Golder Associates

January 19, 2011

103-87579

Florida Department of Environmental Protection
ATTN: Mr. Al Linero, Program Administrator
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: DEP File No. 0930104-018-AC and PSD-FL-382A Permit Modification
Okeechobee Landfill, Inc.
Modification of Conditions of Permit No. 0930104-014-AC (PSD-FL-382)

Dear Mr. Linero:

Okeechobee Landfill, Inc. (OLI), a subsidiary of Waste Management (WM), Inc. of Florida, has received a request for additional information (RAI) from the Florida Department of Environmental Protection (FDEP) dated November 10, 2010, regarding the air construction permit application for the modification of the recently issued Prevention of Significant Deterioration (PSD) Permit No. PSD-FL-382 for the construction of additional flares and new landfill gas (LG) fueled combustion turbines along with a gas desulfurization plan (GDP) at the Okeechobee Landfill.

Each of the FDEP's requests is answered below, in the same order as they appear in the RAI letter.

Comment 1. ***Section III.A, Emission Unit Description:*** **Please provide a replacement language for the OLI comment made in the application that said, "According to OLI, the closure date (2012) of the Berman Landfill and the opening date (2012) of the Clay Farm landfill are no longer correct, are subject to revision at any time and OLI suggests these statements be deleted".**

Response: OLI believes it is not possible to determine the exact closure dates for each landfill, and believes it would be speculative to place actual dates in the permit. Therefore, OLI requests that this language be removed from the emissions unit description. OLI recommends the following replacement language:

Berman Road Landfill: This is an existing emission unit 208 acres in size.

Clay Farm Landfill: This is a new 639-acre landfill located in another portion of the overall existing stationary source. The maximum solid waste disposal rate at this landfill is specified at 7,000 tons per day (TPD) in the Solid Waste Permit No. 0247963-001-SC.

Comment 2. **Condition III.A.8 Continuous Emission Monitoring Procedure (OLI Comment): Please provide the alternative monitoring methodology and procedures for promptly returning the H2S CEMS to reliable operation. It appears the proposed submittal is the protocol to use daily H2S monitoring instead of the CEMS, not the alternative methodology for promptly returning the H2S CEMS to reliable operation. Also, please enumerate and explain the claimed redundancy in the proposed cost of the equipment. In the March 30, 2010 letter you estimated a range of $40,000 to 60,000 for the CEMS system; now the proposed cost is $150,000. We have reason to believe the cost of such an instrument is on the order of $25,000. Please explain the discrepancy?**

Golder Associates Inc.
6026 NW 1st Place
Gainesville, FL 32607 USA
Tel: (352) 336-5600 Fax: (352) 336-6603 www.golder.com

Response: As discussed with FDEP verbally, OLI is requesting that daily hydrogen sulfide (H_2S) sampling be conducted in lieu of a continuous emissions monitoring system (CEMS) for H_2S. OLI is not only concerned about the extremely high capital cost of such an instrument, but also is concerned about the reliability of such instrument, and ongoing operation and maintenance costs. OLI believes that the CEMS is in excess in light of the very low H_2S concentrations which will be present in the landfill gas after the sulfur removal system (<200 parts per million [ppm] as required by the permit). Actual H_2S concentrations are expected to around ppm.

The H_2S sampling and analysis protocol presented in the October 2010 application is an accurate, reliable method of H_2S monitoring approved by FDEP for use at a number of landfills. The minimum detection limit of the method is 100 ppm. Duplicate samples and analysis will be taken each day.

The stated cost of $150,000 for the H_2S CEMS is based on an actual cost estimate of $142,351 from Cameron, who has been awarded the contract to construct a major part of the proposed project. The cost estimate is a small part of a larger cost quote, which is not publicly available. As a result, OLI is unable to provide a detailed cost quote for this system. The e-mail message from Cameron is attached with this letter.

Golder has obtained a cost quote from CEM Solutions for an Ametek brand H_2S CEMS, the details of which are also attached to this letter. The cost of the Ametek systems is as follows:

Analyzer, rack, probe, and sample bundle	$60,000
Instrument rack	$2,500
Shelter	$14,000
Data acquisition system	$35,000

Therefore, the total cost is estimated to be $101,500. Even if a shelter was not ultimately required, the cost would still be $100,000.

Upon review of the cost quote FDEP had obtained from Applied Analytics, it was found that the cost of only the analyzer only is $24,500. The cost quote also includes a list of other items such as a shelter ($15,000) and sampling system (totaling $14,000). Note that this quote does not appear to include a data acquisition system (quoted at $35,000 by Ametek above). So the total cost of the system in the FDEP quote actually appears to be in excess of $70,000 (without shelter). Also, the quote has a qualifier that "This system is dependent on the entire gas stream composition." Therefore there are additional unknowns with this system. It is also questionable as to why the cost of the monitor alone is so much lower than the other quotes received.

OLI has also investigated the requirement and existence of H_2S CEMS systems at other landfills in Florida. Presented in Table 1 is a listing of the landfills and H_2S or sulfur dioxide (SO_2) monitoring requirements. The Brevard County Landfill is the only one such system in excistence. Note that the PSD air construction permit application for the landfill gas-to-energy (LFGTE) project at the Brevard County Landfill did not trigger a PSD review for SO_2, and continuous monitoring of H_2S content of the landfill gas is required to demonstrate compliance with the permit limit of the H_2S content claimed in the permit application. The proposed project at the Okeechobee landfill was already subject to PSD review for SO_2 (i.e., OLI was not taking a limit to "avoid PSD review"). The permit limit of 200 ppm H_2S content for the proposed project is based on the capacity of the landfill gas desulfurization system OLI proposes to install and not to avoid PSD review for SO_2. This statement is made to present a difference between the need to monitor the H_2S content in the landfill gas at the Brevard County landfill and at the Okeechobee landfill.

Please also note that the only LFGTE project in Florida utilizing gas turbines (Broward County Central Landfill) is only required to perform daily sampling. Other LFGTE projects in Florida that were subject to PSD review (Trail Ridge and Osceola Road), are only required to perform semi-annual testing for sulfur content in landfill gas.

OLI is requesting FDEP to re-consider the proposed continuous monitoring of H_2S content and to approve taking daily samples, for which a monitoring methodology was presented in the modification application submitted on October 10, 2010. It is noted that the H_2S monitoring protocol is the proposed backup monitoring method if ultimately an H_2S CEMS is required.

Thank you for consideration of this information. If you have any questions, please do not hesitate to call me at (352) 336-5600.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff

David Buff, P.E.
Principal Engineer

Salahuddin Mohammad
Senior Project Engineer

SKM/DB/edk

Enclosures

cc: D. Thorley, WM
J. Christiansen, WM

Professional Engineer Certification

1. Professional Engineer Name: **David A. Buff**
   Registration Number: **19011**
2. Professional Engineer Mailing Address...
   Organization/Firm: **Golder Associates Inc.****
   Street Address: **6026 NW 1st Place**
   City: **Gainesville** State: **FL** Zip Code: **32607-6018**
3. Professional Engineer Telephone Numbers...
   Telephone: **(352) 336-5600** ext. **21145** Fax: **(352) 336-6603**
4. Professional Engineer E-mail Address: **dbuff@golder.com**
5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here ☐, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here ☐, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

David A. Buff
Signature

1/19/2011
Date

(seal)

* Attach any exception to certification statement.
**Board of Professional Engineers Certificate of Authorization #00001670.

Table 1. H_2S Monitoring Requirements at Florida Landfills

Facility	Site Name	Permit No.	Permit Date	PSD Required?	Type of Engines	Emission-limited Pollutants	PSD Pollutants	LFG H_2S or Sulfur Monitoring?	Frequency of Monitoring	Test Method
Waste Management of Florida	Naples Landfill	0210051-014-AC	4/12/2010	No	8 CAT G3516s	NOx, CO, VOC, VE	--	Yes	Quarterly	EPA Method 16
Gulf Power Co.	Perdido Landfill Gas-to-Energy Facility	0330286-001-AC	1/7/2010	No	3 CAT 3520s	CO	--	No		
Charlotte County	Zemel Road Facility	0150075-004-AC	11/19/2009	No*	1.6 MW RICE (2)	NOx, CO, VOC, VE	--	Yes	S, Cl content; Initial & at renewal	Not specified
Sarasota County County Commissioners	Bee Ridge Landfill	1150090-006-AC	6/26/2009	No	2 CAT 3520s	None	--	No		
Brevard County	Central Disposal Facility	0090069-007-AC; PSD-FL-378A	3/16/2009	Yes	6 CAT 3520s	SO2, H2S	SO_2	Yes	S, Cl content; Initial & semi-annual; H2S CEMS	H2S not specified
Waste Management of Florida	Okeechobee Landfill	0930104-016-AV	8/22/2008	No	Flares	NMOC, CO	--	No	--	--
City of Jacksonville	Trail Ridge MSW Landfill	0310358-004-AC/PSD-FL-374	12/11/2006	Yes	6 CAT 3520s	NOx, CO, PM10, VOC, HCl, SO2, VE	CO, NOx, PM10	Yes	S, Cl content; Initial & semi-annual	Not specified
Waste Management of Florida	Broward Co.- Central Landfill	0112094-005-AV	5/28/2006	No	3 CT's w/LO-CAT	NOx	--	Yes	Daily	40 CFR 60.335(b)(10) or Gas chromatograph
Waste Management of Leon County	Springhill Regional Landfill	0630045-005-AC	5/3/2005	No	8 CAT 3516s	CO	--	No		
City of Jacksonville	East Municipal Solid Waste Landfill	0310318-004-AV	6/16/2009	No	4 CAT 3516s	None found	--	No		
Seminole Energy, LLC	Osceola Rd Solid Waste Manag. Facility	1170084-005-AC/PSD-FL-376	1/17/2007	Yes	6 CAT 3520s	NOx, CO, PM10, VOC, HCl, SO2, VE	--	Yes	S, Cl content; Initial & semi-annual	
Volusia County Solid Waste	Tomoka Farms Road Landfill	1270117-005-AV	10/17/2007	No	4 CAT 3516s	None	--	No		
Marion County Commissioners	Marion County Baseline Landfill	0830124-009-AV	8/4/2010	No	2 CAT 3520s	VE	--	No		
Marion County Commissioners	Marion County Baseline Landfill	0830124-008-AC	10/7/2009	No	1 CAT 3520	VE	--	No		

* IF H_2S sampling and analysis indicate SO2 emissions >250 TPY, PSD review would apply.

From: Henderson, John [mailto:John.Henderson@c-a-m.com]
Sent: Friday, November 05, 2010 4:41 PM
To: Thorley, David
Subject: H2S Analyzer

David,

As we discussed on the phone today, the installed cost for one H2S analyzer is $142,351. Please note that this cost is the installed cost, and includes the sampling system, rack, rain enclosure, electrical hook-up, data collection system, etc.

Thanks,

John

John Henderson
Account Manager
Custom Engineered Systems

CAMERON

Cameron
11210 Equity Drive, Suite 100
Houston, TX 77041
Tel 713.895.4891
Cel 281.381.5949
Fax 713.849.8973
john.henderson@c-a-m.com

From: Jeremy Johnson [mailto:jeremyj@cem-solutions.com]
Sent: Thursday, December 16, 2010 4:44 PM
To: Buff, Dave
Subject: RE: H2S Analyzer Costs

Dave,

Sorry for the delayed response. It took a while for Ametek to get back to me.

The system will run approximately $60,000.00 for the analyzer, rack, probe and sample bundle.
Instrument rack: $2500.00
Shelter w/AC, 6X8X8 (if required): $14,000.00
DAS: $35,000.00

Some information is attached regarding the analyzer, etc. The picture is of a Div. II system

Let me know if you need anything else.

Thanks,

Jeremy A. Johnson
President
C.E.M. Solutions, Inc.
1183 E. Overdrive Circle
Hernando, Florida 34442
Ph: 352-489-4337
Fax: 352-489-4801
email: jeremyj@cem-solutions.com

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Model 933RM UV H_2S Analyzer

The Need

The measurement of hydrogen sulfide (H_2S) in natural gas is a critical quality control measurement. For many years lead acetate tape has been a very common technology for making this measurement. This approach results in a relatively slow speed of response and high maintenance effort associated with frequent change-out of tape cassettes. Additional problems associated with lead acetate paper tape analyzers is the inherent difficulty handling H_2S overload conditions during process or pipeline upsets, sensitivity of the technology to ambient conditions and used cassette disposal (toxic lead content). Tunable diode laser technology has recently been successfully applied to the analysis of H_2S in natural gas. This non-contact approach works well for concentrations greater than about 500 ppm. The AMETEK 5100 Series of tunable diode laser gas analyzers are a good choice for H_2S in natural gas at these relatively high H_2S levels.

AMETEK Western Research® provides a ultraviolet based analyzer, the Model 933 for H_2S analysis when present below 100 ppm in natural gas. The Model 933 uses AMETEK Western Research's proprietary frontal elution chromatography sampling technique, combined with the exceptionally high resolution, multi-wavelength AMETEK 900 Series UV optical bench to provide an accurate, interference free measurement of H_2S. The result is a unique low level H_2S analyzer that is designed to operate unattended for six to nine months, or longer. The Model 933 is now available in a rack mount version, for installation in General Purpose (GP) area metering stations or natural gas laboratories.

The Measurement

AMETEK Western Research's unique sample conditioning system uses frontal elution chromatography to separate and eliminate interfering species. This ensures an accurate analysis of the gas via direct-UV absorption spectroscopy. H_2S is the first absorbing specie to elute through the proprietary chromatography column and is measured by the UV photometer, followed by carbonyl sulfide (COS) and methyl mercaptan (MeSH), which are also independently measured. The sample analysis is terminated prior to the breakthrough of the interfering ethyl mercaptan. Two columns are employed in the 933.

While the first column is conditioning the gas sample, the standby column is automatically regenerated. AMETEK's unique frontal elution chromatography sampling system eliminates the need for carrier gas, as the natural gas is used as the carrier. The 933 may be configured to output the concentration values of just the H_2S or all three components. The Model 933 utilizes two onboard microprocessors that provide concentration calculations, data processing, calibration, sophisticated self-diagnostics, and column switching control.

Benefits

- Extended, unattended operation for 6 – 9 months and longer
- Self-recovery after high concentration H_2S events
- Fast response time to increasing or decreasing H_2S concentrations
- Multi-component capability (methyl mercaptan and carbonyl sulfide optionally available)
- No consumables, reagents, or disposables other than zero gas
- Rack-mount package for general purpose area mounting

Applications

- Gas sweetening (amine contactor overhead)
- Pipeline quality/custody transfer
- Synthetic natural gas (SNG)
- Blending stations

Model 933RM UV H_2S Analyzer

Performance Specifications

Methodology: Proprietary frontal elution sampling; nondispersive ultraviolet analysis for hydrogen sulfide (H_2S), carbonyl sulfide (COS) and methyl mercaptan (MeSH)

Full Scale Ranges: ppm ranges are standard; mg/Nm^3 and other ranges are available

Standard Range:
H_2S: 0 to 25 ppm min. to 0 to 100 ppm max.
COS option: 0 to 100 ppm min. to 0 to 500 ppm max.
MeSH option: 0 to 50 ppm min. to 0 to 250 ppm max.
Higher ranges are available upon request

Low Range:
H_2S: 0 to 5 ppm min. to 0 to 50 ppm max.
COS option: 0 to 25 ppm min. to 0 to 250 ppm max.
MeSH option: 0 to 15 ppm min. to 0 to 100 ppm max.

Accuracy:
Standard range: ±2% of full scale
Low range: ±5% of full scale

Repeatability:
Standard range: ±2% of full scale

Zero Drift:
Standard range: less than ±2% of full scale in 24 hours
Low range: less than ±5% of full scale in 24 hours

Response Time, Excluding Sampling System
H_2S: less than 30 seconds to 90% response
COS: less than 60 seconds to 90% response
MeSH: less than 180 seconds to 90% response

Zero Gas: Instrument zero purity carbon dioxide; UHP nitrogen, or UHP methane. Minimum auto-zero interval is once per 24 hours.

Sample Pressure Requirement: 830 kPag to 13790 kPag (120 psig to 2000 psig)

Typical Flow: 2.5 L/min. (5 SCFH)

Outputs: Up to 4 isolated 4-to-20 mA, loop or self-powered; 4 non-isolated 1 to 5 VDC; 5 independent sets of SPDT, Form C, potential free alarm relay contacts, 2 A at 240 VAC

Digital Communication: RS485 Modbus port; RS232/RS485 service port

Power Consumption: <500 W (analyzer only)

Power:
104 to 132 VAC, 47 to 63 Hz, <3A
207 to 264 VAC, 47 to 63 Hz, <2A

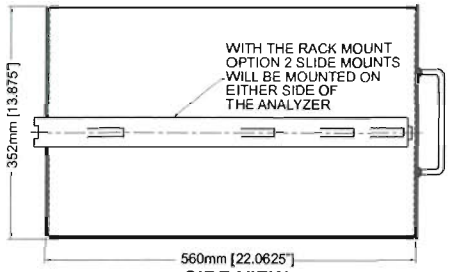
Ambient Temperature: 0°C to 40°C (32°F to 104°F)

Dimensions (H x W x D):
355 x 482 x 560 mm (13.975 x 18.975 x 22.063 in.)

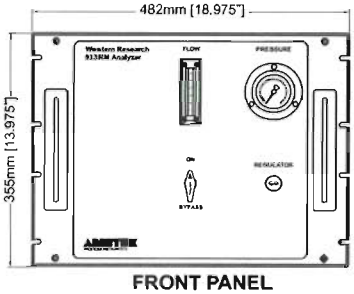
Weight: Approximately 28 kg (62 lbs)

Options: Gas/liquid (glycol) separating filter, other measuring ranges, COS and methyl mercaptan measurement, pressure compensation, and up to 4 V/I outputs

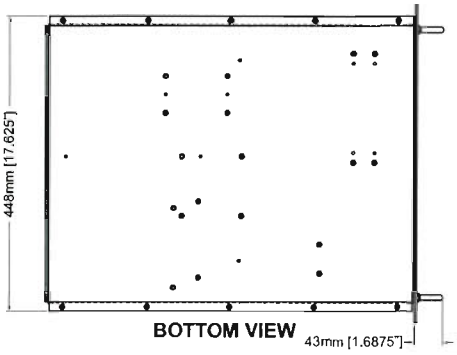
1. 0.6% maximum water content is based on a 35°C maximum water dew point temperature at 830 kPag (120 psig).



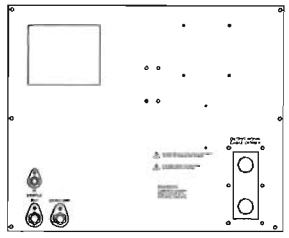
SIDE VIEW

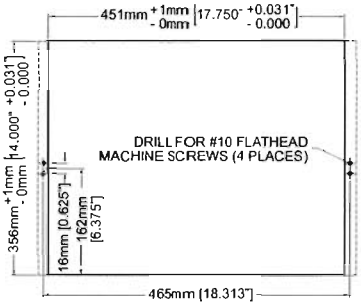


FRONT PANEL



BOTTOM VIEW


REAR PANEL



PANEL CUTOUT DETAIL

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