

Johnston Co. 51-01
2004

51012004



North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

April 28, 2004

Mrs. Joan A. Smyth, P.G.
G.N. Richardson and Associates, Inc.
14 N. Boylan Avenue
Raleigh, N.C. 27603

Re: Continued Ground-water Assessment at the Johnston County MSW Landfill and Proposed C&D Landfill, Permit Number 51-01

Dear Mrs. Smyth,

The Solid Waste Section has reviewed your recent submittal of April 13, 2004, regarding continued ground-water assessment in the proposed C&D Landfill area at the Johnston County MSW Landfill facility. Overall the plan appears satisfactory. Conditional approval is granted in accordance with the following conditions:

- Based upon Figure No. 1, it appears the proposed deep monitoring wells on the South side of the dike (those wells to be used as part of the pumping test) are to be located about 50 to 60 feet from the dike. If possible it would be better to locate these two wells somewhat closer to the dike. I realize that the location of the dike is not precise and that it is important to maintain the relative location of these wells in relationship with other wells and the dike. However to the extent reasonable, it would be better to try to locate these wells a little closer to the dike.
- At this time it is difficult to determine where future monitoring wells may be needed. The suitability of this area for C&D waste disposal has not yet been established. And the influence of the dike(s) on ground-water flow is not yet clear. This being said, it appears that two of the proposed shallow wells are in relatively good locations. Generally we try to avoid locating monitoring wells downgradient of sedimentation basins. Therefore it would be better to locate the proposed well shown at the Northeast corner of the sed basin to a location about 100 to 120 feet South of the location currently proposed, to a location just East of the sed basin and immediately North of the proposed C&D disposal area.
- It is not clear which wells are to be monitored for aquifer response as part of the pumping test. Certainly the deep well to be pumped and the other two deep wells in this area should be monitored. Wells PZ-5, PZ-6, PZ-7, MW-5A, and the new shallow well near the sed basin as referenced above should be monitored. If most of these wells show a response, then perhaps wells further out should also be checked, such as wells PZ-3A, PZ-4, and PZ-8.

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
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Mrs. Joan Smyth
Johnston Co. Landfill
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- Although the times proposed for the pumping test and recovery test would appear to be sufficient, if there has not been adequate aquifer response or if significant response is still occurring, then these times may need to be extended.

The Solid Waste Section approves the April 13, 2004, plan for additional ground-water assessment in the area of the proposed C&D Landfill area at the Johnston County MSW Landfill facility in accordance with the conditions stated in this letter. If you have any questions, please call me at (919) 733-0692, ext. 258.

Sincerely,

Bobby Lutfy

Bobby Lutfy
Hydrogeologist
Solid Waste Section

Cc:	Jim Barber	Solid Waste Section
	Mark Poindexter	Solid Waste Section
	Ed Mussler	Solid Waste Section
	Jaclynn Drummond	Solid Waste Section
	Cheryl Marks	Superfund Section
	Haywood Phthisic	Johnston County



North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

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March 16, 2004

Mr. Haywood Phthisic
Director of Public Utilities
Johnston County
P.O. Box 2263
Smithfield, N.C. 27577

RE: Ground-water Assessment at the Johnston County MSW Landfill
and Proposed C&D Landfill Area
Permit Number 51-01

Dear Mr. Phthisic,

The Solid Waste Section has reviewed the Revised Johnston County Landfill Proposed Future C&D Landfill Area Ground Water Assessment Report of January 2004, prepared by G.N. Richardson and Associates. The water quality assessment is still incomplete and there is insufficient information to make a determination regarding the suitability of the area for possible future use as a C&D Landfill disposal area. Please have G.N. Richardson and Associates respond to the following questions and comments:

While a snapshot of existing water quality in the area of concern has been provided, there is still quite a bit of information lacking toward providing a comprehensive assessment of water quality. How do the level of contaminants compare to the water quality standards? How do the levels of contaminants compare to background values? Are the levels increasing? Are the contaminants degrading? What is the fate and transport of the contaminants? What is the ground-water flow regime in the area? What are the horizontal and vertical dimensions of ground-water flow? Are there preferential flow pathways due to weathering, structural weaknesses, dikes...? What about contaminant transport through fractured bedrock? What are the ground-water discharge features and has surface water quality been degraded? What are the horizontal and vertical limits of the existing contaminant plume? Where is the existing waste boundary in relation to the piezometers? How fast and in what directions are contaminants migrating? How can existing contaminants be monitored, assessed, and remediated if the area should be developed as a C&D Landfill Unit?

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In addition to the larger conceptual questions regarding nature and extent and fate of contamination, there are a number of specific questions regarding the Revised Report of January 2004:

Pg 1 There is still some confusion regarding when ground-water monitoring began at the site. Our records indicate monitoring began in 1989 rather than 1994.

Pg 4 There is still a lack of clarity regarding the number of borings at the site. Is 49 the total number of borings ever drilled for the entire site? Which borings and piezometers are relevant for the assessment of the proposed C&D area? Figure 1 still indicates two piezometers designated PZ-3.

Pg10 While the presumptive remedy of a less permeable cover may reduce infiltration, it also affects hydrology. How does the less permeable cap influence the predictability of contaminant transport?

Pg10 It is not clear why wells MW-14D, 15D and 16D are referenced in this report on the proposed C&D area. (Normally all wells in the approved monitoring system are required to be monitored at least semi-annually.) The dikes associated with these wells are oriented perpendicular to ground-water flow, while the dikes mapped in the proposed C&D area are oriented more parallel to ground-water flow. Thus the dikes in the C&D area are more likely to have a significant affect on the ground-water flow regime. More information is needed on how these dikes influence ground-water flow. Likewise a fracture trace lineament analysis would be useful to evaluate zones of structural weakness that could influence ground-water flow.

Table 1 There are no Ground Surface Elevations indicated on most of the Boring Logs. What is the source for the Ground Surface Elevations? The TOC Elevations for PZ-4 and MW-16D do not match those on the Boring Logs. The Top Of Screen and Bottom Of Screen Elevations are incorrectly calculated based on TOC Elevations rather than Ground Surface Elevations. The Total Depth for MW-16D appears to be incorrect. The Bedrock Depths for wells MW14D and MW-16D appear to be incorrect. All the Bedrock Elevations also appear to be incorrectly calculated based upon TOC Elevations.

Tables 2 and 3 The hydraulic characteristics are not broken down for each lithologic (hydrogeologic) unit. This would be useful in the Assessment Report and required for any possible future C&D Application.

Table 3 What is the source for the gradient and (effective) porosity values? There are no Boring Logs or Well Construction Logs for the MW-4 nest or MW-13 nest in the Report. What is the source of data for these wells? As previously referenced, the Top Of Screen and Bottom Of Screen Elevations are incorrectly calculated for the PZ-9 well nest. Were values for the mid-point of the saturated portion of the shallow wells used in the calculations?

Table 4 All monitoring wells in the approved monitoring well network are to be sampled at least semi-annually.

Table 5 The TOC Elevations and therefore the Water Table Elevations for wells PZ-4 and MW-16D appear to be incorrect. A complete Table of water table elevations for the August 2003 event is needed for all piezometers and wells used in making the Ground Water Potentiometric Surface Map (Figure 3).

Table 6 The Table needs to include all monitoring wells and piezometers located in or near the proposed C&D area. Based on a review of Appendix F, there is some incorrect data and some missing data in Table 6.

Fig. 1 There are still two piezometers designated PZ-3 on this figure.

Fig. 2 The approved Facility Boundary is different from the Property Boundary shown on Figure 2.

Fig. 3 Note previous comments regarding incorrect measurements for piezometers PZ-4 and MW-16D and the need for a Table of all ground water elevations for the August 2003 event used to generate the ground-water contours on this figure. Additional care should be taken to ensure that the contour lines are proportional to the data and topography.

Apx. A It would be helpful to have Boring Logs and Well Construction Records for other previously drilled borings located in or near the proposed C&D area.

Apx. B On Figure 1 of Appendix B, it appears that the Liquid Limit values for PZ-1A and PZ-2 have been reversed.

Apx. C The folding map designated as Figure No. 1 in Appendix C has not been copied correctly.

At this point there does not appear to be a thorough evaluation of the existing ground-water quality in the proposed C&D area. The data indicates fairly extensive contamination over the study area. Multiple metals were detected. To date there is little evaluation regarding to what extent some of the metals may be due to natural variability and to what extent some of the metals may be due to the release of contaminants. Has any comparison to background values been done? A couple of well locations (PZ-4 and PZ-9) appear to have significant levels of multiple metals above the N.C. 2L Groundwater Standards. There also appears to be a fairly extensive plume of Lead at levels above the 2L Standard. Manmade organic chemical contaminants have been identified at six piezometer locations. At several of these locations the organic constituents are present at levels exceeding the 2L Standards.

At this point there does not appear to be a good understanding of the ground-water flow regime in the proposed C&D area. Provide a conceptual model for ground-water flow in this area that will better define contaminant transport. In addition to the ground-water contours in plane view, cross-sections should be provided illustrating the vertical dimension of ground-water flow and showing the impacted monitoring wells and piezometers (with a legend that shows contaminant concentrations). Any preferential ground-water flow paths should be identified, such as areas of structural weakness, more highly weather units, dikes, etc.

The MW-13 well nest appears to be at a critical monitoring location. VOCs are increasing in this area, and unless it can be demonstrated that there is a location that can monitor this area as effectively, the MW-13 nest will need to remain as a monitoring point.

It also appears that contamination has already migrated beyond the MW-13 location to the PZ-9 well nest location. Comparison of data between these two well nest locations may be useful in evaluating the break down process for contaminants of concern.

There remains a need for significant further assessment of water quality in the area proposed for possible C&D Landfill development. It is necessary to fully define the nature and extent of existing ground-water contamination and also to develop a good understanding of the ground-water flow regime in order to predict contaminant fate and transport. Based on the information presently available, it is difficult to see how adequate ground-water monitoring, assessment, and possible corrective action would be possible if the proposed C&D Landfill Unit were to be developed. A complete and accurate comprehensive assessment must be available before any meaningful evaluation can be made regarding the possibility of permitting C&D disposal in the area proposed.

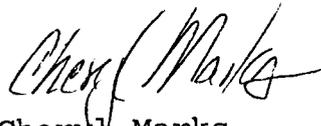
Mr. Haywood Phthisic
Johnston Co. Assessment
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Please consider the comments and questions raised in this letter in planning additional water quality assessment activities for the study area and in preparing further revisions to the Assessment Report. If you have any questions regarding these comments and questions, or would like to arrange for a meeting to discuss these issues, please contact us at (919) 733-0692.

Sincerely,



Bobby Lutfy
Hydrogeologist
Permitting
Solid Waste Section



Cheryl Marks
Hydrogeologist
Environmental Compliance
Solid Waste Section

cc: Jim Barber
Mark Poindexter
Ed Mussler
Mark Fry
Joan Smyth
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G.N. Richardson & Assoc.