

Apex Camps – Magnetic Island Wastewater Treatment Upgrade

Commissioning Plan

27 October 2023

Project Details

PROJECT TITLE:	Apex Camps WWTP Upgrade
PROJECT LOCATION:	Picnic Bay, Magnetic Island, QLD
PROJECT DESCRIPTION:	Install new onsite wastewater treatment plant and subsurface irrigation areas featuring Orenco AdvanTex Treatment and Evapotranspiration system
PEAK DESIGN:	26,000 L/day
SYSTEM DESCRIPTION:	The proposed Final Design of the system consists of: (3) 18 m³ septic tanks (1) 18 m³ pre-anoxic tank (1) 23 m³ recirculation tank (3) AX100 treatment units with active ventilation (1) 10 m³ Evapotranspiration recirculation/discharge tank (1) Orenco Telemetry control panel (1) UV disinfection unit (1) ITS evapotranspiration system (4) Poly tanks for storing treated water (1) Drip irrigation system
CLIENT:	Department of Energy and Public Works (QBuild)
PREPARED BY:	Matt McKennarley Director ENVR Solutions Pty Ltd Mobile: 0402 524 033 Email: m.mckennarley@envr.com.au
DATE PREPARED:	27 October 2023

Contents

Project Details 2

1. Installation..... 4

2. WWTP Start Up Oversight..... 4

3. Primary Tank..... 5

4. Anoxic Tank 7

5. AdvanTex Recirculation Tank 11

6. AdvanTex AX100s 15

7. ITS Recirculation Tank 17

8. Recycled Water Storage Tanks..... 21

9. Evapotranspiration Beds 24

11. UV Disinfection System 24

12. Microfiltration 25

13. Control Panel..... 25

14. Irrigation 26

15. Process Proving 27

1. Installation

The Apex Camp Onsite Wastewater Treatment Plant (OSWTP) must be installed in accordance with its applicable design drawings by ENVR Solutions and Installation Instructions published by Orenco.

The WWTP must be installed by an Orenco Authorised Commercial Installer. These installers must be trained on how to properly install the applicable system (using trainings prepared by Orenco) and authorised by Orenco (under some contracts) or Distributor (under others).

Training must be completed before the time of the installation. Orenco and/or Distributor support Authorised Commercial Installers during each installation, including answering questions about the applicable Installation Instructions or products.

2. WWTP Start Up Oversight

Orenco will elect whether to oversee the Treatment start-up itself or arrange with ENVR to oversee the start-up.

Orenco and/or ENVR will coordinate schedules with all parties that should be at the start-up, including the operator, installer, engineer, and regulator, and other arrangements necessary to start-up the system, including ensuring that power and water is available and adequate to test all system functions, and that a phone line is connected for testing the control system.

Each system must be operated and maintained in accordance with its applicable O&M Instructions published by Orenco and ENVR. All operators must be trained on how to properly operate and maintain the applicable system (using trainings prepared by Orenco, and ENVR Training may be completed before or at the time of start-up).

The party overseeing the start-up (ENVR or Orenco) will walk through the complete system with the operator, review the O&M manual, and provide clarification if needed. For each start-up inspection Orenco and ENVR oversees, it will complete the most current version of the applicable Start-up Forms for the project file.

If Orenco elected to have ENVR oversee the start-up, and Distributor submits a completed copy of the Start-up Forms and photos of the system installation to Orenco within 10 days of the inspection.

ENVR will conduct a start-up inspection and will document all necessary repairs and/or modifications discovered during start-up and will communicate such to all affected parties. Following communication, they will verify that all repairs and/or modifications have been completed and will communicate such to all affected parties.

3. Primary Tank

System Start-Up: Primary Tank(s)

Tank

Tank manufacturer: _____ Type: _____

Tank and Accessories

Watertight test performed: ☐ Yes ☐ No ☐ N/A

Flow direction correct: ☐ Yes ☐ No ☐ N/A

Tank anti-flotation measures: ☐ Yes ☐ No ☐ N/A

Notes: _____

Access Risers

Proper grading and drainage: ☐ Yes ☐ No ☐ N/A

Riser, riser adapters, grommets installed correctly: ☐ Yes ☐ No ☐ N/A

Riser lids secure: ☐ Yes ☐ No ☐ N/A

Notes: _____

Biotube Filter

Cartridge is removable: ☐ Yes ☐ No ☐ N/A

Cartridge handles are extended for easy removal: ☐ Yes ☐ No ☐ N/A

Filter firmly connected: ☐ Yes ☐ No ☐ N/A

Notes: _____

Filter Alarm

Invert of inlet setting (measures from outside top of tank): _____

Invert of outlet setting (measures from outside top of tank): _____

Alarm float setting (measures from outside top of tank): _____

Sanitary Tee: ☐ Yes ☐ No

Inspect splice box/watertight splices: ☐ Yes ☐ No ☐ N/A

Verify alarm operation: ☐ Yes ☐ No ☐ N/A

Notes: _____

Photographs of Key Components

General site / component pictures: ☐ _____

Items needing correction: ☐ _____

Notes: _____

4. Anoxic Tank

System Start-Up: Pump Tank(s)

Tank

Tank manufacturer: _____ Material: _____

Tank and Accessories

Watertight test performed: ☐ Yes ☐ No ☐ N/A

Tank anti-flotation measures: ☐ Yes ☐ No ☐ N/A

Notes: _____

Access Risers

Proper grading and drainage: ☐ Yes ☐ No ☐ N/A

Riser, riser adapters, grommets installed correctly: ☐ Yes ☐ No ☐ N/A

Riser lids secure: ☐ Yes ☐ No ☐ N/A

Notes: _____

Biotube Pump System

Cartridge is removable and handle is accessible: ☐ Yes ☐ No ☐ N/A Notes: _____

Discharge assembly orientation/access to union/cam and valve: ☐ Yes ☐ No ☐ N/A Notes: _____

Float cords neatly wrapped, cords long enough for removal: ☐ Yes ☐ No ☐ N/A Notes: _____

Floats are properly orientated and handle is accessible : ☐ Yes ☐ No ☐ N/A Notes: _____

Float settings are appropriate: ☐ Yes ☐ No ☐ N/A Notes: _____

Sanitary Tee: ☐ Yes ☐ No ☐ N/A _____

Tank invert of inlet from outside top of tank: _____

Float function	Float setting (from outside top of tank)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Verify pump voltage and phase match control panel: ☐ Yes ☐ No ☐ N/A Notes: _____

Voltage/Phase: _____

Check pump operation in manual: ☐ Yes ☐ No ☐ N/A Notes: _____

Splice box is accessible, waterproof splices, conduit seal: ☐ Yes ☐ No ☐ N/A Notes: _____

Record Pump Voltage and Amperage at Control Panel

[illegible]

Notes: _____

Control Panel

Model: Custom number: TCOM phone/IP:

Verify internal overloads and phase monitor (3 phase only): ☐ Yes ☐ No ☐ N/A Notes:

Verify inputs from floats are communicating with control panel: ☐ Yes ☐ No ☐ N/A Notes:

Verify automatic operation of pumps and alarms: ☐ Yes ☐ No ☐ N/A Notes:

Verify range on current sensor: ☐ Yes ☐ No ☐ N/A Notes: _____

Verify/calibrate pump gpm, enter it into control panel: ☐ Yes ☐ No ☐ N/A Notes:

Verify timer mode: ☐ Yes ☐ No ☐ N/A Notes:

Timer Setting (if applicable)

Time on: Timer off: Override on: Override off:

Verify pump & control breakers are "on" and system is in "auto": ☐ Yes ☐ No ☐ N/A Notes:

Verify correct phone number: ☐ Yes ☐ No ☐ N/A Notes:

Verify alarms are called out to operator: ☐ Yes ☐ No ☐ N/A Notes:

Verify remote connectivity: ☐ Yes ☐ No ☐ N/A Notes:

Notes: _____

_____**Sampling Location(s)**

Influent: _____ Effluent: _____

Photographs of Key Components

General site / component pictures:

Items needing correction: _____

_____**General Comments**

5. AdvanTex Recirculation Tank

System Start-Up: Recirculation Tank(s)

Tank

Tank manufacturer: _____ Material: _____

Tank and Accessories

Watertight test performed: ☐ Yes ☐ No ☐ N/A

Tank anti-flotation measures: ☐ Yes ☐ No ☐ N/A

Notes: _____

Access Risers

Proper grading and drainage: ☐ Yes ☐ No ☐ N/A

Riser, riser adapters, grommets installed correctly: ☐ Yes ☐ No ☐ N/A

Riser lids secure: ☐ Yes ☐ No ☐ N/A

Notes: _____

Biotube Pump System

Cartridge is removable and handle is accessible: ☐ Yes ☐ No ☐ N/A Notes: _____

Discharge assembly orientation/access to union/cam and valve: ☐ Yes ☐ No ☐ N/A Notes: _____

Float cords neatly wrapped, cords long enough for removal: ☐ Yes ☐ No ☐ N/A Notes: _____

Floats are properly orientated and handle is accessible : ☐ Yes ☐ No ☐ N/A Notes: _____

Verify float and RSV settings and operation: ☐ Yes ☐ No ☐ N/A Notes: _____

MM/RSV model: _____ MM/RSV setting: _____ MM/RSV is removable: _____

Note: Refer to setting instructions for model used. RSV is typically set to approximately 80% of the tank depth or volume.

Tank invert of inlet from outside top of tank: _____

Float function _____ Float setting (from outside top of tank) _____

Verify pump voltage and phase match control panel: ☐ Yes ☐ No ☐ N/A Notes: _____

Voltage/Phase: _____

Check pump operation in manual: ☐ Yes ☐ No ☐ N/A Notes: _____

Splice box is accessible, waterproof splices, conduit seal: ☐ Yes ☐ No ☐ N/A Notes: _____

Record Pump Voltage and Amperage at Control Panel

Pump #	Pump Model	Voltage		Amperage	
		Static	Dynamic	Pump	Panel

Notes: _____

Control Panel

Model: _____ Custom number: _____ TCOM phone/IP: _____

Verify internal overloads and phase monitor (3 phase only):	☐ Yes ☐ No ☐ N/A	Notes: _____
Verify inputs from floats are communicating with control panel:	☐ Yes ☐ No ☐ N/A	Notes: _____
Verify automatic operation of pumps and alarms:	☐ Yes ☐ No ☐ N/A	Notes: _____
Verify range on current sensor:	☐ Yes ☐ No ☐ N/A	Notes: _____
Verify/calibrate pump gpm, enter it into control panel:	☐ Yes ☐ No ☐ N/A	Notes: _____
Verify timer mode:	☐ Yes ☐ No ☐ N/A	Notes: _____

<u>Manual</u>	<u>Estimated Flow</u>	<u>Trend</u>
Time on: _____	Ret recirc ratio: _____	Ret recirc ratio: _____
Time off: _____	RT max off time: _____	RT Max off time: _____
Override on: _____	RT min off time: _____	RT Min off time: _____
Override off: _____	Est avg daily flow: _____	No. of days-Avg: _____
	Est peak daily flow: _____	

Verify pump & control breakers are "on" and system is in "auto":

☐ Yes ☐ No ☐ N/A

Notes:

Verify correct phone number:

☐ Yes ☐ No ☐ N/A

Notes:

Verify alarms are called out to operator:

☐ Yes ☐ No ☐ N/A

Notes:

Verify remote connectivity:

☐ Yes ☐ No ☐ N/A

Notes:

Notes:

Sampling Location(s)

Influent:

Effluent:

Photographs of Key Components

General site / component pictures:

Items needing correction:

General Comments

6. AdvanTex AX100s

System Start-Up: AX Pod(s)

Installation Inspection

Site grading and drainage adequate: ☐ Yes ☐ No Notes: _____

Pod installed correctly: ☐ Yes ☐ No Notes: _____

Lids aligned and no sidewall deflection: ☐ Yes ☐ No Notes: _____

Installation method (buried, partial bury, above grade, bermed): _____

Pod bedding material used: _____

Pod bury depth to native grade: _____

Spacing between pods: _____

Pod anti-flotation method: _____

Pod Inspection

Laterals flushed: ☐ Yes ☐ No Notes: _____

Verify distribution valve operation, plumbing: ☐ Yes ☐ No Notes: _____

Verify spray pattern, pressures: ☐ Yes ☐ No Notes: _____

Pod #	Serial #	Pressure (PSI)/Squirt Height	Pod #	Serial #	Pressure (PSI)/Squirt Height
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Pod(s) drain correctly : ☐ Yes ☐ No

Proper slope on return line: ☐ Yes ☐ No

Flow splitter basin installed level, ports level: ☐ Yes ☐ No ☐ N/A

Percentage split: _____

Venting

Vent piping appropriately sized and installed: ☐ Yes ☐ No Manifold Diameter: _____

Vent intakes properly located and installed: ☐ Yes ☐ No ☐ N/A

Verify fan operation in manual: ☐ Yes ☐ No ☐ N/A

Verify air flow at assembly exhaust: ☐ Yes ☐ No ☐ N/A

Verify fan current sensor alarm operation: ☐ Yes ☐ No ☐ N/A

Observe visual alarm light with panel in auto and fan breaker off

Verify fan operation in auto: ☐ Yes ☐ No ☐ N/A

Notes: _____

Photographs of Key Components

General site / component pictures: ☐ _____

Items needing correction: _____

7. ITS Recirculation Tank

System Start-Up: Pump Tank(s)

Tank

Tank manufacturer: _____ Material: _____

Tank and Accessories

Watertight test performed: ☐ Yes ☐ No ☐ N/A

Tank anti-flotation measures: ☐ Yes ☐ No ☐ N/A

Notes: _____

Access Risers

Proper grading and drainage: ☐ Yes ☐ No ☐ N/A

Riser, riser adapters, grommets installed correctly: ☐ Yes ☐ No ☐ N/A

Riser lids secure: ☐ Yes ☐ No ☐ N/A

Notes: _____

Biotube Pump System

Cartridge is removable and handle is accessible: ☐ Yes ☐ No ☐ N/A Notes: _____

Discharge assembly orientation/access to union/cam and valve: ☐ Yes ☐ No ☐ N/A Notes: _____

Float cords neatly wrapped, cords long enough for removal: ☐ Yes ☐ No ☐ N/A Notes: _____

Floats are properly orientated and handle is accessible : ☐ Yes ☐ No ☐ N/A Notes: _____

Float settings are appropriate: ☐ Yes ☐ No ☐ N/A Notes: _____

Sanitary Tee: ☐ Yes ☐ No ☐ N/A _____

Tank invert of inlet from outside top of tank: _____

Float function	Float setting (from outside top of tank)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Verify pump voltage and phase match control panel: ☐ Yes ☐ No ☐ N/A Notes: _____

Voltage/Phase: _____

Check pump operation in manual: ☐ Yes ☐ No ☐ N/A Notes: _____

Splice box is accessible, waterproof splices, conduit seal: ☐ Yes ☐ No ☐ N/A Notes: _____

Record Pump Voltage and Amperage at Control Panel

[illegible]

Notes: _____

Control Panel

Model: Custom number: TCOM phone/IP:

Verify internal overloads and phase monitor (3 phase only): ☐ Yes ☐ No ☐ N/A Notes:

Verify inputs from floats are communicating with control panel: ☐ Yes ☐ No ☐ N/A Notes:

Verify automatic operation of pumps and alarms: ☐ Yes ☐ No ☐ N/A Notes:

Verify range on current sensor: ☐ Yes ☐ No ☐ N/A Notes: _____

Verify/calibrate pump gpm, enter it into control panel: ☐ Yes ☐ No ☐ N/A Notes:

Verify timer mode: ☐ Yes ☐ No ☐ N/A Notes:

Timer Setting (if applicable)

Time on: Timer off: Override on: Override off:

Verify pump & control breakers are "on" and system is in "auto": ☐ Yes ☐ No ☐ N/A Notes:

Verify correct phone number: ☐ Yes ☐ No ☐ N/A Notes:

Verify alarms are called out to operator: ☐ Yes ☐ No ☐ N/A Notes:

Verify remote connectivity: ☐ Yes ☐ No ☐ N/A Notes:

Notes: _____

_____**Sampling Location(s)**

Influent: _____ Effluent: _____

Photographs of Key Components

General site / component pictures:

Items needing correction: _____

_____**General Comments**

8. Recycled Water Storage Tanks

System Start-Up: Pump Tank(s)

Tank

Tank manufacturer: _____ Material: _____

Tank and Accessories

Watertight test performed: ☐ Yes ☐ No ☐ N/A

Tank anti-flotation measures: ☐ Yes ☐ No ☐ N/A

Notes: _____

Access Risers

Proper grading and drainage: ☐ Yes ☐ No ☐ N/A

Riser, riser adapters, grommets installed correctly: ☐ Yes ☐ No ☐ N/A

Riser lids secure: ☐ Yes ☐ No ☐ N/A

Notes: _____

Biotube Pump System

Cartridge is removable and handle is accessible: ☐ Yes ☐ No ☐ N/A Notes: _____

Discharge assembly orientation/access to union/cam and valve: ☐ Yes ☐ No ☐ N/A Notes: _____

Float cords neatly wrapped, cords long enough for removal: ☐ Yes ☐ No ☐ N/A Notes: _____

Floats are properly orientated and handle is accessible : ☐ Yes ☐ No ☐ N/A Notes: _____

Float settings are appropriate: ☐ Yes ☐ No ☐ N/A Notes: _____

Sanitary Tee: ☐ Yes ☐ No ☐ N/A _____

Tank invert of inlet from outside top of tank: _____

Float function	Float setting (from outside top of tank)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Verify pump voltage and phase match control panel: ☐ Yes ☐ No ☐ N/A Notes: _____

Voltage/Phase: _____

Check pump operation in manual: ☐ Yes ☐ No ☐ N/A Notes: _____

Splice box is accessible, waterproof splices, conduit seal: ☐ Yes ☐ No ☐ N/A Notes: _____

Record Pump Voltage and Amperage at Control Panel

[illegible]

Notes: _____

Control Panel

Model: Custom number: TCOM phone/IP:

Verify internal overloads and phase monitor (3 phase only): ☐ Yes ☐ No ☐ N/A Notes:

Verify inputs from floats are communicating with control panel: ☐ Yes ☐ No ☐ N/A Notes:

Verify automatic operation of pumps and alarms: ☐ Yes ☐ No ☐ N/A Notes:

Verify range on current sensor: ☐ Yes ☐ No ☐ N/A Notes: _____

Verify/calibrate pump gpm, enter it into control panel: ☐ Yes ☐ No ☐ N/A Notes:

Verify timer mode: ☐ Yes ☐ No ☐ N/A Notes:

Timer Setting (if applicable)

Time on: Timer off: Override on: Override off:

Verify pump & control breakers are "on" and system is in "auto": ☐ Yes ☐ No ☐ N/A Notes:

Verify correct phone number: ☐ Yes ☐ No ☐ N/A Notes:

Verify alarms are called out to operator: ☐ Yes ☐ No ☐ N/A Notes:

Verify remote connectivity: ☐ Yes ☐ No ☐ N/A Notes:

Notes: _____

_____**Sampling Location(s)**

Influent: _____ Effluent: _____

Photographs of Key Components

General site / component pictures:

Items needing correction: _____

_____**General Comments**

9. Evapotranspiration Beds

Number of pods_____

Configuraion_____

Check	Confirm		
Gravity flow of water transfer between each pod	Yes	No	N/A
Above-pod irrigation working	Yes	No	N/A
All plants healthy	Yes	No	N/A
Adequate covering of mulch	Yes	No	N/A

Notes_____

11. UV Disinfection System

Manufacturer_____

Type_____

Number of UVs_____

Configuraion_____

Check	Confirm		
Flow of water	Yes	No	N/A
Leaks or loose end caps	Yes	No	N/A
Lamps operational	Yes	No	N/A
Ultraviolet Monitor Installed	Yes	No	N/A
Manual wiper functioning	Yes	No	N/A

Notes_____

12. Microfiltration

Manufacturer_____

Type_____

Number of filters_____

Configuraion_____

Check	Confirm		
Flow of water	Yes	No	N/A
Leaks or loose wing nuts	Yes	No	N/A
Micron Filter Installed	Yes	No	N/A
Pressurized adequately	Yes	No	N/A

Notes_____

13. Control Panel

Manufacturer_____

Type_____

Email Recipients for Alarms _____

Check	Confirm		
Panel wired per manufacturer's wiring diagram	Yes	No	N/A
All electrical connections in panel secured	Yes	No	N/A
Panel energized and T-Com circuit board blinking	Yes	No	N/A
Pump auto and manual operation	Yes	No	N/A
Audible alarm	Yes	No	N/A
Visual alarm	Yes	No	N/A
T-COM Viewer set up	Yes	No	N/A
Remote alarm set up	Yes	No	N/A

Date and time programmed	Yes	No	N/A
Verify remote log in access	Yes	No	N/A
Verify email alarm setup	Yes	No	N/A
Verify Orenco remote login access	Yes	No	N/A
Control panel diagrams left in panel for future review	Yes	No	N/A

Notes _____

14. Irrigation

Irrigation Type _____

Number of Zones _____

Schduling _____

Check	Confirm		
Zone 1 pressurized and irrigating	Yes	No	N/A
Zone 2 pressurized and irrigating	Yes	No	N/A
Zone 3 pressurized and irrigating	Yes	No	N/A
Zone 4 pressurized and irrigating	Yes	No	N/A
Indexing valve operational	Yes	No	N/A
All valve box lids secured	Yes	No	N/A
All flush valves closed	Yes	No	N/A
All pipework buried	Yes	No	N/A
Signage installed	Yes	No	N/A
Verify remote log in access	Yes	No	N/A
Verify email alarm setup	Yes	No	N/A
Verify Orenco remote login access	Yes	No	N/A
Control panel diagrams left in panel for future review	Yes	No	N/A

Notes _____

15. Process Proving

For the initial commissioning phase when the system is first installed, the sampling regime will include five samples on day 1 followed by 1 sample per day thereafter for five days that meet both the medium and maximum criteria in the table below.

Quality Characteristic	Units	Release Limit				Monitoring Frequency
		Min	Median	95 th Percentile	Max	
Turbidity	NTU	-	-	-	10	Daily
Total Chlorine	mg/L	-	-	-	5	Daily
<i>E. coli</i>	Colony Forming Units/100 mL	-	<10	-	-	Monthly
5-day Biochemical Oxygen Demand	mg/L	-	20	-	30	Monthly
Total Suspended Solids	mg/L	-	5	-	7.5	Monthly
Dissolved Oxygen	mg/L	2.0	-	-	-	Monthly
pH	scale	6.0	-	-	8.5	Monthly
Total Nitrogen	mg/L as Nitrogen	-	-	-	60	Monthly
Total Phosphorus	mg/L as Phosphorus	-	-	-	10	Monthly
Electrical Conductivity	Micro Siemens per cm	-	-	-	<1,600	Monthly

Prepared by:

Matt McKennariey

Director

ENVR Solutions Pty Ltd

0402 524 033

m.mckennariey@envr.com.au

envr.com.au

