

Meeting Minutes

Waste Management Disposal Services of Maine, Inc. (WMDSM) Crossroads Landfill and Maine Department of Environmental Protection Phase 14 Hydrogeology Conference Call Meeting

Date: April 30, 2020, 1:00 pm

Location: Remote, via Microsoft Teams

Attendees: Linda Butler, Gail Lipfert, Kathleen Tarbuck, Molly King – MEDEP
Kate Tierney – Office of the Maine Attorney General
Sherwood McKenney, Christopher Prucha – WMDSM
Mellissa Landon – Normandeau Associates
Alistair Macdonald, Brendan Lennon – Golder
Scott Luettich, Nick Yafrate – Geosyntec Consultants
Juliet Browne, Mathew Todaro –Verrill Dana LLP

Notes prepared by: K. Tarbuck, MEDEP

The purpose of the conference call meeting was to discuss hydrogeology related comments made by MEDEP on Volumes I and III of the Phase 14 Expansion Application. The Volume I MEDEP comments are dated February 14, 2020, a response from WMDSM is dated March 31, 2020, and follow-up MEDEP comments are dated April 13, 2020. The Volume III MEDEP comments are dated April 15, 2020.

The meeting agenda followed the discussion topics proposed by WMDSM (attached).

As an introduction, Sherwood McKenney provided that the reason for the conference call was to discuss the hydrogeology topics raised in the Phase 14 Application review. Alistair Macdonald added that the purpose is to understand the MEDEP's comments and respond appropriately with reasonable paths forward.

1. **Topic 1: Concerns related to desiccation features in the Presumpscot Clay**

Primary Related Comments: Volume 1: Comments 12d, 12e, 26b, 26d and Volume III: Comments 9, 16, 17b, and 25

- Gail Lipfert discussed that the potential for fractures in both the upper stiff and lower soft clay should be addressed, although there is a greater potential for fractures in the stiff clay.
- Alistair Macdonald stated that desiccation could occur in the upper stiff clay, but they hadn't seen evidence of fracture in the soft clay and they could provide background on this. He stated that even in the upper stiff clay, fracture observance was limited to areas where the clay is close to the ground surface, not where it is deeper and fully saturated.
- Gail Lipfert stated that not all fractures are desiccation related and observations are worth including in the submitted information. She noted that

4 boring logs included more descriptions than the others and photos would reinforce observations.

- Alistair Macdonald mentioned that no boreholes represented fractures or fissures. He also said that they checked with field staff on their observations.
- Gail Lipfert reiterated that the potential for fractures in clay should be addressed and that intersections are hard to identify in the Presumpscot clay.
- Alistair Macdonald questioned if she thought this was a problem across the footprint.
- Gail Lipfert did note that the maximum depth for soft clay was approximately 17 feet or so and that there is a thinner layer of Presumpscot clay in Phase 14 than in other areas of the existing landfill.
- Alistair Macdonald stated that it is like trying to prove the negative – that fractures don't exist.
- Gail Lipfert agreed and said it can't be proved that there are no fractures, but she stated the possibility of fractures should be acknowledged, also that concerns could be eased if time of travel could be determined for worst-case.
- Alistair Macdonald stated that they can present what they know, and that fractures are unlikely, particularly in soft clay and that more descriptions can be included.

2. **Topic 2: Restrictive Siting Criteria: Ch 401.1.C(3)(b) states that “The area within the solid waste boundary must be located on soils that contain sufficient fines and clay-size particles to minimize infiltration of leachate. The in-situ soils must have an undisturbed hydraulic conductivity less than or equal 1×10^{-5} cm/sec”.**

Primary Related Comment: Volume 1, Comment 26d

- Alistair Macdonald stated that there is ample evidence that the clay meets the criteria and mentioned specific locations and depths.
- Gail Lipfert said in some locations, it may suffice and be reasonable.
- Alistair Macdonald discussed hydraulic conductivity in the vertical and horizontal and the use of Shelby tube samples and permeability testing.
- Gail Lipfert said that slug tests determine horizontal hydraulic conductivity, but they are not for the vertical direction; and she discussed the interpretation of in-situ and “undisturbed”.
- Alistair Macdonald talked about the hydraulic conductivity of soils in place vs soils brought in.
- Gail Lipfert reiterated the need for determining vertical hydraulic conductivity on soils in place and that best way to do that is with a pumping test.
- Alistair Macdonald stated the pump test is not required based on what has been presented.
- Gail Lipfert said a pump test was asked for in the Juniper Ridge Landfill (JRL) expansion licensing process and results were used to confirm the hydrogeology.
- Alistair Macdonald stated that the pump test is not a simple process.

- Gail Lipfert noted the pump test would give information on vertical hydraulic conductivity.
- Alistair Macdonald commented that the use of Shelby tubes is standard practice.
- Gail Lipfert explained that a pumping test expands the area in which data is collected, it is not just a single Shelby tube or boring result.
- Linda Butler added that more information will help in decision making.
- Juliet Browne noted there are logistical issues with a pump test and mentioned scope of evidence.
- Alistair Macdonald listed pump test issues as including design, location, work plan, request for monitoring instrumentation, well installation, and timing.
- Sherwood McKenney summarized the permitting schedule, including relocating material prior to cell construction, with cell construction in 2022.
- Linda Butler noted that the DEP will conduct its review with whatever is submitted and that will be the basis for decisions.
- Chris Prucha asked what is the hydraulic conductivity in the stiff or soft clay and can existing soils be improved? What would be a solution vs a pump test?
- Gail Lipfert said options are allowed in rules, although a pump test answers more than adding fill.
- Linda Butler said MEDEP would need to discuss options internally.
- Alistair Macdonald pointed out that the sand above the clay layer will be removed so that there is no desiccation concern. The clays will be recompacted, creating in-situ soils.
- Gail Lipfert reiterated she strongly recommends a pump test, gaining more confidence in no fractures and information on vertical hydraulic conductivity.
- Alistair Macdonald asked about what is allowable under the rules and if an expanded proposal can be made. He also asked if a variance is needed.
- Scott Luettich stated that the design was the optimized configuration with the sump in the South part of the cells. They proposed to remove sand and backfill with 10^{-5} cm/sec clay where most of the soft clay is absent.
- Alistair Macdonald brought up the attached figure showing where sand is to be removed and compacted clay placed. He noted that they could do additional work to this proposal (scarifying clay and getting permeability, expanding clay under berms and elsewhere).
- Gail Lipfert mentioned that rules state in-situ soils must have 10^{-5} cm/sec.
- Juliet Browne stated that the imported clay will demonstrate 10^{-5} cm/sec, but she hears the MEDEP's view. WMDSM is looking at finding a practical way to address the issue. The imported material will meet the hydraulic conductivity and it would be needed to be confirmed where material is not brought in. There is time and cost associated with a pump test. Is a variance needed for an alternative plan?
- Scott Luettich noted that as an engineer, it is known that the 10^{-5} would be met if placing material. There is a large part of Cells A, D, and E proposed for imported material and there is confidence in the material.
- Linda Butler stated MEDEP would have to consider this internally.

3. **Topic 3: Time of Travel Analysis**

Primary Related Comments: Volume III: Comments 22, 23, 25, and 26

- Alistair Macdonald asked about the sensitive receptors.
- Gail Lipfert said an internal discussion will occur on what is a sensitive receptor in terms of groundwater in bedrock.
- Alistair Macdonald stated that the designed approach for time of travel was based on what was done at JRL. The closest location of downgradient water supply well in bedrock was the New Office Well.
- Alistair Macdonald said a sensitivity analysis could be done similar to JRL.
- Gail Lipfert said that proposal sounds good.
- Alistair Macdonald said it is unreasonable to evaluate a range since two things together happening at the same time won't occur. He suggested averaging out variations is appropriate.
- Gail Lipfert said she'd have to review the JRL analysis further.
- Scott Luettich mentioned that a sensitivity analysis with a determined range of values and a standard deviation on each side is appropriate and it shouldn't be a combination of all worst-case scenarios on top of each other.
- Gail Lipfert stated that there should be various ranges used and all combinations because it is unknown which would go together.
- Scott Luettich asked what would be done with the results since a landfill doesn't have that worst-case scenario.
- Alistair Macdonald stated that standard practice should be used and that not all situations exist. Ranges around the mean are more appropriate and accurate.
- Gail Lipfert said this will be discussed more internally.
- Chris Prucha mentioned that ranges are used in investigative work. These should be used or other referenced work. This is a more scientific approach with investigative data.
- Gail Lipfert mentioned that there is also other data available at the site.
- Alistair Macdonald stated that there are other wells and data, but not all the same clays. He mentioned that the time of travel starting point was based on sump locations and wanted concurrence that this was appropriate, notwithstanding MEDEP calculation concerns.
- Gail Lipfert stated this seemed reasonable.

ACTION ITEMS:

- MEDEP is asking WMDSM to consider doing a pump test.
- WMDSM is asking MEDEP to consider alternatives to the restrictive criteria and will submit a proposed scenario summary.
- A mutual understanding on the appropriate input parameters to a time-of-travel sensitivity analysis needs to be confirmed.
- MEDEP will respond to WMDSM regarding the sensitive receptor issue.