

REFERENCE DOCUMENT 3

PUMP STATION MAINTENANCE PROCEDURES



Hillsborough County
Public Works Department
Solid Waste Management Division

Southeast County Landfill
Hillsborough County, Florida
Pump Station Maintenance Procedures

September 2015

OPERATION PROCEDURE FOR PUMP STATIONS A & B (PS-A and PS-B)

Pump Station B (PS-B) removes leachate from the landfill Phases I-VI and discharges into the Pump Station A sump (PS-A).

The standard practice valve settings are as follows:

1. Valves 1, 3, 4, 5, and 6 are OPEN.
2. Valves 2, 7, 8, 9, and 10 are CLOSED.
3. Standard practice is for Pump No. 1 to be in operation.

All of the following conditions begin from the standard practice valve settings shown above.

To use Pump No. 2 go to Step 4 or to use the Backup Pump go to Step 6.

4. CLOSE Valves 5 and 6, then ensure Valves 9 and 10 are CLOSED.
5. OPEN Valves 7 and 8. (DO NOT PROCEED TO STEP 6)
6. CLOSE Valves 5 and 6, then ensure Valves 7 and 8 are CLOSED.
7. OPEN Valves 9 and 10.

If PS-A needs to be repaired or maintained, PS-B can bypass PS-A and discharge directly into the Main Leachate Pump Station by performing the following:

1. CLOSE Valves 1 and 3.
2. OPEN Valve 2. Ensure Valve 4 is OPEN.

OPERATION PROCEDURE FOR TEMPORARY PUMP STATION 6 (TPS-6)

Temporary Pump Station 6 (TPS-6) operates using the primary Mobile Pump 1 (Pump 1). A mobile backup pump (backup pump) is in place to be used as necessary. TPS-6 pumps from Cleanout 4-1 to Sump B in Phases I-VI. Under standard practice Pump 1 is on/off running in tandem with Pump Station B (i.e., via radio telemetry, TPS-6 will start and stop at the same time as PS-B).

The standard practice valve settings are as follows:

Valves 1 and 2 are OPEN.

Valves 3 and 4 are CLOSED.

The following condition begins from the standard practice valve settings shown above.

If Pump 1 needs to be repaired or maintained, the mobile backup pump may be used to continue removing leachate from Phase IV. Perform the following when Pump 1 is off and the backup pump is running manually. County personnel will manually start and stop the pump at 7:30 A.M. and 4:30 P.M., respectively.

-CLOSE Valves 1 and 2.

-OPEN Valves 3 and 4.

OPERATION PROCEDURE FOR SECTION 7 PUMP STATION (PS-7)

Section 7 Pump Station pumps leachate from Sections 7 and 8 to the MLPS.

The standard practice valve settings are as follows:

1. Valves 1 and 2 are OPEN.

If Section 7 needs to be isolated from the MLPS, perform the following:

1. CLOSE Valve 1.

Sections 7 and 8 Leak Detection System is currently setup to pump directly into PS-7 Leachate Collection Sump. If the Action Leakage Rate of 1,930 gpd (Section ~~9.3.3~~9.3.2 of the LMP) is exceeded, the Leak Detection System Discharge will be retrofitted to divert the discharge directly into the forcemain heading to the Main Leachate Pump Station.

OPERATION PROCEDURE FOR SECTION 9 PUMP STATION (PS-9)

Section 9 Pump Station pumps leachate from Section 9 to the leachate storage tank (T1) at the Leachate Treatment and Reclamation Facility.

The standard practice valve settings are as follows:

1. Valves 1, 2, 3, and 4 are OPEN.

If the Section 9 Pump Station needs to be isolated from the Main Leachate Pump Station, perform the following from the standard practice valve condition above:

1. CLOSE Valve 4.

If the LCS 1, LCS 2, or LDS pumps require repair, they may be isolated by closing Valves 1, 2, or 3, respectively.

OPERATION PROCEDURE FOR MAIN LEACHATE PUMP STATION (MLPS)

The Main Leachate Pump Station (MLPS) pumps leachate from Sections 7 and 8, Pump Station A (PS-A), and the Truck Loading Area to the leachate storage tank (T1) at the Leachate Treatment and Reclamation Facility (LTRF).

The standard practice valve settings are as follows:

1. Valves 2, 5, 6, 7, 8, 9, 12, 16, 21, and 22 are CLOSED
2. Valves 1, 3, 4, 10, 11, 13, 14, 15, 17, 18, 19, and 20 are OPEN

All of the following conditions begin from the standard practice valve settings shown above.

A. To spray irrigate effluent from Pond A, perform the following:

1. OPEN Valves 10, 13, 14, and 15 (set under standard practice).
2. CLOSE Valves 7, 8, 9, and 16 (set under standard practice).
3. Record the flow meter readings at the irrigation pump.
4. Start/Stop the irrigation pump manually.
5. Record the flow meter reading at the irrigation pump.

B. To haul effluent by truck from Pond A, perform the following:

1. OPEN Valve 9 and ensure Valves 13, 14, and 15 are OPEN.
2. CLOSE Valve 10 and ensure Valves 7, 8, and 16 are CLOSED.
3. Record the flow meter readings at the truck loading arm.
4. Start/Stop the irrigation pump.
5. Record the flow meter readings at the truck loading arm.

C. If the effluent in Pond A needs to be re-circulated to stabilize the pH, perform the following:

1. CLOSE Valve 13.
2. OPEN Valve 16.

D. If Pond B is to be used for storage of effluent from the LTRF and spray evaporation, perform the following:

1. OPEN Valves 1, 3, and 4 (set under standard practice).
2. CLOSE Valves 2, 5, 6, 7, and 22 (set under standard practice).
3. If Pond B reaches its maximum level of 4.4 feet, CLOSE Valve 3. Increase spray irrigation, pond spray evaporation, and hauling as needed.
4. When the effluent in Pond B reaches 3.0 feet deep, as noted on the staff gauge in the pond, the pump for the spray evaporation system may be activated. Manually operate the spray evaporation system and monitor for changing weather conditions (i.e. wind speed greater than 10 mph). Over spraying outside the limits of geomembrane is not allowed.

E. If Pond B is to be used for leachate storage, then perform the following:

1. Notify FDEP and Hillsborough County EPC 24 hours before continuing operation. The notification must include reasons for and the anticipated duration of leachate storage in Pond B.

To empty Pond B of effluent before beginning leachate storage perform the following:

2. CLOSE Valves 1, 3, and 4.
3. OPEN Valves 5 and 6,
4. Ensure Valve 7 is CLOSED,
5. Start evaporation pump at Pond B to pump effluent from Pond B to Pond A.
6. When Pond B is empty, shut of evaporation pump.
7. To fill Pond B with leachate from LTRF go to Step 8 or to fill Pond B with leachate from Pump Station A and Section 7/8 go to Step 11:

To fill Pond B from LTRF perform the following:

8. CLOSE Valves 1, 3, 4, 5 and 6.
9. OPEN Valve 2.
10. When Pond B is full, CLOSE Valve 2. Do not proceed to Step 11.

To fill Pond B from Pump Station A and Section 7/8:

11. CLOSE Valve 11.

12. OPEN Valve 12.

13. When Pond B is full, CLOSE VALVE 12 and OPEN Valve 11.

F. To resume effluent storage and spray evaporation in Pond B after leachate storage, perform the following:

1. CLOSE Valves 10 and 13 and ensure Valve 6 is CLOSED.

2. OPEN Valves 5 and 7 to begin draining Pond B of leachate.

3. To pump leachate to the truck loading station next to Ponds A and B go to Step 4 or to pump to the leachate storage tank (T1) at the LTRF via the MLPS go to Step 7, if the evaporation pump at Pond B is not operational go to Step 10:

To pump leachate to the truck loading station, perform the following:

4. OPEN Valve 9.

5. CLOSE Valve 8.

6. Start the evaporation pump at Pond B and Go to Step 12.

To pump to the leachate storage tank (T1) and LTRF via the MLPS, perform the following:

7. OPEN Valve 8.

8. CLOSE Valve 9.

9. Start the evaporation pump at Pond B. Go to Step 12.

If the evaporation pump is not operational, Pond B can be emptied by connecting a portable pump to Valve 22 and perform the following:

10. CLOSE Valves 4 and 5

11. OPEN Valve 22, Go to Step 12.

12. When Pond B is emptied, rinse the leachate off the geomembrane using effluent or clean water and pump out the rinse water to the truck loading station to haul off

site as leachate. **Pond B must be cleaned of leachate before effluent storage resumes.** If leachate was pumped from the LTRF, go to Step 13.

13. OPEN Valve 2 and pump out the first 18,000 gallons of effluent to the truck loading arm for off-site disposal as leachate.
14. When all leachate is removed and Pond B is clean, shut off the evaporation pump, and CLOSE Valves 2, 5, 6, and 7.
15. OPEN Valves 1, 3, 4, 10, and 13.

OPERATION PROCEDURE
FOR EFFLUENT/LEACHATE STORAGE TANK (T6)

The standard practice operation for the effluent/leachate storage tank (T6) is to receive pumped effluent from the Leachate Treatment and Reclamation Facility (LTRF).

The standard practice valve settings are as follows:

1. Valves 4, 11, 12, 15, 20, 20A, 20B, 21, 22, 24, and 28 are CLOSED
2. Valves 5, 6, 13, 14, 16, 17, 18, 19, 23, 25, 26, 27, 29, and 30 are OPEN

Please note that Valves 1, 2, 3, 7, 8, 9, and 10 are not shown on the attached schematic since they are internal to the operation of the LTRF.

All of the following conditions begin from the standard practice valve settings shown above.

The standard practice for operating the booster pumps is to pump effluent from the effluent/leachate storage tank (T6) to Ponds A and B. Under this standard practice use the following settings:

3. Ensure Valves 18, 19, 24, 25, 26, and 27 are OPEN. Valve 24 is electronically actuated (see Note 1 below).
4. Ensure Valves 21, 22, and 28 are CLOSED. Valve 22 is electronically actuated (see Note 1 below).

If effluent is pumped to the truck loading arm from the effluent/leachate storage tank (T6), then perform the following:

5. Ensure Valve 24 is CLOSED. Valve 24 is electronically actuated (see Note 1 below).
6. OPEN Valve 22 and ensure Valve 23 is OPEN. Valve 22 is electronically actuated (see Note 1 below).

If effluent from the LTRF is pumped directly to Ponds A and B, perform the following:

7. CLOSE Valve 13 and ensure Valve 12 is CLOSED.
8. OPEN Valve 11.

If leachate from the Main Leachate Pump Station (MLPS) must be stored in the effluent/leachate storage tank (T6) while the leachate storage tank (T1) is repaired or inspected, then perform the following:

9. CLOSE Valve 14.
10. OPEN Valve 15.
11. Determine if effluent is to continue to be pumped to the Effluent/Leachate Storage or diverted to Ponds A and B. If pumping effluent to Pond A and B, then go to instructions above for that condition.

If leachate stored in the effluent/leachate storage tank (T6) is to be pumped back to the leachate storage tank (T1) after repairs or inspection, perform the following:

12. OPEN Valves 14 (previously closed in Step 9) and 28, then ensure that Valves 18, 19, 24, 25, and 26 are OPEN. Valve 24 is electronically actuated (see Note 1 below).
13. CLOSE Valves 15 (previously opened in Step 10) and 27, then ensure that Valves 21 and 22 are CLOSED. Valve 22 is electronically actuated (see Note 1 below).

Note 1: Valves 22 and 24 are electronically actuated and controlled by a switch on the Booster Pump control panel at the truck loading station. When the switch is in the "To Ponds" position, Valves 22 and 24 are set in the closed position. Valve 24 will only open in the condition when one or both of the booster pumps are activated. Until the booster pumps are activated Valve 24 will remain closed. When the switch is in the "To Truck" position Valve 22 is set in the open position, Valve 24 is set to the closed position, and the booster pumps are deactivated.

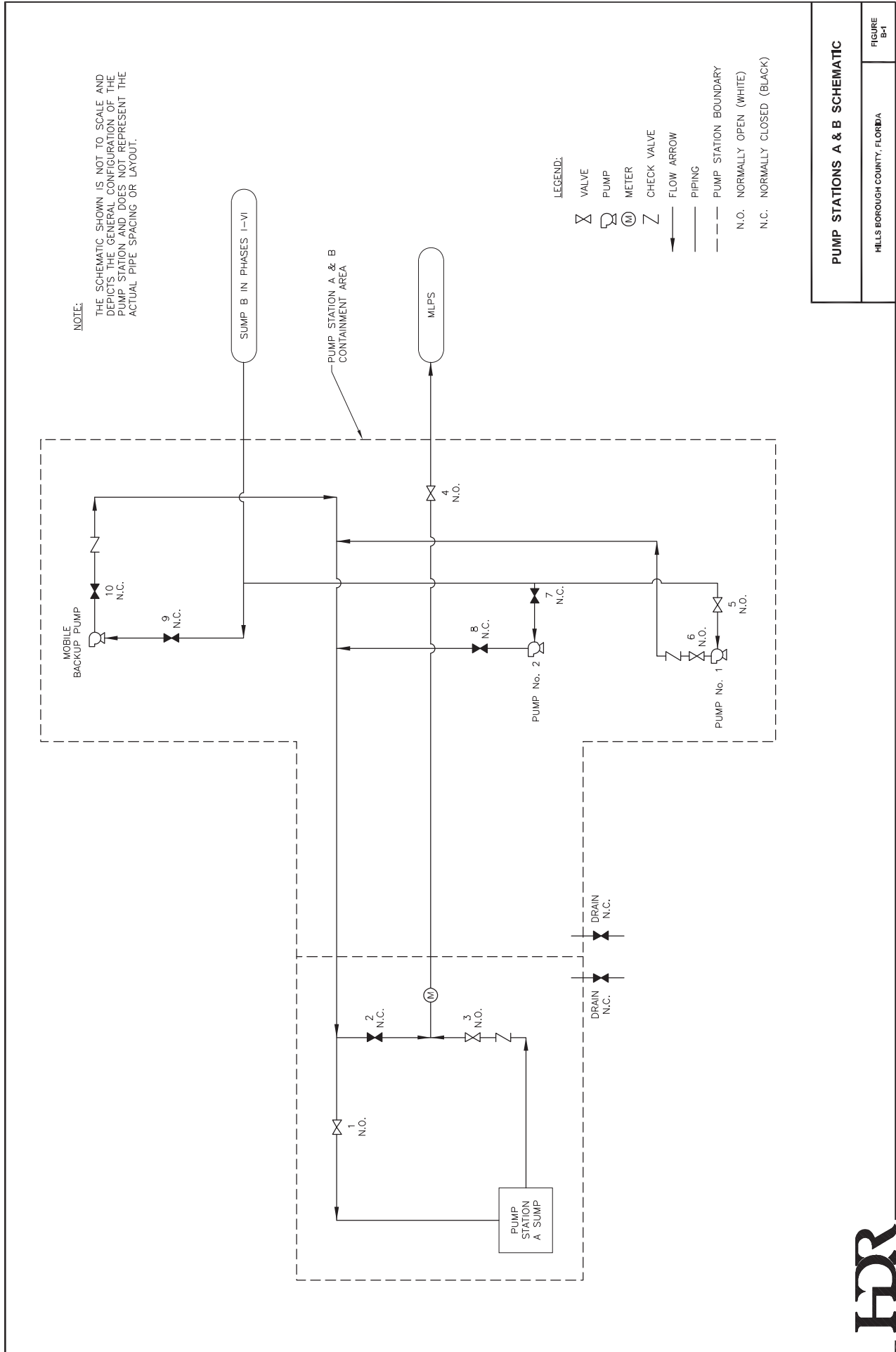
In addition, after the pumps are signaled off, the pumps will run for an additional 30 seconds to allow the system to flush any sulfuric acid from the piping. The electronically actuated valves (22 and 24) are set to close after 60 seconds.

The electronically actuated valves can also be operated using the manual wheel located on the actuator assembly.

The standard practice to remove stormwater from the effluent/leachate storage tank (T6) is as follows:

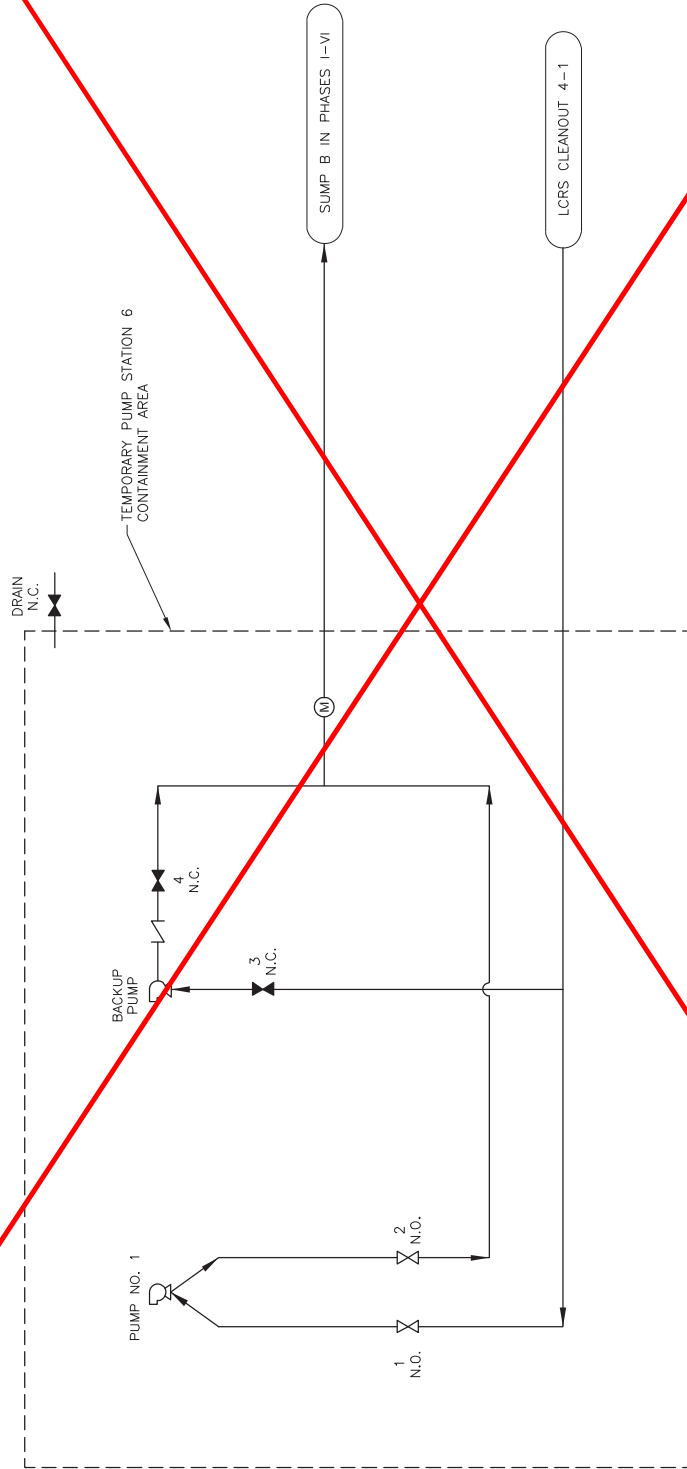
1. Inspect the tank and piping to ensure there are no leaks. If there are no visible leaks proceed to Step 2. If a leak is observed proceed to Steps 5.
2. If no leaks were observed, OPEN Valve 20 and ensure that Valves 20A and 20B are CLOSED.

3. Start the secondary pump.
4. When stormwater is pumped out of the secondary containment, Stop the secondary pump and CLOSE Valve 20.
5. If a leak was observed, contact supervisor immediately
6. Go to Step 7 to pump liquid to either the leachate storage tank (T1), Ponds A and B, or the truck loading arm. Go to Step 13 to pump liquid via hose to a tanker truck.
7. To pump from the containment area using the secondary pump, OPEN Valves 20A and 21.
8. Ensure Valves 20 and 20B are CLOSED.
9. CLOSE Valve 19 and refer to Step 12 to pump to the leachate storage tank (T1) at the LTRF, to Step 3 to pump to Ponds A and B, or to Step 5 to pump to the truck loading arm for the appropriate valve settings depending on where liquid is to be pumped.
10. Start the secondary pump and the booster pump or truck loading pump.
11. When containment area is pumped down, stop secondary pump and booster pump and OPEN Valve 19.
12. CLOSE Valves 20A and 21. DO NOT PROCEED TO STEP 13.
13. The containment area may also be pumped to a tanker truck on the adjacent road by performing the following:
14. Ensure Valves 20 and 21 are CLOSED.
15. OPEN Valves 20A and 20B.
16. Connect a temporary hose to the camlock connector and run hose to tanker truck.
17. Start secondary pump.
18. When containment area is pumped down, stop secondary pump, and CLOSE Valves 20A and 20B.



REMOVE FROM SET

NOTE:
THE SCHEMATIC SHOWN IS NOT TO SCALE AND
DEPICTS THE GENERAL CONFIGURATION OF THE
PUMP STATION AND DOES NOT REPRESENT THE
ACTUAL PIPE SPACING OR LAYOUT.



LEGEND:

- ⊗ VALVE
- ⊕ PUMP
- Ⓜ FLOW METER
- Z CHECK VALVE
- FLOW ARROW
- PIPING
- - - PUMP STATION BOUNDARY
- N.O. NORMALLY OPEN (WHITE)
- N.C. NORMALLY CLOSED (BLACK)

TEMPORARY PUMP STATIONS 6
SCHEMATIC

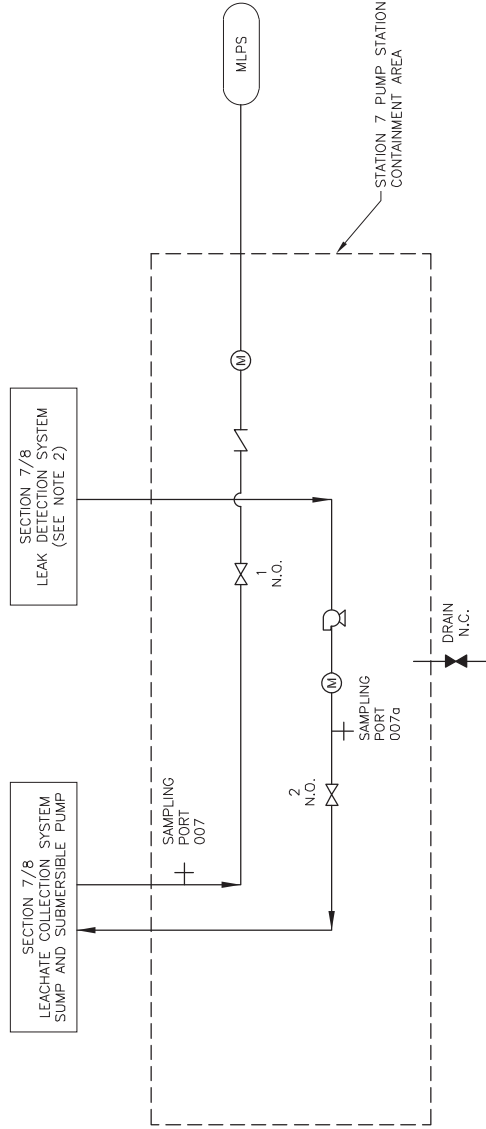
HILLS BOROUGH COUNTY, FLORIDA

FIGURE
B-2



NOTE:

1. THE SCHEMATIC SHOWN IS NOT TO SCALE AND DEPICTS THE GENERAL CONFIGURATION OF THE PUMP STATION AND DOES NOT REPRESENT THE ACTUAL PIPE SPACING OR LAYOUT.
2. SECTION 7 AND 8 LEAK DETECTION SYSTEM IS CURRENTLY SETUP TO PUMP DIRECTLY INTO PS-7 LEACHATE COLLECTION SUMP. IF THE ACTION LEAKAGE RATE OF 1,930 GDP (SECTION 9.3.3 OF LMP) IS EXCEEDED, THE LEAK DETECTION SYSTEM DISCHARGE WILL BE RETROFITTED TO DIVERT THE DISCHARGE DIRECTLY INTO THE FORCEMAIN HEADING TO THE MAIN LEACHATE PUMP STATION.



LEGEND:

- ⊗ VALVE
- ⊕ PUMP
- Ⓜ FLOW METER
- Z CHECK VALVE
- FLOW ARROW
- PIPING
- - - PUMP STATION BOUNDARY
- N.O. NORMALLY OPEN (WHITE)
- N.C. NORMALLY CLOSED (BLACK)

SECTION 7 PUMP STATION SCHEMATIC

HILLS BOROUGH COUNTY, FLORIDA

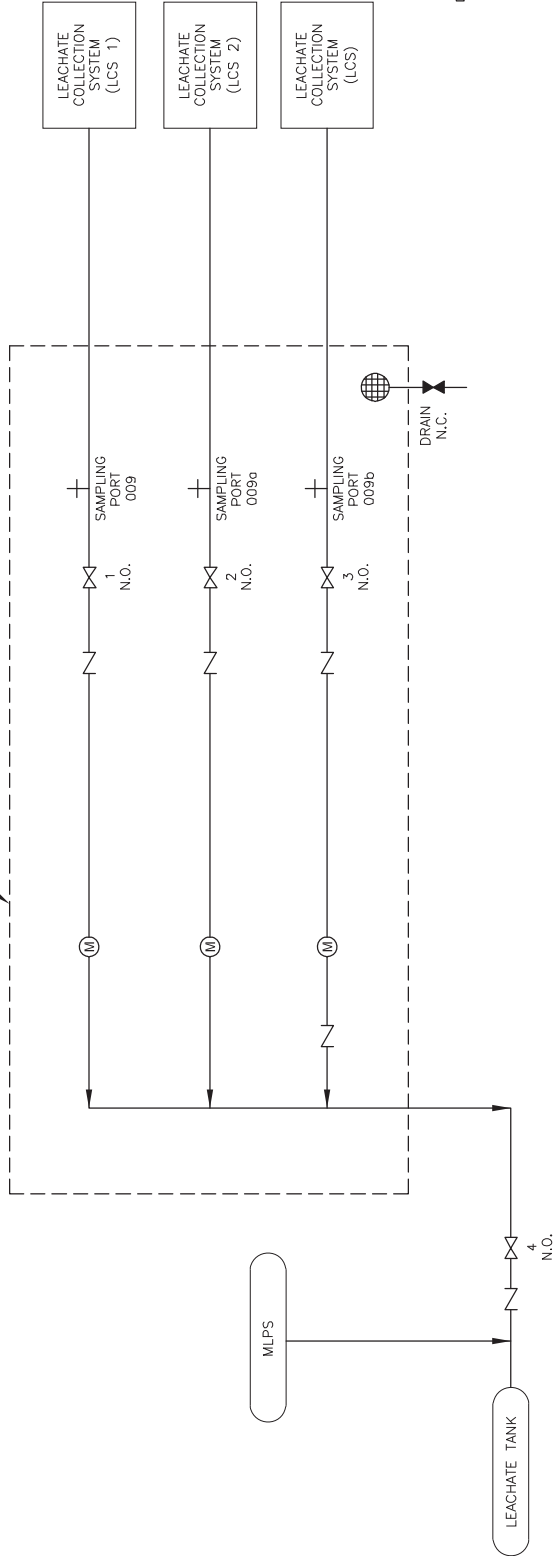
FIGURE B-3



NOTE:

THE SCHEMATIC SHOWN IS NOT TO SCALE AND DEPICTS THE GENERAL CONFIGURATION OF THE PUMP STATION AND DOES NOT REPRESENT THE ACTUAL PIPE SPACING OR LAYOUT.

STATION 9 PUMP STATION
CONTAINMENT AREA



LEGEND:

- ⊗ VALVE
- Ⓜ PUMP
- Ⓜ FLOW METER
- Z CHECK VALVE
- FLOW ARROW
- PIPING
- - - PUMP STATION BOUNDARY
- N.O. NORMALLY OPEN (WHITE)
- N.C. NORMALLY CLOSED (BLACK)

**SECTION 9 PUMP STATION
SCHEMATIC**

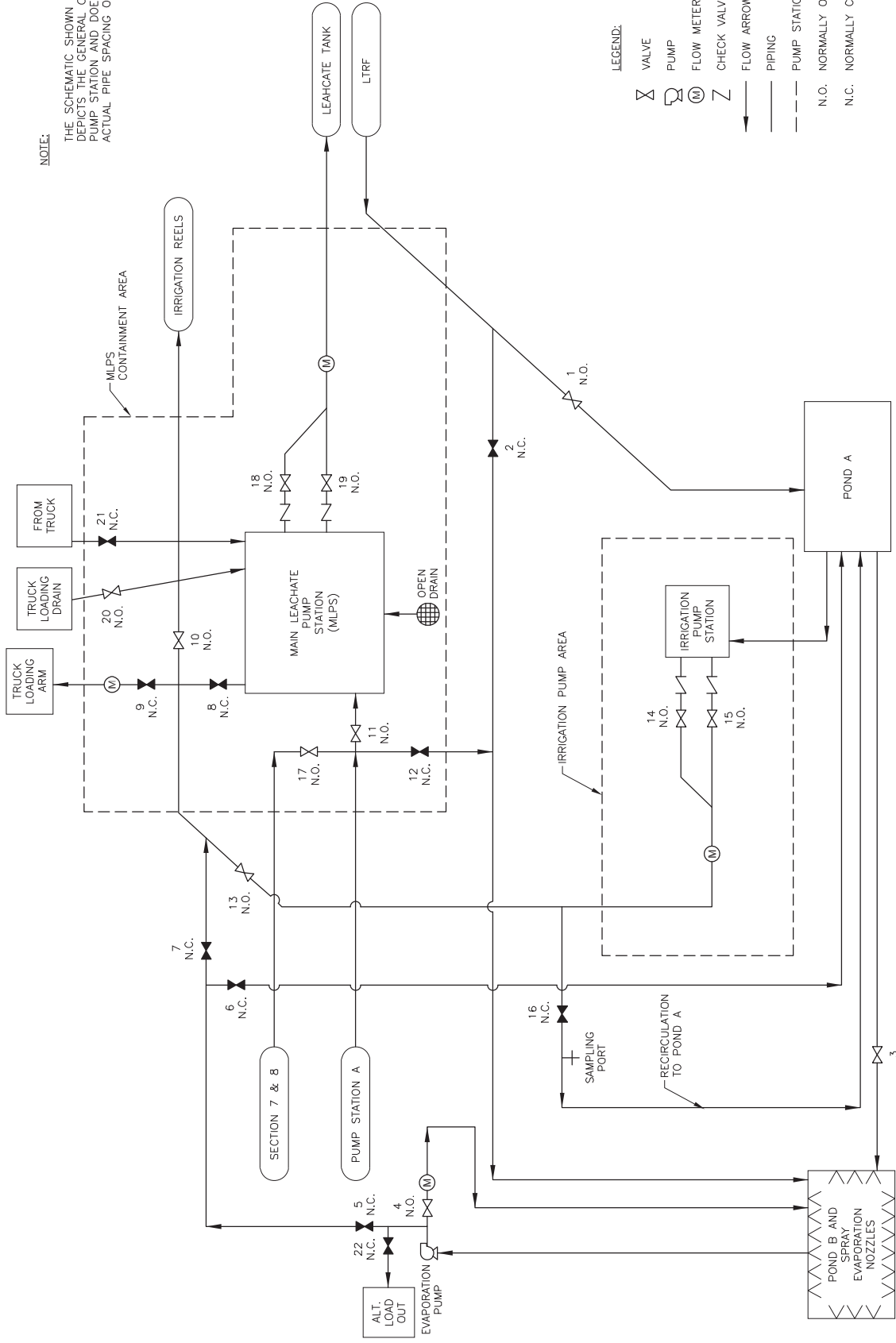
HILLS BOROUGH COUNTY, FLORIDA

FIGURE
B-4



NOTE:

THE SCHEMATIC SHOWN IS NOT TO SCALE AND DEFECTS THE GENERAL CONFIGURATION OF THE PUMP STATION AND DOES NOT REPRESENT THE ACTUAL PIPE SPACING OR LAYOUT.



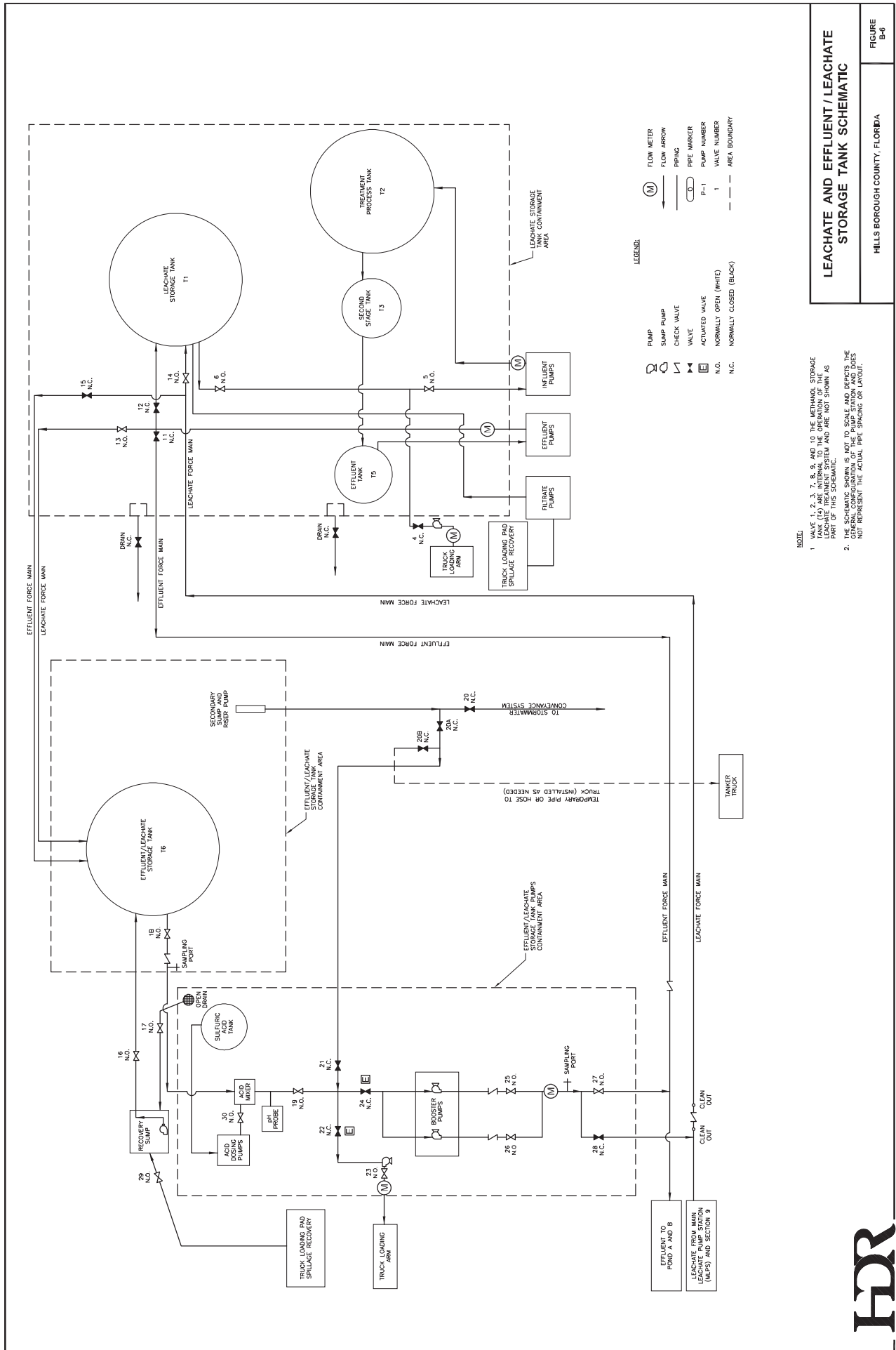
- LEGEND:
- ⊗ VALVE
 - Ⓜ PUMP
 - Ⓜ FLOW METER
 - Z CHECK VALVE
 - FLOW ARROW
 - PIPING
 - - - PUMP STATION BOUNDARY
 - N.O. NORMALLY OPEN (WHITE)
 - N.C. NORMALLY CLOSED (BLACK)

MAIN LEACHATE PUMP STATION SCHEMATIC

HILLS BOROUGH COUNTY, FLORIDA

FIGURE B-5





LEACHATE AND EFFLUENT / LEACHATE STORAGE TANK SCHEMATIC

HILLS BOROUGH COUNTY, FLORIDA

FIGURE B-6

NOTE:
 1. VALVE 1, 2, 3, 7, 8, 9, AND 10 THE METHANOL STORAGE TANK (T4) ARE INTERNAL TO THE OPERATION OF THE LEACHATE TREATMENT AND ARE NOT SHOWN AS PART OF THIS SCHEMATIC.
 2. THE SCHEMATIC SHOWN IS NOT TO SCALE AND REFLECTS THE GENERAL CONFIGURATION OF THE PUMP STATION AND DOES NOT REPRESENT THE ACTUAL PIPE SPACING OR LAYOUT.

