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OCD-SW-10-0374

Osceola County - SW
JED Solid Waste Management Facility
Permit # SO49-0199726-005 and SC49-0199726-004
WACS # 89544
Response to Methane Gas Migration Investigation

Dear Mr. McCash:

As requested during the May 20, 2010 JED Landfill CH₄ Exceedance meeting, the Department received the document titled Methane Gas Migration Investigation dated June 17, 2010. The document summarizes all actions taken regarding the issue to date, conclusions regarding the studies completed, and outlines further steps to be taken in efforts to better understand and control the methane gas migration issue. The following are the Department's questions and comments to the conclusions within the report.

General Questions/Comments:

1. What is the distance in feet between the temporary gas probes and the permanent gas probes?
2. In the Subsurface Migration via Waste section of the report, Golder states that they have observed the lingering presence of landfill gas still present below ground at a similar facility. Based on Golder's experience at this other facility, how long did it take for the gas concentrations present below ground to diminish over time?

Monthly Monitoring:

Conclusion: There does not appear to be strong correlation between seasonal or meteorological conditions and the methane content monitored in the probes.

Department Comments: The department agrees with this conclusion.

Probe Pair Trend Analysis:

Conclusion: Engineering judgment indicates that if the landfill were the sole methane source (of the apparent migration), that the methane content in the probes closest to the landfill (temporary probes) should indicate higher methane content than those further from the disposal boundary (permanent probes).

Department Comments: The Department agrees that the temporary probes should have higher methane concentrations than the permanent probes (when accumulation is not a factor). We do not agree that this is what is being seen in the data outlined in Table 2. The data and conclusions do not take into account the gas flow rate of the methane migration. The 'gas bubble' takes time to travel from the temporary probe to the permanent probe; therefore, the measurement at the temporary probe on 'day 1' cannot be compared to the measurement taken at the corresponding permanent probe on 'day 1'. Instead, the temporary gas probe should be compared to a measurement taken at the permanent probe at a later date based upon the gas flow migration rate. As seen by the lack of correlation between the temporary probes and the permanent

probes, the time it takes for a 'gas bubble' to travel from the temporary probe to the corresponding permanent probe is not quarterly or monthly.

Department Recommendation: The Department recommends taking measurements on a daily basis in the six gas probes listed in Table 2 for a limited amount of time. This will allow for a more accurate correlation of the temporary probes to the permanent probes and the ability to determine a rough estimate of the gas flow rate. It is recommended to purge the probes after measurements are taken in these six probes in order to minimize the influence of gas accumulation on the results.

Gas Sampling and Analysis:

Conclusion: Chlorinated VOCs tend to indicate a non-natural source and can be tracers of landfill gas.

Department Comments: The Department agrees that chlorinated VOCs can be a tracer of landfill gas but the effects of natural attenuation in soil and leaching into the groundwater of such VOCs must also be taken into account. The results outlined in the report are inconclusive because of the possibility for natural attenuation of chlorinated VOCs and the contamination of vinyl chloride seen in the ground water.

Department Recommendations: The Department recommends a fingerprint analysis of the flare gas and probe gas for constituents which are not impacted when moving through soil via adsorption, absorption or degradation. For example, the study Fingerprinting and Forensic Techniques for Landfill Gas Geochemical Assessment by Abu-Shaban and Centeno, 2006 recommends landfill gas fingerprinting by the analysis of H₂S and/or ¹³C/¹²C and ²H/¹H isotopes (see attached).

Potential Migration beneath Dry Retention Areas:

Conclusion: Golder and Omni Waste theorize that the elevated methane concentrations measured within the perimeter probes comes partially from biological sources (wetlands, buried organic matter, etc.) outside of the waste disposal area.

Department Comments: The Department accepts the possibility of biological sources affecting the methane content in the monitoring probes. However, we are not convinced it is the only source of methane in the perimeter probes.

Department Recommendations: Conduct a fingerprint analysis for H₂S and ¹³C/¹²C and ²H/¹H isotopes. Through this analysis, the difference between the landfill gas isotopes and any gas resulting from swamp gas can be analyzed and compared (reference Fingerprinting and Forensic Techniques for Landfill Gas Geochemical Assessment, Abu-Shaban and Centeno, 2006).

SUMMARY – Landfill Gas Migration:

Conclusion: Based upon site improvements, field monitoring data, and laboratory analysis, there does not appear to be a direct relationship in the methane content in the GMPs and landfill gas migration.

Department Comments: The analysis conducted to date is inconclusive. Additional data and analysis must be performed prior to concluding the source of methane in the monitoring probes.

Proposed Actions:

1. Perform additional laboratory analysis of all of the probe pairs (i.e. TGP-1 and GP-10, TGP-2 and GP-14, TGP-3 and GP-18) for the full suite of organics monitored during the 2008 and 2009 sampling events. Additionally, samples from probes GP-11, GP-15, GP-19, GP-21, and GP-22 will be analyzed as well to compare the results from historical sampling. Research the available literature to determine if additional parameters that may be helpful in confirming whether another source of methane is impacting the probes should be added to the analysis.

Department Comments: The Department recommends a fingerprint analysis of the flare gas and probe gas for constituents which are not impacted when moving through soil via adsorption, absorption or degradation.

2. Connect the leachate collection sump manhole risers and any adjacent leachate cleanout risers to the GCCS.

Department Comments: Acceptable.

3. Investigate the cap integrity at the Cell 4 sump area and other areas at the base liner and closure cap liner tie-in locations.

Department Comments: Acceptable.

4. Determine the total organic content using method 415.1 in the soil (vadose/smear) upgradient and downgradient of the GMPs to trend TOC in relation to the probes.

Department Comments: Acceptable.

5. Increase the collection efficiency of the GCCS (increased vacuums at selected wells) and monitor for any influences at the temporary and permanent probes.

Department Comments: Acceptable.

6. Install a series of two temporary groundwater piezometers in various locations in the dry retention areas near selected GMPs. The temporary piezometers will be screened at different intervals to assist in determining whether saturated conditions exist in underlying soils when there is standing water in the dry retention area.

Department Comments: Acceptable.

7. Continue monitoring the temporary and permanent probes on a monthly basis and note any trends that develop.

Department Comments: The Department recommends taking measurements on a daily basis in the six gas probes listed in Table 2 for a limited amount of time. This will allow for a more accurate correlation of the temporary probes to the permanent probes and the ability to determine a rough estimate of the gas flow rate. It is recommended the probes be purged after measurements are taken in these six probes in order to minimize the influence of gas accumulation on the results.

8. Based on findings from the above listed activities, determine whether a new monitoring probe system or techniques should be proposed.

Department Comments: Acceptable.

Additional Actions Proposed by the Department (as discussed in the meeting May 20, 2010):

9. Install a wet ditch which goes to the water table along GP18, GP19 and GP20.
10. Install the next series of gas wells in cells 1-4.

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Please contact Gloria-Jean DePradine by telephone at (407) 893-3994 or by e-mail at gloria.depradine@dep.state.fl.us, or contact Kim Rush at (407) 893-2312 or by e-mail at kim.rush@dep.state.fl.us if you have any questions or need additional information.

Sincerely,



F. Thomas Lubozynski, P.E.
Waste Program Administrator

Date: July 6, 2010

Attachment: PowerPoint presentation: Fingerprinting and Forensic Techniques for Landfill Gas Geochemical Assessment, Abu-Shaban and Centeno, 2006

cc: Mike Kaiser, Omni Waste, MikeKaiser@wsii.us

FTL/gnd/kr