bank I/O List	I-LST-THH-002	0
West Bank I/O List	I-LST-THH-003	0
MECHANICAL SCHEDULES		
Valve List	M-LST-THH-001	0
Actuated Valve List	M-LST-THH-002	0
Mechanical Equipment List	M-LST-THH-003	1
Tie In Point (TIP) List	M-LST-THH-004	1
MECHANICAL DATASHEETS		
Fluoride Dosing Service Water Pumps	M-DST-THH-001	0

Title	Document Number	Rev
Fluoride Batching Tank Mixers	M-DST-THH-002	0
Fluoride Dosing Tank Mixers	M-DST-THH-003	0
West Bank Fluoride Dosing Pumps	M-DST-THH-004	1
East Bank Fluoride Dose Pumps	M-DST-THH-005	1

2.2.3 TECHNICAL SPECIFICATIONS

The following Technical Specifications form part of this Contract:

Table 3 Technical Specifications

Title	Document Number	Rev
Fluoridation System Structural Specification	C0200	0
Fluoridation System Electrical, Instrumentation and Controls Specification	C2100	0
Fluoridation System Mechanical Specification	C3600	1
Fluoridation System Process Control Philosophy (PCP)	I-PCP-THH-001	9

2.2.4 SEQWATER STANDARDS, PROCEDURES AND REGISTERS

The following Seqwater Standards form part of this Contract:

Table 4 Seqwater Standards

Title	Document Number	Rev
Electrical Design and Construction	E-SPE-STD-001	2
Instrumentation	E-SPE-STD-002	1
Control Systems Design and Construction	I-SPE-STD-001	1
SCADA Standard Specification	I-SPE-STD-002	1
PLC Standard Specification	I-SPE-STD-003	**2**
Communications Network Specification	I-SPE-STD-004	1
Water Quality Monitoring Specification	I-SPE-STD-005	1
Control Systems Testing	I-SPE-STD-011	2
P&ID Legend - Sheet 1 of 2 Symbols	B-DWG-STD-001	2
P&ID Legend - Sheet 2 of 2 Codes and Abbreviations	B-DWG-STD-001	2
Engineering Drawing Number Procedure	X-PRO-STD-002	2
PID Equipment Numbering Convention	X-PRO-STD-006	1
Drawing and Spatial Data Standards	X-PRO-STD-007	1.04
Engineering Design, Review and Approval	X-PRO-STD-009	2
Asset Information Instruction for Project Managers, Contractors and Suppliers	X-PRO-STD-010	2
Engineering Statement: ES1 – Design	X-TMP-STD-005	2
Engineering Statement: ES2 – Construction Review	X-TMP-STD-006	3
Engineering Statement: ES3 – Change Approval	X-TMP-STD-007	3
Asset Creation Template Built and Natural Assets	X-LST-THH-001	1
Water Quality Management in Drinking Water Catchments	GDE-0001	2
Seqwater EMU Endorsed Waste Transporters	EMU_EWT	N/A

The following Seqwater Procedures form part of this Contract:

Table 5 Seqwater Procedures

Title	Document Number	Rev
Energy Tag and Lockout Procedure	PRO-00014	5
Fluoride Safety at Water Treatment Plants	PRO-00030	10
Regulated and Trackable Waste Management	PRO-01496	2
Disinfection of Water Mains	PRO-01554	3
Reservoir Disinfection and Return to Service	PRO-01559	3
Tools and Equipment Disinfection	PRO-01560	3
Permit Access Safety System (PASS) Procedure	PRO-01820	1
Disinfection of Pumps and Hoses	PRO-01869	3

The following Seqwater Risk Registers form part of this Contract:

Table 6 Seqwater Risk Registers

Title	Document Number	Rev
Holts Hill Fluoride Dosing System Overhaul Detailed Risk Assessment	O-REG-THH-001	3
Holts Hill Fluoride Dosing System Overhaul Safety WHS Risk Identification	O-REG-THH-002	3
Holts Hill Fluoride Dosing Overhaul Safety in Design Register	O-REG-THH-003	1.2
Mount Crosby - Eastbank WTP - WHS Risk Register	REG-00331	3

2.3 PRINCIPAL SUPPLIED DRAWINGS AND DOCUMENTS

The drawings, documents and schedules set out in following table are the Principal-supplied drawings, documents and schedules referenced in Item 15 of Annexure Part A to the Contract and are subject to subclause 8.2 of the Conditions of Contract. Without limiting subclause 8.2 of the Conditions of Contract, these documents are non-reliance documents.

Any reliance by the Contractor on the following drawings, documents and schedules are at the Contractors own risk.

Table 7 Non-Reliance Drawings, Documents and Schedules

Title	Document Number	Rev
Fluoridation System Process Operating Philosophy (POP)	B-POP-THH-450	6
Fluoride Dosing Operation and Maintenance Manual Volume 1	Vol 1 O&M	2009
Fluoride Dosing Manufacturers Documentation Instruments Volume 3	Vol 3 MD Ins	2009
Fluoride Dosing Manufacturers Documentation Equipment Volume 4	Vol 4 MD Eq	2009
Fluoride Dosing Manufacturers Documentation PLC & Pumps Volume 5	Vol 5 MD PP	2009
Orion 2109XP Fluoride Monitor User Guide	2109XP TISAB	N/A
DR 4022 Datasheet	4080_001	N/A
Fluoride Hopper Trace Heating Compliance Letter	4083_001	N/A
Holts Hill East Bank Fluoride Dosing System PLC Code	Holts Hill East	10
Holts Hill West Bank Fluoride Dosing System PLC Code	Holts Hill West	10
Autodesk Navisworks 3D Model Realistic	3559297-3D-GE-000 v2014 IFC Realistic	IFC
Autodesk Navisworks 3D Model	3559297-3D-GE-000 v2014 IFC	IFC

2.4 STANDARDS AND STATUTORY REQUIREMENTS

The Contractor shall comply with all applicable relevant legislation, statutory requirements and standards under this Contract.

The Contractor shall comply with the latest Standards and requirements of the relevant Australian, British, American or International Standards where available based on the following order of precedence:

a. Australian Standards
b. British Standards
c. American Standards
d. International Standards.

2.5 DESIGN SERVICE LIFE REQUIREMENTS

The following table specifies the design service life requirements for the Contract Works.

Table 8 Design Service Life Requirements for the Contract Works

Component	Service Life (years)
Structures (steel and concrete)	50 years
Protective coatings on steelwork	15 years
FRP/GRP/Plastic Tanks	25 years
Mechanical Equipment	15 years
Electrical Equipment	20 years
PLC and SCADA	15 years
Telemetry	15 years
Pipework > 500mm diameter	50 years
Pipework < 500mm diameter	15 years
Roadwork/Pavements	20 years
Concrete protective coatings	10 years

3 PRELIMINARIES AND GENERAL

3.1 SITE AND CONTRACT MANAGEMENT

3.1.1 SCOPE

The Contractor must perform the following general tasks as part of the WUC:

- Project management
- Supervision of the Works by Work Supervisor(s) at each Works' element
- Provision of site workplace health and safety, quality and environmental representatives
- Provision of construction program and monthly updates
- Co-ordination of the Works with the Principal's Operational staff
- Attendance at fortnightly (or as otherwise directed by the Superintendent) meetings for coordination of the project progress and safety, including recording and distribution of meeting minutes to the Superintendent
- Monthly reporting in relation to Workplace Health and Safety, Environment, Quality and progress of the Works
- Document control including drawings revisions and other documentation as required under the Contract and including transmittal and control of shop drawings produced by the Contractor
- Preparation, implementation and management of Inspection and Test Plans and procedures
- Setting out, traffic and access control
- Quality control
- Management of procurement and expenditure of all materials involved, including all manufacturers' compliance requirements, guarantees, storage, delivery
- Preparation, implementation and management of a Project Management Plan inclusive of a Site Based Co-operation Plan, Workplace Health and Safety Plan, Project Quality Plan, Environmental Management Plan, Traffic Management Plan and other plans and procedures in accordance with the Contract
- Preparation of shutdown plans inclusive of supply contingency needs
- Preparation, implementation and management of a commissioning and training plan
- Preparation of As-Constructed records, Operation and Maintenance Manuals and an Asset Register
- Timely rectification of defects during the defects liability period

3.1.2 PROGRESS MEETINGS

The Contractor's representative shall hold and attend site progress meetings at such times as the Superintendent shall deem necessary, which shall normally be fortnightly. The Contractor shall chair, keep and distribute minutes of such meetings. Such minutes, once reviewed and commented on by all parties, shall constitute the only recognised records of the site meeting. Minutes of the previous meeting shall be confirmed at the commencement of each meeting.

3.1.3 SITE MEASUREMENT

The Contractor shall confirm all dimensions on site before proceeding with the Works, including all Fluoride Building entry doors. Before ordering materials or executing the Works, the Contractor shall ensure that the sizes and the dimensions stated on the design drawings or in the Specifications are confirmed where necessary for compatibility on the site and any quantities stated should not be used for ordering purposes without similar confirmation and allowance for cutting and waste in the use of materials. Any measured discrepancy shall be forwarded to the Superintendent for direction.

3.1.4 ACCESS AND COORDINATION WITH OTHERS

All site access shall follow the minimum requirements of the approved Site Based Cooperation Plan, to be prepared by the Contractor. The approved access route shall be used at all times unless other routes are approved or directed by the Superintendent.

The Contractor shall delineate all work areas on site, including partially completed works, available for use by the Principal and other Contractors carrying out other contract works.

Seqwater personnel and other contractors will require access to areas within the site to undertake routine and reactive operational and maintenance works. The Contractor shall make available safe access to Seqwater personnel and their contractors at all times. Activities are likely to include but not limited to the following:

- Pre-fluoride Analyser Building
    - Monitoring and maintaining existing instruments and assets
    - Collection of water quality samples
- Fluoride Dosing Service Water Pump Building
    - Monitoring and maintaining mains flow switches and existing assets
- Fluoride Dosing System Building
    - Maintenance of all existing assets outside the scope of this Contract
- Access to all operating plant infrastructure for inspection of performance
- Access by contractors to undertake Seqwater minor works and renewals projects

3.1.5 SECURITY

The Contractor shall supply and install temporary fencing and signage to delineate the agreed construction work areas as per the approved Site Based Cooperation Plan.

Where it is not possible or practical to physically separate or visually demarcate a boundary between a construction work area and other operational areas on site the Contractor shall demonstrate how risks associated with workers or others crossing the boundary between a construction work area and other operational areas are identified and managed, and how the duty to ensure that the construction work area is secured against unauthorised access is met.

The Contractor shall ensure the security of their own possessions, and materials, whether or not incorporated into the Works.

3.1.6 SITE ESTABLISHMENT

The Contractor shall provide transportation for all personnel, plant, equipment and materials to and from the site.

The Contractor shall provide all welfare facilities including site offices, meeting rooms, toilets, washing and other utility services. The Contractor shall not use the Principal's facilities during the Contract period.

The Contractor's construction facilities, material, equipment and plant lay down and hardstand areas shall be located in an area to be agreed by the Superintendent, the landowner or relevant authority (if applicable) and detailed within the Site Based Cooperation Plan.

All temporary services shall be fully decommissioned and removed at the completion of the Works.

3.1.6.1 Temporary Water Supply

The Principal will provide service (non-potable) water supply for construction and commissioning use. The Superintendent will advise the locations of the connection points.

The Contractor is to complete whatever works are necessary to supply water for construction purposes to other parts of the site from the existing water supply system to the Contractor's facilities and the Works.

The Contractor shall supply their own potable water.

3.1.6.2 Temporary Power Supply

The Principal will provide access to power supply for construction use at no cost to the Contractor. The Superintendent will advise the locations of the connection point within the existing plant.

The Contractor shall be responsible for the reticulation of the necessary power to and within the site from the connection point. However there is limited and variable spare capacity available and the Contractor shall install a temporary power meter at the point of connection to the existing plant. Should the Contractor's maximum demand exceed the Principal's available spare capacity at any time the Contractor shall provide its own independent power generation device.

Subject to the review and comment of the Superintendent, if portable generation devices are used, such devices shall be fitted with emission control devices to comply with local and statutory regulations. The permitted times of use of such equipment may also be restricted by local or statutory regulations, and the Contractor shall comply with all such regulations.

3.1.6.3 Telecommunication

The Principal will not provide any telecommunication services under this Contract.

The Contractor shall make arrangements for all telephone/data lines needed for construction purposes including payment of supply. On completion the Contractor shall disconnect and remove temporary services, including but not limited to temporary poles and cables.

3.1.6.4 Site Maintenance

The Contractor shall maintain the work areas neat and tidy at all times to the satisfaction of the Superintendent.

3.1.6.5 Garbage Disposal

The disposal on site of garbage, or other putrescent rubbish, from the Contractor's activities on or around the site is not permitted. The Contractor shall make arrangements for, at the Contractor's cost, for the disposal off site of all garbage and putrescent rubbish.

All costs required to provide service are deemed to have been included in the Contract Sum.

3.1.6.6 Reinstatement

The Contractor shall restore all works including, but not restricted to, the road pavements, concrete works, earth surfaces, channels, fences, trees, shrubs and grass.

The restoration of disturbed areas shall be carried out to an equivalent, or better, standard to that before the commencement of the Works and to the satisfaction of the Superintendent.

3.1.7 RECOVERED MATERIAL AND EQUIPMENT

Notwithstanding the provisions of the General Conditions of Contract, any recovered material and equipment (not supplied by the Contractor) which the Superintendent considers suitable for retention by the Principal shall remain the property of the Principal. The Contractor shall deliver up such material and equipment to a place nominated by the Superintendent. All other material and equipment shall become the property of, and shall be disposed of by, the Contractor.

3.2 EQUIPMENT, MATERIALS AND WORKMANSHIP

All materials used in, and the standard of workmanship to be employed in the manufacture and installation of, the Works shall be of best practice standards to ensure all structures are fit for purpose and constructed as designed.

The Contractor shall perform workmanship of the highest quality by qualified tradesmen.

3.3 SITE

3.3.1 SITE ACCESS AND LIMITATIONS

Access to the operating existing treatment plant, excluding the fluoride dosing system, must be maintained continuously for Seqwater operators and contractors throughout the entire Contract period.

On-site space is restricted, with minimal space for laydown and storage on site. The expected laydown areas, shown on Figure 2, include a grassed area at road level and another area inside the filter cell adjacent to fluoride dosing building. Note that there is no vehicle access into the filter cell (filter cell is hatched in orange on Figure 2). The Contractor shall provide their own crane to transfer equipment and materials into the filter cell.

The Contractor shall maintain security fencing for the duration of the Contract that physically separates the construction work areas from the operating work areas on site and maintains security for both.

All Works carried out on the site (i.e. the area(s) on the site for which the Contractor is the 'Principal Contractor' for the purposes of WH&S legislation) shall be subject to the Contractor's work permit system.

3.3.2 WATER TREATMENT PLANT SHUTDOWNS

The Mt Crosby WTPs is an operational facility and is required to remain in continuous operation, including for the duration of the Works.

3.3.3 OCCUPIED PREMISES

a. Occupancy by the Principal

   The Principal or persons authorised by the Principal shall continue in possession and occupancy of the existing operational facilities at Holts Hill throughout the Contract period.

b. Principal's Access

The Contractor shall provide safe access to such premises for the Principal and such authorised persons be notified to the Contractor by the Principal.

c. Contractor's and Subcontractor's Staff

The Contractor shall take responsibility for the suitability of all of their and subcontracted staff on site, set reasonable standards of conduct, investigate complaints about their behaviour and take appropriate action including removal from site if so requested by the Principal.

3.3.4 SURVEY INFORMATION

The Contractor shall engage the services of a qualified surveyor to undertake all the required survey work, prepare a report and complete the "As−Constructed" Drawings.

The Navisworks 3D model (see Table 9 Non-Reliance Drawings, Documents and Schedules above) is a Principal-supplied document and has been provided for information only. The Contractor is entirely responsible for any interpretation made relating to the content of this model.

4 OPERATIONAL INTERFACES

4.1 EXISTING SERVICES

4.1.1 GENERAL

Existing services obstructing the Works, or if damaged in the course of the undertaking the Works, shall be managed by the Contractor as follows (subject to Superintendent's prior review and comment):

- If the service is to be continued then repair, divert, relocate as required
- If the service is to be abandoned the cut and seal or disconnect and make safe as required.

Note that drawings provided under this Contract should not be relied upon to indicate the presence or accurate location of existing services. Best practices (such as tracing and potholing) shall be followed to identify buried services prior to commencing excavation and steps taken during excavation to minimise the risk both damage to unidentified services and safety issues from encountering unidentified services.

There are no known services that will require relocation prior to commencing construction.

The Contractor shall notify the Superintendent immediately upon the discovery of services obstructing the WUC.

4.1.2 POWER

Refer Section 3.1.6.2.

4.1.3 SERVICE WATER

Refer Section 3.1.6.1.

The Principal cannot guarantee the timing and the duration of the availability of service water.

4.1.4 RAINWATER AND STORMWATER NETWORK CONNECTION

No modifications are expected to be required.

4.1.5 SEWER NETWORK CONNECTION

No modifications are expected to be required.

4.1.6 TELECOMMUNICATIONS

Refer Section 3.1.6.3.

4.2 FACILITIES DURING CONSTRUCTION

The Contractor shall provide and connect, at the Contractor's cost, all facilities required for and during construction, including:

- Maintenance of a suitably rated power supply extended to the site
- Service water supply facilities (note that potable water supply cannot be supplied)
- Phone / fax line required for use by the Superintendent
- Power supply and lighting
- Security of the site
- Sanitary facilities

- Storm water drainage and temporary works to ensure that runoff from the site does not adversely impact on any land and waterways in the proximity of the Works.

All costs required to provide these facilities are deemed to have been included in the Contract Sum.

5 HANDOVER

5.1 OPERATION AND MAINTENANCE MANUALS

5.1.1 GENERAL

The Contractor shall revise and supply an updated Operation and Maintenance (O&M) manual for the overhauled Holts Hill Fluoride Dosing System.

The Principal will supply the Contractor with an electronic copy of the existing O&M manual.

The updated O&M manuals supplied by the Contractor shall include as a minimum the following completed appendices:

- Emergency Telephone Numbers
- Register of all Hazardous Substances
- Routine Inspection Testing Monitoring and Maintenance
- WTP Asset Management
- Workplace Health and Safety
- Environmental Management Systems
- Quality Certification
- Education and Training
- Treatment Unit and Dosing Design Data
- Plant and Equipment Technical Information
- Instrumentation Technical Information
- Electrical and PLC Technical Information
- SCADA Alarms and Telemetry
- Laboratory Testing and Water Quality Monitoring

The O&M manuals shall be detailed to the extent that the complete fluoride dosing system can be operated by Principal's Operation's staff unsupervised by the Contractor following the successful commissioning. Any sections required to ensure this is possible shall be added by the Contractor. Any additional sections added by the Contractor shall match the formatting and layout of the existing manuals.

5.1.2 SUBMISSION OF OPERATION AND MAINTENANCE MANUALS

All submissions of Operation and Maintenance Manuals shall include three (3) draft hard copies, one single file soft .pdf copy (with all attachments) and a .doc copy (attachments may be separate files). Submission of Operation and Maintenance Manuals shall be made (including all required appendices) to the Superintendent for review and comment at least four (4) weeks prior to the start of any testing or commissioning for review during the Commissioning Workshop. Any changes required shall be made and the manuals resubmitted for review.

The Contractor shall provide three (3) copies of each amended manual at least three (3) weeks prior to the start of commissioning.

All manuals are to be revised to include as commissioned modifications and details within four weeks of the completion of commissioning.

Each manual is to be neatly bound in loose leafed, hardback (4 ring 'D' type) binders at ISO A4 size and appropriately labelled, indexed and divided.

The Contractor shall submit three complete final "As Commissioned" manuals to the Superintendent for review and acceptance prior to the date for practical completion.

5.2 CORPORATE ASSET INFORMATION

The identification of assets is a key component of the Principal's asset management strategy and provides the framework through which the performance of assets constructed, installed or otherwise acquired by the Principal can be assessed and maintenance activities undertaken. It is vital that asset information is presented consistently and in the format specified so that it is readily available to support business decisions.

The Contractor shall provide asset information as specified in X-PRO-STD-010. In particular the Contractor shall complete the project asset data list X-LST-THH-001 and submit to the Superintendent with the "As Constructed" Drawings.

5.3 AS CONSTRUCTED DRAWINGS

The Contractor shall complete and submit all As−Constructed Drawings in accordance with X-PRO-STD-002 and X-PRO-STD-007.

The procedure for updating drawings to record their "As Constructed" status shall be as follows:

- The Contractor shall maintain (on site) red line marked-up "For Construction" drawings showing all changes that have been made during construction.
- The Contractor shall submit scanned copies of all red lined marked up "For Construction" drawings to the Superintendent at completion of commissioning and at other times as requested by the Superintendent.
- The Contractor shall prepare "As Constructed" CAD drawings by revising the "For Construction" CAD drawings to align with the red line marked-up "For Construction" drawings.
- The Contractor shall submit the "As Constructed" drawings to the Superintendent, including CAD, PDF and RPEQ certified copies of each drawing.

In addition, as per X-PRO-STD-009, the Contractor is required to provide certification from an engineer with relevant RPEQ certification that the construction has been carried out in accordance with the "For Construction" design documentation.

5.4 PROCESS CONTROL PHILOSOPHY

The Process Control Philosophy (PCP) describes the control strategy required for the Holts Hill Fluoride Dosing System that the Contractor shall adhere to and incorporate into the overhauled fluoride dosing system. The Contractor shall revise, complete and submit the PCP to the Superintendent for review and comment at least three weeks prior to starting commissioning.

6 WORKPLACE HEALTH AND SAFETY

Seqwater places great emphasis on safety. Seqwater is committed to the health and safety of all people in their workplace.

Contractors engaged by Seqwater must provide and maintain a safe working environment in which people are not exposed to unacceptable hazards from any work being undertaken. This includes Contractor employees, Seqwater employees, members of the public and any other person at the workplace.

The Contractor shall be the "Principal Contractor" in respect of the WUC (refer to clause 12B(b) of the Contract) and shall perform the duties of the "principal Contractor" as defined in the Work Health and Safety Regulation 2011 (Qld).

All Contractors working at SEQ Water sites shall perform work in a manner that complies with:

- Work Health and Safety Act, 2011
- Work Health and Safety Regulation, 2011
- The Electrical Safety Act, 2002
- The Electrical Safety Regulation, 2013
- Other relevant legislation;
- Any relevant codes of practice; and
- Seqwater policies and procedures.

6.1 RISK AND HAZARDS IDENTIFICATION

The Contractor shall make itself aware of all potential risks, hazards and safety requirements relating to the Works. To assist the Contractor a number of risk registers have been provide (refer to Table 6 Seqwater Risk Registers. These documents are not a comprehensive list risks and the Contractor should not rely solely on the information supplied. The Contractor shall undertake an independent assessment of the hazards and risks associated with the delivery of the Works.

6.2 DOCUMENTATION

The Contractor shall submit safety documentation that is specific to this project and meets all relevant legislative requirements, detailing how the Contractor shall manage the risk associated with undertaking the Works. This may include but not limited to:

a. WHS Management Plan (included in the Project Construction Safety Management Plan)

b. Safe Work Method Statement (SWMS) associated with all high risk activities involved in the delivery of the project, this may include but not limited to:

   - Electrical work
   - Working near water
   - Working at heights
   - Demolition work

c. Job Safety and Environmental Analysis (JSEA)

This documentation must be submitted prior to commencement onsite for review by the Superintendent, the Superintendent's Representative and WHS Project & Compliance Coordinator.

6.3 INDUCTIONS

All contractors, including the Contractor, engaged by Seqwater are required to undertake a Seqwater Contractor Induction and a site specific induction. Both inductions can be completed on line via the Seqwater web site. On completion of these inductions, a certificate can be obtained from the web site. These certificates shall be retained as a record of training and submitted to Superintendent's Representative upon request.

6.4 PERMITS AND SITE ACCESS

Seqwater's Permit Access Safety System (PASS) is a system that manages access to their sites and controls work that is conducted on these sites. It enables Seqwater to control when work activities occur, to manage the impacts of work activities and to allow greater visibility of what work activities are occurring at any point in time.

The following procedures provide additional information about PASS:

- PASS Procedure (PRO-01820)
- Energy Tag and Lockout Procedure (PRO-00014)

Seqwater operates a permit access safety system (PASS) to manage:

6.4.1 SITE ACCESS APPROVAL

You must obtain site access approval prior to undertaking work on any Seqwater site, unless the work involves performing administration activities, such as attending a meeting, within an administration area.

Your engaging officer will generally organise your site access unless you have approval to apply for your own site access.

6.4.2 PERMITS

Depending on the type of work being undertaken, there may be permits required. PASS requires the use of the following permits:

- Major Works Permit (MWP) – this permit is required for all work activities that will impact, or are assessed as having a high risk of impacting, on water supply to customers, water quality or the management of flood mitigation assets.
- Control Systems Permit (CSP) – this permit is used to manage work activities performed on Seqwater's control systems.
- Project Works Permit (PWP) – this permit is required for all projects that involve construction work.
- High-Risk Work Permits – these permits are used to manage the hazards associated with high-risk work activities. Within Seqwater we have the following high-risk work permits and rescue plans:
    - Hot Work Permit Form (FRM-00040)
    - Confined Space Entry Permit Form (FRM-00107)
    - Grid mesh, Handrail and Flooring Removal Permit Form (FRM-00412)
    - Working at Height Permit Form (FRM-00414)
    - Excavation and Trenching Permit Form (FRM-00413)
    - High Voltage Access Permit Form (FRM-00439)

- High Risk Work Rescue Plan Template (TEM-00027)
- Penetration Permit Form (FRM-00636)
- Energised Work Permit Form (FRM-00415)

6.4.3 ISOLATIONS

Only people who have been authorised by Seqwater are permitted to perform isolations on our sites. Planning for any work being undertaken at Seqwater's sites will include planning how isolations will be undertaken and who will be responsible for completing the isolation.

Any person working under the control of an isolation must attach a blue personal lock and personal danger tag to the lock board before commencing the work activity.

If you will be required to performing isolations while working for the Principal, please discuss training and authorisation requirements with your engaging officer.

6.4.4 TRAINING

Any contractors performing work (other than administrative work) on any of Seqwater's sites must complete PASS Overview Training. If a contractor is also required to apply for, or work under, a Major Works Permit they must also complete Major Works Permit Training.

All personnel conducting Works within a Seqwater site shall undertake online training in the permit and site access system. This is a mandatory requirement.

6.5 HAZARD / INCIDENT REPORTING

Contractors, including the Contractor, shall report all safety incidents and environmental and hazards noted while working at an Seqwater operational site by reporting the hazard to the Seqwater Incident Hotline ph: 07 3270 4040 and the Superintendent's Representative.

6.6 SAFETY AUDITS

Safety audits and monitoring of the implementation of all safety documentation will be carried out throughout the project by the Superintendent, the Superintendent's Representative, The Principal's Construction Manager and the Principal's WH&S Representatives.

7 ENVIRONMENTAL MANAGEMENT

7.1 GENERAL

The Contractor shall comply with and ensure that's its employees, subcontractors and their employees comply with the obligations under the Environmental Protection Act 1994, including regulations and policies made under the Environmental Protection Act 1994 and other environmental legislation, regulations and policies.

- Environmental Protection Act 1994 (and relevant regulation)
- The site's Environmental Authority (EA) (EPPR00640413)

7.2 ENVIRONMENTAL POLICY

The Contractor shall consider the Seqwater's Environmental Policy which aims to minimise and manage all environmental aspects and impacts of our operations and activities.

7.3 LEGISLATIVE REQUIREMENTS

The Contractor shall identify all relevant environmental protection legislation and policies applicable to the Works and comply with their requirements.

The Contractor shall ensure protection of environmental values and shall comply at all times with all statutory and other environmental requirements. The Contractor shall be held responsible for any incidents which cause environmental harm.

7.4 LICENCES, APPROVALS AND PERMITS

The Contractor shall identify all approvals, licences and permits which may be applicable to the Works and comply with their requirements. The Contractor shall also establish a process for obtaining, holding and maintaining all environmental licences, approvals, and permits necessary to complete the Works.

Many Seqwater sites have existing environmental approvals, licences and/or permits attached to them and the Contractor shall seek clarification from Seqwater if any of these will be applicable to the project.

7.5 CONTRACTOR ENVIRONMENTAL PERFORMANCE

The Contractor shall supply records of any prior enforcement action undertaken by a Regulator or Authority over the last five years including infringement notices, prosecutions, convictions or similar in regards to any non-compliances with environmental management legislation.

7.6 ENVIRONMENTAL RISKS

The Contractor shall detail how environmental risks/issues that may arise as part of the proposed Works and during the construction (e.g. dust, noise, release of water, etc.) will be managed and specifically address any licence and approval conditions.

A preliminary risk assessment shall be provided to demonstrate the environmental impacts and risks involved with the construction and that appropriate mitigation controls can be provided. The Contractor shall prepare and submit an Environmental Management Plan (EMP) for mitigation the potential impacts from construction activities. Possession of the site will not be given until the EMP has been approved by the Principal and it is satisfied that all reasonable and particular measures have been adopted to minimise risk.

7.7 ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) shall follow the guidelines of AS/NZS ISO 14001:2004 Environmental Management Systems – Requirements with Guidance for Use.

The EMP shall incorporate all relevant sections of the Seqwater Development Guidelines for Water Quality Management in Drinking Water Catchments to ensure compliance with Seqwater internal policy on environmental management at all times

The Contractor shall document and implement an Environmental Management System which as a minimum includes:

- Company environmental policy and objectives
- Organisation structure including resources, roles, responsibilities and authority
- Environmental risk management outlining any significant aspects and impacts to the site with sufficient controls applied to mitigate risk
- Environmental work practices and procedures
- Environmental training and induction
- Environmental auditing and inspection procedures
- Environmental consultation procedures
- Environmental performance monitoring
- Environmental emergency preparedness and response.

The Contractor shall provide Subcontractors with a copy of their EMP and ensuring that, where necessary, Subcontractors develop their own compatible Environmental Management Plan.

The Contractor shall submit the EMP to the Superintendent within 14 days from the date of acceptance of tender.

The Superintendent will review the completed Environmental Management Plan for compliance with the Principal's requirements.

No site construction works shall proceed until the complete EMP or a section of the EMP relevant to a particular construction operation has been submitted, and approval to proceed has been provided by the Principal.

The contractor shall pay all penalties, costs and expenses with may be incurred in respect to offences committed or alleged to be committed under the provision of the Environmental Protection Legislation.

7.8 NOISE

The Contractor shall carry out all Works in compliance with the Queensland Department of Environment and Heritage Protection (DEHP) and local government and regulations.

The EMP shall fully detail the Contractor's noise management plan and measures, and procedures to minimise noise.

7.9 DUST

The Contractor shall carry out all operations in compliance with the Department of Environment and Heritage Protection (DEHP) and Seqwater's own policy for environmental management, the Seqwater Development Guidelines for Water Quality Management in Drinking Water Catchments (Element 3: Waste and Emissions Management)".

This requirement includes the use of watering tankers or carts, temporary windbreak fencing and hydromulching as necessary given the nature of the soil and wind conditions on site. Water carts must be available for a minimum of 8 hours a day including weekends and public holidays.

The EMP shall fully detail the Contractors dust management plan and measures, and procedures to minimise visible dust on site.

7.10 EROSION AND SEDIMENT

The Contractor shall ensure compliance with the Seqwater Development Guidelines for Water Quality Management in Drinking Water Catchments (Element 5: Water Sensitive Design and Stormwater / Runoff Management) and the International Erosion Sediment Control Association (IESCA) *Best Practice Erosion and Sediment Control*. In addition to the requirements contained therewith, the Contractor shall ensure the following:

- Excessive trench widths or depths must be avoided;
- Limit construction equipment activity to disturbed areas;
- Wherever possible, spoil must not be placed where it is likely to fall or be washed into roads, gutters or drains;
- Soil should be placed on the far side of the trench away from roads, gutters or drains;
- Stockpile topsoil separately from general excavated material. Respread over disturbed areas;
- After backfilling, excess or unsuitable spoil should be removed from the site;
- Excavations shall be left open for the minimum practical time and shall not be opened for a greater length than pipes can be laid in a day. Progressively construct work and stabilise;
- Water pipes laid must be securely covered with filter cloth at the end during times that pipe laying is not being carried out;
- If the trench needs to be pumped dry, passing it through a grass buffer or a suitable silt trap prior to entering a channel shall clean the discharge water;
- Run−off from works must be passed through sediment controls;
- Where on−site controls are not practical, storm water drains water channels or bodies of water must be protected from sediment-laden run-off.

7.11 WATER SUPPLY CONTAMINATION

The Principal considers water supply contamination as a significant threat to its business. The Contractor shall take extreme caution when undertaking the WUC, as actions can pose a risk of contamination to potable (drinking) water supplies (which affects public health), and the environment. If it is suspected that contamination may have occurred, the Contractor shall report the incident to Superintendent immediately.

7.11.1 DISINFECTION

The Contractor shall conduct reservoir, pipework, tools and equipment disinfection in accordance with Seqwater's disinfection procedures which are broadly based on the AWWA Standards for Disinfection of Water Storages. The treated water tank internal surface/liner shall be compliant with AS/NZ 4020 and compatible with a minimum free chlorine residual level >25 mg/L.

The Contractor shall provide their work method statement relating to this activity two weeks prior to undertaking the disinfection activity to allow for review and comment.

It should be noted that all materials, products that come into contact with drinking water are required to comply with AS/NZ 4020 or NSF 61 (US standard) which includes any liners/coatings or baffles.

7.11.2 FLORA CONSERVATION

The Contractor shall comply with the requirements of the relevant acts and regulations, as well as Seqwater's own policy, the Seqwater Development Guidelines for Water Quality Management in Drinking Water Catchments (Element 2: Riparian Land Management and Element 7: Vegetation Management). Due care must be exercised in the performance of the WUC to avoid unnecessary destruction of native flora.

The Contractor shall comply with any measures notified by the Superintendent about the location of sites of rare flora on the site identified by the Superintendent. If, during the course of the WUC, the Contractor identifies any further locations of rare flora, or what may be rare flora, the Contractor shall immediately bring this to the attention of the Superintendent.

7.11.3 DISPOSAL OF DEWATERED PRODUCTS

The Contractor shall not discharge or cause to be discharged into any drain, creek, river or other receiving waters any Dewatered Products which contain levels of salt, organic material, hydrocarbons, detergents or sediments which are incompatible with the receiving water body.

The Contractor shall ensure that all dewatering procedures are reviewed and commented on by the Principal's EMU and Queensland Department of Environment and Heritage Protection, and other relevant authorities as applicable.

"Dewatered Products" means water and associated waste materials pumped by the Contractor out of an excavation or extracted from the area adjacent to an area being excavated or to be excavated, that has to be disposed of by the Contractor.

All practices should also adhere to Seqwater's own policy, the Seqwater Development Guidelines for Water Quality Management in Drinking Water Catchments (Element 3: Waste and Emissions Management)".

7.12 COMMISSIONING WATER MANAGEMENT

The Contractor is to implement a Commissioning Water Management Plan to minimise the potential environmental impacts of discharge to stormwater. Commissioning water shall not be chlorinated. The Commissioning Water Management Plan shall be reviewed and commented on by Superintendent.

7.13 WASTE MANAGEMENT

The Contractor shall:

- Minimise waste products by reducing or reusing packaging and minimising excess material
- Take excess material off the site and dispose of it or retain it, at all times complying with relevant legislative and regulatory requirements
- Keep waste separated from work activities and regularly remove waste material from the work site
- Dispose of waste only at prescribed waste sites.

Waste must be managed in accordance with Seqwater's own policy, the Seqwater Development Guidelines for Water Quality Management in Drinking Water (Element 3: Waste and Emissions Management)

Fluoride is a regulated and trackable waste (waste code D110) under the Environmental Protection Regulation. Any equipment contaminated with fluoride residuals are regulated (contaminated) and must be disposed by the Contractor in accordance with Seqwater's Regulated Trackable Waste Management Procedure at an appropriate waste facility using a licenced waste transporter that has entered into an agent agreement with Seqwater pursuant to section 81U of the Environmental Protection Regulation 2008 (Qld). Refer to Seqwater EMU Endorsed Waste Transporters for a list of waste transporters with agent agreements in place. The Contractor shall obtain copies of waste transport certificates from the waste transporter and submit to the Superintendent. All waste transport and disposal shall be at the cost of the Contractor.

7.14 INCIDENTS AND REPORTING

The Contractor is to inform the Principal immediately of any environmental incident as a result of construction activities.

The Contractor shall ensure that any detrimental effects on the environment resultant from any activity associated with the Contract are kept to the minimum practicable. If any damage to the environment occurs as a result of non-compliance with the requirements of the Specification, the Contractor shall reinstate the damaged area to the condition existing prior to the commencement of work. This includes, but is not limited to, damage to vegetation and contamination of soil or water.

7.15 ENVIRONMENTAL RECORDS

The Contractor shall maintain all environmental records during the Works.

7.16 MONITORING OF CONTRACTOR ENVIRONMENTAL PERFORMANCE

The Principal will monitor the environmental performance of the Contractor to ensure the required environmental standards are achieved. The Principal will conduct site inspections and system audits, if necessary, according to the scope of the contract and the risk associated with the work.

The Principal will look for evidence of the implementation of the Contractor's EMP. Monitoring of contractors may include, but is not limited to, the following:

- Evidence that environmental risk assessment and control processes are implemented accordingly (e.g. workplace environmental inspection sheets, and incident investigation reports);
- Evidence of induction process;
- Observance of environmental regulations and site procedures;
- Observance of work practices and systems of work;
- Specific requirements relating to, but not limited to, hazardous substances and dangerous goods;
- Observance of general housekeeping;
- Provision of emergency response equipment (e.g. spill kits).

The Contractor shall to rectify environmentally damaging situations (pollution, discharges, contamination) and the Principal reserves the right to review any Contract in which environmental breaches have occurred.

8 QUALITY MANAGEMENT

8.1 QUALITY SYSTEM

For all work WUC, including work by subcontractors the Contractor shall plan, establish, implement and maintain a quality system which satisfies at least the following requirements of ISO 9001:2008.

- Operations Control
- Control of Nonconformity
- Corrective Action.

8.2 QUALITY SYSTEM DOCUMENTATION

The Contractor shall submit to the Superintendent a copy of the following documents within 14 days of the award of the Contract:

- Certificate of Approval to ISO 9001:2008
- Corporate Quality Manual (for review and return to the Contractor)
- Two controlled copies of the Project Quality Plan.

The Contractor shall modify his Project Quality Plan and documentation to include additional requirements of the Superintendent.

Provide the Superintendent with access to inspect Corporate Quality Procedures applicable to this Contract.

The Project Quality Plan shall follow the guidelines of AS/NZS ISO 9004 and AS/NZS ISO 3905.

The Project Quality Plan shall cover all quality system elements required by the appropriate Quality Systems Standard that are applicable to this Contract.

As a minimum, the Project Quality Plan shall contain the following information:

a. A Project Organisation Chart or list of nominated Project Personnel showing their positions, lines of communication and details of the responsibilities of the positions
b. Details of the qualifications and experience of the following positions
    - Project Manager
    - Construction Manager/Job Site Supervisor
    - Commissioning Manager
    - Site Safety Manager
    - Project Engineer
    - Contractor's Quality Representative (QAR)
    - Surveyor
    - Foreman, Supervisor(s)
c. Design Change Request Authorisation Request forms and procedures (refer to Section 8.9)
d. Access Permit procedures and templates for works on Seqwater existing site
e. Inspection and Test Plans for the various phases during design, manufacture, construction and commissioning, to be submitted at least 7 days prior to commencement of relevant activity

f. A copy of the NATA Terms of Registration for the Contractor's Compliance Testing Laboratory (Internal or Sub−Contract)

g. Project specific operating procedures or descriptions outlining as a minimum, details of activities, who is responsible for implementation/verification, identification of relevant Quality Records and distribution and of such records, to be submitted at least 7 days prior to commencement of relevant activities

h. A register of all intended Quality Records to be used on the project, together with proformas

i. Forms and templates for non−conformance, incidents.

8.3 CONTRACTOR'S PROJECT MANAGEMENT PLAN

Within two (2) weeks of the date which appears on the written notice of acceptance of tender (i.e. date of acceptance of tender) the Contractor shall submit to the Superintendent the Contractor's Project Management Plan covering all aspects of the Contract, including the following components:

- Construction program
- Site Based Cooperation Plan
- Workplace, Health and Safety Management Plan
- Environmental Management Plan
- Quality Management Plan
- Traffic Management Plan

8.4 SITE BASED COOPERATION PLAN

The Contractor shall submit a Site Based Cooperation Plan for review and comment by the Principal and Superintendent, prior to the commencement of the Works.

The plan shall include:

- A sketch plan indicating the areas of site delineation, fencing, any additional access routes, location of emergency muster point, material storage areas, site accommodation requirements, first aid location, safety signage, etc.
- Induction procedures for Contractors, visitors and the Principal's staff
- Any specific Seqwater site based safety requirements, such as Permits to Work and Isolation Procedures; and
- Emergency contact details in event of incident or emergency

The plan, once reviewed and commented on shall be signed by both the Contractor and Principal.

The limits of the site area and Contractor's works area may only be altered with the written review and comment of the Superintendent.

The Contractor shall provide and maintain in good order all access roads, side tracks and detours required for use by his plant and personnel and authorised public or other traffic.

The Contractor shall not enter onto the Principal's workplace without approved site access, other than to undertake the Works assigned to the Contractor within agreed areas of control.

Any works to be undertaken within the Holts Hill site boundary under the Principal's agreed delineated area of control shall incorporate the Principal's site specific safety requirements, or equivalent approved systems, inclusive of but not limited to:

- Corporate safety inductions for all employees working on site
- Site specific safety inductions for all employees entering site and
- Site access and work permit system inclusive of Principal Contractor site access, work permits, isolation permits and high risk work permits for any associate work activity.

8.5 INSPECTION AND TEST PLANS

The Contractor shall prepare Inspection and Test Plans (ITPs) plus any necessary associated checklists. The Contractor shall submit ITPs to the Superintendent at least 7 days prior to commencing work on the activity covered by the respective ITP.

The ITPs shall contain at least the following information for each significant activity identified in the relevant process:

- Description of activity
- Specification requirements/reference
- Person responsible for activity (title)
- Hold Points and Witness Points
- Activity checklists
- Drawing reference
- Inspection and test type
- Tolerances or other acceptance criteria
- Identification of relevant procedure and quality records
- Test/inspection frequency
- Work item or work lot identification.

In the ITPs include "Hold" and "Witness" points covering any requirement identified as a "Hold" or "Witness" point in the Contract and any tests or inspections required by the Contract or Statutory Authorities. Include any checklists that are necessary to summarise a group of activities, attributes or standards to be verified at a particular inspection or test.

The Contractor shall have appropriately authorised personnel notate the ITPs when the quality of work inspected or tested is as specified.

The Contractor shall submit copies of ITPs relating to completed work with each progress payment claim.

8.6 IDENTIFICATION AND TRACEABILITY

The Contractor shall implement quality systems which clearly identify all stages of works and can be easily traced by the Superintendent. This shall include, but not be limited to the following:

- Drawing register
- Sub Contract work including design, manufacture, site construction and commissioning into distinct work items
- Choose work items as required, but subject to review and comment by the Superintendent
- Assign an identification number to each work item
- Maintain a register of work item numbers containing at least:

- a brief description of the work item
- location reference (3 dimensional where applicable)
- item status (conforming or non−conforming)

- Maintain traceability of all records under this Contract
- Identify test results where applicable with work item number
- Notify the Superintendent in writing 24 hours prior to commencing a new work item.

8.7 WITNESS AND HOLD POINTS

Critical and discipline specific witness and hold points for the Contract are specified within the Technical Specifications.

The Contractor shall incorporate all of the hold−points and witness hold points identified in the Technical Specification into the Project Quality Plan and Project Program. The Contractor shall include any additional hold−points or witness hold points that are considered to be essential that are not included in the Technical Specification in the Quality Plan and Project Program.

The Contractor shall not proceed with stages of work, which have a witness and hold−point, and shall seek review and comment of the Superintendent to proceed. The Superintendent will give approval, or otherwise reasons for approval not being given, within five (5) days of notification by the Contractor, or in the case of documentation, within the specified time from submission by the Contractor.

The primary Hold Points that must be included in the Project Quality Plan and Project Program are as follows:

a. submission of Project Quality Plan
b. submission of Project Safety Plan
c. submission of Environmental Management Plan
d. submission of Visual Record and Dilapidation Survey
e. commencement of setting out and any site works
f. commencement of earthworks or excavations through any easements
g. prior to equipment ordering and manufacturing
h. connection or modification to existing systems
i. prior to any plant shutdowns
j. removal of existing infrastructure and equipment
k. commencement of civil works
l. commencement of mechanical works
m. commencement of electrical works
n. commencement of controls works
o. equipment factory testing and inspection
p. prior to equipment commissioning – dry and wet tests
q. prior to process commissioning – dry and wet tests
r. prior to introduction of fluoride into the distribution system
s. prior to proof of performance test

t. submission of training plan

u. any additional witness of or hold points specified in the Technical Specifications

8.8 RECORDS

The Contractor shall retain all records throughout the Contract and ensure the records are secure against deterioration, damage and loss and are suitably filed and indexed to allow convenient retrieval of individual records.

This shall include as a minimum:

- ITPs and checklists
- quality or test records obtained from subcontractors, manufacturers and suppliers
- test results obtained from testing laboratories etc.
- Work as executed documents required under the Contract.

Make records available to the Superintendent on request.

8.8.1 CONFORMANCE REPORTS

The Contractor shall provide the Superintendent with Conformance Reports for each designated work item, within 24 hours of completion of the work item.

As a minimum this shall include the following:

- All Conformance Reports are to include a reference system which enables all quality certificates, records and the like to be easily located for each facet of the Works
- A verification statement certifying that the relevant work items have been inspected and/or tested in accordance with the Contractor's Inspection and Test Plan(s) and that they comply with the Contract
- All relevant signed off Inspection and Test Plans and associated Checklists
- NATA certified compliance test results (where applicable)
- Note: In cases where test results are not available within this period (e.g. 28 day concrete strengths), submit preliminary results or previous analytical data of the same mix type which statistically indicates a high probability of conformance. This does not absolve the Contractor from his responsibilities under this Contract should actual results subsequently identify non−conformance of the work item
- Survey and measurement compliance data (where applicable).

8.8.2 NON-CONFORMANCE REPORTS

The Contractor shall submit a Non−conformance Report to the Superintendent within 24 hours of detecting nonconforming work. This shall include but not be limited to the following:

- The nature and extent of the non−conformance
- The work item number it relates to including the precise boundaries of the nonconforming work
- Any relevant information, data, test results and/or measurements (as applicable)
- The corrective and preventive actions the Contractor proposes to take
- The time frame within which the non−conformance will be rectified
- The method of isolating/identifying nonconforming work, applying and releasing hold points, etc., shall be clearly stated in the Project Quality Plan

- The proposed corrective action shall be subject to review and comment by the Designer and the Superintendent.

8.8.3 SUBMISSION OF CONFORMANCE REPORTS

The Contractor shall submit all fully completed Conformance Reports Conformance for completed works with each progress claim.

8.9 DESIGN CHANGE REVIEW AND APPROVAL

The Contractor shall implement a design change review and approval procedure and associated forms. The Contractor may either use its own procedure and forms provided that they meet the minimum requirements of the Principal's procedure and forms; or use the Principal's procedure and forms. If the Contractor proposes to use its own procedure and form they shall be first submitted to the Superintendent for review and approval. The Principal may engage the Design Consultant during the design change review and approval process.

8.10 QUALITY AUDITS

The Superintendent reserves the right to audit conformance to the requirements of the Contract either at the source or at site.

Audit by the Superintendent shall not absolve the Contractor of the responsibility to conform to specified requirements nor shall subsequent rejection in accordance with the Contract be prejudiced.

8.11 QUALITY MANAGEMENT REPORT

The Contractor shall submit to the Superintendent for review and comment a Quality Management Report which contains all of the quality documentation identified within the Quality section of this Contract.

8.12 FAILURE TO COMPLY

If the Contractor fails to comply with the requirements of clause "Quality Management", the Principal may carry out such inspections and tests that the Superintendent determines and any cost incurred by the Principal shall be a debt due from the Contractor.

9 CONSTRUCTION SEQUENCE

A key requirement of the project is that construction will be completed on an operating site and continuity of supply must be maintained. The existing site is constrained and the Contractor shall give particular attention to construction sequencing to ensure continuity of supply.

The Contractor shall undertake the Works in accordance with the approved detailed construction methodology. The detailed construction methodology shall be submitted to the Superintendent for review within one month of the date of acceptance of tender. The Contractor shall update the detailed construction methodology as necessary during the Contract period.

9.1 DECOMMISSIONING, DEMOLITION AND DISPOSAL FROM SITE

The Contractor shall decommission, demolish, recycle and/or dispose, to a waste facility which can lawfully accept the waste, all items within the site that require removal. The Contractor shall pay all offsite disposal fees.

Demolition of asbestos-containing material shall be carried out in an acceptable manner as required under Queensland legislation. Removal and disposal off site shall be to an existing licensed and regulated facility.

All demolition work shall be carried out and completed prior to the date for practical completion of the Works.

9.2 REINSTATEMENT

The Contractor shall be responsible for all restoration works including, but not restricted to road pavements, concrete works, earth surfaces, channels, fences, trees, shrubs and grass.

Restoration of disturbed areas shall be carried out to equivalent or better standard as they were before commencement of work and to the satisfaction of the Superintendent.

Photographic evidence and the dilapidation survey of the original state of the existing and adjacent developed areas shall be used to validate the restoration standard provided.

10 PROGRAMING

10.1 REQUIREMENT

Within two (2) weeks of the *date of acceptance of tender*, the Contractor shall supply a detailed program detailing individual activities. In particular reference should be made to the requirements of Clause 'Construction Sequence'.

10.2 FORMAT

The Contractor shall set out the program as a Gant Chart on a time scale of calendar weeks with individual tasks and activities.

The program shall be baselined and show, but not be limited to, the following:

- Clearly identify the start and finish dates for major phases of the Works;
- Clearly identify each task/activity;
- A project calendar clearly denoting the Start and Finish dates for tasks allowing for restrictions on working time and contingencies for which the Contractor is responsible under the terms of the Contract;
- Full construction sequence;
- Durations and lead times for all major equipment and when such equipment shall be incorporated into the Works;
- Testing, Commissioning and Proof of Performance Testing sequence;
- Task predecessors between tasks;
- Estimated duration of all tasks in number of days;
- Key Personnel and subcontractors allocated for each of the tasks;
- Project activity milestones;
- Project "Hold" or "Witness Points".

10.3 PROGRESS

Every month and with each Payment Claim the Contractor shall submit an updated program to the same detail as that specified for the original program and show time extensions granted and progress achieved against the program. List all specific actions to correct or address any delays which may impact upon the date for practical completion.

10.4 REVISED PROGRAM

A revised program may be requested by the Superintendent at any time if the Superintendent considers that the current program cannot be adhered to. Within two (2) weeks of such a request, the Contractor shall submit an updated program incorporating changes in methods, times or sequence of activities, and showing the planned progress towards the date for practical completion, to the same detail as specified for the original program.

10.5 DAILY RECORDS

For each working day the Contractor shall submit a certified daily record for the work performed to the Superintendent detailing work performed on each significant activity during the day and any special comments regarding the work carried out.

10.6 REPORTING

Every calendar month and with each payment claim the Contractor shall supply a written report addressing the following:

- A two (2) page summary describing the following:
  - Actual Works Achieved in the previous calendar month,
  - Works planned for the next calendar month,
  - Key Issues and Key Risks and Risk mitigation Plans.

Additional to the Summary the following shall also be provided as part of the Project progress Report:

- Actual Work Achieved: Provide an Extension of Time register which shows the status of actual and anticipated claims for *EOT (*extensions of time). Notwithstanding that an updated program is to be provided, report the Contractor's assessment of progress making reference to any activities which may be well behind or ahead of schedule, ability to achieve the due date for practical completion, and action to be taken to improve progress if necessary;
- WH&S Management: Results of audits completed by the Contractor (including those on sub−Contractors), inspections by Work Cover Authority and PINS/Infringement Notices, identify any non−conformances and associated corrective and preventive actions, details of incidents and/or accidents, status of submission of Safe Work Method Statements;
- Quality Management: Results of audits completed by the Contractor (including those on subcontractors), status of development of Procedures, Method Statements and Inspection and Test Plans, identify any non−conformances and associated corrective and preventive actions;
- Environmental Management: As required by the Environmental Management Plan;
- Industrial Relations Management: Industrial action (on site or off site) which may impact upon the WUC, inspections of the site by union officials;
- Variations/Claims: Provide a variation/claim register that shows the status of actual and anticipated variations/claims;
- Contract Payments: Provide a table of payment claims, payments received and predicted payment claims;
- Subcontract Matters: Provide a register of the work which has been or will be subcontracted and the name of the subcontractors;
- Requests for Information (RFI) Register: Details of correspondence for which a response from the Superintendent's Representative is open or outstanding. Include dates by which a response is required against each RFI;
- Status of work As Constructed information and O&M Manuals: Contractor's assessment of the status of preparation of the As Constructed information and O&M Manuals and confirmation that the As Constructed information and O&M Manuals shall be submitted prior to the date for practical completion;
- Status of Third Party Complaints: Provide a register of all complaints received including source, date, time, issue and action/status.