

Leachate Collection and Removal System Effectiveness Evaluation

Pasco County Resource Recovery Facility



Pasco County Utilities

Report Assessing the Effectiveness of the Leachate Collection and Removal System at the Pasco County Resource Recovery Facility

June 2016

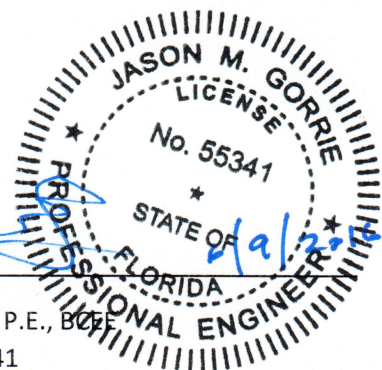


Prepared For:

Pasco County Utilities

A handwritten signature in blue ink, appearing to read "Jason M. Gorrie", is written over a horizontal line.

Jason M. Gorrie, P.E., BCEE
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The seal certifies the engineering information included herein
provides reasonable assurance of meeting the requirements of
Chapters 62-701 of the Florida Administrative Code.

Overview

The Pasco County Resource Recovery Facility is a solid waste management Facility located in northwestern Pasco County, Florida and is comprised of multiple solid waste management operations including: a 1,050 ton per day Waste-to-Energy Facility, a Class I landfill for the disposal of ash residue, a Class I landfill for the disposal of municipal solid waste, a Class III landfill for disposal of construction and demolition debris, and various support operations. The Facility is regulated in part under the Florida Electrical Power Plant Siting Act (PPSA) and the Conditions of Certification associated PPSA License No. PA 87-23. Specific Condition No. XIV.14.D of the Conditions of Certification requires the landfill owner to prepare...

“A report assessing the effectiveness of the leachate collection and removal system, force mains and gravity pipe lines, leachate storage tank and treatment Facility shall be submitted to the Department at least every five years. As part of the five-year assessment, the entire leachate collection and removal system, force mains and gravity pipelines, shall be visually or video inspected or pressure tested where possible to verify adequate performance. Components not performing adequately shall be cleaned and/or repaired. Those portions of the tank secondary containment liner which can be readily visually inspected shall be inspected for damage, and repaired if necessary. The report shall include the results of the inspection and any corrective measures undertaken to demonstrate adequate performance, signed and sealed by a professional engineer.”

On January 26, 2016, the Pasco County Board of County Commissioners authorized JMG Engineering, Inc. (JMG) to undertake an assessment of the leachate collection system at the Pasco County Resource Recovery Facility and to issue a Report rendering an opinion as to the effectiveness of the leachate collection system. This Report summarizes the findings of that assessment and provides Conclusions and Recommendations as detailed below.

Assessment Procedures

To evaluate the effectiveness of the leachate collection system at the Pasco County Resource Recovery Facility, JMG reviewed the following historical data:

- As-Built Drawings of all components of the leachate collection system;
- Landfill operating records for the past five years of operation;
- Leachate generation records for the past five years of operation;
- Documentation of modifications to the leachate collection system (with particular emphasis on the modification of ash disposal cell A2 from a mechanically pumped system to a gravity system);
- Previous video inspections of the leachate collection system

In addition to a review of the documentation above, JMG procured the services of Florida JetClean, Inc. to high-pressure wash all leachate system laterals, cleanouts, and manholes and reviewed the contractor's activities. Finally, JMG visually inspected accessible components, including metering manholes and pump stations.

Leachate Collection System Overview

There are four separate leachate collection and removal systems associated with the solid waste disposal cells at the Pasco County Resource Recovery System. Each system operates independently and is described in detail below.

Ash Disposal Cells A1, A2, and A3

Ash disposal cells A1, A2, and A3 were constructed sequentially between 1990 and 2002 to accommodate ash residue from the waste-to-energy facility. Each disposal cell was designed and constructed with a double liner system comprised of a primary liner to collect and drain leachate and a secondary liner designed, in part, to indicate the presence of a leak within the primary liner. The primary liner system (and associated leachate collection pipes and laterals) evacuates leachate via gravity to a metering manhole, where the flow is measured before draining (again via gravity) to an 8" leachate header pipe common to all three cells¹. The secondary liner system evacuates leachate that has managed to permeate the primary liner via gravity to a metering manhole, where it is allowed to accumulate before being pumped (and metered) into the primary metering manhole (downstream of the primary metering system so as to avoid being double counted). Leachate from all three cells accumulates in a manhole before being pumped (and again metered) to a 2 million gallon storage tank for eventual transport to an off-site disposal facility. **Figure 1** provides a simplified schematic of the leachate collection system for Ash Cells A1, A2, and A3.

Ash Disposal Cell A4

Ash disposal cell A4 was constructed in 2009 and is currently serving as the active cell for disposal of ash from the waste-to-energy facility. The leachate collection system is similar to that of A1, A2, and A3 in that leachate from each of the liner systems (primary and secondary) flows via gravity to manholes before being pumped (and metered) into a 6' diameter wet well for further pumping (and metering) to the 2 million gallon storage tank. **Figure 2** provides a simplified schematic of the leachate collection system for Ash Cell A4.

Solid Waste Disposal Cells SW-1, and SW-2

Solid Waste Disposal Cells SW-1 and SW-2 were constructed sequentially between 1991 and 2000 to accommodate municipal solid waste that is either by-passed from the waste-to-energy facility when it is at capacity or wastes that are unacceptable in the waste-to-energy facility. The leachate collection system design of the Solid Waste Cells is similar to that of the Ash Disposal Cells, with the notable exception that collected leachate is pumped to the Shady Hills Wastewater Treatment Facility for disposal. **Figure 3** provides a simplified schematic of the leachate collection system for Solid Waste Disposal Cells SW-1 and SW-2.

¹ The original leachate evacuation principle for Ash Disposal Cell A2 was modified circa 1999 and is discussed in further detail under Assessment Findings.

FIGURE 1
ASH DISPOSAL CELLS A1 THROUGH A3 LEACHATE COLLECTION

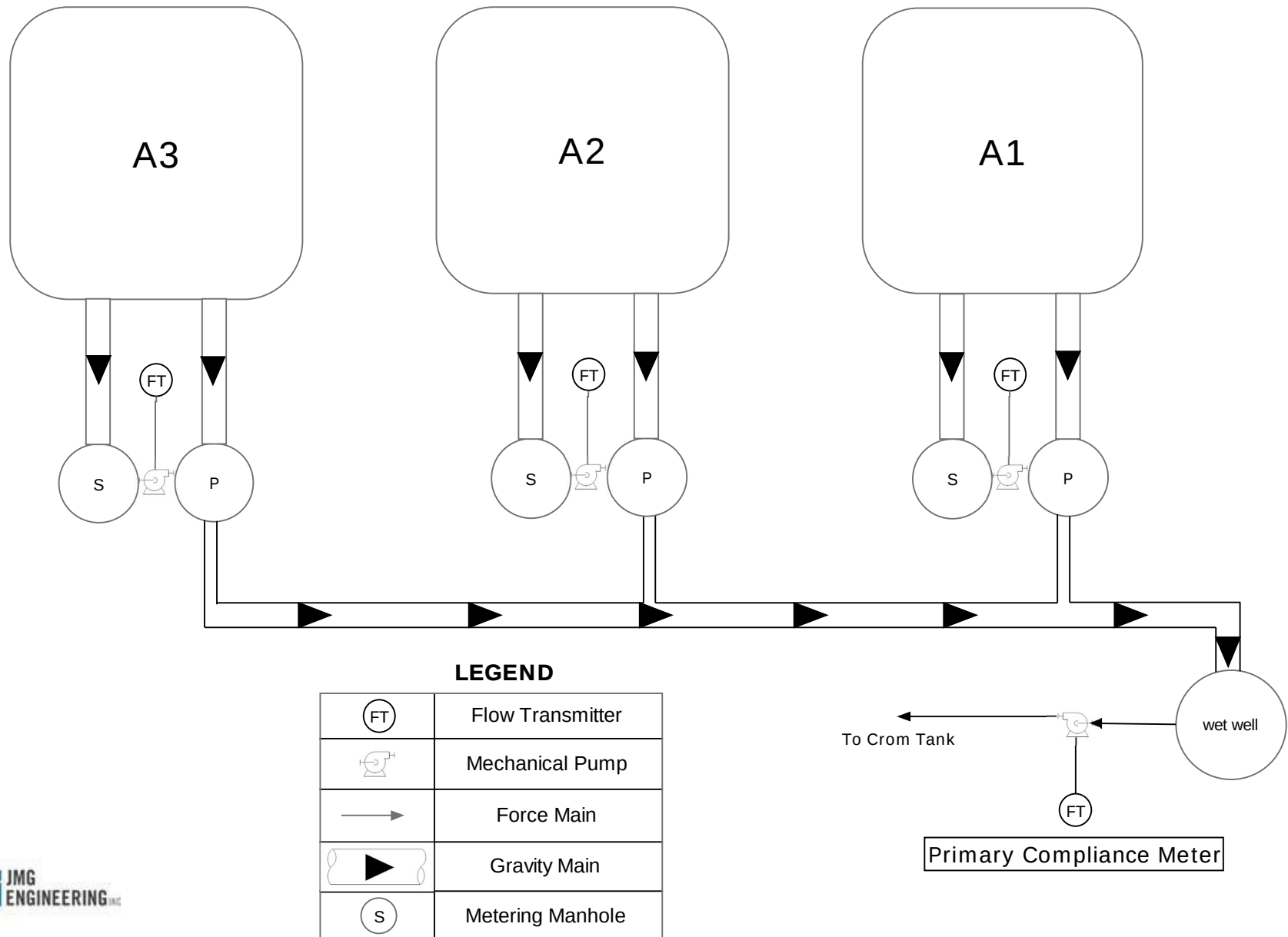


FIGURE 2
ASH DISPOSAL CELL A4 LEACHATE COLLECTION

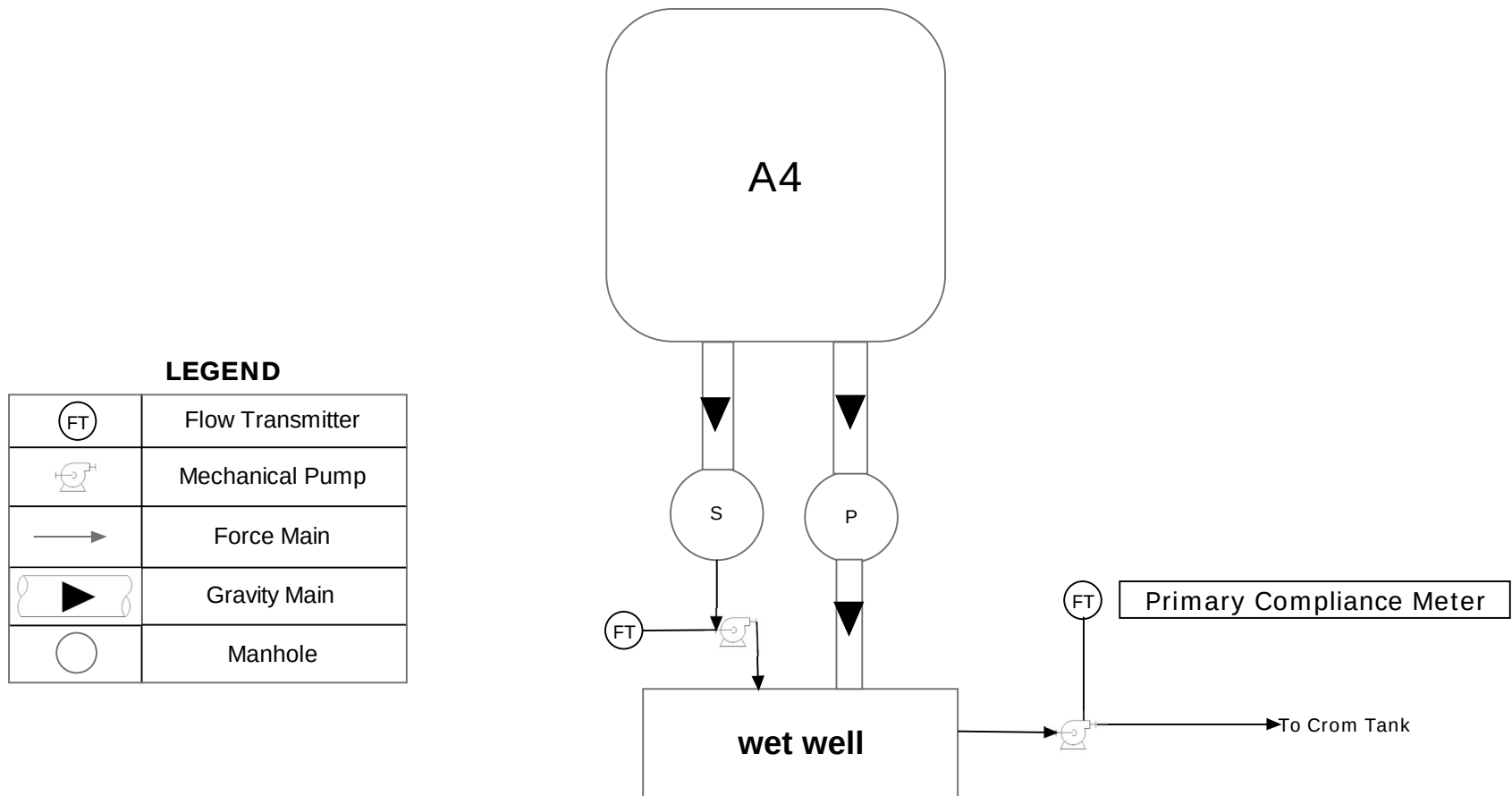
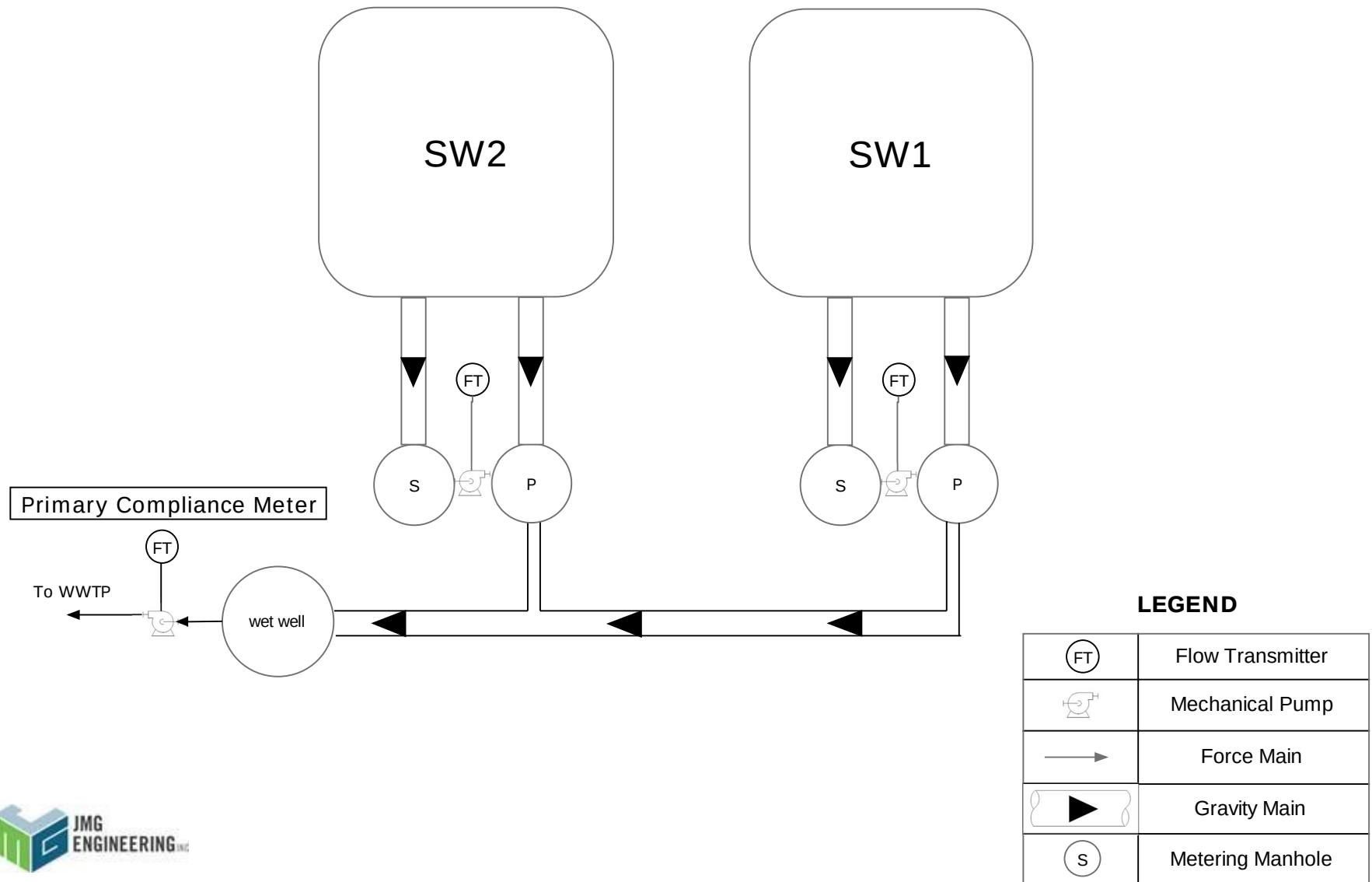


FIGURE 3
SOLID WASTE DISPOSAL CELLS SW1 AND SW2 LEACHATE COLLECTION



Class III Landfill

The Class III Landfill is a landfill constructed with a single-liner system in 1990 to accept construction and demolition debris only. Leachate collected by the single liner flows via gravity to one of two collection manholes, where it accumulates and is periodically pumped to a gravity trunk line. The trunk line flows to a wetwell, which is emptied by mechanical pumping to the Shady Hills Wastewater Treatment Facility. **Figure 4** provides a simplified schematic of the leachate collection system for the Class III Landfill.

Assessment Findings

Based on a review of the documents, operating records, and equipment inspections outlined above, the following Assessment Findings are presented:

Ash Disposal Cell A2

The original leachate evacuation principle for Ash Disposal Cell A2 incorporated the concept of accumulating leachate from the primary and secondary liner systems in Leachate Collection Sumps before mechanically pumping the accumulated leachate by way of submerged pumps through sideslope risers to the common header serving A1, A2, and A3. Leachate collected by the primary and secondary header pipes within the disposal cell (and the associated lateral pipes) emptied through open tees in the primary and secondary header pipes into a collection sump filled with FDOT #57 coarse stone. As the leachate accumulated within the sump, the submerged pumps would periodically pump the leachate into the common disposal header.

In an effort to make the A2 leachate system consistent with that of Disposal Cells A1 and A3, the decision was made to remove the submerged pumps in the sideslope risers and install gravity drains (through liner penetrations) to drain the primary and secondary collection sumps. The gravity drains emptied into metering manholes, from which the leachate drained once again to the common disposal header. **Figure 5** shows the concept of the modified leachate removal system with open tees from the primary and secondary headers emptying through the sump drainage material to gravity drain lines. These modifications to Disposal Cell A2 were undertaken in conjunction with the construction of Disposal Cell A3 and remain in effect today.

A review of the operating record indicates that little to no leachate is flowing to the metering manhole of the primary liner system. A review of the Florida JetClean Report indicates that leachate *is* properly flowing through the entirety of the primary leachate header pipe and that the gravity drain *is free* of obstruction between the metering manhole and the collection sump. This indicates that the leachate is not properly flowing between the open tee on the leachate header pipe and the gravity drain (by way of the stone-filled sump). The most likely reason for this is that the stone within the sump has become calcified and no longer allows leachate to flow to the gravity drain. The secondary liner leachate collection system appears to be working properly and not affected by such blockage within the secondary sump.

FIGURE 4
CLASS III DISPOSAL CELLSLEACHATE COLLECTION

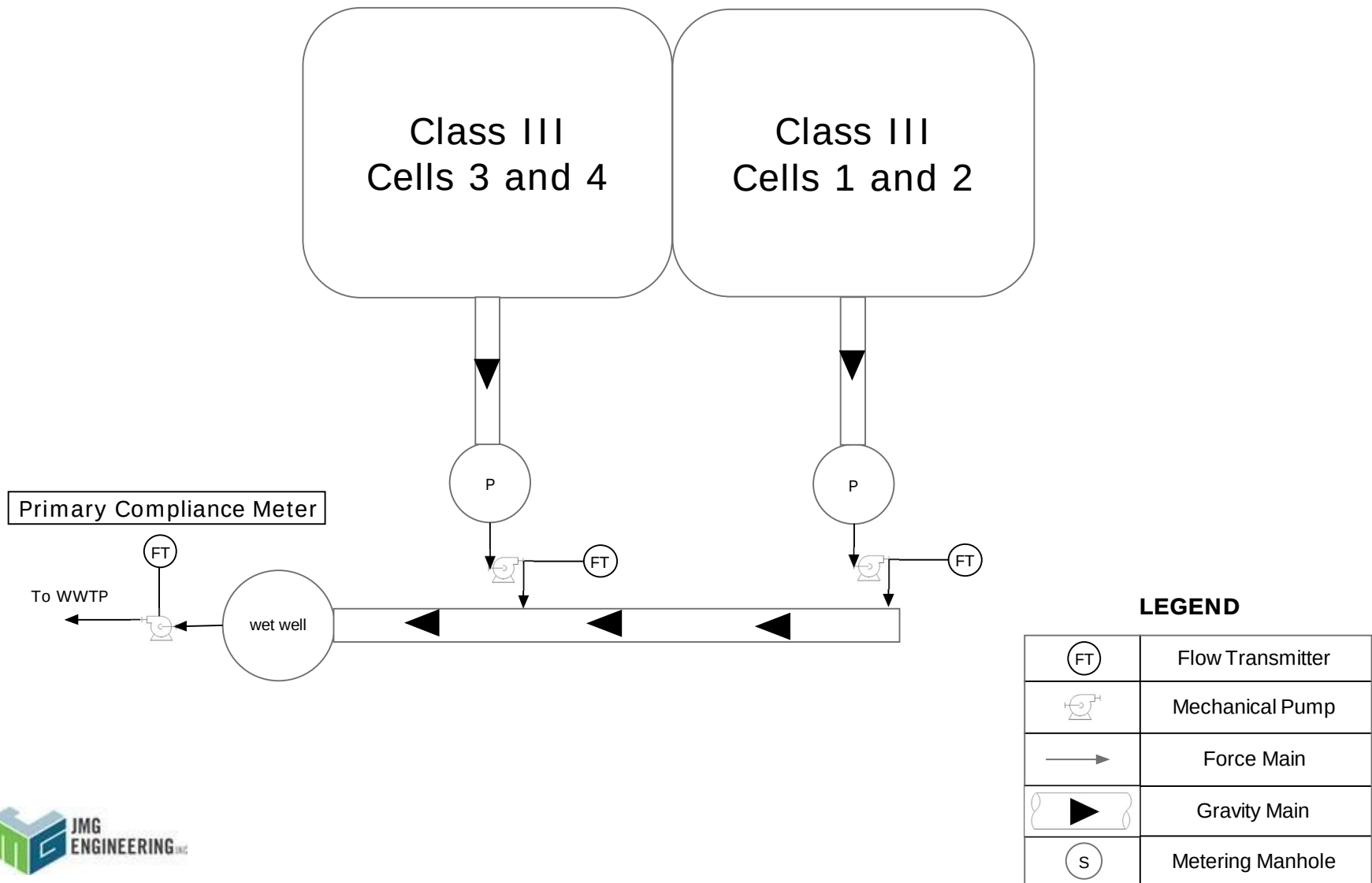
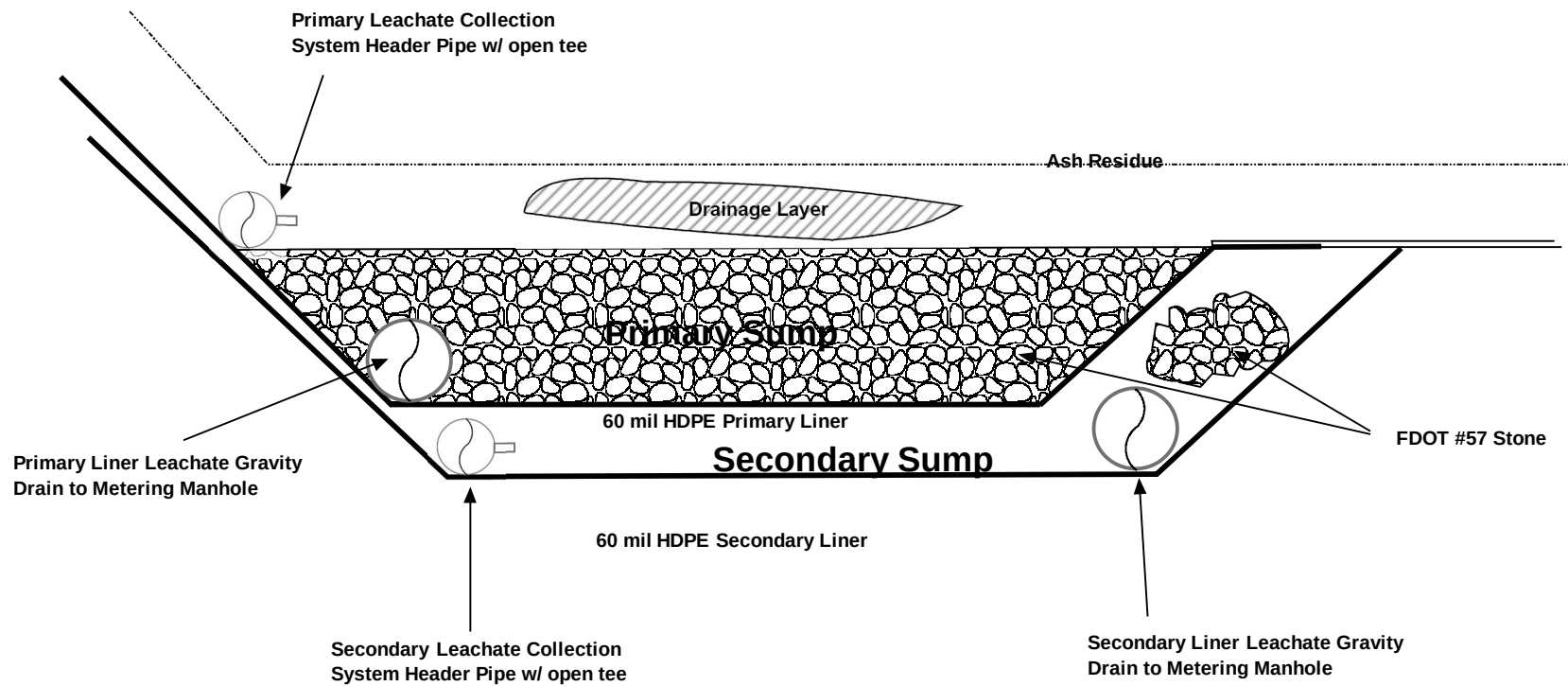


FIGURE 5
SECTION THROUGH PRIMARY TEE AND INTO SUMP
DISPOSAL CELL A2



Ash Disposal Cells A1 and A3

No issues were noted or observed in cells A1 and A3.

Ash Disposal Cell A4

No issues were noted or observed in cells A1 and A3.

Solid Waste Disposal Cells SW-1 and SW-2

No issues were noted or observed in Cells SW-1 and SW-2.

Class III Disposal Cells

No issues were noted or observed in the Class III disposal cells.

Conclusions and Recommendations

Proper drainage of the A2 disposal cell must be restored to remain in compliance with Chapter 62-701, F.A.C. The following are potential options for restoring the functionality of cell A2:

1. In-situ chemical treatment of the drainage rock within the sump to restore its ability to drain leachate;
2. Excavation of ash to expose the 8" tee on the primary leachate header followed by hard-piping the tee to the gravity drain line (thus by-passing the sump);
3. Abandonment of the gravity line draining the sump accompanied by construction of a side slope riser type pumping system and associated forcemain to evacuate leachate from the disposal cell.

Following a discussion with the FDEP Southwest District Solid Waste staff on April 7, 2016, it was agreed that the option providing the highest likelihood of success would be Option 3. A follow up teleconference was conducted with FDEP Bureau of Solid Waste Staff on May 10, 2016, and it was further agreed that Option 3 presented a viable option for restoring the functionality of the A2 leachate removal system. Accordingly, Pasco County should initiate design and permitting of a side slope riser type pumping system to restore the functionality of cell A2. All other leachate removal system components at the Pasco County Resource Recovery Facility are operating properly.

APPENDIX I
Florida JetClean Report

FLORIDA JETCLEAN

HIGH PRESSURE WATER JETTING
EXPLOSION PROOF VIDEO INSPECTION
VACUUM TRUCK SERVICES
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**JMG Engineering, Inc.
Pasco County Solid Waste
West Landfill
A1, A2, A3, A4
SW1, SW2, Class III, Gravity Manholes
Leachate Collection Pipe Jetcleaning**

**Work Performed
March 2016**

Conducted By:
**Florida Jetclean
800-226-8013**

FLORIDA JETCLEAN

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REPORT

DATE : 3/25/2016
TO : Jason Gorrie – JMG Engineering, Inc.
FROM : Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT : 2016 West Pasco County Landfill Pipe Jetcleaning Project

Florida Jetclean completed the high-pressure water-jetting of the leachate collection piping at the above landfill on 3/11/2016. The jetting log (below) documents the pipes that were addressed, as well as the jetting distances that were achieved in each pipe.

CELL A-1 (6" HDPE Primary)

Lateral 1 (farthest East)	412'	Entire Pipe Cleaned
Lateral 2	412'	Entire Pipe Cleaned
Lateral 3	412'	Entire Pipe Cleaned
Lateral 4	412'	Entire Pipe Cleaned
Lateral 5	412'	Entire Pipe Cleaned
Lateral 6	412'	Entire Pipe Cleaned
Lateral 7	412'	Entire Pipe Cleaned
Lateral 8	412'	Entire Pipe Cleaned
Lateral 9	412'	Entire Pipe Cleaned
Lateral 10 (farthest West)	412'	Entire Pipe Cleaned
NE Manhole toward NW Cleanout	1,075'	Entire Pipe Cleaned
NW Cleanout toward NE Manhole	400'	Entire Pipe Cleaned

CELL SW-2 (8" HDPE)

NE Lateral Cleanout	1,362'	Entire Pipe Cleaned
SE Lateral Cleanout	1,362'	Entire Pipe Cleaned
NE Header Cleanout	375'	Entire Pipe Cleaned
SE Header Cleanout	375'	Entire Pipe Cleaned
NW Lateral Cleanout	500'	Entire Pipe Cleaned
SW Lateral Cleanout	500'	Entire Pipe Cleaned

CELL A-3 (8" HDPE)

NE Lateral Cleanout	1,063'	Entire Pipe Cleaned
SE Lateral Cleanout	1,063'	Entire Pipe Cleaned
NE Header Cleanout	200'	Entire Pipe Cleaned
SE Header Cleanout	200'	Entire Pipe Cleaned

CELL A-2 (8" HDPE Primary)

Lateral 1 (farthest East)	393'	Entire Pipe Cleaned
Lateral 2	425'	Entire Pipe Cleaned
Lateral 3	201'	Entire Pipe Cleaned
Lateral 4	340'	Entire Pipe Cleaned
Lateral 5	340'	Entire Pipe Cleaned

Lateral 6	290'	Entire Pipe Cleaned
Lateral 7	450'	Entire Pipe Cleaned
Lateral 8	560'	Entire Pipe Cleaned
Lateral 9 (farthest West)	530'	Entire Pipe Cleaned
South Header A	1,170'	Entire Pipe Cleaned
North Header B	360'	Entire Pipe Cleaned
Metering Well To Secondary Sump	256'	Entire Pipe Cleaned

CELL A-2 (6" HDPE Secondary)

Lateral 1 (farthest East)	360'	Entire Pipe Cleaned
Lateral 2	360'	Entire Pipe Cleaned
Lateral 3	360'	Entire Pipe Cleaned
Lateral 4	360'	Entire Pipe Cleaned
Lateral 5	360'	Entire Pipe Cleaned
Lateral 6	360'	Entire Pipe Cleaned
Lateral 7	360'	Entire Pipe Cleaned
Lateral 8	360'	Entire Pipe Cleaned
Lateral 9 (farthest West)	360'	Entire Pipe Cleaned
South Header A	1,170'	Entire Pipe Cleaned
North Header B	360'	Entire Pipe Cleaned

CELL SW-1 (8" HDPE)

Lateral 1 (farthest East)	97'	Jet Stopped (Same as 2008)
Lateral 2	280'	Entire Pipe Cleaned
Lateral 3	355'	Entire Pipe Cleaned
Lateral 4	355'	Entire Pipe Cleaned
Lateral 5	355'	Entire Pipe Cleaned
Lateral 6	355'	Entire Pipe Cleaned
Lateral 7	358'	Entire Pipe Cleaned
Lateral 8	358'	Entire Pipe Cleaned
Lateral 9	358'	Entire Pipe Cleaned
Lateral 10 (farthest West)	358'	Entire Pipe Cleaned
Manhole toward Lateral 1	330'	Entire Pipe Cleaned
East-West Header to Pump Station	75'	Entire Pipe Cleaned

CLASS III (6" HDPE)

Cell 1 - Pipe 1 (Outside Pipe)	500'	Entire Pipe Cleaned
Cell 1 - Pipe 2 (Inside Pipe)	560'	Entire Pipe Cleaned
Cell 1 - Manhole to Pump Station 1	75'	Entire Pipe Cleaned
Cell 2 - Pipe 2 (Inside Pipe)	560'	Entire Pipe Cleaned
Cell 2 - Pipe 1 (Outside Pipe)	500'	Entire Pipe Cleaned
Cell 2 - Manhole to Pump Station 1	75'	Entire Pipe Cleaned
Cell 3 - Pipe 1 (Outside Pipe)	500'	Entire Pipe Cleaned
Cell 3 - Pipe 2 (Inside Pipe)	560'	Entire Pipe Cleaned
Cell 3 - Manhole To Pump Station 2	75'	Entire Pipe Cleaned
Cell 4 - Pipe 2 (Inside Pipe)	560'	Entire Pipe Cleaned
Cell 4 - Pipe 1 (Outside Pipe)	500'	Entire Pipe Cleaned
Cell 4 - Manhole to Pump Station 2	75'	Entire Pipe Cleaned

CELL A-4

Lateral 1 (farthest South)	1,212'	Entire Pipe Cleaned
Lateral 2	1,225'	Entire Pipe Cleaned

Collection Header	455'	Entire Pipe Cleaned
Detection Header	440'	Entire Pipe Cleaned

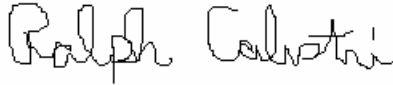
GRAVITY MANHOLES

A1-A2-A3 (MH to MH to PS)	905'	Entire Length Cleaned
SW1 - SW2 (MH to MH to PS)	568'	Entire Length Cleaned

All pipes were jetted in their entirety with the exception of the Cell SW-1 Lateral 1 where the jet nozzle stopped short of the estimated pipe length at the same location as was last documented 2008 and 2011.

Please call us with questions or concerns.

Thank you,



Ralph Calistri - Florida Jetclean - 800-226-8013