BAKKAVOR CUCINA SANO, BOSTON

WASTEWATER TREATMENT & RECYCLING PLANT

OPERATION AND MAINTENANCE MANUAL

OPERATING PROCEDURES

Plant Area: **Effluent Discharge System**

Procedure: **Start-Up/Shutdown Procedures**

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1.0 SAFETY

The Effluent Discharge System involves the following safety issues:-

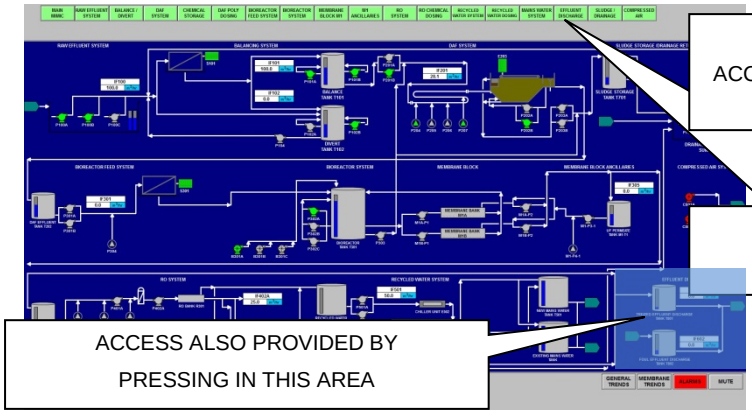
CAUTION: AUTOMATIC OPERATION OF VALVES

Danger is present from the automatic operation of valves. The Treated Effluent or Foul Effluent Discharge System must be must be shutdown prior to any maintenance work on any valve.

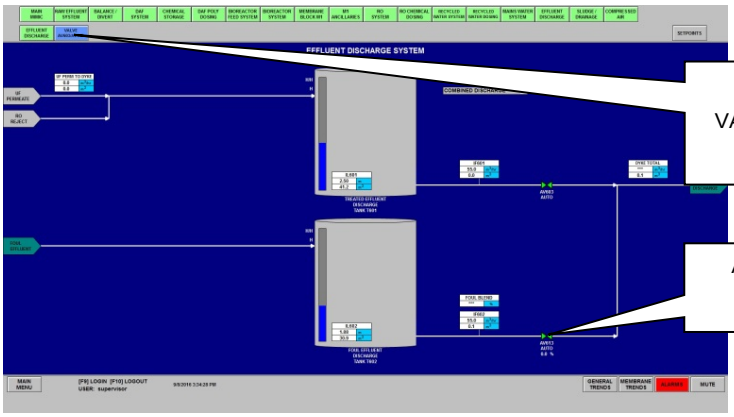
REFER TO SECTION OM03 HEALTH & SAFETY, FOR FURTHER SAFETY INFORMATION.

2.0 SCADA NAVIGATION

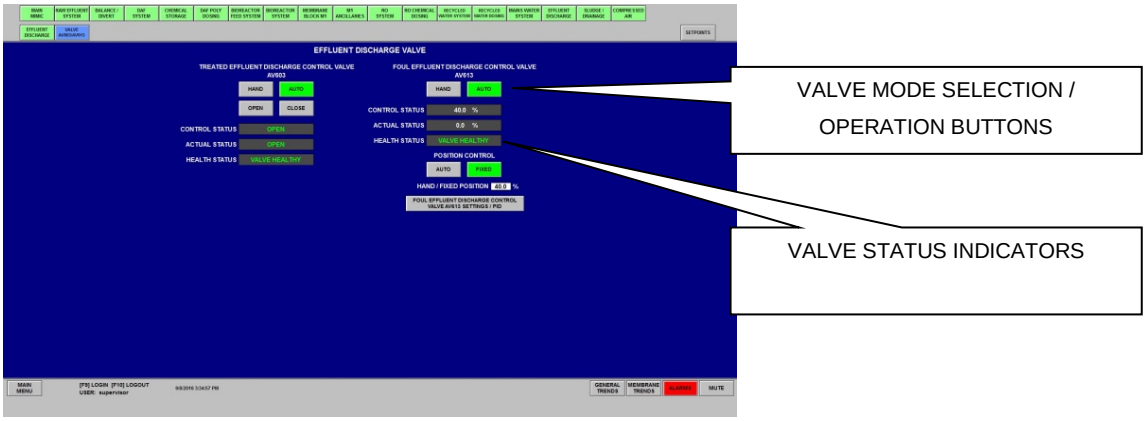
The equipment associated with the Effluent Discharge System is accessed at the SCADA PC as shown below:-



Main Mimic Page

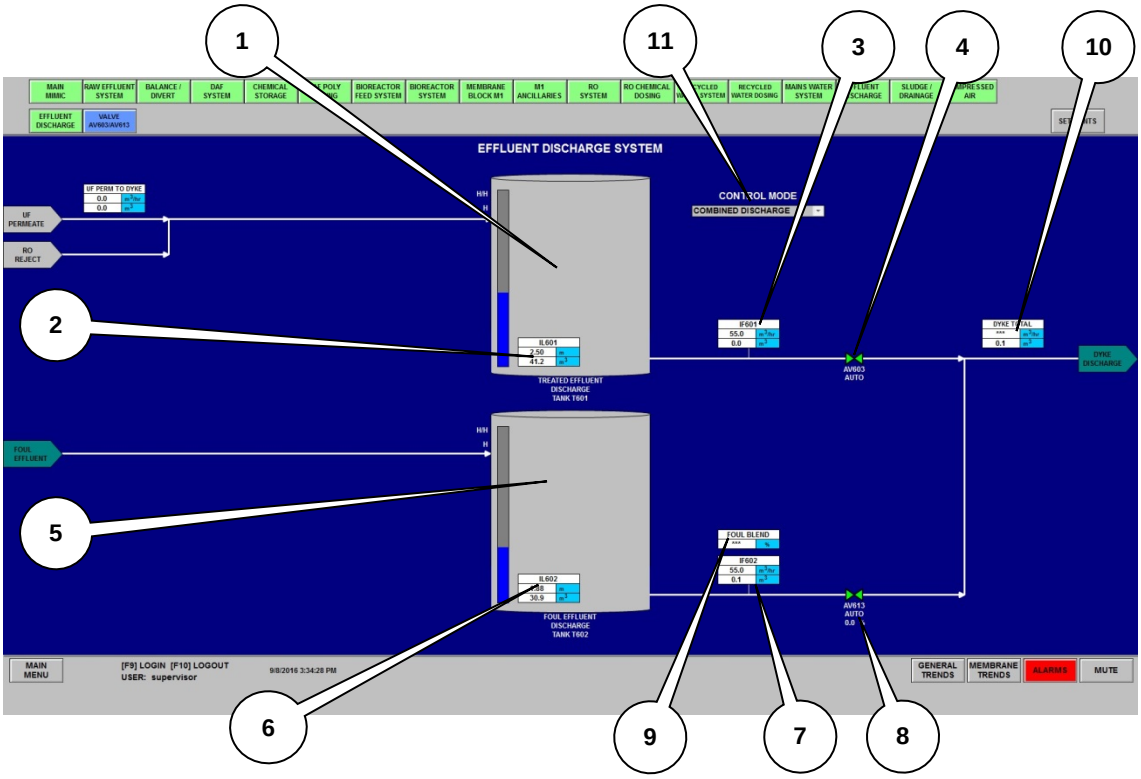


Effluent Discharge System Mimic Page



Effluent Discharge Control Valve Operation Page

Explanation of Effluent Discharge System Mimic Page



No.	Item
1	Treated Effluent Tank T601
2	Treated Effluent Tank Pressure Type Level Transmitter IL601
3	Treated Effluent Discharge Flowmeter IF601
4	Treated Effluent Discharge Control Valve AV603, open/close
5	Foul Effluent Tank T602
6	Foul Effluent Tank Pressure Type Level Transmitter IL602
7	Foul Effluent Discharge Flowmeter IF602
8	Foul Effluent Discharge Control Valve AV613, modulating
9	Calculated Foul Effluent Blend Ratio Indication
10	Calculated Total Discharge Flow to Dyke Indication
11	Effluent Discharge Control Mode Selector

3.0 START-UP PROCEDURE

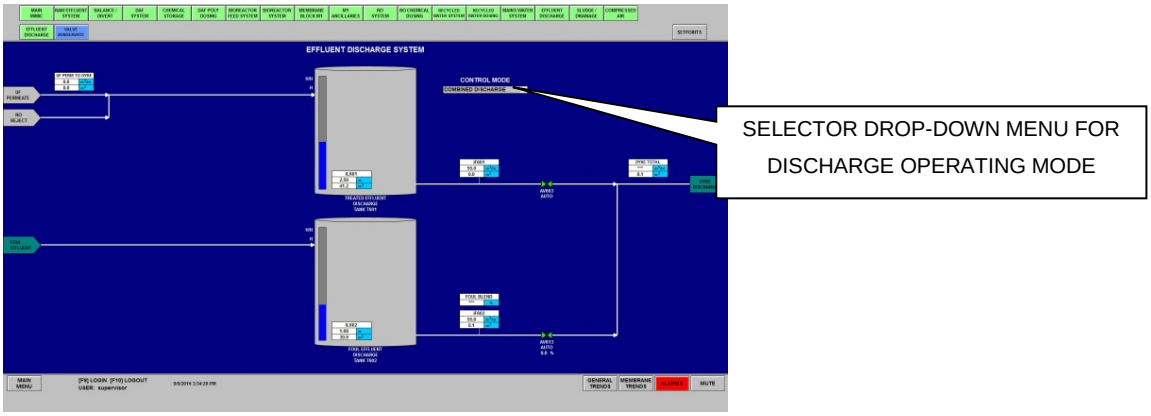
To start-up the Effluent Discharge System, the following procedures apply:-

NOTE:

THE PROCEDURES GIVEN IN THIS SECTION ASSUME THAT THE ASSOCIATED PLANT IS READY TO START-UP AND THAT ALL ASSOCIATED EQUIPMENT AND VALVES HAVE BEEN CHECKED PREVIOUSLY FOR CORRECT OPERATION AND SET-UP. IF THE ASSOCIATED EQUIPMENT HAS BEEN SHUTDOWN FOR MAINTENANCE OR IF THERE IS ANY DOUBT REFER TO THE PRE START-UP CHECKS IN SECTION 5.0.

1. At the Effluent Discharge System Mimic Page, select whether the Effluent Discharge System will operate in COMBINED DISCHARGE, TREATED EFFLUENT ONLY or FOUL EFFLUENT ONLY Mode via the drop-down menu box.
   - In COMBINED DISCHARGE Mode the Effluent Discharge and Foul Effluent Discharge Systems work in conjunction with each other to create a blend of foul and treated effluent.
   - In TREATED EFFLUENT ONLY Mode the Treated Effluent Discharge System is allowed to operate but the Foul Effluent Discharge System is inhibited.
   - In FOUL EFFLUENT ONLY Mode the Foul Effluent Discharge System is allowed to operate but the Treated Effluent Discharge System is inhibited.

   The system should normally be operated in COMBINED DISCHARGE mode.



Effluent Discharge System Mimic Page

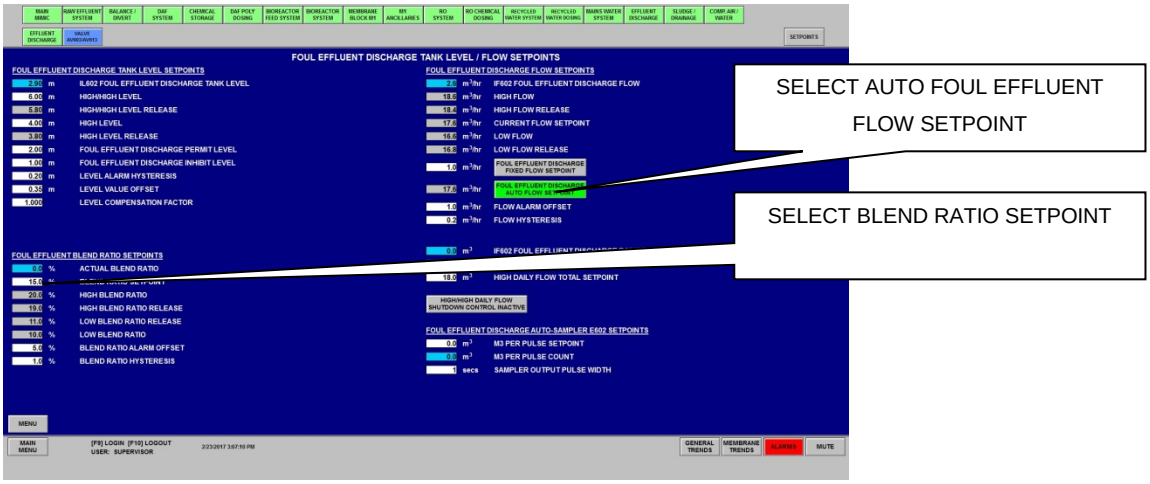
2. At the operator interface, set the following actuated valves to AUTO: -
   - Control Valves AV603, AV613

3. Measure the ammonia concentration in the latest Foul Effluent sample (from Auto-Sampler E602) and Treated Effluent sample (from Auto-Sampler E601) and use the Foul Effluent Blend Calculator sheet to lookup or calculate the required Foul Effluent Blend Ratio.

Treated Effluent Ammonia mg/l	Foul Effluent Ammonia mg/l	Target Blended Ammonia mg/l	Calculated Blend Ratio %
0.3	10	9.0	20.0%
0.3	20	9.0	20.0%
0.3	30	9.0	20.0%
0.3	40	9.0	20.0%
0.3	50	9.0	17.5%
0.3	60	9.0	14.6%
0.3	70	9.0	12.5%
0.3	80	9.0	10.9%
0.3	90	9.0	9.7%
0.3	100	9.0	8.7%
0.3	110	9.0	7.9%
0.3	120	9.0	7.3%
0.3	130	9.0	6.7%
0.3	140	9.0	6.2%
0.3	150	9.0	5.8%
0.3	160	9.0	5.4%
0.3	170	9.0	5.1%
0.3	180	9.0	4.8%
0.3	**60**	**9.0**	**14.6%**

View of Foul Effluent Blend Calculator Sheet

4. Navigate to the Foul Effluent Level / Flow Setpoints Page and select the required Foul Effluent Blend Ratio Setpoint. In addition ensure that the Auto Foul Effluent Flow Setpoint is selected.



Foul Effluent Level / Flow Setpoints Page

5. Once the Discharge Permit Level is reached in the Treated Effluent Tank, the Treated Effluent Discharge Control Valve AV603 will open and treated effluent will be discharged to the Dyke.

6. Once the Treated Effluent Water System is operational, check hat suitable flow is measured at flowmeter IF601.

7. Once the Discharge Permit Level is reached in the Foul Effluent Tank, the Foul Effluent Discharge Control Valve AV613 will open and foul effluent will be discharged to the Dyke. In Combined Discharge Mode the Foul Effluent Discharge will only be permitted to operate when the Treated Effluent Discharge System is operating.

8. Once the Foul Effluent Discharge System is operational, check that flow is measured at flowmeter IF602 and that the position of control valve AV613 is being controlled correctly to achieve the required Foul Effluent Flow Setpoint and hence the correct Foul Effluent Blend Ratio.

9. Check that the Treated Effluent Auto-Sampler E601 and the Foul Effluent Auto-Sampler E602 are operational and set up to provide 24 hour composite samples.

10. Check the Foul Effluent ammonia concentration on a daily basis to determine whether the Blend Ratio needs to be adjusted to maintain the combined discharge to the Dyke within the consent limit of 10mg/l.

4.0 SHUTDOWN PROCEDURE

4.1. Treated Effluent Discharge System

To carry out a shutdown of the Treated Effluent Discharge System, the following procedures apply:-

1. At the operator interface, set the actuated valves AV603 to HAND and Closed.

2. If necessary for maintenance the compressed air supply for the control valve can be isolated at the local ASi board.

NOTE:

Shutting down the Treated Effluent Discharge System will also shut down the Foul Effluent Discharge System if the COMBINED DISCHARGE Mode is selected.

Only if the Foul Effluent ammonia concentration is known to be less than the consent limit of 10mg/l could the Foul Effluent Discharge System be operated alone in FOUL EFFLUENT ONLY Mode.

4.2. Foul Effluent Discharge System

To carry out a shutdown of the Foul Effluent Discharge System, the following procedures apply:-

1. At the operator interface, set the actuated valves AV613 to HAND. The modulating control valve AV613 will automatically default to 0% position when first set to Hand.

2. If necessary for maintenance the compressed air supply for the control valves can be isolated at the local ASi board or directly at the control valve in the case of modulating valve AV613.

NOTE:

Shutting down the Foul Effluent Discharge System will **not** shut down the Treated Effluent Discharge System.

5.0 PRE START-UP CHECKS

Prior to starting up the Effluent Discharge System following a shutdown for maintenance the following checks must be undertaken:-

1. Ensure that the following equipment is correctly installed and that all necessary commissioning checks are carried out in accordance with the manufacturer's instructions.
   - Control Valves AV603, AV613
   - Treated Effluent Tank Pressure Type Level Transmitter IL601
   - Foul Effluent Tank Pressure Type Level Transmitter IL602
   - Treated Effluent Discharge Flow Transmitter IF601
   - Foul Effluent Discharge Flow Transmitter IF602
   - Treated Effluent Auto-Sampler E601
   - Foul Effluent Auto-Sampler E602

2. Check that all pipework connections are complete and flange bolts/unions correctly tightened.

3. Ensure that a compressed air supply of at least 6 bar is available to the following control valves:-
   - Control Valves AV603, AV613

4. Check and/or set the following valve positions, to allow the pump to be operated:-

VALVE	POSITION	NOTES
V600	Closed	Tank T601 drain
V601	Open	Level instrument IL601 isolation
V602	Open	Treated Effluent discharge isolation
V604	Closed	Treated Effluent discharge sample point
V610	Closed	Tank T602 drain
V611	Open	Level instrument IL602 isolation
V612	Open	Foul Effluent discharge isolation
V614	Closed	Foul Effluent discharge sample point

5. The normal Start-Up Procedure (Section 3) can now be carried out.