

Attachment D

Landfill Disposal Areas Ground Water Monitoring Plan

1. Water Quality Monitoring Quality Assurance.

a. All field work done in connection with the facility's Water Quality Monitoring Plan shall be conducted in accordance with the Standard Operating Procedures (SOPs) described in DEP-SOP-001/01 (March 31, 2008) [or as replaced by successor SOPs], as referenced in Rule 62-160.210(1), F.A.C. All laboratory analyses done in connection with the facility's Water Quality Monitoring Plan shall be conducted by firms that hold certification from the Department of Health Environmental Laboratory Certification Program under Chapter 64E-1, F.A.C., as referenced in Rule 62-160.300(1), F.A.C. The SOPs utilized and the laboratory's list of certified test methods and analytes must specifically address the types of sampling and analytical work that are required by this Attachment [the "Water Quality Monitoring Requirements, Landfill Disposal Areas"] and shall be implemented by all persons performing sample collection or analysis related to this Attachment. Alternate field procedures and laboratory methods may be used if approved according to the requirements of Rules 62-160.220 and 62-160.330, F.A.C., respectively.

b. The field testing, sample collection and preservation, and laboratory testing, including the collection of quality control samples, shall be in accordance with the requirements of and methods approved by the Department in accordance with Rule 62-4.246 and Chapter 62-160, F.A.C. Approved methods published by the Department or as published in Standard Methods, or by A.S.T.M., or EPA methods shall be used.

2. Zone of Discharge.

a. The zone of discharge for this facility shall extend horizontally 100 feet from the limits of the landfill disposal areas [i.e., the closed northern landfill and the active southern landfill] or to the property boundary, whichever is less. The zone of discharge shall extend vertically through the surficial aquifer to the bottom of the intermediate confining unit which has been described at the facility to be the clayey strata of the Hawthorn Group. Compliance with the zone of discharge will be measured in the monitor wells completed in the Floridan aquifer, and in the monitor wells completed in the surficial aquifer and the permeable zones within the intermediate confining unit [i.e., the "intermediate aquifer"] that are designated as "compliance wells" based on their proximity to the property boundary [see [Condition #3.](#), below].

b. The facility owner shall ensure that the primary standards for Class G-II ground waters referenced in Rule 62-520.420(1), F.A.C., will not be exceeded at the boundary of the zone of discharge. The facility owner shall ensure that the minimum criteria for ground water referenced in Rule 62-520.400(1), F.A.C., will not be exceeded outside the footprint of the landfill disposal areas [i.e., the closed northern landfill and the active southern landfill]. In accordance with Rule 62-520.520(1), F.A.C., the Department considers the facility to be an "existing installation" that is exempt from compliance with the secondary standards for Class G-II ground water referenced in Rule 62-520.420(1), F.A.C.

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3. Ground Water Monitor Well Locations. The ground water monitoring system locations for the closed northern landfill and the active southern landfill areas at the C.D. McIntosh, Jr. Power Plant are shown on Drawing No. 23-1018-3002, entitled "McIntosh Power Plant, Monitoring Well Locations," prepared by Lakeland Electric, received September 14, 2012, as follow:

<u>Well #</u>	<u>Scheduling Notes</u>	<u>WACS Testsite #</u>	<u>Aquifer Monitored</u>	<u>Well Designation</u>	<u>Location</u>
MW-2S	A	27267	Surficial	Compliance	See Drawing
MW-10S	A	27272	Surficial	Intermediate	↓
MW-17S	A	27277	Surficial	Intermediate	↓
MW-18S (R)	A	27278	Surficial	Intermediate	↓
MW-21S	A	27282	Surficial	Compliance	↓
MW-22S	A	27283	Surficial	Compliance	↓
MW-23S	A	27284	Surficial	Compliance	↓
MW-23I	A	27285	Surficial	Compliance	↓
MW-24S	A	27286	Surficial	Compliance	↓
MW-25S	A	27287	Surficial	Intermediate	↓
MW-26S	A	27288	Surficial	Intermediate	↓
MW-W14	A	27310	Surficial	Compliance	↓
MW-10I	A	27314	Intermediate	Intermediate	See Drawing
MW-18I	A	27316	Intermediate	Intermediate	↓
MW-22I	A	27318	Intermediate	Compliance	↓
MW-2D (R)	A	27313	Floridan	Compliance	See Drawing
MW-10D	A	27303	Floridan	Compliance	↓
MW-17D	A	27302	Floridan	Compliance	↓
MW-21D	A	27304	Floridan	Compliance	↓
MW-2I	B	27312	Intermediate	Abandoned	
MW-3S (R)	B	27268	Surficial	Abandoned	
MW-3I	B	27269	Intermediate	Abandoned	
MW-6S	B	27270	Surficial	Abandoned	
MW-6I	B	27271	Surficial	Abandoned	
MW-14S (R)	B	27273	Surficial	Abandoned	
MW-14I	B	27274	Surficial	Abandoned	
MW-15S	B	27275	Surficial	Abandoned	
MW-16S (R)	B	27276	Surficial	Abandoned	
MW-16I	B	27315	Surficial	Abandoned	
MW-19S	B	27279	Surficial	Abandoned	
MW-19I	B	27280	Surficial	Abandoned	
MW-20S	B	27281	Surficial	Abandoned	
MW-20I	B	27317	Intermediate	Abandoned	
MW-27S	B	27289	Surficial	Abandoned	
MW-28S	B	27290	Surficial	Abandoned	
MW-28I	B	27291	Surficial	Abandoned	
MW-29S	B	27292	Surficial	Abandoned	
MW-30S	B	27293	Surficial	Abandoned	
MW-31S	B	27294	Surficial	Abandoned	
MW-32S	B	27295	Surficial	Abandoned	
MW-33S	B	27296	Surficial	Abandoned	
MW-34S	B	27297	Surficial	Abandoned	
MW-35S	B	27298	Surficial	Abandoned	
MW-35I	B	27319	Intermediate	Abandoned	
MW-36S	B	27299	Surficial	Abandoned	
MW-36I	B	27320	Intermediate	Abandoned	
MW-37S	B	27300	Surficial	Abandoned	
MW-38S	B	27301	Surficial	Abandoned	
MW-38D	B	27321	Floridan	Abandoned	
W-2 (R)	B	27306	Surficial	Abandoned	
W-9	B	27308	Surficial	Abandoned	
W-10 (R)	B	27309	Surficial	Abandoned	

3. Ground Water Monitor Well Locations (continued).

Scheduling Notes:
A = existing monitor well; construction details previously provided; to be included in the sampling events described in Condition #4.c., and #4.d.

B = existing monitor well **to be abandoned within 90 days of approval of the "Water Quality Monitoring Requirements"** in accordance with Condition #6.

The monitor wells are to be clearly labeled and easily visible at all times, and shall be kept locked to minimize unauthorized access.

4. **Ground Water Sampling.** The locations, parameters, and frequencies specified herein represent the minimum requirements for ground water monitoring. Additional samples, wells, and parameters may be required based upon subsequent analysis. Method Detection Limits must be reported at or below the Maximum Contaminant Levels established for the individual parameters to demonstrate compliance with Class G-II ground water standards referenced in Chapter 62-520, F.A.C. Compliance with ground water standards will be based on analysis of unfiltered samples.

a. Ground water levels shall be measured **semi-annually** (during the periods from January 1-June 30, and from July 1-December 31, of each year) including all sampling events described in [Condition #4.c.](#), and [#4.d.](#), at all active monitor wells and piezometers listed in [Condition #3.](#), to a precision of 0.01 foot. Ground water surface contour maps shall be prepared for each sampling event to include water elevations (using a consistent, nationally recognized datum) calculated for each monitor well and piezometer.

b. An "initial sampling event" shall be conducted **within 7 days of installation and development** of all new monitor wells for analysis of the parameters listed in Rules 62-701.510(8) (a) and (8) (d), F.A.C., including:

Field Parameters	Laboratory Parameters	
Static water levels	Total ammonia	Iron
before purging	Chlorides	Mercury
Specific conductivity	Nitrate	Sodium
Temperature	Total dissolved solids (TDS)	
pH	Those parameters listed in	
Dissolved oxygen	<u>40 CFR Part 258, Appendix II</u>	
Turbidity		
Color & sheens (by obs.)		

c. The locations designated as intermediate wells and compliance wells as listed in [Condition #3.](#), shall be sampled **semi-annually** for analysis of the following parameters:

Field Parameters	Laboratory Parameters		
Static water levels	Chloride	Arsenic	Manganese
before purging	Gross Alpha	Cadmium	Nickel
Specific conductivity	Nitrate	Chromium	Selenium
Temperature	Sulfate	Iron	Sodium
pH	TDS	Lead	Vanadium
Dissolved oxygen			
Turbidity			
Color & sheens (by obs.)			

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4. Ground Water Sampling (continued).

d. To demonstrate that the parameters listed in [Condition #4.c.](#), remains appropriate, the locations designated as intermediate wells and compliance wells in [Condition #3.](#), shall be sampled **every 5 years during the second half sampling event** [starting with the 2012 second half event] for analysis of the following parameters:

Field Parameters	Laboratory Parameters	
Static water levels	Total ammonia	Antimony
before purging	Chloride	Arsenic
Specific conductivity	Fluoride	Barium
Temperature	Gross Alpha	Beryllium
pH	Nitrate	Boron
Dissolved oxygen	Sulfate	Cadmium
Turbidity	TDS	Chromium
Color & sheens (by obs.)		Copper
		Iron
		Lead
		Manganese
		Mercury
		Molybdenum
		Nickel
		Selenium
		Silver
		Sodium
		Thallium
		Vanadium
		Zinc

5. Ground Water Monitor Well Construction. Prior to construction or abandonment of any new or replacement monitor wells and piezometers, the shall request and receive Department approval of proposed modifications to this Attachment [the "Water Quality Monitoring Requirements, Landfill Disposal Areas"]. All proposed modifications shall be submitted in accordance with [Section A, Condition #XXI](#) [Procedures for Post-Certification Submittals] of the License for this facility. The following information is required to be submitted **within 90 days of new or replacement well installation**, or as stated below:

a. Construction details for all new or replacement wells and piezometers shall be provided to the Department's Southwest District Office, Solid Waste Section on Department Form #62-701.900(30), Monitoring Well Completion Report.

b. **Within one week of well completion and development**, each new or replacement well shall be sampled for the parameters listed in [Condition #4.b.](#), to comply with the requirements of Rules 62-701.510(8) (a), and 62-701.510(8) (d), F.A.C.

c. A surveyed drawing shall be submitted in accordance with Rule 62-701.510(3)(d) (1), F.A.C., showing the location of all monitor wells and piezometers (active and abandoned) horizontally located in degrees, minutes and seconds of latitude and longitude, and the elevation of the top of the well casing to the nearest 0.01 foot, using a consistent, nationally recognized datum. The surveyed drawing shall include the monitor well or piezometer identification number, and the locations and elevations of all permanent benchmarks and/or corner monument markers at the site. The survey shall be conducted by Florida Licensed Professional Surveyor and Mapper.

6. Well Abandonment. All monitor wells and piezometers not listed in [Condition #3.](#), and not a part of this Attachment [the "Water Quality Monitoring Requirements, Landfill Disposal Areas"] shall be plugged and abandoned in accordance with Rule 62-532.500(5), F.A.C., and the rules of the Southwest Florida Water Management District. The facility owner shall submit a written report to the Department **within 90 days of well/piezometer abandonment** verifying proper abandonment. A written request for exemption to the abandonment of a well/piezometer must be submitted to the Department's Solid Waste Section for approval.

7. Verification/Evaluation Monitoring. If at any time monitoring parameters are detected at concentrations significantly above background water quality, or exceed the Department's water quality standards or minimum criteria specified in Chapter 62-520, F.A.C., in any location designated as an intermediate well, the facility owner has 30 days from receipt of the sampling results to resample the monitor well(s) to verify the original analysis. Should the facility owner choose not to resample, the Department will consider the water quality analysis as representative of current ground water conditions at the facility. If the data is confirmed, or if the facility owner chooses not to resample, the facility owner shall notify the Department in writing within 14 days of this finding. Upon notification by the Department, the facility owner shall initiate evaluation monitoring as described in Rules 62-701.510(7)(a) and 62-701.510(7)(b), F.A.C. If monitoring parameters are detected and confirmed at concentrations significantly above background water quality, and exceed the Department's water quality standards or minimum criteria in any location designated as a compliance well, the facility owner shall notify the Department in writing within 14 days of this finding and shall initiate corrective actions as described in Rule 62-701.510(7)(c), F.A.C.

8. Surface Water Sampling. All surface water bodies that may be affected by a contaminant release at the facility shall be monitored, except bodies of water contained completely within the property boundaries of the site which do not discharge from the site to surface waters (Rule 62-701.510(4), F.A.C.).

a. At this time, the collection of surface water samples for laboratory analysis is not required as part of this Attachment [the "Water Quality Monitoring Requirements, Landfill Disposal Areas"] for monitoring associated with the closed northern landfill area or the active southern landfill area. Surface water monitoring at the facility shall be conducted in accordance with General Condition XXX.B., of the License for this facility.

b. Surface water levels shall be measured at the staff gauges located in Fish Lake, Lake B, Lake C and Lake D as shown on Drawing No. 23-1018-3002, entitled "McIntosh Power Plant, Monitoring Well Locations," prepared by Lakeland Electric, received September 14, 2012, during all ground water sampling events described in [Conditions #4.c., and #4.d.](#), to a precision of 0.01 foot. The water table surface elevation contour maps of the surficial aquifer shall be prepared for each set of water level measurements including the ground water surface elevation (using a consistent, nationally recognized datum) calculated for each monitor well and piezometer, and surface water elevations (using a consistent, nationally recognized datum) calculated for each of the above-listed staff gauges. The contour maps shall be submitted to the Department in the reports for the routine ground water sampling events [\[see Condition #10.a., below\]](#).

9. Leachate Sampling. As the closed northern landfill area and active southern landfill area were not constructed with a liner and leachate collection system, the facility is exempt from the requirements to collect leachate samples for laboratory analysis.

10. Water Quality Reporting Requirements. The results of each water quality sampling event conducted in proximity to the landfill disposal areas of the C.D. McIntosh, Jr., Power Plant to comply with this Attachment shall include Electronic Data Deliverable (EDD) reports that provide:

a. Required water quality monitoring reports and all analytical results shall be submitted in hard copy and electronically. Water quality monitoring reports submitted electronically shall be provided in Adobe ["pdf"] file format. The water quality EDD report shall be provided to the Department in an electronic format consistent with requirements for importing the data into the Department's databases as summarized on the Department's web site at:

<http://www.dep.state.fl.us/waste/categories/shw/pages/ADaPT.htm>.

Water quality monitoring reports shall be signed and sealed by a Florida registered professional geologist or professional engineer with experience in hydrogeological investigations, and shall provide the information required by Rules 62-701.510(9)(a)1 through 62-701.510(9)(a)10, F.A.C., including:

1. Cover letter;
2. Summary of exceedances and recommendations;
3. Ground water surface elevation contour maps for the surficial aquifer;
4. Chain of custody forms;
5. Water level measurements [ground water and surface water], water surface elevation table;
6. Water Quality Monitoring Certification, using Department Form #62-701.900(31);
7. Appropriate sampling information on Department Form #FD 9000-24 (DEP-SOP-001/01); and,
8. Laboratory and Field data, and error logs, as applicable. [In addition to the Adobe "pdf" file format, this data and associated error logs shall be submitted in an ADaPT-compatible, comma separated text file format.]

The report of results shall be submitted to:

- Department of Environmental Protection, Southwest District Office, Solid Waste Section, 13051 North Telecom Parkway, Temple Terrace, FL 33637-0926; [hard copy and electronic copy of results] and,
- Department of Environmental Protection, Solid Waste Section, 2600 Blair Stone Road, MS 4565, Tallahassee, FL 32399-2400 [electronic copy of results only].

b. The facility owner shall submit to the Department the results of analyses reported for each sampling event conducted at the facility by the following due dates:

1. **Condition #4.b.** - results of ground water "initial sampling events" shall be submitted **within 60 days from completion of laboratory analyses;**
2. **Condition #4.c.** - results of ground water routine semi-annual sampling events shall be submitted **within 60 days from completion of laboratory analyses and no later than January 15th and July 15th of each year** for the periods July 1 to December 31, and January 1 to June 30, respectively;
3. **Condition #4.d.** - results of ground water "expanded parameter list" sampling events conducted at 5-year intervals shall be submitted **within 60 days from completion of laboratory analyses and no later than January 15th every five years** [the initial report for the "expanded parameter list" is due January 15, 2013]; and,
4. **Condition #7.** - results of ground water verification events shall be submitted **within 60 days from completion of laboratory analyses.**

