

SCS ENGINEERS, PC

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Mr. Ming-Tai Chao
NCDENR, Division of Waste Management
1646 Mail Service Center
Raleigh, NC 27699

RECEIVED
January 14, 2011 via an e-mail
Solid Waste Section
Raleigh Central Office

Subject: Response to comments, Permit Modification
Johnson County Landfill Gas Collection and Control System Project

Dear Ming-Tai Chao:

A solid waste permit modification for the installation of a voluntary landfill gas collection and control system (GCCS) was submitted to the Division of Waste Management (DWM), Solid Waste Section (SWS) on behalf of the Johnson County MSW and C&D Landfill Facility (Landfill). The parties involved in the voluntary GCCS project include Blue Source and SCS Engineers (the "Development Team"). The Development Team will finance, design, permit, build, commission, own, operate, and maintain the voluntary GCCS. This project is a "design-build" project.

Previously in North Carolina similar voluntary GCCS projects have been developed with minimal comments from the SWS. Past projects only required the applicable air permit for the construction and operation of the flare in accordance with the Division of Air Quality (DAQ), and a straight forward notification to the SWS. Based on our experience with the previous similar projects, the response letter from the SWS for the Johnston County project indicates a more active and enhanced role by the SWS for voluntary GCCS projects. Several comments in your letter we take exception with and do not know the regulatory basis for such comments.

This is a voluntary greenhouse gas emission reduction project and the proper operation of the gas collection system is needed for it to be successful. Therefore, the County and the Development Team have an inherent interest in keeping the system operating properly.

This response letter has been reviewed and approved by Johnston County. We are planning to begin construction in January and trust our responses herein will allow this project to move forward in a timely manner.

Your comments (contained in a letter dated December 9, 2010) are provided below in *italics* followed by our responses in **bold**.

1. *(LFG Extraction Wells, on page 2) Please address the following comments:*

- i. *Provide the construction project specifications as appendices of the permit application. The specifications include, but not limited to, gas well installation (safety, provisions to handle obstruction while drilling, etc.) and completion (well logs and decontamination), the gas well abandonment/capping.*

As stated above this project is a design-build project and as such, written specifications were not prepared. SCS will construct this system in accordance with their internal safety procedures that have been developed through SCS's experience in the design and construction of these systems at hundreds of landfills nationwide.

- ii. *The wells located in the active filling area are expected to encounter leachate due to the vertical expansions at the existing phases in the future. Therefore, the coarse aggregates backfilled between the borehole and well casing must be tested of the calcium carbonate content and the grain size analysis to confirm the aggregate gradations. The maximum amount of the calcium carbonate content must be specified in the specification. The specification shall also include test methods and frequencies of the grain size analysis and measurement of calcium content.*

A grain size analysis is routinely performed by SCS on design-build projects. Grain-size testing may be performed as deemed necessary by the Certifying Engineer. A note that addresses grain size testing will be added to Drawing No. 4.

SCS is unaware of any LFG extraction well that was properly designed, installed, and maintained that has been impacted by leachate reacting with the well aggregate backfill. Based on review of the local aggregate supply, there is no concern with calcium carbonate content in the well backfill materials planned to be used. In our professional opinion, we do not feel testing the aggregate backfill for calcium carbonate content is needed.

This project is voluntary and only benefits the parties involved if it maximizes the safe recovery of LFG.

- iii. *Prior to installing extraction wells, if JCL is accepting and has accepted asbestos containing materials....report.*

The Health Hazards Control Unit of the Division of Public Health has been contacted and provided the required documentation. A copy of the documentation and approval will be included in the construction documentation report.

- iv. *In addition to the extraction gas wells, the coordinates of the other LFGCCs components including the alignment of the header pipe, buried control valves, and sumps must be surveyed by a surveyor licensed in the State of North Carolina; and the final locations must be presented in the as-built drawings. Please add these requirements to this section.*

Although we are unaware of any solid waste regulation that requires this survey, SCS will survey pertinent components of the GCCS. The components will be shown on the as-built drawings. GCCS components may be field located using GPS and/or the services of a licensed surveyor.

2. *(LFG Header and Lateral Piping on Page 3) Please address the following concerns:*

- i. *Please describe the estimated gas flow rates and capacities of the current and future LFGCCs based on the described SCS model.*

A calculation for sizing the proposed current primary header pipes has been added to the permit modification submittal. Calculations for future pipes are not available.

- ii. *Please describe the existing closure cover system at Phase 3 and 4 –clay liner, synthetic composite liner, or two-foot thick soil layer.*

Phase 3 was closed in accordance with the pre-1998 regulations with a 2-ft thick soil cover and a small top portion which includes a GCL.

Phase 4 does have a final cover system which consists of a flexible membrane liner (FML) covered by 18” of vegetative soil. No drilling will be performed in Phase 4. Pipe installation will only occur within the 18” soil layer.

- iii. *If the prescribed cover system (clay liner or synthetic composite liner) should be damaged while excavation of trench, what provisions (repair approaches, QC testing methods and frequencies, etc.) are there to ensure the final cover system can be properly restored? Please clarify.*

In the unlikely event the prescribed cover system is damaged in Phase 4, the final cover will be prepared in like and kind in accordance with the original design plans and CQA plans.

- iv. *Will the condensate flow by gravity in the header/lateral piping? If so, please specify the minimum pipe slope/gradient (post settlement).*

Yes, condensate will flow by gravity within the header/lateral piping. The typical slope is 3 percent. The minimum slope is 1 percent. A note has been added to Drawing 3 to clarify slope/gradient requirements.

Calculating potential settlement for purposes of LFG header/lateral design is cumbersome, burdensome, and does not guarantee future settlement will not impact condensate movement. If future settlement impacts the operation of the header/lateral pipe, the watered-in pipes will be repaired or replaced.

- v. *Please provide the specification for testing leakage and air-tightness of the solid piping (header and leachate/condensate piping).*

As previously stated technical specifications were not prepared for this project since it was structured to be a design/build project. The standard pressure testing guideline we use at SCS (and will use on this project also) is pressurizing gas and leachate piping to 5 psi for 4 hour. This procedure will be added as a note to Drawing 3.

- vi. *To mitigate nuisances (such as vector, odor, etc..) and maintain dry condition of the open trench, please specify (a) the maximum length of trench (such as 200 feet) may be opened in advance of pipe installation in the landfill units and (b) the open trench shall be backfilled at the end of each workday.*

The maximum length of trench open at one time will be limited to 1,000 feet. All trenches must be backfilled at the end of the day. Both of these guidelines are standards in the industry and will be followed by SCS during construction.

3. *(Condensate Management, on Page 3) Please address the following concerns:*

- i. *Does the sump pump have overflow alarm/prevention and auto shut off devices, which can't be found in the Condensate Sump Detail on Drawing No. 6 of 6?*

No.

- ii. *If the answer in the comment i in the subparagraph is "No". Please describe the spill prevention plan. The Phases 3 & 4 are unlined landfills; therefore, the condensate can't be drained back to the wastes in these two areas in compliance the requirement stated in Rule .1626(9)(a)(2).*

There is no spill prevention plan and in our professional opinion a spill prevention plan is not necessary because of the design of the sump. If the pump should fail, condensate will collect in the sump and eventually cause a "blockage" in the header pipe. The blockage will essentially prohibit landfill gas from moving through the sump; thereby stopping the production of condensate. The sump is deep enough to prevent the possibility to over flow with condensate.

- iii. *Pursuant to Rule .1626(9)(a)(2), the force mains inside the unlined landfill footprint must be dual contained. Please revise the context accordingly.*

We agree. A note was added to Drawing No. 3.

- iv. *Will there be scheduled or routine inspection of the condensate sump? This inspection plan can be incorporated into the existing Operations Plan.*

Prior to operating the GCCS, Johnston County will modify their existing Operations Plan to cover routine inspection activities for components of the GCCS in accordance with the solid waste regulations.

4. *(Blower/Flare Station, on page 3) Please describe the LFG control system and emergency shutdown of the system.*

SCS is not aware of this request from SWS on any previous GCCS installed in North Carolina. The flare manufacturer provides a comprehensive Operations and Maintenance Manual that contains information of the control systems, emergency shutdowns, and maintenance requirements. These manuals are extensive and specific to the system installed at the landfill.

The blower/flare station planned for this landfill will have a safety interlock system that will automatically shutdown the blower if no flame is present in the flare. Providing the complete system design and emergency shutdown procedures in this response would be extensive. When the blower/flare station is installed, a copy of the operation and maintenance manual, which includes emergency shut-down procedures, will be kept on-site.

The construction and operation of the flare is permitted through the NCDENR, Division of Air Quality. A copy of the Permit-to-Construct application and DAQ approvals will be included in the Construction Documentation Report.

5. *(Existing Permitted Cap, on page 4) The DWM records show the Phases 3 and 4 were originally proposed to close by constructed two-foot-thick soil. On August 4, 1998 DWM approved the alternative final cap design for Phases 3 and 4 which included for Phase 4, on top portions of the landfill, a geomembrane will be installed; for Phase 3, on the top portion, a GCL will be installed. Soil will be used on the side slopes. In 1999 the construction completed; and the deck portion of the Phase 3 cover system consisted of a GCL and drainage composite layer overlain by 18-inch thick top soil. Phase 4 cap consisted of 12-mil geomembrane overlain by 18-inch thick top soil. Based on the findings the SWS requests County address the following concerns:*

- i. *The plan proposes that the header pipe trench will be 2 to 3 feet deep and installed above the synthetic liner with the vegetative soil layer as described in this section, LFG Header and Lateral Piping” and on the “Pipe Trench Detail” – Drawing no. 5 of 6. Since the vegetation layer is approximately 18-inch thick, please explain how the proposal can be implemented in the field without damaging the liners?*

Where header pipe is installed over areas with final cover, the pipe will be installed above the FML or GCL, regardless of soil depth. Additional grading may be necessary in areas where the soil layer is approximately 18 inches to ensure proper storm water runoff and management.

- ii. *Since gas extraction wells will be installed in the Phase 3 & 4 areas, the synthetic cover systems (FML and GCL) will likely be penetrated, if wells are not located on side slope areas. Therefore, please provide details of the connections (boots) and seals around the well casing and liners on Drawing 4 of 6.*

No extraction wells are proposed in Phase 4. There are existing wells in this phase that will be used for LFG extraction. In addition, there are existing horizontal collectors installed underneath the Phase 4A bottom liner system that will be used for LFG extraction.

All wells installed in 3 will be located outside the final cover limits and no GCL will be penetrated.

- iii. If the portions of the liners are expected to be damaged or removed during the trench excavation, please provide specifications for restoration of cap (final cover) including material, construction procedures, & QA/QC testing (methods and frequency) which are consistent with the previously approved closure plans.*

No portion of the liners is expected to be damaged or removed during any activities associated with this project. If damage does occur, the liners will be repaired according to the design plans provided by RSG Engineers.

- 6. Please provide a section that describes how the operating LFGCCs and LFGTE project will properly be coordinated with the active fill operations. The section needs to include, but not limited to the following information:*

We do not feel adding a “section” to the permit modification submittal to address this comment should be required. We offer the following responses to provide clarity to the SWS:

- i. Restricted access and security to the blower/flare station, engines, and apparatus.*

The landfill is restricted to the public; therefore the GCCS will be restricted to the public.

A fence will be installed around the blower/flare station.

- ii. A detailed emergency response plan for a landfill fire and/or natural disaster. The plan should include provisions to train landfill employees in the proper response to a fire or inclement weather, specifically step to be taken concerning the LFGCCs and LFGTE.*

The blower/flare station is designed with an automatic safety interlock system that will shut the system down in case of irregular operation. Additionally, the blower/flare station will incorporate a system to alert the County, SCS field personnel, and BlueSource if a malfunction occurs. County Management personnel are trained in emergency response and crisis management.

- iii. Descriptions of how the presence of the gas collection system will be coordinated with the operation of the landfill units. For example, will gas well be vertical extended in the active cell in coordination with the fill operation in the future vertical expansion? Protection measures to be implemented to protect the wells from filing operation.*

The wells proposed for this project are at or near final grade. In the event a well needs to be raised, the well will be raised in accordance with industry standards and future well expansions will be coordinated with landfill operations.

- iv. *Descriptions of the routine maintenance requirements of the LFGCCs and LFGTE project.*

SCS is not aware of any regulation that requires the County to provide this information. Routine maintenance requirements are not available at this time.

The LFGTE project is still in the planning process, therefore no information is available at this time.

- v. *Descriptions of the party (County or the contractor) will be in charge of the operations of the LFGCCs and LFGTE and operator's credentials. If County will contact third party to operate & manage the LFGCCs and LFGTE, please describe the contractor responsibilities and contact information. It is advised that the SWS will hold the County responsible, as permittee of the landfill, for any problems or violations at the landfill, even if the problems or violations are performed by a contractor on the property.*

This information is not available at this time. Once the systems are constructed and operational, they will be operated by a qualified company. The County is aware of their responsibility as the permit holder for the Landfill.

- vi. *Record keeping requirements pertain to LFGCCs and LFGTE; records and reports must be placed in the facility operating records ready for agencies' audit.*

Record keeping requirements for the flare are stipulated in the Permit to Construct provided by NCDENR Division of Air Quality and will also be provided in the facility's Title V Air Operating Permit. All record keeping requirements contained in these documents will be maintained in accordance with the regulations.

SCS is not aware of any other regulation that requires record keeping for voluntary GCCS. Once the facility is under the jurisdiction of the NSPS, the NSPS record keeping requirements will be followed.

It should be noted that a sophisticated system control and data acquisition system is planned for this system to record numerous data in order to qualify for a greenhouse gas emission reduction project and for the Federal greenhouse gas monitoring requirements.

7. *Provide a section describe how the installation and presence of the LFGCCS will be coordinated with the closure of the existing units. Or, should the operating of LFGCCs be extended to the post-closure period of the landfill, the existing Post Closure Plan for JCL must be modified by adding a new plan defining the steps necessary to*

decommissioning the wells, piping (.), sumps, and the blower/flare station at the end of their useful life. The costs associated with the decommissioning activities must be added to the cost estimates for either closure or the post-closure cares. JC must rectify the final cost amounts in the annual financial assurance.

We do not feel adding a “section” to the permit modification submittal to address this comment should be required. We offer the following responses to provide clarity to the SWS:

When portions of the landfill are closed, the presence of the wells will be considered and proper engineering performed. At this time, it is not practical to address landfill closures for a GCCS installation.

Costs associated with the gas system will be added to the closure and the post closure financial assurance estimates by Johnston County, as needed, and in accordance with the solid waste regulations.

8. *Please describe the construction completion report which will be signed, sealed, and certified by a professional engineer registered in the State of North Carolina and submitted to the DWM after the project is completed. In a minimum the report must include:*
 - i. *Brief descriptions of the project activities, scheduled and all involved parties.*
 - ii. *Descriptions of variances or deviations from the proposed plan*
 - iii. *Copies of approval letters (including the one described in Comment No. 1.iii) and/or permit documents*
 - iv. *As-built drawings including survey coordinates of gas wells, valves, sumps and piping gradient.*
 - v. *Well completion logs and final well completion schedule.*
 - vi. *Certified pipe test results.*
 - vii. *QA/QC testing report for the cover restoration, if required.*
 - viii. *A series of color photographs to document the major project features.*
 - ix. *Operation, Maintenance, and Inspection Plan for LFGCCs and LFGTE.*
 - x. *Provide a schedule for submitting the construction completion report. The SWS suggests a 30-day after the construction is complete.*

A Construction Documentation Report will be prepared to include the above referenced items with the exception of comment ix. A Plan will be kept on site that includes information related to operation, maintenance, and inspection of the GCCS. As stated previously, nothing is available for the LFGTE yet.

Upon approval of the construction completion report, the SWS will grant County an authorization to operate LFGCCs and/or LFGTE.

The blower/flare station will be installed, constructed, and operated in accordance with the DAQ regulations and the facility's Title V Permit. We are not aware of any specific solid waste regulation that requires authorization by the SWS for operation of a voluntary GCCS.

From a practical standpoint, as soon as the GCCS is completed, it needs to be operated. The SWS cannot expect all of the contractors (electrical, flare, general) to leave the site, wait on approval from SWS to operate, and then re-mobilize back to the site weeks later to turn the system on.

It is our position that the flare can operated as soon as it is installed in accordance with the terms and conditions contained in the Permit to Construct issued by the NCDENR DAQ and waiting for "approval" of the Construction Documentation Report by the SWS is not needed.

9. *During the course of the project, what provision are there to prevent the disturbed soil cover from erosion due to stormwater runoff and to restore vegetation covers? Please clarify.*

SCS will prepare an Erosion & Sediment Control Plan prior to the construction of the project in accordance with local and State requirements. Standard E&S practices such as silt fencing will be used where needed. The Landfill has an E&S plan and has already implemented this plan for the entire Landfill facility.

10. *(Drawing No. 4 of 6) Please address the following concerns:*

- i. *Provide the proposed gas extraction wells – EW402, EW403, and EW404 data to the "Well Schedule" Table.*

EW402, EW403, and EW404 are existing wells, so adding data to the Well Schedule is not needed.

- ii. *In the "Well Schedule" Table, the data of "baseliner elevation" for the gas extraction wells – EW405 through EW412 are not provided (or not available) but the well depth of 41 feet is pre-selected for each above –mentioned well. It is advised that the assumption for selection the proposed well depth is noted on the drawing.*

Noted.

Mr. Ming-Tai Chao
January 14, 2011
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A revised permit modification submittal with the permit drawings will be submitted following your review on our responses. If additional information is still needed by the SWS, maybe a meeting to discuss these items would be more efficient. If there are any questions, please contact either of the undersigned at 704-504-3107.

Sincerely,



Steven C. Lamb, PE
Vice President
SCS ENGINEERS, PC



J Morgan, PE
Senior Project Professional
SCS ENGINEERS, PC

scl/jm

cc: Ed Mussler, DWM, SWS
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