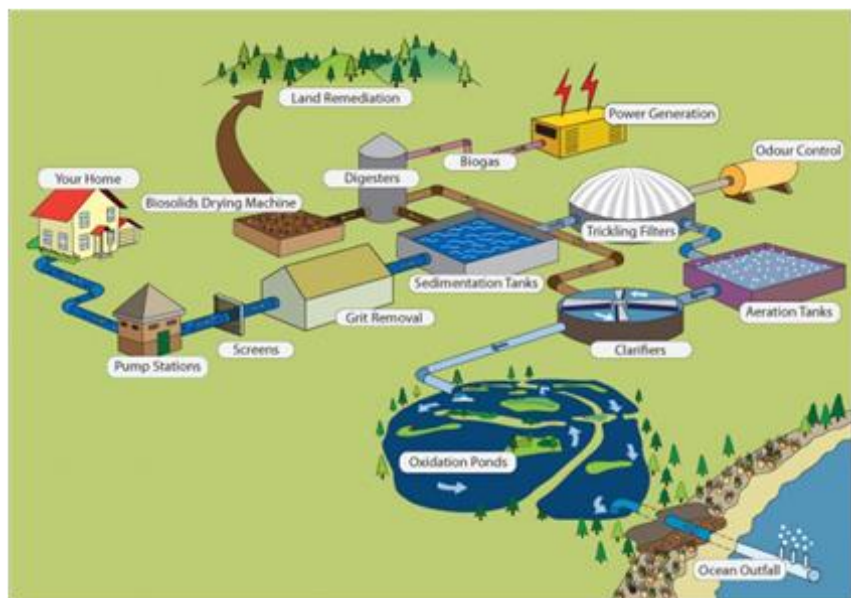


Extending SAP from a Financial Reporting to an Operational Tool

Mr Adam Twose MSc. (Christchurch City Council)

&

Dr. Becky Macdonald (Jacobs NZ Ltd)



Agenda

- SAP as a Financial Tool
- What Christchurch Wastewater Treatment Plant (CWTP) Assets were there in Christchurch City Council's (CCC) SAP?
- What Assets do Operation and Maintenance teams need in SAP?
- What CWTP Assets are there now in CCC's SAP?



The “Plan”

- What we've done
- What we will do



SAP as a Financial Tool

- For the past 20 years Christchurch City Council (CCC) has used the internationally recognised software programme known as SAP
- CCC primarily uses SAP as a financial transaction tracking tool
- At the Christchurch Wastewater Treatment Plant (CWTP) this includes linking operational costs to assets
- SAP can be used for generating maintenance Work Orders (WO's)



What CWTP Assets were there in CCC's SAP?

Christchurch Wastewater Treatment Plant Replacement Value	No. of Individual Assets in SAP	Average value per asset
\$900,000,000.00	1,455	\$618,556.70

Granularity of asset breakdown was at a high level;

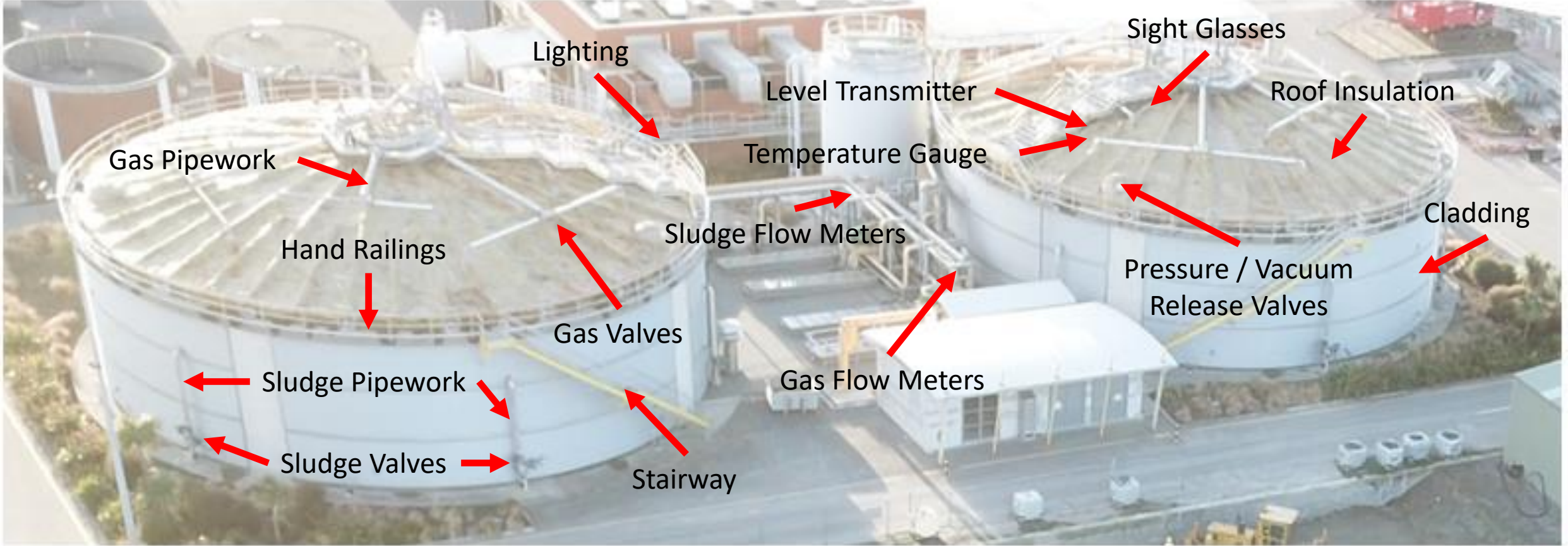


Asset Manager 😊

Project Manager 😊

Operations Manager 😞

What Assets do Operations need in SAP?



Operations Manager 😊

What CWTP Assets are there now in CCC's SAP?

Christchurch Wastewater Treatment Plant Replacement Value	No. of Individual Assets in SAP	Increase in number of assets
\$900,000,000.00	6,080	76%

Granularity of asset breakdown now at operational level that individual operational & maintenance tasks can be assigned

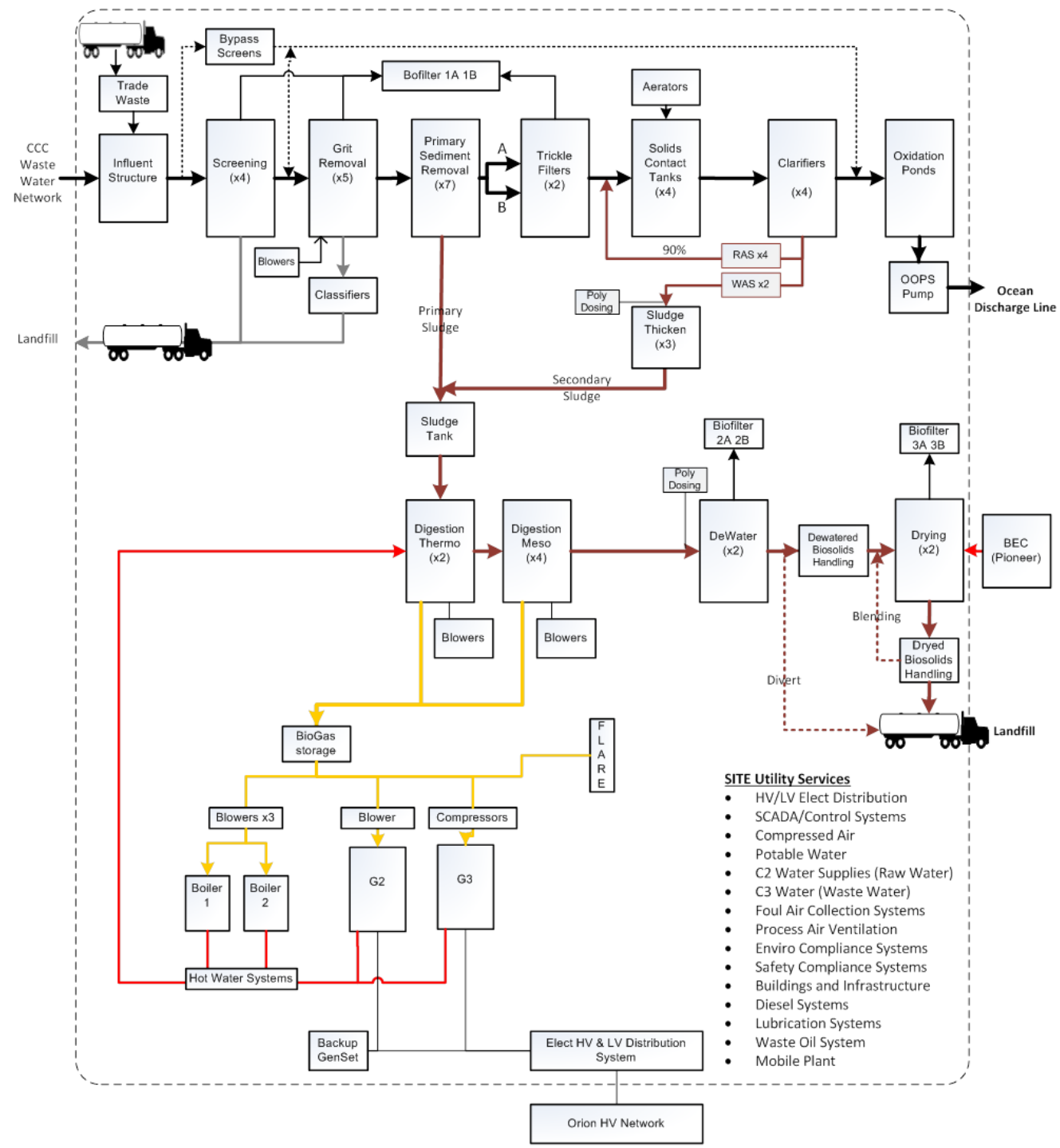


The “Plan”

- The “Plan” is called “Effective Operation and Maintenance”, (EO&M for short)
- Plan’s very high level aims;
 - Stage 1 – Improve the asset database
 - Stage 2 – Improve the operation and maintenance of the assets and treatment process
- What CCC recognises;
 - We do not have the internal resources available to effectively manage the EO&M Plan
 - Deemed that an external, impartial resource would elicit the best results and improve the chance of success of the project (cross team engagement)
- The contractor will hold two key positions;
 - Co-ordination and facilitation of the EO&M plan (extract knowledge from both data sources & personnel)
 - Impart and extract technical maintenance and process knowledge to the EO&M Plan



ACTIVITY 1 - BREAK DOWN CWTP OPERATION INTO PROCESS STAGES



ACTIVITY 2 - DEFINE CRITICALITY CRITERIA ASSESSMENT PROCESS

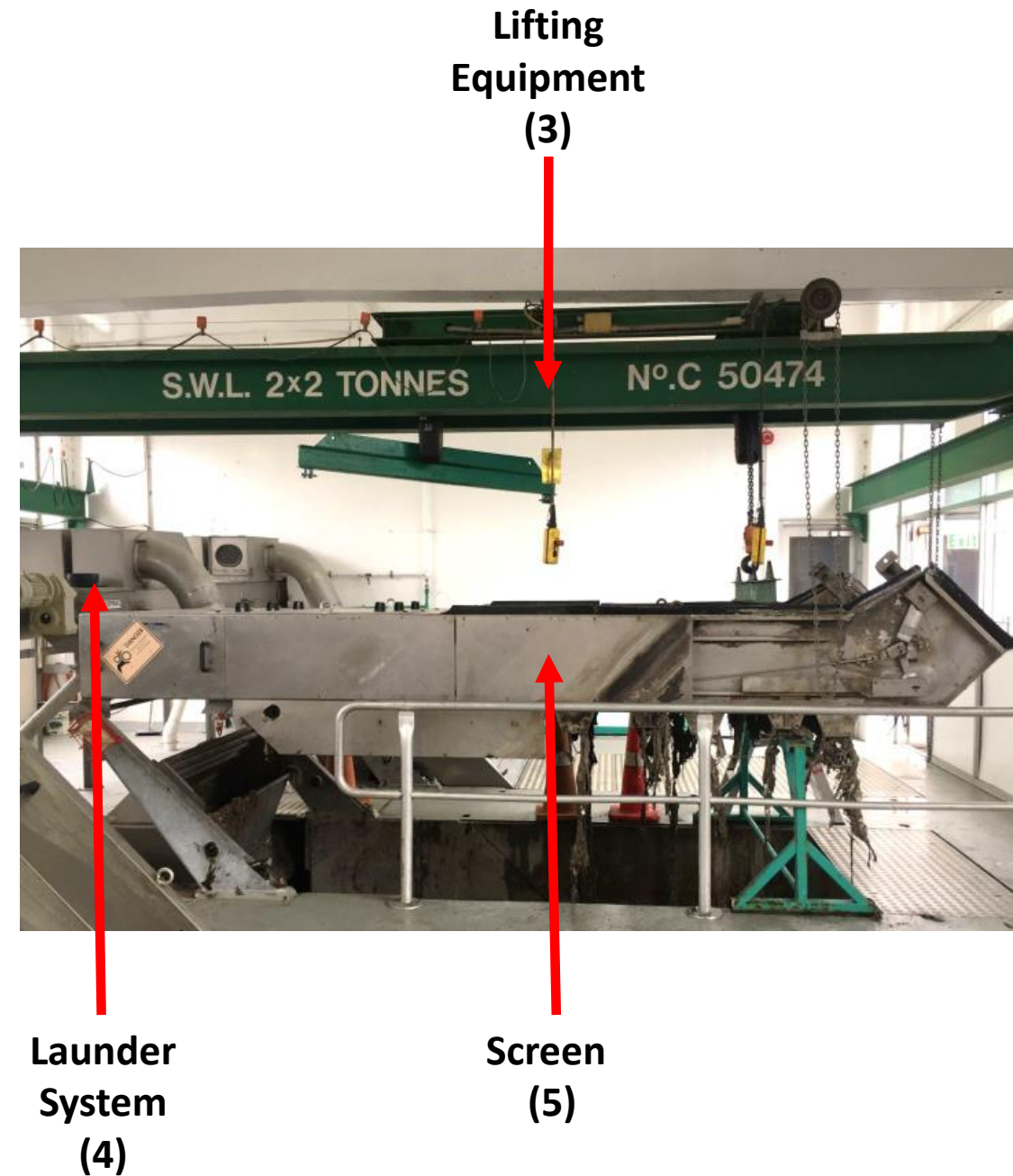
- 1. Process Criticality** -Process Criticality defines the main processes and utilities within CWTP and their relative priority within the overall function of the wastewater treatment process. Each process stage is rate on a scale 5-1
- 2. Functional Criticality** -Each of the main process stages is then be broken down into sub-processes and functions. The functional criticality is the relative importance of each function within a process stage. Scale 5-1



Main Process	Rating	Classification	Description
WW Network Intake Process	5	Critical (Very High)	Critical that CWTP can receive all network wastewater to avoid backlog and uncontrol discharges across network.
Trade Waste Process	1	Very Low	Very low criticality. Industrial waste intake can be bypassed or stopped.
Screening Process	5	Critical (Very High)	Critical –Removal of larger > 3mm non-biological matter is removed (screened) prior to processing or bypassing to ponds.
Treatment Bypass	5	Critical (Very High)	Critical to maintain Bypass as contingency for high flow events (inflows exceed processing capacity) or treatment stage constraints -essential to avoid over loading process stages and fouling, and avoid backlog and uncontrolled discharges
Grit Removal Process	3	Important (Medium)	Treatment Stage –Removal of grit / sand and other residual non organic solids (<=3mm) from the wastewater stream. Grit removal is required to minimise fouling / blockages through the downstream treatment processes
Sedimentation Process	4	Essential (High)	Treatment Stage -Segretaion of hydraulic and solids waste streams
Pumping Process	4	Essential (High)	Trickle filter process stage supply –Potential environmental impact on failure.
Trickle Filters Process	4	Essential (High)	Treatment Stage –Conditioning, Potential environmental impact on failure.
Clarification Process	2	General (low)	Treatment Stage –Conditioning, storage
Oxidation Ponds Process	4	Essential (High)	Treatment Stage –Conditioning, storage, and essential conduit stream to ocean outfall.
Ocean Discharge Process	5	Critical (Very High)	Critical conduit to ocean outfall
Digestion Process	4	Essential (High)	Treatment Stage –Biosolids conditioning, gas production, storage controls odour, key compliance KPI
BioGas Process	4	Essential (High)	Important secondary function –collection and use of biogas controls odour, key compliance KPI
Sludge Thickening Process	2	General (low)	Treatment Stage –Biosolids conditioning
Sludge Dewatering Process	2	General (low)	Treatment Stage –Biosolids conditioning
BioSolids Drying Process	2	General (low)	Treatment Stage, Biosolids conditioning
Utilities	Rating	Classification	Description
Electricity Reticulation	5	Critical (Very High)	Critical process utility
Foul air / Odor control	4	Essential (High)	Critical process utility
Power Generation	1	Minor (Very low)	Secondary function, economic benefits
Compressed Air	4	Essential (High)	Essential utility
Hot Water Generation	4	Essential (High)	Important utility for digestion process
C1 -Potable Water Supplies	1	Minor (Very low)	Not required for WW treatment
C2 –Bore Water Supplies	3	Important (Medium)	Important Utility – Wastewater processes, Cooling water for compressors and pump glands
C3 – Waste Water Supplies	1	Minor (Very low)	Not required for WW treatment

ACTIVITY 2 - DEFINE CRITICALITY CRITERIA ASSESSMENT PROCESS

- 1. Process Criticality** -Process Criticality defines the main processes and utilities within CWTP and their relative priority within the overall function of the wastewater treatment process. Each process stage is rate on a scale 5-1
- 2. Functional Criticality** -Each of the main process stages is then be broken down into sub-processes and functions. The functional criticality is the relative importance of each function within a process stage. Scale 5-1



ACTIVITY 2 - DEFINE CRITICALITY CRITERIA ASSESSMENT PROCESS

- 1. Process Criticality** -Process Criticality defines the main processes and utilities within CWTP and their relative priority within the overall function of the wastewater treatment process. Each process stage is rate on a scale 5-1
- 2. Functional Criticality** -Each of the main process stages is then be broken down into sub-processes and functions. The functional criticality is the relative importance of each function within a process stage. Scale 5-1
- 3. Asset Criticality** -The risk associated with the assets failure to performing its intended functions. This risk rating is based on the factors of –Safety, Environmental, Operational, and / or Economic impact. Scale 5-1



Screen
Motor
(5)

Screen
Steps
(4)

Screen
Seals
(3)

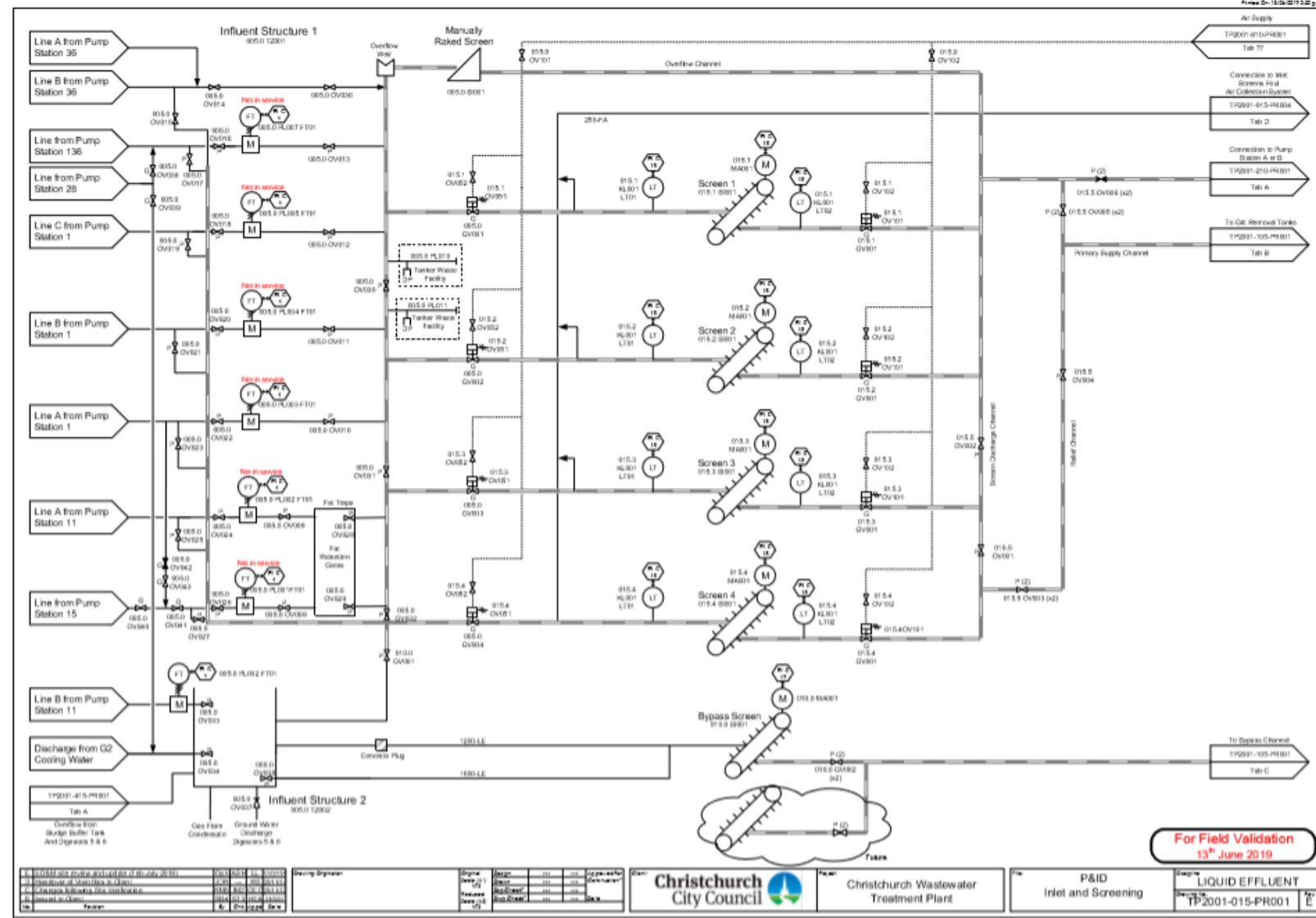
ACTIVITY 3 - IDENTIFY CWTP OPERATIONAL ASSETS

- Asset Information is currently being collected with Fulcrum Application on a tablet



ACTIVITY 3 - IDENTIFY CWTP OPERATIONAL ASSETS

- Updating all CWTP Process and Instrumentation Diagrams (P&ID's)
- Established a common tag register between PIDs, Control System Database, and the SAP database



ACTIVITY 4 - CAPTURE ALL PHYSICAL OPERATIONAL ASSETS IN SAP

Functional loc.	STN_WW_TP_2001	Valid From	18.06.2019
Description	Christchurch Wastewater Treatment Plant		
STN_WW_TP_2001	Christchurch Wastewater Treatment Plant	521/571	
STN_WW_TP_2001_PRET	CHWW Pre-Treatment	521/571/1	
STN_WW_TP_2001_PRIM	CHWW Primary Treatment	521/571/2	
STN_WW_TP_2001_SCND	CHWW Secondary Treatment	521/571/3	
STN_WW_TP_2001_SCND_PSTA	2050-Pumping Station A	521/571/3/1	
STN_WW_TP_2001_SCND_PSTB	2100-Pumping Station B	521/571/3/2	
10007687	2100-Instruments (Lumped)		
10007688	Pump Station B- Pump B1	TF Pump B1	210.1 OP001
10007689	Pump Station B- Pump B2	TF Pump B2	210.2 OP001
10007690	2104-Sewage Pipework 01		
11316046	B1 Level Vessel	Level Vessel B1	210.1 VT001
11316049	B2 Level Vessel	Level Vessel B2	210.2 VT001
11316053	Grease Pump B2	Grease Pump B2	210.2 OP002
11316056	Grease Pump B1	Grease Pump B1	210.1 OP002
11316059	Pump Station B - Plant Air Valve	Pump Station B - Plant Air - Inlet Valve 01	210.8 OV005
11316060	Pump Station B - Plant Air Valve	Pump Station B - Plant Air - Inlet Valve 02	210.8 OV004
11316061	Pump Station B - Air Reciever	Pump Station B - Plant Air - Air Reciever 01	210.8 TT001
11316062	Pump Station B - Plant Air Pressure Reli	Pump Station B - Plant Air - Air Reciever 01 - Pressure Relief Valve	210.8 OV008
11316063	Pump Station B - Plant Air Drain Valve	Pump Station B - Plant Air - Inlet Line - Drain Valve	210.8 OV009
11316066	Pump Station B - Air Reciever	Pump Station B - Plant Air - Air Reciever 02	210.8 TT002
11316067	Pump Station B - Air Recievers Outlet Va	Pump Station B - Plant Air - Air Recievers Outlet Valve 01	210.8 OV001
11316068	Pump Station B - Air Recievers Outlet Fi	Pump Station B - Plant Air - Air Recievers Outlet Filter 01	210.8 OF001
11316069	Pump B1 - Discharge Control Valve Air Va	TF Pump B1 - Discharge Control Valve 01 - Actuator - Plant Air inlet v	210.8 OV002
11316070	Pump B2 - Discharge Control Valve Actuat	TF Pump B2 - Discharge Control Valve 01 - Actuator - Plant Air inlet v	210.8 OV003
STN_WW_TP_2001_SCND_PSTB_B001	2100-Building 01	521/571/7/1	
STN_WW_TP_2001_SCND_PSTB_IPSB	2100-Pumping Station B Instrumentations	521/571/3/2	
11316045	Pump Station B - Secondary Return Channe	Pump Station B - Secondary Return Channel - Level Transmitter 01	210.0 KL001 LT01
11316047	Pump B1 - Discharge Pressure	TF Pump B1 - Discharge Pressure Transmitter	210.1 OP001 PT01
11316048	Pump B1 - Discharge Valve Position	TF Pump B1 - Discharge Valve 01 - Position Feedback Transmitter 01	210.1 CV001 ZT01
11316050	Pump B2 - Discharge Pressure	TF Pump B2 - Discharge Pressure Transmitter	210.2 OP001 PT01
11316051	Pump B2 - Discharge Control Valve Positi	TF Pump B2 - Discharge Control Valve 01 - Position Feedback Transmitte	210.2 CV001 ZT01
11316052	Trickling Filter Common Line - Pressure	Trickling Filter Common Line - Pressure Transmitter 01	210.0 KL002 PT01
11316054	Pump B2 Gland Water Pressure	Pump B2 Gland water - Pressure Indicator	210.2 OP002 PI02
11316055	Pump Station B - Pump 2 Flush Water Flow	Pump Station B - Pump 2 Flush Water Flow Switch	210.2 OP002 FS01
11316057	Pump B1 Gland Water Pressure	Pump B1 Gland water- Pressure Indicator	210.1 OP002 PI02
11316058	Pump Station B - Pump 1 Flush Water Flow	Pump Station B - Pump 1 Flush Water Flow Switch	210.1 OP002 FS01
11316064	Pump Station B - Plant Air Pressure Indi	Pump Station B - Plant Air - Air Reciever 01 - Pressure Indicator	210.8 TT001 PI01
11316065	Pump Station B - Plant Air Pressure Swi	Pump Station B - Plant Air - Air Reciever 01 - Pressure Switch	210.8 TT001 PS01
STN_WW_TP_2001_SCND_TRFP	2150-Trickling Filter Process	521/571/3/3	
STN_WW_TP_2001_SCND_SDCP	2200-Solids Contact Process	521/571/3/4	
STN_WW_TP_2001_SCND_SCCL	2250-Secondary Clarification	521/571/3/5	
STN_WW_TP_2001_SCND_PASA	2300-Activated Sludge & Air Pump Stn	521/571/3/6	

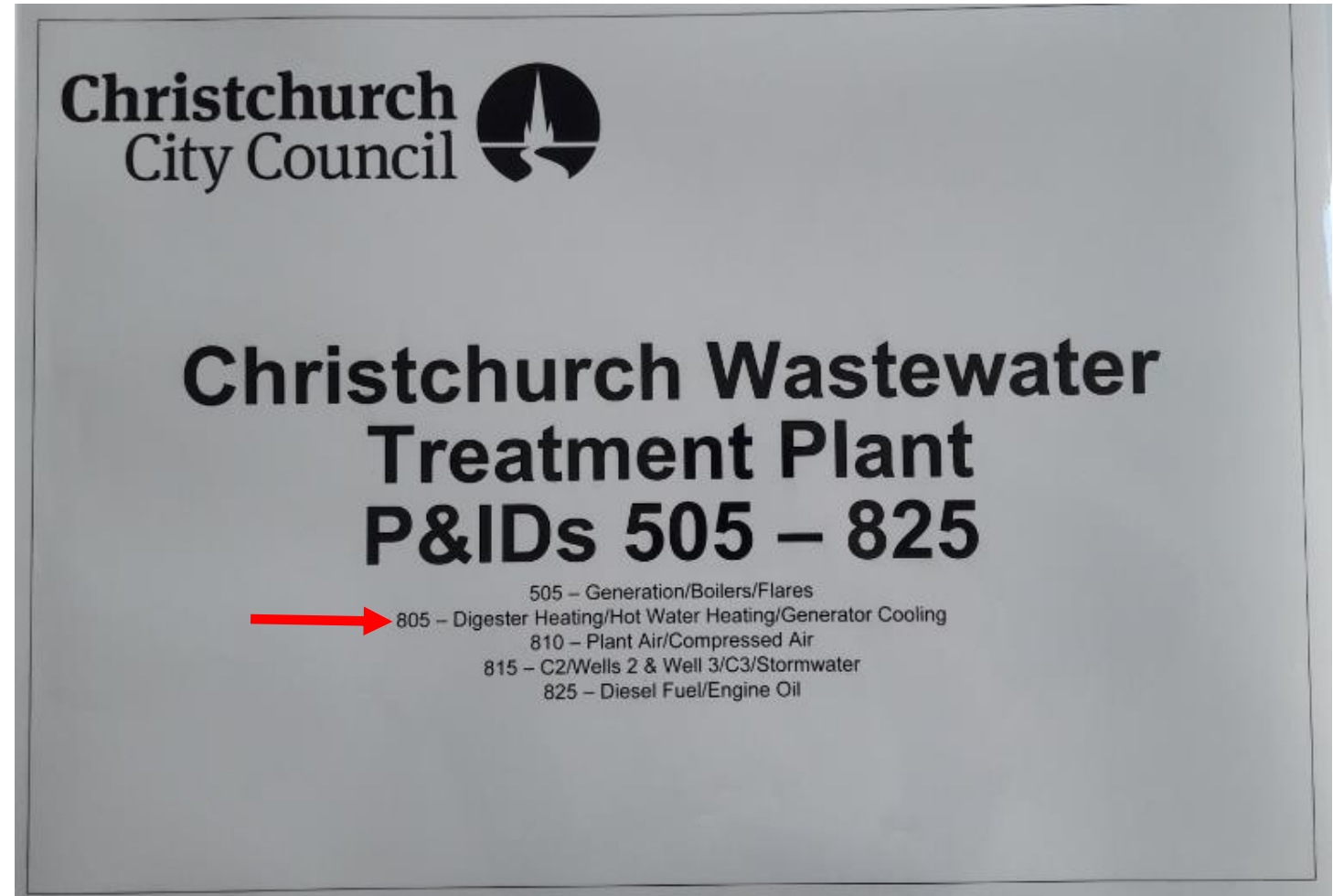
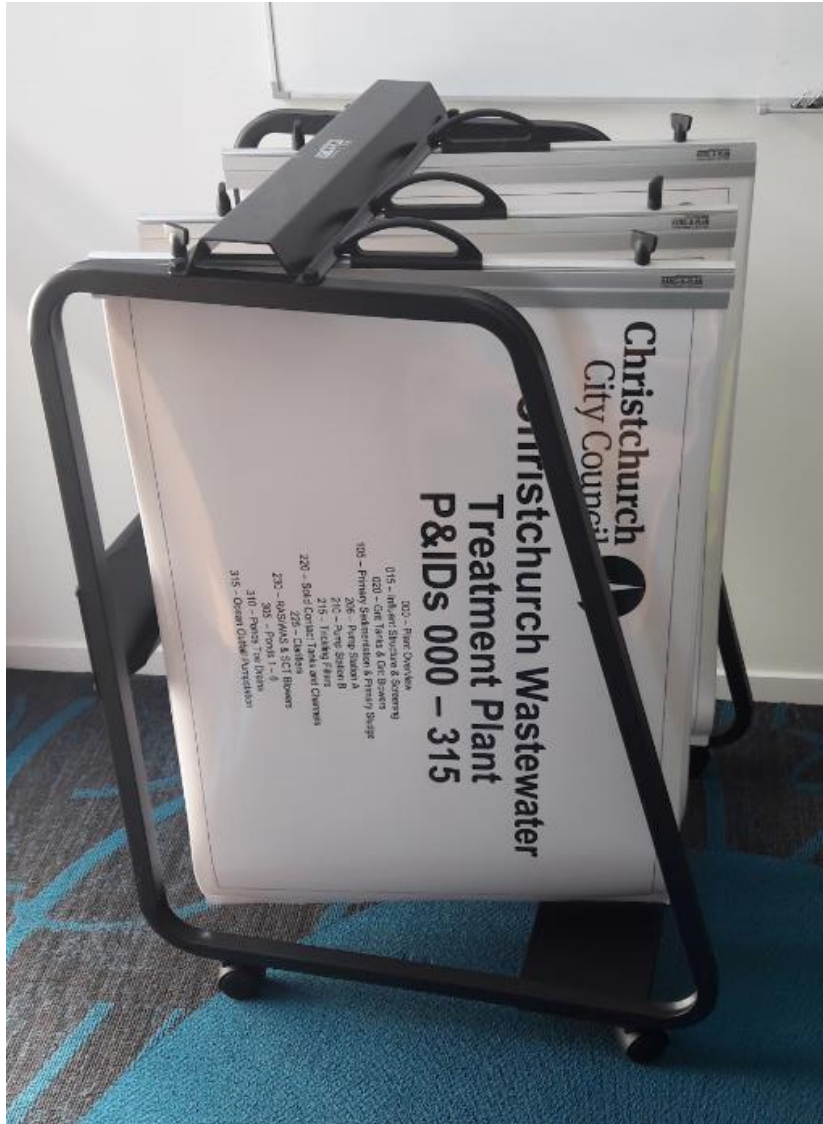
ACTIVITY 5 - ESTABLISH LABELLING CRITERIA

826.9 OP001 G2 Water Pump 1	415.9 TT002 HXB1/B2 Water Circ. Expansion Tank
826.9 OP002 G2 Water Pump 2	415.5 OP005 D5 Heat Exchanger Water Pump

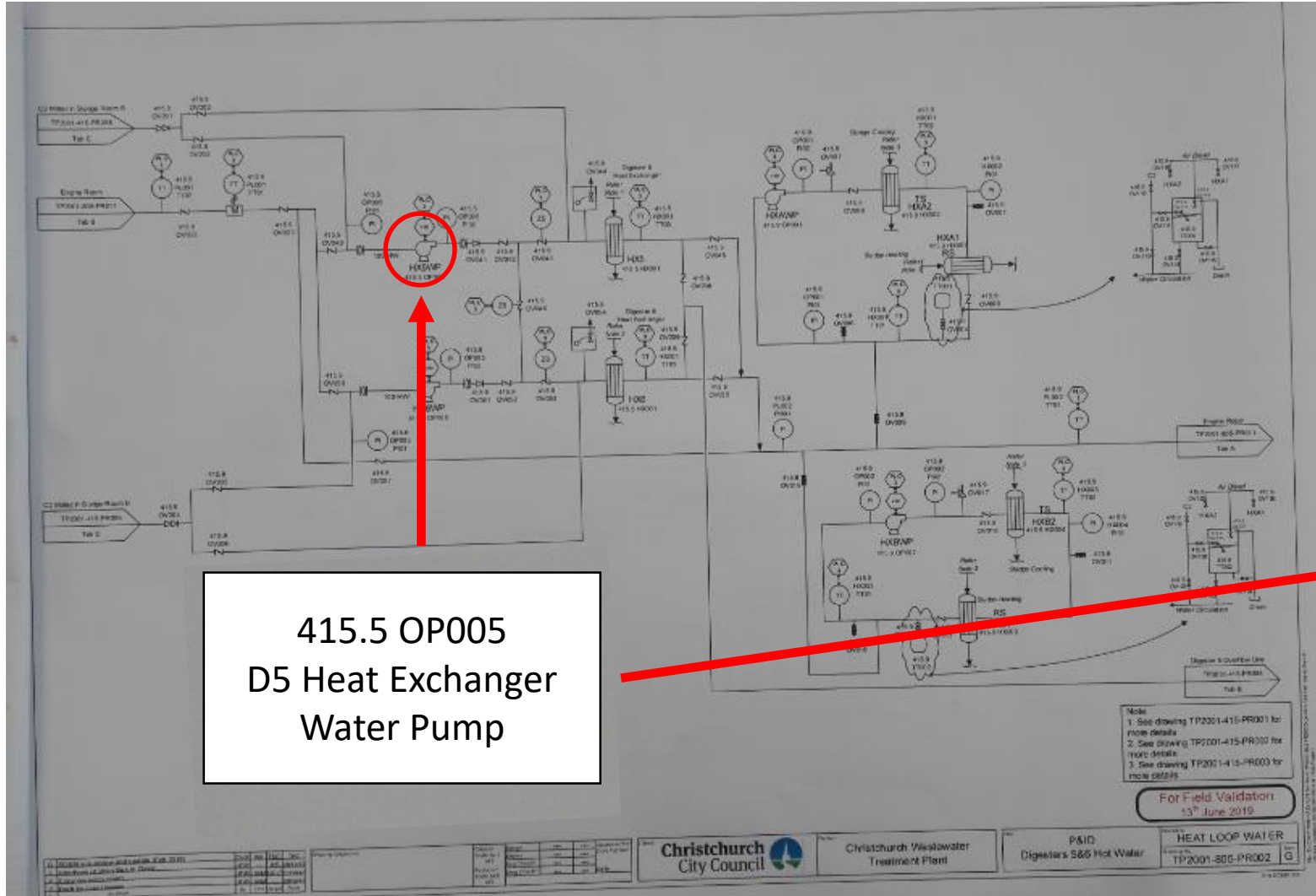


Say SAP churns a WO out against this asset;

ACTIVITY 5 - ESTABLISH LABELLING CRITERIA



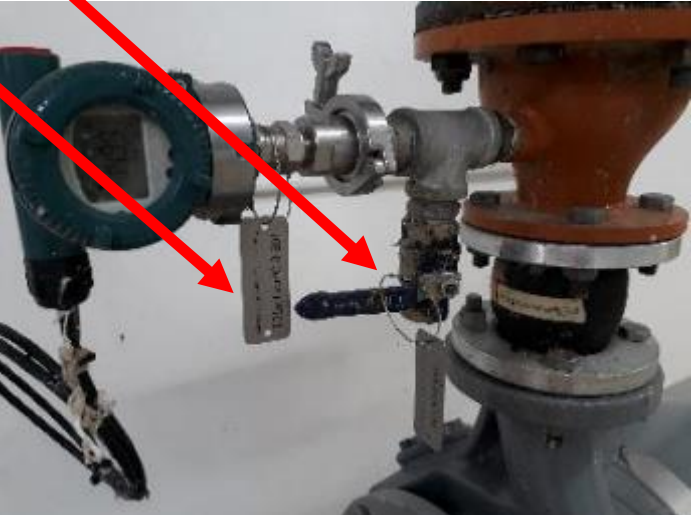
ACTIVITY 5 - ESTABLISH LABELLING CRITERIA



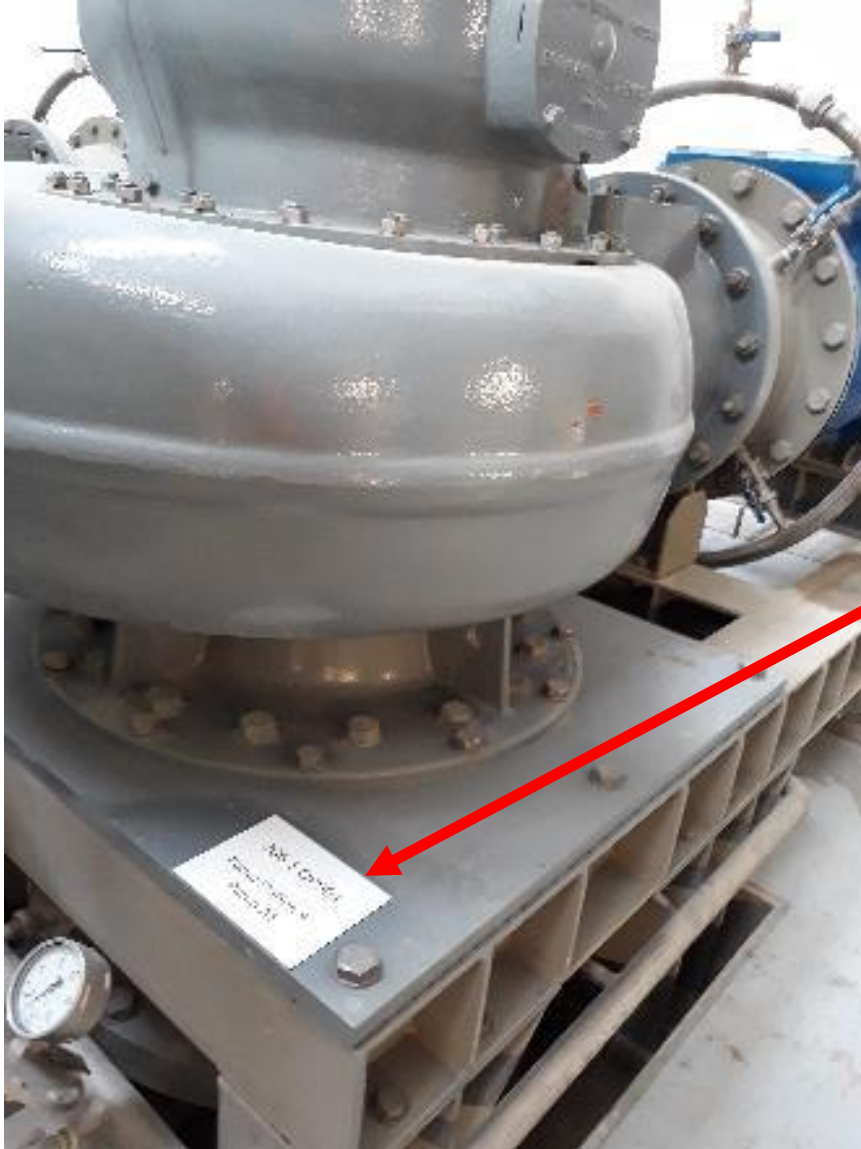
ACTIVITY 6 - LABEL ALL OPERATIONAL ASSETS



Labelling



ACTIVITY 6 - LABEL ALL OPERATIONAL ASSETS



Physical Tags
& Labels
Installed



Halfway Point

Plan's very high level aims;

- Stage 1 – Improve the asset database (Activities 1–6)

We now have:

- A top notch database
- All the assets broken down in a form useful to the O&M team
- Asset information available as needed
- Up to date P&IDs
- All assets and pipelines labelled



Stage 2 – Improve the operation and maintenance of the assets and treatment processes (Activities 7–13)

ACTIVITY 7 - DEFINE CRITICALITY FOR EACH ASSET & RECORD IN SAP

Functional loc.	STN_WW_TP_2001	Valid From	18.06.2019
Description	Christchurch Wastewater Treatment Plant		
STN_WW_TP_2001	Christchurch Wastewater Treatment Plant	521/571	
STN_WW_TP_2001_PRET	CHWW Pre-Treatment	521/571/1	
STN_WW_TP_2001_PRIM	CHWW Primary Treatment	521/571/2	
STN_WW_TP_2001_SCND	CHWW Secondary Treatment	521/571/3	
STN_WW_TP_2001_SCND_PSTA	2050-Pumping Station A	521/571/3/1	
STN_WW_TP_2001_SCND_PSTB	2100-Pumping Station B	521/571/3/2	
10007687	2100-Instruments (Lumped)		
10007688	Pump Station B- Pump B1	TF Pump B1	210.1 OP001
10007689	Pump Station B- Pump B2	TF Pump B2	210.2 OP002
10007690	2104-Sewage Pipework 01		
11316046	B1 Level Vessel	Level Vessel B1	210.1 VT001
11316049	B2 Level Vessel	Level Vessel B2	210.2 VT001
11316053	Grease Pump B2	Grease Pump B2	210.2 OP002
11316056	Grease Pump B1	Grease Pump B1	210.1 OP002
11316059	Pump Station B - Plant Air Valve	Pump Station B - Plant Air - Inlet Valve 01	210.8 OV005
11316060	Pump Station B - Plant Air Valve	Pump Station B - Plant Air - Inlet Valve 02	210.8 OV004
11316061	Pump Station B - Air Reciever	Pump Station B - Plant Air - Air Reciever 01	210.8 TT001
11316062	Pump Station B - Plant Air Pressure Reli	Pump Station B - Plant Air - Air Reciever 01 - Pressure Relief Valve	210.8 OV008
11316063	Pump Station B - Plant Air Drain Valve	Pump Station B - Plant Air - Inlet Line - Drain Valve	210.8 OV009
11316066	Pump Station B - Air Reciever	Pump Station B - Plant Air - Air Reciever 02	210.8 TT002
11316067	Pump Station B - Air Recievers Outlet Va	Pump Station B - Plant Air - Air Recievers Outlet Valve 01	210.8 OV001
11316068	Pump Station B - Air Recievers Outlet Fi	Pump Station B - Plant Air - Air Recievers Outlet Filter 01	210.8 OF001
11316069	Pump B1 - Discharge Control Valve Air Va	TF Pump B1 - Discharge Control Valve 01 - Actuator - Plant Air inlet v	210.8 OV002
11316070	Pump B2 - Discharge Control Valve Actuat	TF Pump B2 - Discharge Control Valve 01 - Actuator - Plant Air inlet v	210.8 OV003
STN_WW_TP_2001_SCND_PSTB_B001	2100-Building 01	521/571/7/1	
STN_WW_TP_2001_SCND_PSTB_IPSB	2100-Pumping Station B Instrumentations	521/571/3/2	
11316045	Pump Station B - Secondary Return Channe	Pump Station B - Secondary Return Channel - Level Transmitter 01	210.0 KL001 LT01
11316047	Pump B1 - Discharge Pressure	TF Pump B1 - Discharge Pressure Transmitter	210.1 OP001 PT01
11316048	Pump B1 - Discharge Valve Position	TF Pump B1 - Discharge Valve 01 - Position Feedback Transmitter 01	210.1 CV001 ZT01
11316050	Pump B2 - Discharge Pressure	TF Pump B2 - Discharge Pressure Transmitter	210.2 OP001 PT01
11316051	Pump B2 - Discharge Control Valve Positi	TF Pump B2 - Discharge Control Valve 01 - Position Feedback Transmitt	210.2 CV001 ZT01
11316052	Trickling Filter Common Line - Pressure	Trickling Filter Common Line - Pressure Transmitter 01	210.0 KL002 PT01
11316054	Pump B2 Gland Water Pressure	Pump B2 Gland water - Pressure Indicator	210.2 OP002 PI02
11316055	Pump Station B - Pump 2 Flush Water Flow	Pump Station B - Pump 2 Flush Water Flow Switch	210.2 OP002 FS01
11316057	Pump B1 Gland Water Pressure	Pump B1 Gland water- Pressure Indicator	210.1 OP002 PI02
11316058	Pump Station B - Pump 1 Flush Water Flow	Pump Station B - Pump 1 Flush Water Flow Switch	210.1 OP002 FS01
11316064	Pump Station B - Plant Air Pressure Indi	Pump Station B - Plant Air - Air Reciever 01 - Pressure Indicator	210.8 TT001 PI01
11316065	Pump Station B - Plant Air Pressure Swi	Pump Station B - Plant Air - Air Reciever 01 - Pressure Switch	210.8 TT001 PS01
STN_WW_TP_2001_SCND_TRFP	2150-Trickling Filter Process	521/571/3/3	
STN_WW_TP_2001_SCND_SDCP	2200-Solids Contact Process	521/571/3/4	
STN_WW_TP_2001_SCND_SCLL	2250-Secondary Clarification	521/571/3/5	
STN_WW_TP_2001_SCND_PASA	2300-Activated Sludge & Air Pump Stn	521/571/3/6	

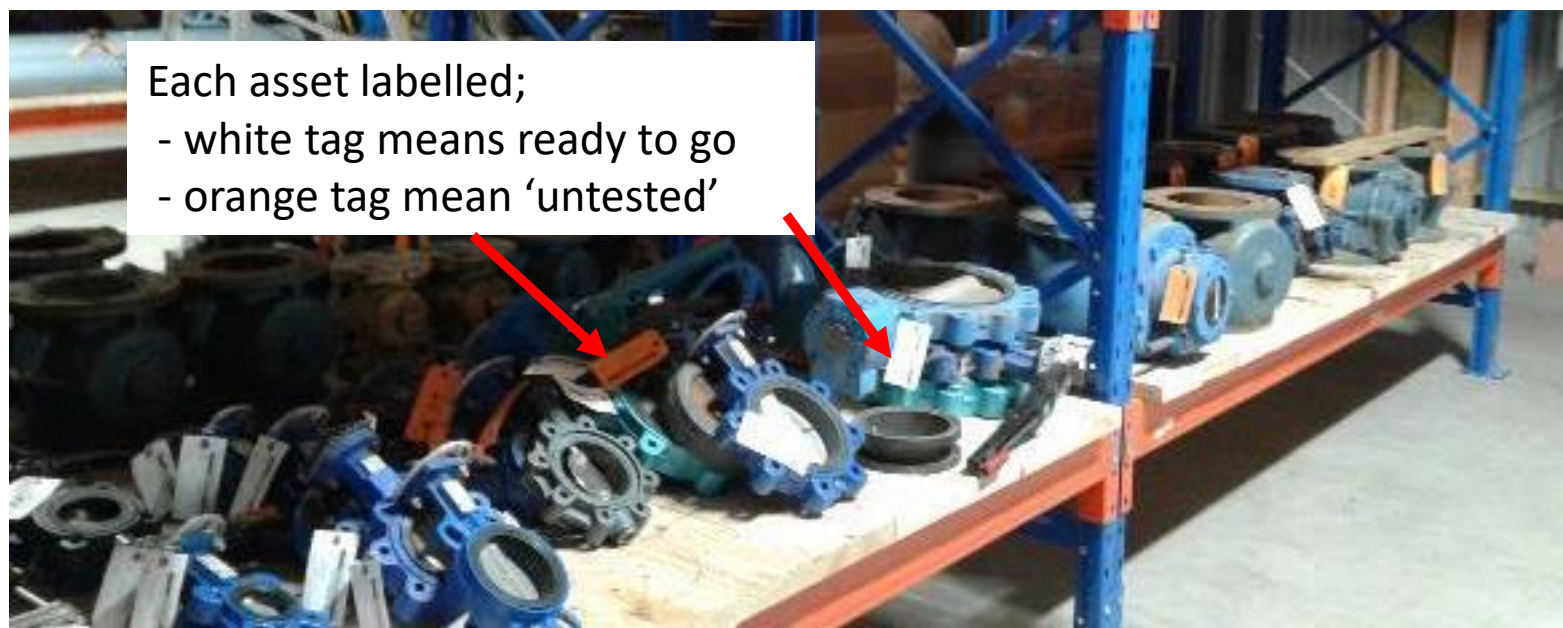
Main Process	Rating	Classification	Description
WW Network Intake Process	5	Critical (Very High)	Critical that CWTP can receive all network wastewater to avoid backlog and uncontrol discharges across network.
Trade Waste Process	1	Very Low	Very low criticality. Industrial waste intake can be bypassed or stopped.
Screening Process	5	Critical (Very High)	Critical -Removal of larger > 3mm non-biological matter is removed (screened) prior to processing or bypassing to ponds.
Treatment Bypass	5	Critical (Very High)	Critical to maintain Bypass as contingency for high flow events (inflows exceed processing capacity) or treatment stage constraints -essential to avoid over loading process stages and fouling, and avoid backlog and uncontrolled discharges
Grit Removal Process	3	Important (Medium)	Treatment Stage -Removal of grit / sand and other residual non organic solids (<=3mm) from the wastewater stream. Grit removal is required to minimise fouling / blockages through the downstream treatment processes
Sedimentation Process	4	Essential (High)	Treatment Stage -Segregation of hydraulic and solids waste streams
Pumping Process	4	Essential (High)	Trickle filter process stage supply -Potential environmental impact on failure.
Trickle Filters Process	4	Essential (High)	Treatment Stage -Conditioning, Potential environmental impact on failure.
Clarification Process	2	General (low)	Treatment Stage -Conditioning, storage
Oxidation Ponds Process	4	Essential (High)	Treatment Stage -Conditioning, storage, and essential conduit stream to ocean outfall.
Ocean Discharge Process	5	Critical (Very High)	Critical conduit to ocean outfall
Digestion Process	4	Essential (High)	Treatment Stage -Biosolids conditioning, gas production, storage controls odour, key compliance KPI
BioGas Process	4	Essential (High)	Important secondary function -collection and use of biogas controls odour, key compliance KPI
Sludge Thickening Process	2	General (low)	Treatment Stage -Biosolids conditioning
Sludge Dewatering Process	2	General (low)	Treatment Stage -Biosolids conditioning
BioSolids Drying Process	2	General (low)	Treatment Stage, Biosolids conditioning
Utilities	Rating	Classification	Description
Electricity Reticulation	5	Critical (Very High)	Critical process utility
Foul air / Odor control	4	Essential (High)	Critical process utility
Power Generation	1	Minor (Very low)	Secondary function, economic benefits
Compressed Air	4	Essential (High)	Essential utility
Hot Water Generation	4	Essential (High)	Important utility for digestion process
C1 - Potable Water Supplies	1	Minor (Very low)	Not required for WW treatment
C2 -Bore Water Supplies	3	Important (Medium)	Important Utility - Wastewater processes, Cooling water for compressors and pump glands
C3 - Waste Water Supplies	1	Minor (Very low)	Not required for WW treatment

ACTIVITY 8 - DEFINE CRITICAL SPARE REQUIREMENT FOR EACH ASSET



Each bin & shelf labelled

Did you spot the H&S hazard?

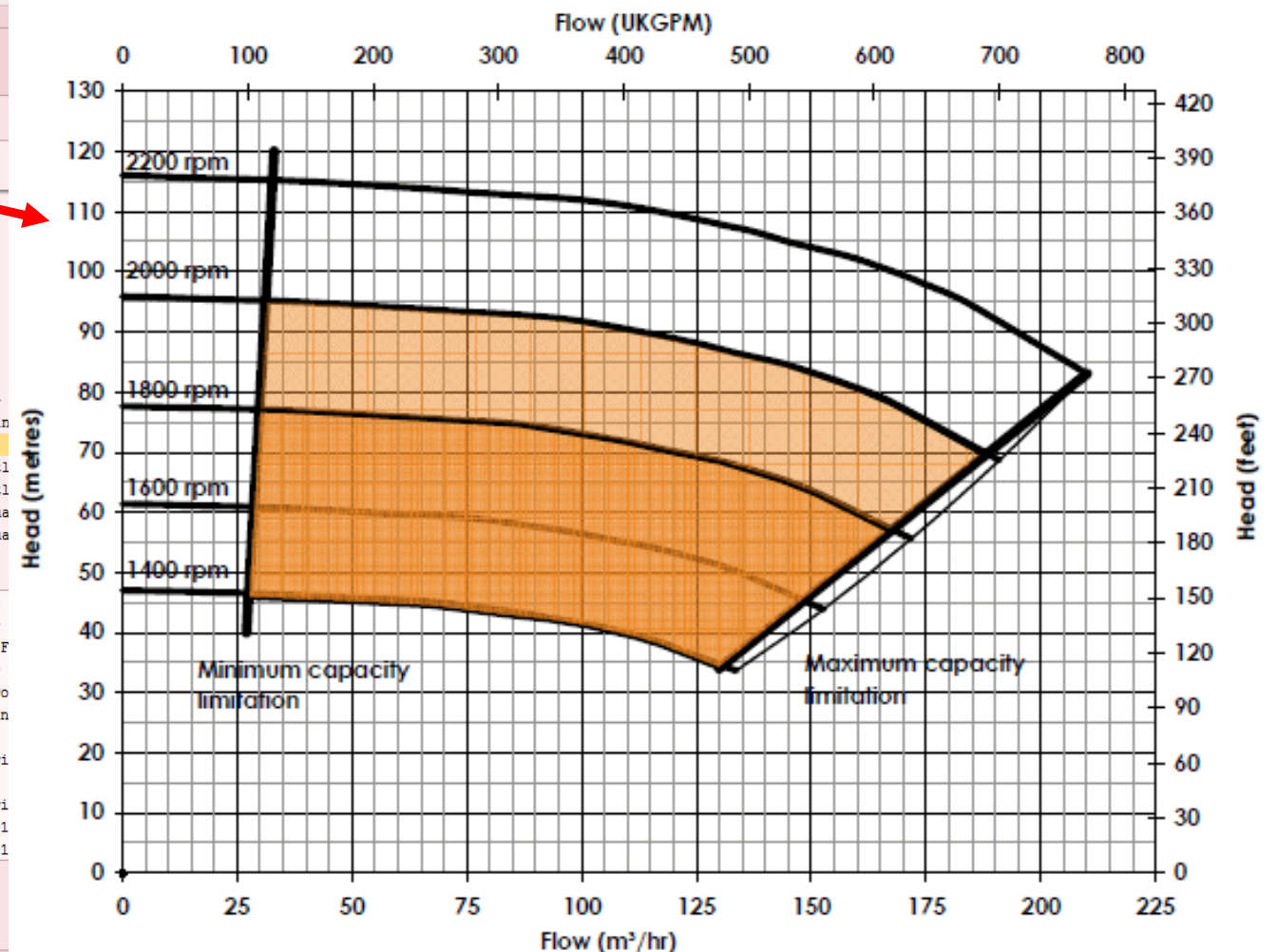


Each asset labelled;
- white tag means ready to go
- orange tag mean 'untested'


ACTIVITY 9 - DEFINE OPERATING PARAMETERS FOR EACH ASSET

Functional loc.	STN_WW_TP_2001	Valid From	18.06.2019
Description	Christchurch Wastewater Treatment Plant		
STN_WW_TP_2001	Christchurch Wastewater Treatment Plant	521/571	
STN_WW_TP_2001_PRET	CHWW Pre-Treatment	521/571/1	
STN_WW_TP_2001_PRIM	CHWW Primary Treatment	521/571/2	
STN_WW_TP_2001_SCND	CHWW Secondary Treatment	521/571/3	
STN_WW_TP_2001_SCND_PSTA	2050-Pumping Station A	521/571/3/1	
STN_WW_TP_2001_SCND_PSTB	2100-Pumping Station B	521/571/3/2	
10007687	2100-Instruments (Lumped)		
10007688	Pump Station B- Pump B1	TF Pump B1	
10007689	Pump Station B- Pump B2	TF Pump B2	
10007690	2104-Sewage Pipework 01		
11316046	B1 Level Vessel	Level Vessel B1	
11316049	B2 Level Vessel	Level Vessel B2	
11316053	Grease Pump B2	Grease Pump B2	
11316056	Grease Pump B1	Grease Pump B1	
11316059	Pump Station B - Plant Air Valve	Pump Station B - Plant Air - Inlet Valve 01	
11316060	Pump Station B - Plant Air Valve	Pump Station B - Plant Air - Inlet Valve 02	
11316061	Pump Station B - Air Reciever	Pump Station B - Plant Air - Air Reciever 01	
11316062	Pump Station B - Plant Air Pressure Reli	Pump Station B - Plant Air - Air Reciever 01 -	
11316063	Pump Station B - Plant Air Drain Valve	Pump Station B - Plant Air - Inlet Line - Drain	
11316066	Pump Station B - Air Reciever	Pump Station B - Plant Air - Air Reciever 02	
11316067	Pump Station B - Air Recievers Outlet Va	Pump Station B - Plant Air - Air Recievers Outl	
11316068	Pump Station B - Air Recievers Outlet Fi	Pump Station B - Plant Air - Air Recievers Outl	
11316069	Pump B1 - Discharge Control Valve Air Va	TF Pump B1 - Discharge Control Valve 01 - Actua	
11316070	Pump B2 - Discharge Control Valve Actuat	TF Pump B2 - Discharge Control Valve 01 - Actua	
STN_WW_TP_2001_SCND_PSTB_B001	2100-Building 01	521/571/7/1	
STN_WW_TP_2001_SCND_PSTB_IPSB	2100-Pumping Station B Instrumentations	521/571/3/2	
11316045	Pump Station B - Secondary Return Channe	Pump Station B - Secondary Return Channel -	
11316047	Pump B1 - Discharge Pressure	TF Pump B1 - Discharge Pressure Transmitter	
11316048	Pump B1 - Discharge Valve Position	TF Pump B1 - Discharge Valve 01 - Position F	
11316050	Pump B2 - Discharge Pressure	TF Pump B2 - Discharge Pressure Transmitter	
11316051	Pump B2 - Discharge Control Valve Positi	TF Pump B2 - Discharge Control Valve 01 - Po	
11316052	Trickling Filter Common Line - Pressure	Trickling Filter Common Line - Pressure Tran	
11316054	Pump B2 Gland Water Pressure	Pump B2 Gland water - Pressure Indicator	
11316055	Pump Station B - Pump 2 Flush Water Flow	Pump Station B - Pump 2 Flush Water Flow Swi	
11316057	Pump B1 Gland Water Pressure	Pump B1 Gland water- Pressure Indicator	
11316058	Pump Station B - Pump 1 Flush Water Flow	Pump Station B - Pump 1 Flush Water Flow Swi	
11316064	Pump Station B - Plant Air Pressure Indi	Pump Station B - Plant Air - Air Reciever 01	
11316065	Pump Station B - Plant Air Pressure Swi	Pump Station B - Plant Air - Air Reciever 01	
STN_WW_TP_2001_SCND_TRFP	2150-Trickling Filter Process	521/571/3/3	
STN_WW_TP_2001_SCND_SDCP	2200-Solids Contact Process	521/571/3/4	
STN_WW_TP_2001_SCND_SCCCL	2250-Secondary Clarification	521/571/3/5	
STN_WW_TP_2001_SCND_PASA	2300-Activated Sludge & Air Pump Stn	521/571/3/6	

Performance Curve



ACTIVITY 9 - DEFINE OPERATING PARAMETERS FOR EACH ASSET

 Christchurch City Council Christchurch Wastewater Treatment Plant Change Management Process			
REFERENCE: GEN_ADMIN_0001	SOP CLASSIFICATION: GEN_OPS_QMS	DATE OF ISSUE:	LAST REVIEWED
BACKGROUND: <p>When new assets are installed at the CWTP, there are process (eg HAZOP's, <u>SID's</u>) to ensure that the assets are safe and comply with all relevant H&S regulations and legislation. Following installation and handover, there will be the requirement to modify/change the asset or the asset's operating parameters. Effective Change Management is about identifying and controlling the risks associated with any temporary or permanent change to CWTP assets or to the way we operate and maintain the assets.</p> <p>This process also ensures that there are appropriate levels of due diligence and authorisation prior to any changes being implemented. The process also ensures that any related procedures are updated, and the completed changes are commissioned and 'signed-off'.</p>			
PURPOSE: <ol style="list-style-type: none">1. To provides details of how changes to CWTP assets and processes must be approached,2. To ensure the Health and Safety or Environmental hazards associated with making a change to an asset or process are identified and appropriately controlled.3. To ensure that all staff involved in the operation and/or maintenance of the plant are provided with the appropriate information.			
SCOPE: <p>Change Management includes all modifications to the CWTP plant and/or its operation which fall outside of what is considered "normal" operations or maintenance. For the purpose of this procedure, a change is defined as any activity which meets the following criteria:</p> <ul style="list-style-type: none">• It is a change to the existing state which is not a "like for like" change and changes the design intent or function. This includes, but is not limited to, physical assets, chemicals, mechanical/electrical equipment, scada and automation.• It is a change outside of existing operational or maintenance parameters. <p><i>*Note, the definition of change is applicable to both temporary and permanent work to treatment processes and assets</i></p>			
AUTHORITY: <p>All plant and process changes which fall within the scope of this procedure require authorisation by either the Shift Engineers Team Leader or Maintenance Team Leader.</p> <p>The <u>only</u> exception is in an emergency situation which presents an unacceptable risk to people, the environment, or the safe operation of the plant. See "Emergency Work" section for details.</p>			

ACTIVITY 10 - DEFINE PREVENTATIVE MAINTENANCE REQUIREMENTS

Functional loc.	STN_WW_TP_2001	Valid From	18.06.2019
Description	Christchurch Wastewater Treatment Plant		
STN_WW_TP_2001	Christchurch Wastewater Treatment Plant	521/571	
STN_WW_TP_2001_PRET	CHWW Pre-Treatment	521/571	
STN_WW_TP_2001_PRIM	CHWW Primary Treatment	521/571	
STN_WW_TP_2001_SCND	CHWW Secondary Treatment	521/571	
STN_WW_TP_2001_SCND_PSTA	2050-Pumping Station A	521/571	
STN_WW_TP_2001_SCND_PSTB	2100-Pumping Station B	521/571	
10007687	2100-Instruments (Lumped)		
10007688	Pump Station B- Pump B1	TF Pump B1	
10007689	Pump Station B- Pump B2	TF Pump B2	
10007690	2104-Sewage Pipework 01		
11316046	B1 Level Vessel	Level Vessel B1	
11316049	B2 Level Vessel	Level Vessel B2	
11316053	Grease Pump B2	Grease Pump B2	
11316056	Grease Pump B1	Grease Pump B1	
11316059	Pump Station B - Plant Air Valve	Pump Station B - Plant Air Valve	
11316060	Pump Station B - Plant Air Valve	Pump Station B - Plant Air Valve	
11316061	Pump Station B - Air Reciever	Pump Station B - Plant Air Valve	
11316062	Pump Station B - Plant Air Pressure Reli	Pump Station B - Plant Air Valve	
11316063	Pump Station B - Plant Air Drain Valve	Pump Station B - Plant Air Valve	
11316066	Pump Station B - Air Reciever	Pump Station B - Plant Air Valve	
11316067	Pump Station B - Air Recievers Outlet Va	Pump Station B - Plant Air Valve	
11316068	Pump Station B - Air Recievers Outlet Fi	Pump Station B - Plant Air Valve	
11316069	Pump B1 - Discharge Control Valve Air Va	TF Pump B1 - Discharge Control Valve	
11316070	Pump B2 - Discharge Control Valve Actuat	TF Pump B2 - Discharge Control Valve	
STN_WW_TP_2001_SCND_PSTB_B001	2100-Building 01	521/571/3/3	
STN_WW_TP_2001_SCND_PSTB_IPSB	2100-Pumping Station B Instrumentations	521/571/3/4	
11316045	Pump Station B - Secondary Return Channe	Pump Station B - Secondary Return Channel	
11316047	Pump B1 - Discharge Pressure	TF Pump B1 - Discharge Pressure	
11316048	Pump B1 - Discharge Valve Position	TF Pump B1 - Discharge Valve Position	
11316050	Pump B2 - Discharge Pressure	TF Pump B2 - Discharge Pressure	
11316051	Pump B2 - Discharge Control Valve Positi	TF Pump B2 - Discharge Control Valve Position	
11316052	Trickling Filter Common Line - Pressure	Trickling Filter Common Line - Pressure	
11316054	Pump B2 Gland Water Pressure	Pump B2 Gland Water Pressure	
11316055	Pump Station B - Pump 2 Flush Water Flow	Pump Station B - Pump 2 Flush Water Flow	
11316057	Pump B1 Gland Water Pressure	Pump B1 Gland water- Pressure Indicator	210.1 OP002 PI02
11316058	Pump Station B - Pump 1 Flush Water Flow	Pump Station B - Pump 1 Flush Water Flow Switch	210.1 OP002 FS01
11316064	Pump Station B - Plant Air Pressure Indi	Pump Station B - Plant Air - Air Reciever 01 - Pressure Indicator	210.8 TT001 PI01
11316065	Pump Station B - Plant Air Pressure Swi	Pump Station B - Plant Air - Air Reciever 01 - Pressure Switch	210.8 TT001 PS01
STN_WW_TP_2001_SCND_TRFP	2150-Trickling Filter Process	521/571/3/3	
STN_WW_TP_2001_SCND_SDCP	2200-Solids Contact Process	521/571/3/4	
STN_WW_TP_2001_SCND_SCCL	2250-Secondary Clarification	521/571/3/5	
STN_WW_TP_2001_SCND_PASA	2300-Activated Sludge & Air Pump Stn	521/571/3/6	

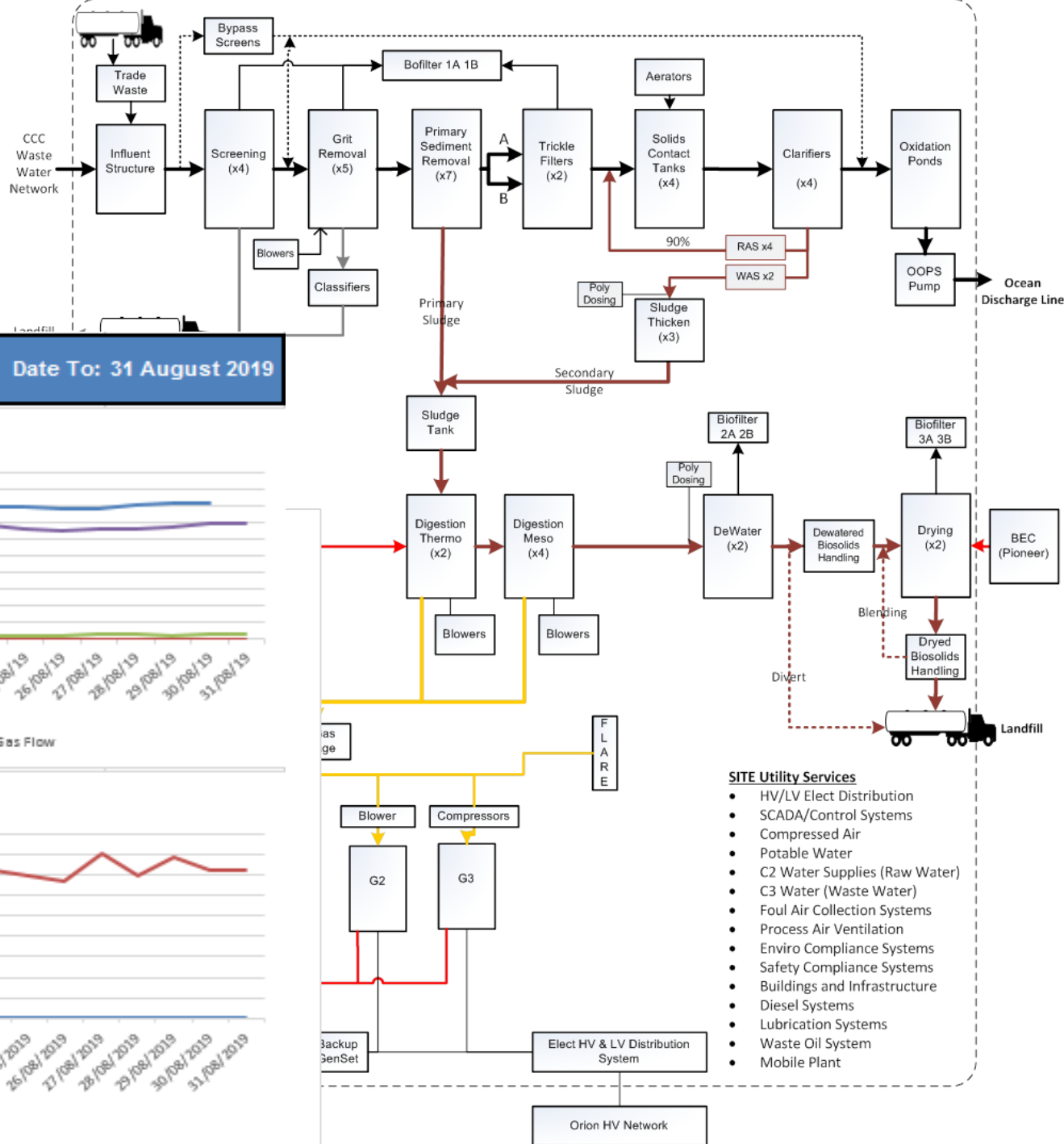


ACTIVITY 11 - DEFINE OPERATING PARAMETERS FOR EACH PROCESS STAGE

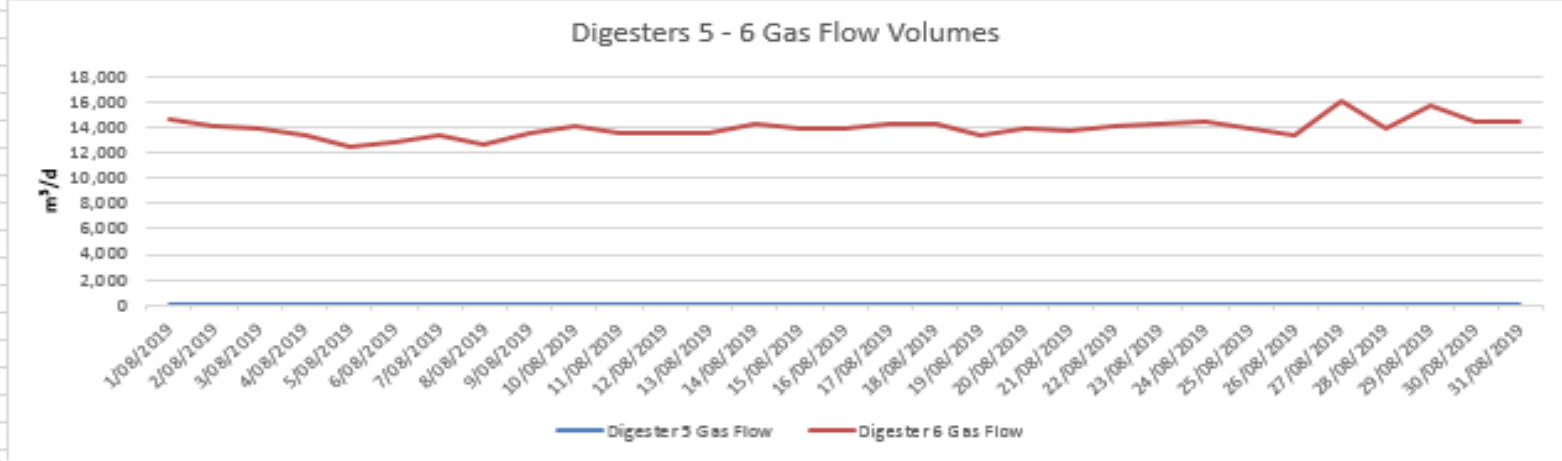
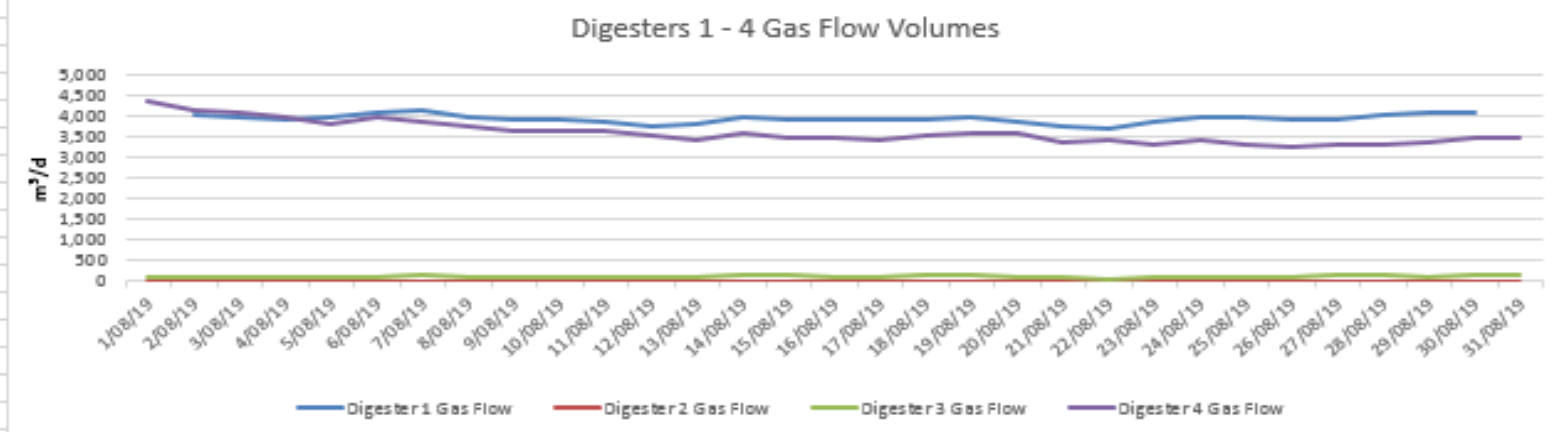
ACTIVITY 11 - DEFINE OPERATING PARAMETERS FOR EACH PROCESS STAGE

		Month:																													Action Log				
		Final Effluent Ammonia Test Result																																	
Consent 5mg/l		Good					Action on site					Escalate to TO/Manager					Out of Consent					Sample to be taken 3 times per week													
		Date																																	
mg/l		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Date	Action taken	Name
7.5																																	5th	Increased monitoring	Joe B
7.0																																	6th	Checked blower performance	Joe B
6.5																																	7th	Tankered excess sludge	John S
6.0																																			
5.5																																			
5.0																																			
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0.0																																			

ACTIVITY 12 – ASSESS STATE OF OPTIMISATION FOR EACH PROCESS



Digester Biogas Quantity Date From: 1 August 2019 Date To: 31 August 2019



- SITE Utility Services**
- HV/LV Elect Distribution
 - SCADA/Control Systems
 - Compressed Air
 - Potable Water
 - C2 Water Supplies (Raw Water)
 - C3 Water (Waste Water)
 - Foul Air Collection Systems
 - Process Air Ventilation
 - Enviro Compliance Systems
 - Safety Compliance Systems
 - Buildings and Infrastructure
 - Diesel Systems
 - Lubrication Systems
 - Waste Oil System
 - Mobile Plant

ACTIVITY 13 - ASSESS FUTURE EFFICIENCIES

Council sets 2030 carbon neutral target

Christchurch City Council has set itself a target of becoming net carbon neutral by 2030.



The push is on to reduce Christchurch's carbon emissions.



Image Source (non-CCC)

<https://www.geo-viz.com/blog/overview-sap-system-security>

<https://www.jacobs.com/>

https://www.stuartgroup.ltd.uk/pumps/images/PumpsForSale/Godwin_HL100M/HL100M-curve.gif

<https://www.fulcrumapp.com>

<https://www.unitedutilities.com/>

OpEx Management Limited

