

MEMORANDUM

TO: Kathy Tarbuck, P.E.; Project Manager - Technical Services
FROM: Stephen E. Farrar, P.E.; Environmental Engineer Specialist - Technical Services
DATE: April 1, 2016
SUBJ: Juniper Ridge Landfill Expansion
Cells 11 through 16
File No. 2112.2005

As requested, we have completed an engineering review of the following document:

Response to Department Staff's Review Comments on the Juniper Ridge Landfill Expansion Application - Exhibit C - BGS and NEWSME's Response to DEP's January 20, 2016 Technical Memorandum March, 2016

The document was prepared in response to recommendations we provided in a memorandum dated January 20, 2016. The status of the individual items in our memorandum will be addressed below with items that require further actions, now or in the future, typed in **bold** print. The outline format of our January 20 memorandum will be followed.

- I.A. Item resolved. We will continue to evaluate the costs provided with the annual operations reports.
- I.B. Item resolved. The recommended assessment has been completed and is acceptable.
- I.C. Item resolved. The recommended clarifications have been provided.
- I.D. Item resolved. The wastewater treatment facility at the Old Town mill will serve as the primary leachate disposal location.
- II.A. Item resolved. The ten foot separation is based on time of travel calculations.
- II.B. Item resolved. The suitability of 12-inch barrier soil lifts will be determined by project specific test pads.
- II.C. Item resolved. The calculated strains are minimal.

- II.D. Item resolved. The pond will not be used for leachate storage without Department approval.
- II.E. Item resolved. The Table has been updated as recommended.
- II.F. Item resolved. The recommended clarification has been provided.
- II.G. Item resolved. The Table has been revised as recommended.
- II.H. Although phased final closure is proposed, NEWSME Landfill Operations, LLC (NEWSME) intends to propose a schedule for completing final closure at least one year prior to the cessation of waste placement. They anticipate that the schedule may extend over a “several year period”. **We agree that extending the closure schedule beyond one year can be technically justified provided the extension is limited to a reasonable timeframe and an exposed geomembrane intermediate cover is used and properly maintained.**
- II.I. Item resolved. An appropriate detail has been provided.
- II.J.1.a. Item resolved. The specification has been revised appropriately.
- II.J.1.b.i. Item resolved. The recommended revisions have been made.
- II.J.1.b.ii. Item resolved. The recommended revisions have been made.
- II.J.1.b.iii. Item resolved. The recommended revisions have been made.
- II.J.1.c. Item resolved. The recommended revision has been made.
- II.J.2.a.i. Item resolved. An appropriate clarification has been provided.
- II.J.2.a.ii. Item resolved. The recommended specification has been added.
- II.J.2.a.iii. Item resolved. The specification has been revised as recommended.
- II.J.2.b. Item resolved. The specification has been revised as recommended.
- II.J.3.a. Item resolved. An appropriate clarification has been made.
- II.J.4.a. Item resolved. The specification has been revised as recommended.
- II.J.5.a. Item resolved. The specification has been revised as recommended.
- II.J.5.b. Item resolved. The leak location survey will be conducted on the primary liner only.

- II.J.6.a. Item resolved. The specification has been revised as recommended.
- II.J.6.b. Item resolved. The specification has been revised as recommended.
- II.J.6.c. Item resolved. The frequency of re-testing of failed interface tests will be determined by the CQA project manager based on the results of the initial tests.
- II.J.7.a. Item resolved. The pipe is being specified appropriately.
- II.J.7.b. Item resolved. The specification has been revised as recommended.
- II.K.1. Item resolved. The recommended change has been made.
- II.K.2. Item resolved. The recommended clarification has been provided.
- II.L.1. Appropriate references justifying the reduction factors for chemical clogging, biological clogging, and intrusion have been provided. **Reference is made to SIM testing completed by TRI that concluded that a reduction factor for creep as low as 1.1 is justified at normal loads of 15,000 psf. We request a summary of the referenced testing program.**
- II.L.2. Item resolved. The typographical error has been corrected.
- II.M. Item resolved. The typographical error has been corrected.
- II.N.1. Item resolved. **Installation details for the transducers will be prepared and included with the construction drawings for Cells 12 and 13.**
- II.N.2.a. Item resolved. The recommended revision has been made.
- II.N.2.b. Item resolved. A suitable conceptual detail has been provided.
- II.N.3. Item resolved. **Transducer installation details and specifications will be handled as part of the contractor submittal process for the individual cells.**
- II.N.4. Item resolved. The note was correct.
- II.N.5. Item resolved. The recommended details have been provided.
- II.N.6.a.i. Item resolved. The recommended details have been provided.
- II.N.6.a.ii. Item resolved. The recommended details have been added.
- II.N.6.a.iii. Item resolved. The recommended detail has been provided.

- II.N.7. Item resolved. The inadvertently omitted cross-section has been added.
- II.N.8.a. Item resolved. It is confirmed that the intent is to 'box' cut into the till.
- II.N.8.b. Item resolved. The recommended dimensions have been added.
- II.N.8.c. Item resolved. The recommended dimension has been added.
- II.N.8.d. Item resolved. The recommended specification has been added.
- II.N.9. Item resolved. An appropriate explanation has been provided.
- II.N.10.a. The inlet invert elevation of Culvert C-2BA has been correctly revised. **The slope has been revised to read 0.08% but should be 0.008% according to Table 7-1.**
- II.N.10.b. Item resolved. The recommended specification has been added.
- II.N.11.a. Item resolved. The recommended specification has been added.
- II.N.11.b. Item resolved. The recommended specification has been added.
- II.N.11.c. Item resolved. The recommended clarification has been made.
- II.N.11.d. **Veneer stability will be addressed during the detailed design for the individual closure projects.**
- II.N.12.a. Item resolved. The recommended clarification has been made.
- II.N.12.b. Item resolved. The recommended specification has been added.
- II.O.1. **Veneer stability will be addressed during the detailed design for the individual closure projects.**
- II.O.2. Item resolved. The recommended stability evaluation has been completed and the factors of safety are acceptable.
- II.O.3. Item resolved. Data from more recent construction projects at the Juniper Ridge Landfill have generally shown higher strength envelopes than those specified.
- II.O.4. Item resolved. The recommended sensitivity analysis has been completed and the factors of safety are acceptable.
- II.O.5. Item resolved. The recommended settlement point labels have been provided and we concur with the conclusions of the settlement analysis.

- II.P.1. Item resolved. Section 4.0 of the LFG System Expansion Design Report does note that the LFG collection and transmission infrastructure is designed for the projected LFG flow rate at 40% CH₄. References to 50% methane were made only for comparison purposes.
- II.P.2. Item resolved. The recommended comparison has been made and indicates that the LandGEM Model is reasonably well calibrated.
- II.P.3. Item resolved. The intermediate cover has been removed from the LFG collection trench design.
- II.P.4. Item resolved. The reference has been clarified.
- II.P.5.a. Item Resolved. The K and L₀ values used in the LandGEM Model were developed based on facility specific information. As noted with Item II.P.2. above, the Model appears to be reasonably well calibrated.
- II.P.5.b. Item resolved. The recommended calculations have been completed and they indicate that the external header pipe is appropriately sized.
- II.P.5.c. Item resolved. The recommended calculations have been completed and they indicate that the internal header pipes are appropriately sized.
- II.P.6.a.i. Item resolved. The recommended plan has been added to the Drawings.
- II.P.6.a.ii. Item resolved. This recommendation was for consideration only. The intent is to replace deep laterals with new shallow laterals at the time of final closure.
- II.P.6.b.i. Item resolved. **Critical pipe crossings will be identified on the construction-level drawings.**
- II.P.6.b.ii. Item resolved. **Critical pipe crossings will be identified on the construction-level drawings.**
- II.P.6.c.i. Item resolved. The appropriate clarifications have been made.
- II.P.6.c.ii. Item resolved. The recommended additions have been made to the Drawing.
- II.P.6.d. Item resolved. An appropriate explanation has been provided.
- II.P.6.e.i. Item resolved. The well bore seal is of adequate dimensions such that the weight of the overburden will be adequate to seal the interface provided the materials are installed in direct contact.
- II.P.6.e.ii. Item resolved. The Detail has been revised as recommended.

- II.P.6.e.iii. Item resolved. The Detail has been revised as recommended.
- II.P.6.e.iv. Item resolved. The Detail has been revised as recommended.
- II.P.6.e.v. Item resolved. The Detail has been revised as recommended.
- II.P.6.f.i. Item resolved. Adequate explanation for the knockout design has been provided.
- II.P.6.f.ii. Item resolved. The pump has been specified as recommended.
- II.P.6.g.i. Item resolved. The Detail has been revised as recommended.
- II.P.6.g.ii. Item resolved. The recommended perforation pattern has been specified.
- II.P.6.h. Item resolved. An adequate explanation for the Note has been provided.
- II.P.7. Item resolved. The specification has been revised as recommended.
- II.P.8. Item resolved. The recommended notification provision has been added to the Construction Quality Assurance Plan.
- II.P.9.a.i. Item resolved. The recommended revisions have been made.
- II.P.9.a.ii. Item resolved. The recommended revision has been made.
- II.P.9.a.iii. Item resolved. The recommended revisions have been made.
- II.P.9.a.iv. Item resolved. Appropriate clarifications have been made.
- II.P.9.a.v. Item resolved. The recommended revisions have been made.
- II.P.9.a.vi. Item resolved. The recommended revisions have been made.
- II.P.9.a.vii. Item resolved. The recommended revision has been made.
- II.P.9.b. Item resolved. The recommended revision has been made.
- II.P.9.c. Item resolved. The recommended revisions have been made.
- II.P.9.d.i. Item resolved. The recommended revision has been made.
- II.P.9.d.ii. Item resolved. The recommended revisions have been made.
- II.P.9.d.iii. Item resolved. The recommended discussion has been added.

- II.P.9.d.iv. Item resolved. The recommended clarification has been made.
- II.P.9.d.v. Item resolved. The recommended revision has been made.
- II.P.9.d.vi. Item resolved. The recommended revision has been made.
- II.P.9.e.i. Item resolved. The recommended revision has been made.
- II.P.9.e.ii. Item resolved. The recommended revisions have been made.
- II.P.9.e.iii. Item resolved. The recommended discussion has been added.
- II.P.9.f.i. Item resolved. The recommended discussion has been added.
- II.P.9.f.ii. Item resolved. The recommended discussion has been added.
- II.P.9.g. Item resolved. The Table has been revised as recommended.
- II.P.11.a. Item resolved. **Sheet C-101 will be updated to reflect existing conditions prior to the construction of Cell 11.**
- II.P.11.b.i. Item resolved. The recommended clarification has been made.
- II.P.11.b.ii. Item resolved. The recommended clarification has been made.
- II.P.11.b.iii. Item resolved. The recommended clarification has been made.
- II.P.11.c. Item resolved. **Transducer installation details and specifications will be handled as part of the contractor submittal process for Cell 11.**
- II.P.11.d. Item resolved. The recommended revisions have been made.
- II.P.11.e.i. Item resolved. It is confirmed that the intent is to 'box' cut into the till.
- II.P.11.e.ii. Item resolved. The recommended dimensions have been added.
- II.P.11.e.iii. Item resolved. The recommended dimension has been added.
- II.P.11.e.iv. Item resolved. The recommended specification has been added.
- II.P.11.f. Item resolved. The recommended dimension has been added.
- II.P.11.g. Item resolved. The recommended calculations have been provided and indicate that the 10"Ø riprap in the plunge pool will remain stable.

II.P.11.h.i. Item resolved. Although originally shown on the Cell 11 Infrastructure Development Plan as new wells the intent is to have well GW-22R, 32R, 41, 50, and 59 installed during development of infrastructure for Cells 9 and 10. The header connection will not be made during Cell 11 installation but at a future date. The Drawings have been revised accordingly. **The Cell 11 LFG Drawings will need to be updated prior to Cell 11 development to account for actual infrastructure development in Cells 9 and 10.**

II.P.11.h.ii. Item resolved. The wells were correctly shown as proposed on the Cell 11 LFG Drawings. The header connection will not be made during Cell 11 installation but at a future date.

II.P.11.i.i. Item resolved. Pipe boots are included on the LFG System Expansion Master Plan.

II.P.11.i.ii. Item resolved. The recommended revisions to the well schedule have been made.

III. Volume IV - Operations Manual

Items in this Section relate to the updated facility Operations Manual¹. NEWSME and their consultants have expressed general agreement with the Department's recommendations. **As we agreed at a meeting on January 29, 2016, these Items are to be responded to in their entirety by the end of April 2016 as part of an updated Operations Manual. Some of the responses were included with this transmittal and we will address them, including the proposed liner leakage action plan, along with the updated Operations Manual.**

cc: Dick Behr, C.G.
Victoria Eleftheriou, P.E.
Ken Libby, P.E.

¹ *Juniper Ridge Landfill Application - Volume IV - Operations Manual* Sevee & Maher Engineers, Inc., July 2015