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OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

November 16, 2000

Mr. Jim Coffey, Head Permitting Branch
Solid Waste Section, NC DENR
401 Oberlin Road
Raleigh, N.C. 27605

Re: Iredell County Landfill Facility Plan Update

Dear Mr. Coffey,

Please find enclosed two (2) copies of the revised Iredell County Facility Plan, "Existing Conditions" sheet showing the current conditions at the Landfill site. The revision to this sheet includes the following:

1. Existing borrow site
2. Existing Construction and Demolition site
3. Access road at creek crossing
4. Methane flare
5. Updated boundary lines along Twin Oaks Road

We appreciate all the consideration that you can give to this matter. If you need additional information or have any comments, please do not hesitate to call.

Very truly yours,
Municipal Engineering Services CO., PA

Bryan M. Badey

NCDENR

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

WILLIAM L. MEYER
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WASTE MANAGEMENT

November 7, 2000

Mr. Tommy London
P. O. Box 389
Newton, NC 28658

Subject: Blackburn MSW Landfill Unit 2, Phase 2

An application for a Permit to Construct the Blackburn Municipal Solid Waste Landfill Unit 2, Phase 2 in Catawba County was received by the Solid Waste Section Permitting Branch on March 15, 2000. The Design Hydrogeological Report was received on March 20, 2000. Following is an initial review letter listing issues which need to be addressed by Catawba County, and their engineering and hydrogeology consulting firms, for this landfill. The areas labeled as Subcells 3, 4, 6 and 7 have not at this time been evaluated as thoroughly by this Section as the Subcell 1, 2 and 3. It is apparent that several groundwater issues will need further evaluation in the Subcell areas 3, 4, 6, and 7. These areas will be addressed in a future letter. The following issues pertaining to Subcells 1, 2, and 3 need to be addressed:

Rule .1624(b)(4) Vertical Separation requirements

Table 1 needs to include the data for all present and past piezometers. In particular the data for B-1, B-17, B17A, B-10, and B-20 needs to be included on Table 1 and incorporated into the Projected High Water Level map, Figure 2. This table should also include all monitoring wells which are to be used as part of the Unit 2 Phase 2 monitoring plan and any in the vicinity (for example MW7). The data should include all readings taken at the wells or piezometers.

Some of the figures recorded on Table 1, in the column labeled *Min Vertical Separation @ Liner*, are incorrect. This table needs to be corrected. The calculations need to take into consideration the post settlement separation from groundwater.

The potentiometric map which was presented to this Section as being representative of long term seasonal high on the Projected High Groundwater Surface Map, in the Revision of the Design Hydrogeological Report and Water Quality Management Plan for Unit #2 – Phase I, dated October 1997, shows

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the potentiometric surface to be much higher than the map included with the March 8, 2000 application. The October 1997 map shows the potentiometric surface to be 4 to 8 feet higher throughout Phase 1 and Phase 2. Please present data to justify why this potentiometric surface is lower, or change the potentiometric surface shown under Phase 1 to reflect the surface, which was found previously to be acceptable by this Section. The change of the potentiometric map as specified will cause the vertical separation to be reduced in the area along the junction between Phase 1 and 2 (Subcell 1, 2 and 3) and in the area between Unit 1 and 2 (Subcell 6 and 7).

.1623 (a)(4)(C)

Unified Soil Classification System (USCS) results are not included in the laboratory data.

The USCS classifications shown on the boring logs are in some instances incorrect. For example the residuum at PZ-8, sampled at a depth of 1-5 feet, according to the sieve analysis information, should not be classified as a ML. When a specific interval is laboratory tested, the designated USCS classification should be used. The field identified USCS classifications should be verified using the laboratory results.

.1623 (a)(4)(E)

Table 3 contains the in situ hydraulic conductivity test information. There is no information available for within the Subcell 1, 2 or 3. Saturated hydraulic conductivity information will be needed within the footprint area of these subcells. The information for Subcells 4, 5, 6, and 7 is limited. More information will also be needed in these areas.

Table 2 contains a summary of the porosity data. There is not any porosity information for the subcells 4, 5, 6 or 7. Porosity and effective porosity information will be needed within these areas.

.1623 (a)(6)

The cross-sections need to identify the hydrogeologic and lithologic units. An explanation within the report could help to clarify these units. The cross-sections should include water table information at the stream(s).

.1623 (a)(7)

All historical data needs to be presented for the piezometers and monitoring well within and surrounding the proposed footprint area. See above Rule .1624(b)(4).

.1623 (a)(11)
All boring logs, field logs and notes, well construction records and piezometer construction records which are pertinent to the project need to be included in the application. In particular the following were found to be missing.

Boring logs:
PZ-7 Sheet 2 of 2
PZ-9
PZ-11
PZ-13
B-1 Sheet 2 of 2
Well Construction Records:
PZ-2
PZ-21
Field Notes:
All field notes are missing

.1623 (b)(2)(E)
The water table elevation data needs to be labeled on the *Long-term seasonal high groundwater map*. All historical data needs to be taken into consideration for this map including the piezometers and monitoring wells, whether existing or not.

.1623 (b)(2)(G and H)
The vertical dimensions of ground-water flow are poorly understood especially in the area immediately west of the landfill. Will the uppermost aquifer be discharging to the stream? The cross-section A-A" shows the September 1999 ground water continuing westward without discharging to the stream. This is not addressed sufficiently in the report, the cross-sections or the potentiometric surface maps.

.1623 (b)(3)
A ground-water monitoring plan including information on the proposed ground-water monitoring system, sampling and analysis requirements, and detection monitoring requirements per Rules .1630 through .1637 needs to be included in the report. The monitoring plan needs to be specific to the entire proposed permitted area. Include a detailed discussion of the geology and hydrogeology as it relates to the number, spacing, location, and screen depths of proposed monitoring wells. Water Quality Monitoring Plan as presented for Unit 2 needs to be updated to include any proposed monitoring wells, surface water monitoring and underdrain sample locations. The proposed Plan should include considerations such as:

Although it was noted in the report that the location of the upgradient well will change, it is questionable whether the MW-18 location as suggested by the Design Hydrogeological Report is upgradiant of the landfill. The potentiometric maps do not indicate that this well location will suffice.

It is suggested that additional wells be placed to the east and the west of the subcells 1, 2 and 3. Although this will be monitoring to a side-gradient direction, to the east the property line is close to the edge of waste and to the west the groundwater has not been shown to discharge to the stream. Is monitoring needed in these areas?

The 1997 Monitoring plan, which was included in the Design Hydrogeological Report, includes the wording on page 19 "The magnetometer survey concluded that no dikes exist beneath the Unit #2 area, therefore there is no concern for monitoring adjacent to or downgradient of a dike." The report accompanying the magnetometer survey actually states "The lack of a strong, coherent magnetic anomaly suggests that the site does not contain a highly magnetic intrusive body such as a diabase dike." It is suggested that the reference to the dike be stricken from the text unless evidence of a dike is found and the monitoring plan is edited to address the dike location.

A map showing the location of all the monitoring wells, surface water monitoring points and any other monitoring points, such as the underdrain monitoring points, needs to be included with the monitoring within the Design Hydrogeological Report.

The following changes/additions will be needed in the *Technical Specifications*, in *the Permit to Construct Submittal Package*:

Subgrade needs to be evaluated by a Geologist or Hydrogeologist after final grading is complete. Particular care should be taken to ensure that if a diabase dike exists in the subgrade of the landfill footprint or vicinity, it is identified, and the monitoring plan is revised accordingly.

Special Requirements – Use of Explosives, Section 01200 L

If explosives are to be used for rock removal in the footprint or vicinity please notify the Hydrogeologist in the NCDENR Solid Waste Section prior to activity.

Classification of Excavated Materials, Section 02220 2.01

The Solid Waste Section defines that any material where auger refusal is achieved is rock. The classification or rock needs to be changed to reflect such.

Blasting, Section 02220 3.03 C
See above Use of Explosives

Abandonment of borings and water supply wells, Section 07700:
The scope of the work covered by this section should consist of the abandonment of water supply wells, **monitoring wells, piezometers,** and test borings. In the following *well* refers to any of the preceeding.
The procedures involved include

1) that all casings and screen material **must** be removed from well prior to initiation of abandonment procedures;
2) delete number 4 on 07700 page 1;
3) all wells within footprint of the landfill should be overdrilled prior to grouting if it is determined that the grout will not seal properly;
4) all wells within footprint of the landfill will be filled with cement grout.

Corrections and/or clarifications which are made concerning the aforementioned issues or any other issues which are deemed necessary, should have the revised text, noting date of revision on the page, resubmitted to the Solid Waste Section. If there are any questions regarding this letter or if a meeting needs to be arranged to discuss these issues, please contact me at (919) 733-0692, extension 345 or by email at Ellen.Lorscheider@ncmail.net.

Sincerely,

Ellen Lorscheider

Ellen Lorscheider
Permitting Hydrogeologist
Solid Waste Section

Cc: Sherri Coghill, Solid Waste Section
Jim Coffey, Solid Waste Section
Mark Cathey, McGill Associates
Bobby Barnes, Terra Consultants, Inc.

OPERATION/CONSTRUCTION MANAGERS

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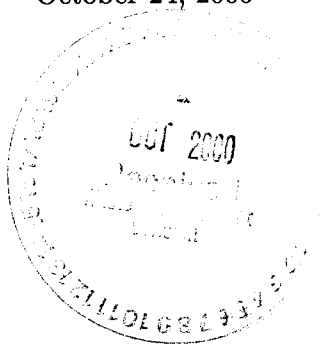
October 24, 2000



Ms. Ellen Lorscheider
Permitting Hydrogeologist
Solid Waste Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
401 Oberlin Road, Suite 150
Raleigh, NC 27605

Re: Response to Section Comments
Site Hydrogeologic Report
Iredell County Subtitle D Lined Landfill, Statesville, North Carolina
MESCO Project No. G99087.0

Dear Ms. Lorscheider:

This letter is intended to answer the questions and comments included in your letter dated September 15, 2000 pertaining to the site hydrogeologic study for the Iredell County Subtitle D Municipal Solid Waste Landfill, Statesville, North Carolina.

Section Comment

Reference is made, in the report, to the local water production wells upgradient of the site (see page 8). Further explanation is needed regarding the possible impact of this pumping to the hydrogeological regime (per rule .1623(a)(2)(A)). Use of specific well locations (probably the closest wells to the site) and pump rates need to be taken into account to determine impact of any cone of depression caused by pumping.

There are, in fact, no production wells in areas immediately upgradient of the proposed landfill site. The closest identified public water supply system is the Murdock Road Water System* located approximately 2100 feet north of the proposed site, and supplies water to houses in its vicinity. Although there may be some minor influence of this pumping on the water table near wells that the water supply system consists of, given the distance from the proposed landfill property, it is unlikely that the pumping activity at this location would significantly influence fluctuations of the water table within the proposed landfill property. The intent of the reference made in the original report was to point out a potential impact of excessive pumping if it occurs, but did not indicate a presence of high-yield production wells in the immediate vicinity of the proposed landfill area.

*PWS ID: 0149128

There are, however, individual water supply wells in the immediate vicinity of the proposed landfill location, but the potential effect of these wells on the site water table was considered negligible. Please refer to section 7.3.2 of the revised text for more detailed discussions.

Section Comment
Clarify where the effective porosity values for the Gneiss, in Table 4, came from. The footnote on this table indicates this value is from a reported value range (Fetter) and the degree of fracturing. Please directly quote this value range. Include in report or on table how "degree of fracturing" was determined. If RQD and REC values or only observation of rock core were used to determine fracturing, be specific.

The effective porosity value included in the original Table 4 was revised, and Table 4 in this submittal provides the effective porosity given as a range, as quoted from Table 2.2 in Domenico and Schwartz (1997).[†] This range reflects a range for the effective porosity typically observed for fractured crystalline rock.

Section Comment
Table 1, Groundwater Elevation Summary, only includes readings for the months of December through April of a year. This is insufficient to establish a (12-month) season (per rule .1623(a)(7)(B)).

This submittal includes monthly water level readings from December, 1999 through September, 2000, which is now sufficient to establish a season as this period covers both the dry and wet seasons of a year. To visualize the trend of the seasonal water table fluctuations, an empirical parameter called "fluctuation index" was computed for each sampling event, and the resulting values were plotted versus the dates of measurement, and included in Appendix D. The fluctuation index ranges from 0 to 1, and is defined by the following equation:

$$I_i = \frac{1}{N_i} \sum_j \frac{h_{ij} - h^j_{min}}{\left(h_{ij} - h^j_{min}\right)^j_{max}}$$

where

I_i = fluctuation index for measurement event i (dimensionless)
N_i = number of wells measured during measurement event i (dimensionless)
h_{ij} = hydraulic head in well j on measurement event i (feet)
h^j_{min} = lowest recorded hydraulic head in well j (feet)
$\left(h_{ij} - h^j_{min}\right)^j_{max}$ = highest value of $h_{ij} - h^j_{min}$ for well j (feet)

The value closest to 1 indicates the date of highest fluctuation for a given period, while the value closest to 0 indicates the date of lowest fluctuation. The graph depicts that the site water table rose continuously from December, 1999 through May, 2000, and started to

[†]Domenico, P. A., and Schwartz, F. W., 1997, Physical and chemical hydrogeology 2nd ed.: John Wiley & Sons, Inc., p. 15.

decline thereafter through September, 2000. Although data following September are not yet available, the water table is expected to stay low through either November or December of 2000 before it starts to rise again toward the high in the next season, which is expected to occur around May of 2001.

LeGrand (1954) states that, in the Statesville area,[‡] the water table generally begins to decline in April or May, owing to the increasing amount of evaporation and transpiration by plants, which not only consume ground water but reduce the amount of precipitation that can reach the water table. This decline generally continues through summer and autumn, in spite of the abundant rainfall of July and August. By November or December, when much of the vegetation is dormant and evaporation is low, the precipitation again becomes effective in producing recharge and the water table begins to rise until it reaches another high stage about April or May of the next year.[§] As indicated in the graph of *Seasonal Groundwater Fluctuation* (Appendix D), the water table within the proposed landfill site follows closely the trend described by LeGrand.

Hydraulic heads in individual piezometers within the site are also plotted versus dates of measurement, and included in Appendix D. Heads in those piezometers near the areas of discharge, namely P-3S/D, P-4, P-6, P-9S/D, P-12S/D, and P-13S reached their highest in May of 2000, while heads in those piezometers distant from the discharge areas (P-1, P-2, P-5, P-7, P-10S/D, and P-11S) peaked in June or July. Since lags in response time for the water table to react to precipitation are expected in hilltop areas where the distance between the ground surface and the water table is greatest, this trend is likely persistent rather than temporal. The highest fluctuations are recorded in piezometers P-6 and P-13S (3.24 and 3.56 feet, respectively), and the lowest are recorded in piezometers P-1 and P-11S (1.38 and 1.30 feet, respectively). It is inferred from the above observations that areas near the discharge features exhibit greater fluctuations of the water table.

All the above information provides a sufficient understanding of seasonal water table fluctuations within the proposed landfill area. Please refer to section 7.5 for discussions on water table fluctuations.

Section Comment

Include the seasonal water level data from the Phase 3 report (referenced on page 9) if it is to be used to substantiate the 3-foot fluctuation in ground water (per rule .1623(a)(7)(B)). Include in the report an explanation why this data is deemed to be representative of the proposed landfill site.

Appendix D provides the seasonal water level data excerpted from the Phase 2 report. This data was deemed representative for the purpose of estimating high and low seasons of the site water table fluctuations. As evident in graphs *Seasonal Groundwater Fluctuation* and *Seasonal Groundwater Fluctuation, Phase 2* included in Appendix D, the pattern of water table fluctuations within the proposed site follows closely that in the Phase 2 area. This

[‡]In his publication *Geology and Ground Water in the Statesville Area, North Carolina* published in 1954, the term "Statesville area" includes Alexander, Catawba, Iredell, Davie, Rowan, and Davidson Counties.

[§]LeGrand, H. E., 1954, Geology and ground water in the Statesville area, North Carolina: Raleigh, North Carolina Department of Conservation and Development, Division of Mineral Resources, Bulletin 68, 68 p.

trend is, in a general sense, applicable at regional scale since the major contributor to changes in groundwater fluctuation is climatic conditions (particularly precipitation), and weather conditions typically extend over wide areas. In this submittal, however, the data from the Phase 2 report was not used to estimate actual amounts of seasonal fluctuations since data available from the proposed location was sufficient to derive such data. Please refer to the revised report for more details.

Section Comment
If the USGS observation well is to be used to help determine seasonal and/or long-term seasonal water table highs or fluctuations the data needs to be included in the report. Additional information about this well is necessary including well depth, geology at well location, distance from the proposed landfill site (per rule .1623(a)(7)(B)).

The data of the USGS observation well is included in Appendix D. This well is located 0.5 miles northeast of Mocksville on U.S. Highway 158 at B.C. Community Center. The latiutde and longitude of this well are $35^{o}53'59''$ and $80^{o}33'17''$, respectively. The well is 6-inch in diameter, installed to a depth of 30.8 feet with open end, and backfilled with gravel from 20 to 30.8 feet. It taps on an unconfined aquifer consisting of weathered granite of Paleozoic age. The surface elevation at the well location is 835 feet above sea level, and all data are with reference to the top of casing which is 1.00 feet above ground surface. All of this information is as given in the original USGS report,[¶] and a copy of the pertinent pages are included in Appendix D.

Section Comment
An estimation of the long-term seasonal high water table (per rule .1623 (a)(7)(C)) was not addressed. Please include this information in report.

The revised text includes a discussion of seasonal high water table estimation. Please refer to section 7.6 of the revised report.

Section Comment
The flow directions, rates and gradients of the horizontal and vertical ground water flow needs to be clearly indicated in the report (per rule .1623(a)(8)). A table showing these values would be helpful. The method of achieving the data and/or equations used should be included on the table or within the report.

Section 7.2 of the revised report includes discussions on groundwater flow components within the proposed landfill site. The flow rates, flow directions, and hydraulic gradients at piezometer locations are clearly indicated in table *Flow Rate Summary* included in the aforementioned section, and methods used to determine these parameters are described therein. These data are also given in table *Flow Rate Calculations* included in Appendix B.

[¶]Howe, S. S., and Breton, P. L., 1998, Water Resources Data - North Carolina v. 2 Ground-Water Records: U.S. Geological Survey Water-Data Report NC-98-2, p. 98.

Section Comment
Plate 5, *Single Day Potentiometric Map Readings from February 24, 2000* should include the data (Dry) for piezometer P-8 (per rule .1623(a)(9)).

Plate 5 has been updated to include the data for piezometer P-8.

Section Comment
Plate 1, *General Site Map*, location of the permanent onsite benchmark needs to be shown on this map (per rule .1623(a)(10)).

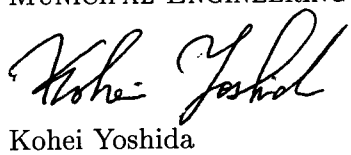
A permanent onsite benchmark is now shown in Plate 1 at the northwest corner of the proposed landfill area. The locations and elevations of all onsite piezometers are relative to this benchmark.

Section Comment
Submit a copy of the field logs and notes to be included in the hydrogeological report (per rule .1623(a)(11)).

A copy of the original field logs are provided in Appendix A along with their corresponding graphical logs. Field logs numbered CP-1, CP-2, CP-3, CP-4, CP-5, CP-6, CP-7, and CP-8 correspond to piezometers P-1, P-2, P-3S, P-4, P-5, P-6, P-7, and P-8, respectively.

Please give me a call at 919-772-5393 if you have any questions or need additional information regarding the content of this report.

Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., P.A.



Kohei Yoshida
Hydrogeologist

Enclosures

cc: Mr. Ron Weatherman, Iredell County
Dr. Edward S. Custer, Jr., P.G.

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

October 17, 2000

Ms. Sherri Coghill
Permitting Engineer
NCDENR - Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, NC 27605

Re: Site Study
Proposed Iredell County MSWLF Landfill Expansion
Permit No. 49-03
MESCO Project No. G99087

Dear Ms. Coghill:

In response to your August 9, 2000 letter, initial review, we submit the following:

Regional Characterization Study:

1. **Please discuss whether potable water is available from the City of Statesville. If so, indicate water mains on regional and local characterization drawings.**

   There is potable water available at the landfill facility. The locations of water mains are shown on the regional and local characterization maps.

2. **Locate wells for Murdock Road Public Water Supply on the regional characterization drawing.**

   All wells for Murdock Road water system have been located and shown on the regional characterization drawing.

3. **Some portions of the text state that the facility will be 224.75 acres while others state that the facility consists of 226.41 acres. Please correct discrepancy.**

   The Discrepancy has been corrected in the text. The facility consists of 226.41 acres.

4. **Sections 2.1 and 2.1.1 indicate that S.R 2462 is a waste transportation route and eventually a means of facility access. Please comment and identify S.R. 2462 on the regional characterization map.**

   S.R. 2462 will not be a waste transportation route. It will not be a means of access to Phases 3 and 4. This has been corrected in the text.

5. Section 2.1.1. mentions Phase 6. This phase is not mentioned on any drawings, or in the life expectancy calculations. Please comment.

There are five (5) phases in the landfill plan. This correction has been made in the text.

Local Characterization Study:

6. Please indicate Statesville's city limits and/or ETJ limits on the local characterization map.

The ETJ limits shown on the Flood Maps were transferred to the Local Characterization Map.

7. Indicate sewer easement on local characterization map.

The sewer easement has been added to the local characterization map.

8. Delineate tributary that runs almost parallel to the western boundary.

The tributary has been added to the local characterization map.

Design Hydrogeology Report:

9. Comments will follow in a separate correspondence from the section hydrogeologist.

When comments are received they will be addressed in separate correspondence from our Geology Section.

Location Restrictions:

10. Provide a legend for the aeronautical chart.

The legend has been added to the aeronautical chart.

11. The text of the wetland report indicates that the landfill expansion area was evaluated for wetlands. However, the map provided indicates a study area that includes only the existing site and not the landfill expansion area. Please verify the area included in the wetland study.

There are no wetlands in this site only waters of the US and the map that was provided was only for a stream crossing so the County can access this site from the existing facility. However, a survey map that shows the locations of waters of the US on the entire project has been forwarded to the US Army Corps of Engineers for their approval. We will forward the approval to you when we receive it back from them.

12. Provide copy of map showing landfill site in relation to seismic impact zone.

In reviewing all pertinent maps, the landfill site is not in a seismic impact zone. The text has been corrected and a map has been included.

13. In accordance with Rule .1618(c)(4), discuss planned compliance with design and construction standards referenced in Rule .1622 (5)(a).

See previous response.

14. **The report entitled *A Preliminary Cultural Resource Assessment for the Proposed Iredell County Landfill* refers to a study area of only 20 acres, while the expansion area is 55 acres in size. Please explain and correct discrepancy.**

    A revised report has been made. The discrepancy has been corrected. The study was done for the 55 acre area.

15. **Provide correspondence from the Department of Cultural Resources regarding the cultural resources report.**

    We are presently awaiting a response from the Department of Cultural Resources.

16. **Please comment as to whether the expansion site was evaluated for the presence of endangered or threatened plant species.**

    The expansion site was evaluated for all endangered species either plant or animal. Enclosed is a letter from Environmental Services, Inc. stating that their survey included all federally recognized endangered species.

17. **Provide correspondence from the US Fish and Wildlife and the Natural Heritage Program regarding the endangered and threatened species survey report.**

    A letter from the United States Department of the Interior, Fish and Wildlife Service, dated July 25, 2000 has been included in Appendix D with the Cultural Resources Report.

Local Government Approvals:

18. **Please be reminded that, in accordance with Rule .1618(c)(5)(A)(iv), a copy of the permit application, written transcripts of all public meetings and any additional material submitted or used at the meetings, and any additional or corrections to the applications, shall be submitted to the closest local library and remain available to the public until the permit decision is concluded.**

    All revisions to the permit will be incorporated in the document that is now in the public library.

19. **In accordance with Rule .1618(c)(5)(C), please submit a letter from the unit of local government responsible for implementation of the comprehensive solid waste MSWLF is consistent with the approved solid waste management plan.**

    The letter from Iredell County is enclosed that addresses their Solid Waste Management Plan.

20. **Provide Iredell County's approval of the landfill expansion area, as well as all records illustrating compliance with N.C.G.S.**

    The minutes from the public meeting that was held to satisfy NCGS 154-136C were included in the original submittal. In the minutes it was addressed on at least two occasions that the purpose fro of the public meeting was to satisfy the requirements of 154-136C and "the Board of Commissioners of a county shall consider alternative sites, socially economic and demographic date, and shall hold a public hearing prior to selecting or approving a site for a new sanitary landfill that residential solid waste that is located within one mile of an existing sanitary landfill within the State". This is a quote from Ronald Weatherman (page 5 of the minutes) to the attendees at the meeting. The Iredell County Board of Commissioners were represented at the meeting by Commissioner Steve Johnson and the other sites that were considered were also presented at the meeting. Enclosed are the

minutes from the County Commissioners Meeting dated March 2, 1999, at which time the Commissioners voted to purchase this property for use as a landfill expansion. The Public Hearing on the property was held January 26, 1999 and the commissioners voted to purchase the property for landfill expansion on March 2, 1999. The County purchased the property with the full intent of utilizing it for landfill expansion.

Proposed Facility Plan:

21. Please revise the survey plat to indicate property boundaries for all tracts making up the facility, and provide copies of the property deeds or other means of conveyance, if applicable, for the separate tracts.

This map has been revised and copies of the deeds have been included.

Enclosed you will find three (2) sets of revised Site Study text, revised maps, additional maps and other pertinent information. If you need additional information or have any questions, please don't hesitate to call.

Very truly yours,
MUNICIPAL ENGINEERING SERVICES CO., PA

D. Wayne Sullivan
Project Manager

DWS:lch

Enclosures

cc: Ron Weatherman, Solid Waste Director w/enclosures
Joel Mashburn, County Manager

NCDENR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WASTE MANAGEMENT

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

WILLIAM L. MEYER
DIRECTOR

September 15, 2000

Mr. Ron Weatherman
P. O. Box 788
Statesville, NC 28677

Dear Mr. Weatherman,

I have received the MSWLF Facility Site Study dated April 2000. I have completed an initial review of this document, according to the North Carolina Solid Waste rules 15A NCAC 13B .1622 and .1623(a). I have the following comments and requests for additional information.

1. Reference is made, in the report, to the local water production wells upgradiant of the site (see page 8). Further explanation is needed regarding the possible impact of this pumping to the hydrogeological regime (per rule .1623(a)(2)(A)). Use of specific well locations (probably the closest wells to the site) and pump rates need to be taken into account to determine impact of any cone of depression caused by pumping.

2. Clarify where the effective porosity values for the Gneiss, in Table 4, came from. The footnote on this table indicates this value is from a reported value range (Fetter) and the degree of fracturing. Please directly quote this value range. Include in report or on table how "degree of fracturing" was determined. If RQD and REC values or only observation of rock core were used to determine fracturing, be specific.

3. Table 1, Groundwater Elevation Summary, only includes readings for the months of December through April of a year. This is insufficient to establish a (12-month) season (per rule .1623(a)(7)(B)).

4. Include the seasonal water level data from the Phase 3 report (referenced on page 9) if it is to be used to substantiate the 3-foot fluctuation in ground water (per rule .1623(a)(7)(B)). Include in the report an explanation why this data is deemed to be representative of the proposed landfill site.

5. If the USGS observation well is to be used to help determine seasonal and/or long-term seasonal water table highs or fluctuations the data needs to be included in the report. Additional information about this well is

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necessary including well depth, geology at well location, distance from the proposed landfill site (per rule .1623(a)(7)(B)).

6. An estimation of the long-term seasonal high water table (per rule .1623(a)(7)(C)) was not addressed. Please include this information in report.

7. The flow directions, rates and gradients of the horizontal and vertical ground water flow needs to be clearly indicated in the report (per rule .1623(a)(8)). A table showing these values would be helpful. The method of achieving the data and/or equations used should be included on the table or within the report.

8. Plate 5, *Single Day Potentiometric Map Readings from February 24, 2000* should include the data (Dry) for piezometer P-8 (per rule .1623(a)(9)).

9. Plate 1, *General Site Map*, location of the permanent onsite benchmark needs to be shown on this map (per rule .1623(a)(10)).

10. Submit a copy of the field logs and notes to be included in the hydrogeological report (per rule .1623(a)(11)).

If you need additional information or assistance regarding these comments please contact me at (919) 733-0692 ext. 345, or by email at Ellen.Lorscheider@ncmail.net.

Sincerely,

Ellen Lorscheider

Ellen Lorscheider
Permitting Hydrogeologist
Solid Waste Section

Cc: Sherri Coghill, SWS
Jim Coffey, SWS
Anthony Foster, SWS
Kohei Yoshida, Municipal Engineering

FAX

Municipal Services Garner, N.C. — Engineering Company, P.A. Garner, N.C.

Date 1-7-00

Number of pages including cover sheet:

TO: ELLEN LORSCHEIDER
Solid Waste Section

Phone
Fax Phone 773-4810

FROM: Lisa for Wayne
Municipal Engineering Services Company
Garner, NC 27529

Phone (919) 772-5393
Fax Phone (919) 772-1176

CC: Boring Logs

REMARKS: ☐ Urgent ☑ For your review ☐ Reply ASAP ☐ Please Comment

Sorry I forgot these earlier

Lisa C. Hampton

9 pages including cover

LOG OF BORING: CP-1

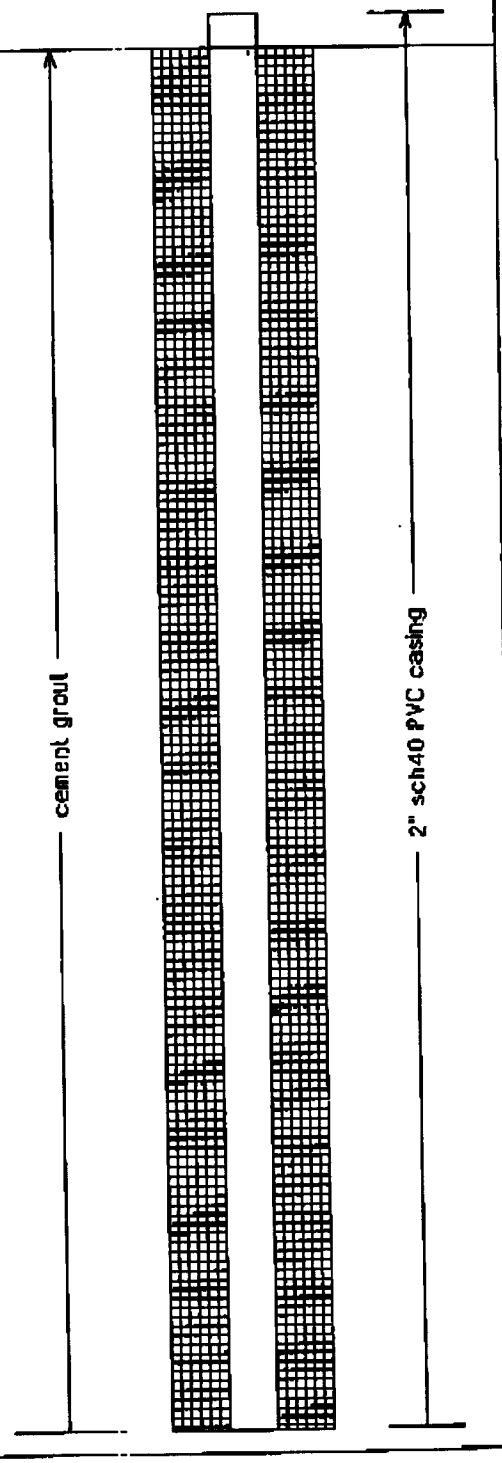
Project: Iredell Campbell Property
Project No. 698110
Type: 4A SS

Drilling Contractor: Engineering Tectonics
Registration Number: 835

Surface Elevation: ft
Top of Casing: ft

DEPTH (ft)	BLOWS PER FOOT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
	15			SILTY CLAY (CL); red, stiff, dry, root debris
				SANDY SILT (ML); red, very stiff, relict crystal structure
5	23			
				SILT (ML); red, relict crystal structure, micaceous
10	13			
15	12			-grades orange to pink and white, relict structure, some coarse quartz grains
20	18			-grades with gray, relict banding
				SANDY SILT (ML); gray and white, relict gneissic foliations, micaceous
25	21			
30	43			-prominent relict foliations, damp
35	21			-grades with mica and quartz fragments, wet
	15			

PIEZOMETER DIAGRAM



Completion Depth: 60 ft
DATE: 11/3/98

Depth to Water: 33.30 ft bgs

MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.

LOG OF BORING: CP-2

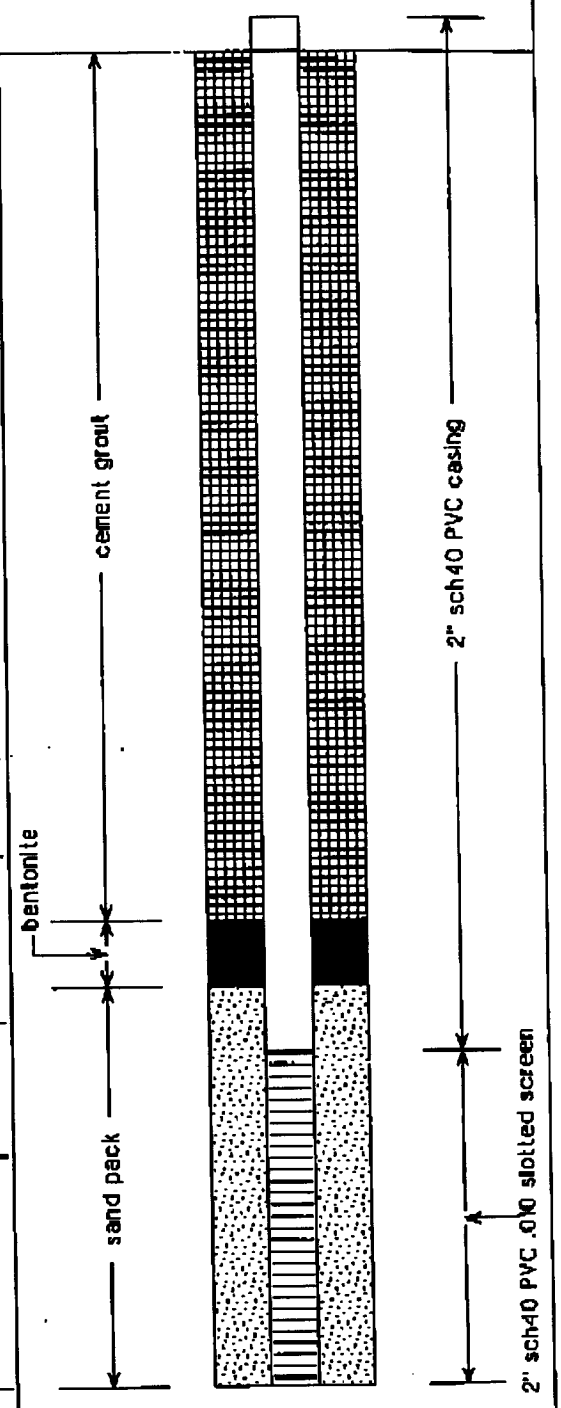
Project: Iredell Campbell Property
Project No. G98111.0
Type A SS

Drilling Contractor: Engineering Tectonics
Registration Number: 835

Surface Elevation: ft
Top of Casing: ft

DEPTH (ft)	BLOWS PER FOOT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
	15			SILTY CLAY (CL); red, stiff, dry, root debris
				SILT (ML); red to orange, relict crystal structure, quartz vein
5	27			
				SANDY SILT (ML); orange and brown, quartz vein, micaceous
10	12			
				PARTIALLY WEATHERED ROCK; quartz fragments, some fine grained schistose fragments
15	38			
20	33			-quartz fragments, damp
				SILT (ML); reddish brown, soft, relict structure, damp
25	15			
				PARTIALLY WEATHERED ROCK; rock fragments in dark gray silt, relict foliation and fractures, damp
30				
				SILT (ML); brown to gray, relict structures, thin quartz veins
35	13			
40	36			End of Boring at 40.0 feet

PIEZOMETER DIAGRAM



Completion Depth: 40 ft
DATE: 11/3/98

Depth to Water: 36.65 ft bgs

MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.

LOG OF BORING: CP-3

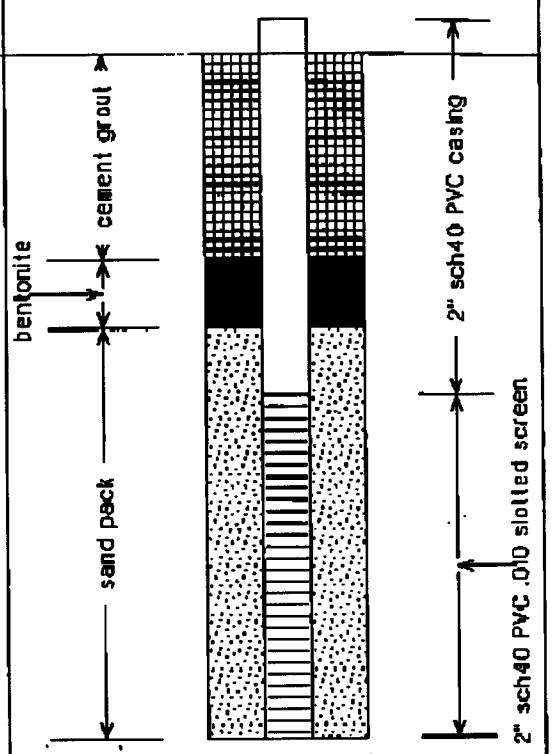
Project: Iredell Campbell Property
Project No. G98111.0
Type: A SS

Drilling Contractor: Enigineering Tectonics
Registration Number: 835

Surface Elevation: ft
Top of Casing: ft

DEPTH (ft)	BLOWS PER FOOT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
	15			SANDY SILT (ML); orange to yellow, some quartz grains, root debris
5	41			SAND (SM); orange to yellow, with silt, quartz fragments, micaceous
10	11			-relict foliations, damp
15	12			-relict gneissic structure, wet
20	10			-orange and white, quartz fragments
				End of Boring at 20.0 feet
25				
30				
35				

PIEZOMETER DIAGRAM



Completion Depth: 20 ft
DATE: 11/4/98

Depth to Water: 13.97 ft bgs

MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.

LOG OF BORING: CP-4

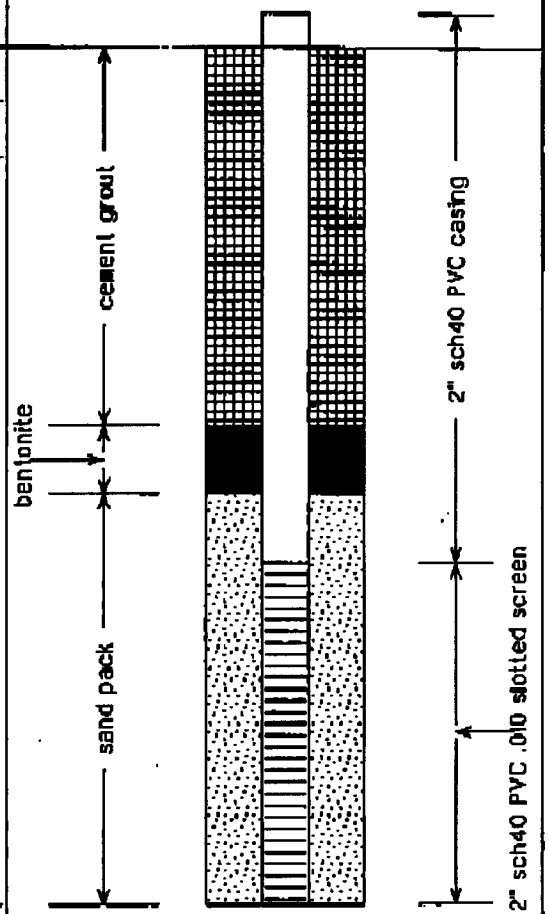
Project: Iredell Campbell Property
Project No. G98111.0
Type SA SS

Drilling Contractor: Engineering Tectonics
Registration Number: 835

Surface Elevation: ft
Top of Casing: ft

DEPTH (ft)	BLOWS PER FOOT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
	19			Topsoil top 2"
				SILTY CLAY (CL); red to orange, firm, dry
				SILT (ML); brown to orange, firm, faint relict structure
5	12			
10	9			-grades with sand, quartz fragments, relict structure
15	6			-grades orange to yellow, relict foliation, damp
20	9			-grades wet
25	9			End of Boring at 25.0 feet
30				
35				

PIEZOMETER DIAGRAM



Completion Depth: 25 ft
DATE: 11/4/98

Depth to Water: 18.57 ft bgs

MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.

LOG OF BORING: CP-5

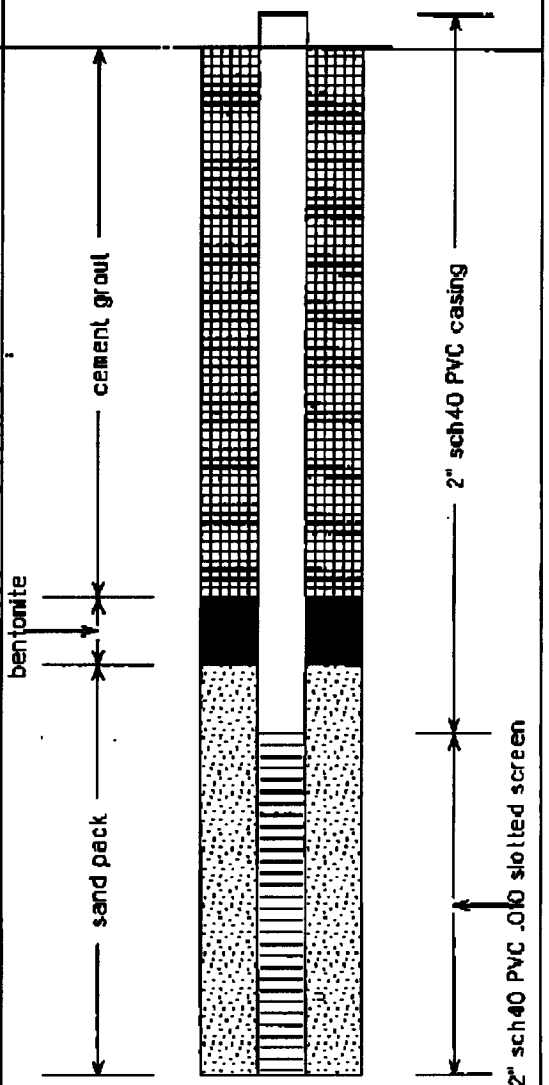
Project: Iredell Campbell Property
Project No. G98111.0
Type: 2" SS

Drilling Contractor: Engineering Tectonics
Registration Number: 835

Surface Elevation: ft
Top of Casing: ft

DEPTH (ft)	BLOWS PER FOOT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
	10			SILTY CLAY (CL): orange to red, firm, dry, root debris
5	22			SILT (ML): brown to orange, faint relict structure, trace clay
10	9			-grades with less clay, some quartz fragments
				SAND (SM): yellow to tan, quartz fragments, micaceous
15	12			
20	11			-relict foliations, moist
25	11			-grades white and gray, relict gneissic structure, wet
30	18			-abundant quartz fragments, gneissic structure
				End of Boring at 30.0 feet
35				

PIEZOMETER DIAGRAM



Completion Depth: 30 ft
DATE: 11/4/98

Depth to Water: 25.85 ft bgs

MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.

LOG OF BORING: CP-6

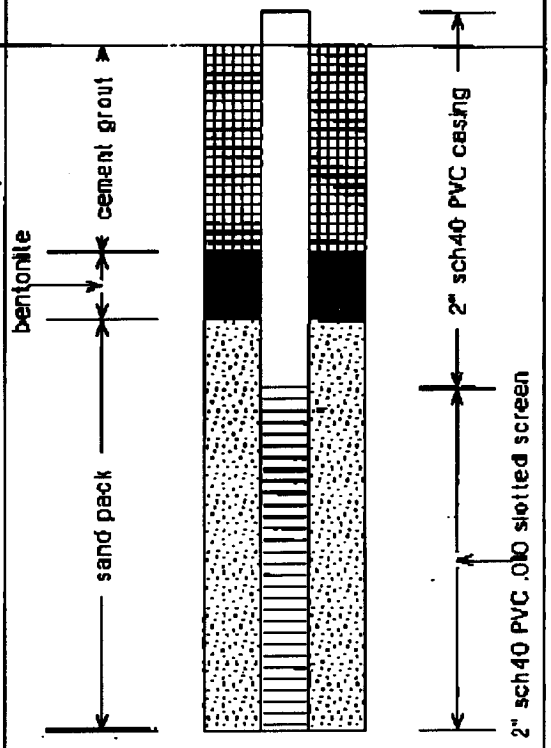
Project: Iredell Campbell Property
Project No. G98111.0
Type: A SS

Drilling Contractor: Engineering Tectonics
Registration Number: 835

Surface Elevation: ft
Top of Casing: ft

DEPTH (ft)	BLOWS PER FOOT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
	17			SILTY CLAY (CL); red to orange, stiff, dry
5	17			SILT (ML); light brown with orange and white mottles, faint relict structure
10	9			-gray to white, relict foliations, damp
15	22			-grades with relict fractures, micaceous, trace rock fragments, wet
20	17			-grades with more rock fragments
				End of Boring at 20.0 feet
25				
30				
35				

PIEZOMETER DIAGRAM



Completion Depth: 20 ft
DATE: 11/5/98

Depth to Water: 11.35 ft bgs

MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.

LOG OF BORING: CP-7

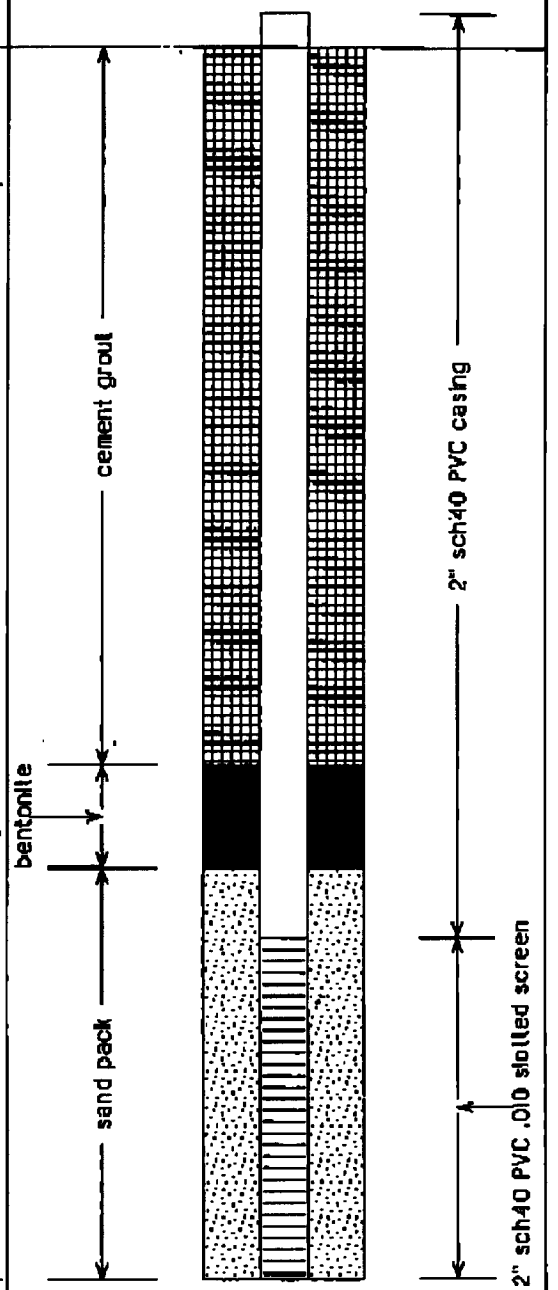
Project: Iredell Campbell Property
Project No. 698111.0
Type SA SS

Drilling Contractor: Engineering Tectonics
Registration Number: 835

Surface Elevation: ft
Top of Casing: ft

DEPTH (ft)	BLOWS PER FOOT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
	15			SILTY CLAY (CL): red, firm, dry, root debris
5	14			SILT (ML): purple to pink, relict folication, micaceous
10	15			-relict fractures and veins, trace quartz fragments
15	16			-grades white to pink, relict fractures with iron staining
20	16			-grades with sand, relict structure, iron mineralization
25	18			SANDY SILT (ML): pink to white, relict structure and fractures, trace quartz fragments, damp
30	15			-grades with more quartz fragments
35	16			-relict fracture near vertical with iron staining, wet
				End of Boring at 36.0 feet

PIEZOMETER DIAGRAM



Completion Depth: 36 ft
DATE: 11/5/98

Depth to Water: 30.32 ft bgs

MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.

LOG OF BORING: CP-8

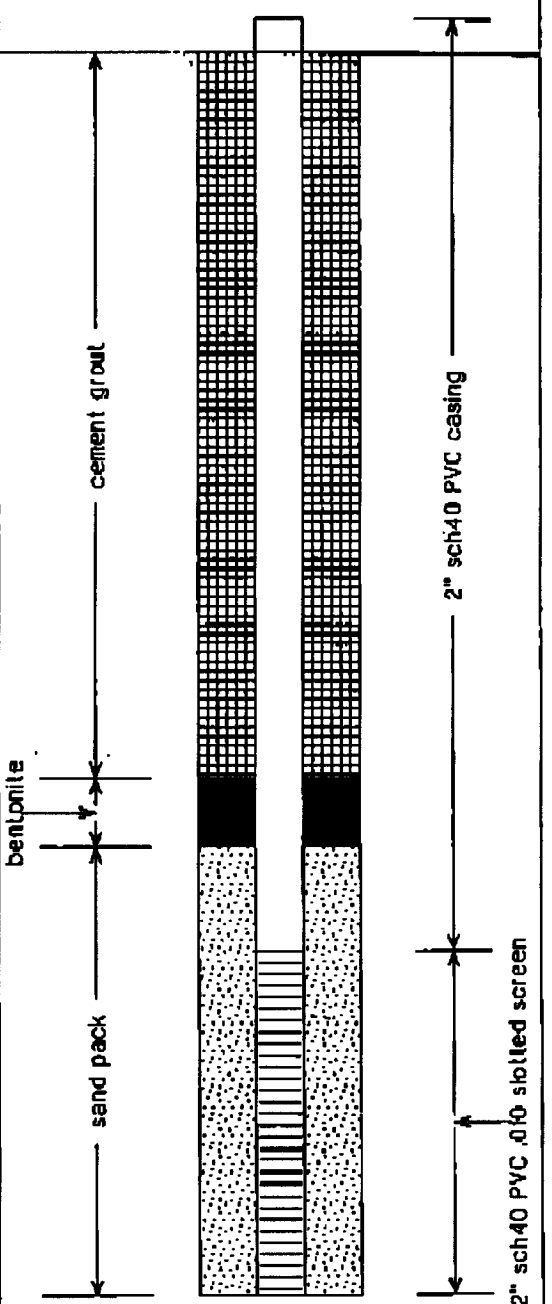
Project: Iredell Campbell Property
Project No. 698111.0
Type: A SS

Drilling Contractor: Engineering Tectonics
Registration Number: 835

Surface Elevation: ft
Top of Casing: ft

DEPTH (ft)	BLOWS PER FOOT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
	27			SILTY CLAY (CL): red, stiff, dry, root debris
5	24			-relict structure
				SANDY SILT (ML): brown and red, relict foliations with iron mineraliztaion, thin quartz veins
10	16			
15	16			
20	18			-grades more quartz, moist, iron staining
25	21			-grades pink to white, prominent relict structure, damp
30	13			-grades with less quartz, wet
35	18			-thin quartz veins, relict fractures with iron mineralization
				End of Boring at 36.0 feet

PIEZOMETER DIAGRAM



Completion Depth: 36 ft
DATE: 11/5/98

Depth to Water: 35.50 ft bgs

MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.

NOTES:

1. General topography and features are shown on this map. USGS maps Statesville East(1994) and Shepherds(1969) were used fo this map.
2. The proposed landfill is shown on this map.
3. There are 10 Public Water Supply wells located within the 2-mile perimeter, they are as follows:

PWS1:	5-wells all named as Murdock Road water system Well No.'s 2,3,5,6, and 7
PWS2:	2-wells all named as Suburban Acres Well No.'s 1 and 2
PWS3:	2-wells all named as Statesville MHP Well No.'s 1 and 2
PWS4:	1 well named Twin Oaks Golf Club Well No. 1

4. There are 7 residential subdivisions, 1 mobile home park and 4 unnamed residential areas within the 2-mile perimeter, they are as follows:
   1) Bellwood
   2) Del-Wan Heights
   3) East Brook
   4) Homestead Estates
   5) Oak Creek
   6) Statesville Country Club
   7) Suburban Acres
   8) Statesville MHP
   9) Residential Area
   10) Residential Area
   11) Residential Area
   12) Residential Area
5. Waste transportation routes are shown on this map. They are US Highway 70, SR 2320, and SR 2319.
6. There are no public use airports or runways located within the 2-mile perimeter.

Post-it® Fax Note 7671	Date 1-7-00	# of pages ▶ 2
To ELLEN LORSCHEIDER	From Wayne Sullivan	
Co./Dept. Solid Waste	Co.	
Phone #	Phone # 772-5373	
Fax # 733-4810	Fax #	


Creek
Creek

NCDENR

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

WILLIAM L. MEYER
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WASTE MANAGEMENT

September 12, 2000

Ronald Weatherman
Iredell County
P. O. Box 788
Statesville, NC 28677

Re: Site Study Application
Iredell County MSWLF Expansion
Permit Number 49-03

Dear Mr. Weatherman:

The purpose of this letter is to confirm receipt of the referenced application on April 26, 2000. Initial review comments were provided by telephone in May 2000, and further review comments forwarded to you and your consultant by correspondence dated August 9, 2000. I would also like to remind you that, as Permitting Engineer, I have been assigned the responsibility of coordinating the review process. The hydrogeologist assigned the responsibility of reviewing the hydrogeologic portion of the application is Ellen Lorscheider. My telephone number is (919) 733-0692, extension 259, and Ellen's telephone number is extension 345.

The letter also serves to introduce a new permitting process called the Critical Path Permitting Process (CPPP). The Solid Waste Section (Section) has implemented this process in response to permit reform initiatives and comments from the regulated community. The stated objectives of this process are to make the permitting process more effective and efficient and improve communication and understanding between the permit applicant and their consultant and the Section. An introduction to the Critical Path Permitting Process is attached to this letter.

Establishing a specific "critical path" for the review of each permit application is the initial step in this process. This step requires the cooperation of the permit applicant and the consultant in determining a schedule of review that ensures that the permit is issued in a timely manner. Based on information obtained during the site visit of July 26, 2000, I understand that Iredell County has approximately 23 months of remaining landfill capacity and would like to receive a site suitability determination in the fall of 2000 and a permit to construct in the spring of 2001. The Section used this information in determining in-house priorities based on the total permitting staff workload and has established a permit review schedule for your application. Please consider the attached review schedule and provide comments regarding acceptability or

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provide additional input that may help the section in revising the schedule to better meet your needs.

Performance of the permitting staff, the applicant, and the consultant will be evaluated relative to the permit review schedule established by critical path planning. Strategies to improve the permitting process will be developed with feed back from the tracking of the permitting process. A questionnaire has been attached to allow the Section to establish a "baseline" in order to measure improvements made to the permitting process.

If you have any questions or comments, please contact me at (919) 733-0692, ext. 259.

Sincerely,

Sherri Coghill
Environmental Engineer
Solid Waste Section

cc: Wayne Sullivan, Municipal Engineering
Ellen Lorscheider, DWM

CRITICAL PATH PERMITTING PROCESS

INTRODUCTION

It is the goal of the Permitting Branch within the Solid Waste Section to **ensure that all solid waste management facility permitting decisions are made in a timely manner and that all permitted facilities are protective of the environment and public health.** In an effort to realize these goals and to improve the permitting process, the Section has implemented a permitting process called Critical Path Permitting (CPPP). Initially, this process will be used only for the review of permit applications for municipal solid waste landfills (MSWLFs) and other high-priority solid waste management facilities. The stated objectives of this process are:

- to minimize environmental releases from permitted solid waste management facilities by ensuring that these facilities meet all pertinent permitting statutes and rules prior to issuance of the permit to operate.

- to conduct the review of permit applications for MSWLFs within the permit review schedule established by critical path planning

- to improve communication and understanding between the permit applicant and the Section regarding the permit review process

Since permitting staff resources have always been limited, the Solid Waste Section has prioritized the review of permit applications; specifically, applications for municipal solid waste landfills (MSWLFs). Permit applications for MSWLFs have been assigned priorities following an assessment of need for the permit and the current permitting workload. While this approach has resulted in an effective and efficient use of staff resources, it has generated some misunderstanding and dissatisfaction with the permitting process among permit applicants and consultants. Also, this approach has not provided the feed back necessary to accurately "measure" the performance of the permitting process in order to target areas of improvement.

The CPP Process incorporates the prioritized workload approach, still necessary due to limited permitting staff, but makes some rather dramatic improvements. The critical path permit review schedule for each permit will be determined in conjunction with the applicant and consultant and a schedule of review and a target permit issuance date will be established. The Permitting Branch will utilize a tracking system to assist in preparing this critical path information and assist in scheduling permit review activities. This system will allow the branch to better track the permitting process, determine the causes of permitting "bottlenecks" and evaluate the need for improvements in the permit review process. Such identified improvements in the permitting process may include: increased staff resources, improvements in the management of permitting staff workloads, additional staff technical training, targeted technical assistance to consultants requiring an above average number of application resubmittals to obtain a permit, the development of guidance documents to assist in the preparation of permit applications, and the revision of the permitting requirements.

Review Schedule
Iredell County MSWLF
Site Expansion

Task	Critical Date	Target Date
Site Study Received	4/26/2000	4/26/2000
Begin Site Study Review	5/15/2000	5/15/2000
Issue Site Suitability	11/15/2000	11/15/2000
Receive Construction Plan	11/15/2000	11/15/2000
Begin Construction Plan Review	11/15/2000	11/15/2000
Issue Draft Permit to Construct and Start 45-day public Comment Period	5/1/2001	4/1/2000
Issue Permit to Construct	6/15/2001	5/15/2000
Receive Final CQA Documentation	2/1/2002	12/15/2001
Issue Permit to Operate	5/1/2002	3/15/2002

NCDENR

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

WILLIAM L. MEYER
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WASTE MANAGEMENT

Solid Waste Section
Permitting Branch
Customer Baseline Survey

Please complete the following survey and return to Jim Coffey, Head, Permitting Branch, in the envelope provided. Results will be used as a baseline to measure the performance of the Permitting Branch and identify areas in the process where we can improve.

Facility Name: _____
Permit Number: _____

For the person completing the survey: (OPTIONAL)

Name: _____
Position: _____
Address: _____
City, ST, Zip: _____
Phone: _____
Fax: _____
email: _____

1. What was the last major municipal solid waste landfill permit you applied for and received? (Please check one)
   Permit to Construct _____
   Site Study_____
   Permit Amendment/Modification_____
   Other_____ Please Specify_____

2. Who was your Permitting Engineer? _____

3. Who was your Permitting Geologist? _____

4. Who was your consultant? _____

5. When was the permit issued? _____

6. How long did the permit process take _____

7. How long did it take you/your consultant to prepare the permit? _____

8. Did you receive your permit when you wanted it? _____

9. Did you receive your permit when you needed it? _____

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10. How long was it between the time you received your permit and when you implemented it or began construction? _____

11. Did you meet with Section Staff prior to beginning your permit? Yes____ No____
You_____ How many Times?____
Your Consultant____ How many Times?____

12. Did you meet with the staff during your permit review? Yes____ No____
You_____ How many Times? ____
Your Consultant____ How many Times? ____

For the following questions, please indicate a score of 1-5, with 1 being the lowest or poor, 3 is average or acceptable and 5 the highest or excellent

		Score
13.	Overall how knowledgeable do you feel that the engineer was?	_____
13a.	Overall how knowledgeable do you feel that the geologist was?	_____
14.	Did they have a good understanding of the rules?	_____
14a.	Did you have a good understanding of the rules?	_____
15.	Was the staff was flexible enough to meet your needs?	_____
16.	Did the Solid Waste permitting staff communicate effectively concerning:	_____
	a) the rules?	_____
	b) the permit process?	_____
	c) the appropriate areas of concern?	_____
17.	Did the staff treat you courteously?	_____
18.	Has the permit process has improved over the last five years?	_____
19.	Overall, how satisfied are you with your most recent permitting activity?	_____

COMMENTS- Please feel free to make comments on any question. Kindly identify the question number to which the comment refers.

Additional comments: Please use additional paper to provide any additional comments that you may have, which can help us to improve the permitting process for MSWLF's. Identify such issues as permitting positives, negatives, suggestions for process improvement, permitting expectations, and potential rule revisions.

NCDENR

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

WILLIAM L. MEYER
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WASTE MANAGEMENT

August 9, 2000

Ronald Weatherman
Iredell County
P. O. Box 788
Statesville, North Carolina 28677

Re: Site Study
Proposed Iredell County MSWLF Landfill Expansion
Permit Number 49-03

Dear Mr. Weatherman:

The Solid Waste Section has completed an initial review of the referenced application. Please address the following review comments:

Regional Characterization Study:

1. Please discuss whether potable water is available from the City of Statesville. If so, indicate water mains on regional and local characterization drawings.
2. Locate all wells for Murdock Road Public Water Supply on the regional characterization drawing.
3. Some portions of the text state that the facility will be 224.75 acres while others state that the facility consists of 226.41 acres. Please correct discrepancy.
4. Sections 2.1 and 2.1.1 indicate that SR 2462 is a waste transportation route and eventually a means of facility access. Please comment and identify SR 2462 on regional characterization map.
5. Section 2.1.1. mentions Phase 6. This phase is not mentioned on any drawings, or in the life expectancy calculations. Please comment.

Local Characterization Study

6. Please indicate Statesville's city limits and/or ETJ limits on the local characterization map.
7. Indicate sewer easement on local characterization map.
8. Delineate tributary that runs almost parallel to the western boundary.

Design Hydrogeology Report

9. Comments will follow in a separate correspondence from the section hydrogeologist.

Location Restrictions

10. Provide a legend for the aeronautical chart.
11. The text of the wetland report indicates that the landfill expansion area was evaluated for wetlands. However, the map provided indicates a

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study area that includes only the existing site and not the landfill expansion area. Please verify the area included in the wetland study.

12. Provide copy of map showing landfill site in relation to seismic impact zone.
13. In accordance with Rule .1618(c)(4), discuss planned compliance with design and construction standards referenced in Rule .1622(5)(a).
14. The report entitled *A Preliminary Cultural Resource Assessment for the Proposed Iredell County Landfill* refers to a study area of only 20 acres, while the expansion area is 55 acres in size. Please explain and correct discrepancy.
15. Provide correspondence from the Department of Cultural Resources regarding the cultural resources report.
16. Please comment as to whether the expansion site was evaluated for the presence of endangered or threatened plant species.
17. Provide correspondence from US Fish and Wildlife and the Natural Heritage Program regarding the endangered and threatened species survey report.

Local Government Approvals

18. Please be reminded that, in accordance with Rule .1618(c)(5)(A)(iv), a copy of the permit application, written transcripts of all public meetings and any additional material submitted or used at the meetings, and any additional or corrections to the applications, shall be submitted to the closest local library and remain available to the public until the permit decision is concluded.
19. In accordance with Rule .1618(c)(5)(C), please submit a letter from the unit of local government responsible for implementation of the comprehensive solid waste management plan setting forth a determination that the operation of the proposed MSWLF is consistent with the approved solid waste management plan.
20. Provide Iredell County's approval of the landfill expansion area, as well as all records illustrating compliance with N.C.G.S. §153A-136(c).

Proposed Facility Plan

21. Please revise the survey plat to indicate property boundaries for all tracts making up the facility, and provide copies of the property deeds or other means of conveyance, if applicable, for the separate tracts.

If you need further information regarding these review comments, please contact me at (919) 733-0692, ext. 259.

Sincerely,

Sherri Coghill
Permitting Engineer
Solid Waste Section

cc: Ellen Lorscheider
Brent Rockett
Tim Jewett
Anthony Foster

Facility Name: Medell
Type Application: Site expansion → phases 3 & 4
Type of Review:
Date Application Received:
Date of Review Letter:

.1623 GEOLOGIC AND HYDROGEOLOGIC INVESTIGATIONS FOR MSWLF FACILITIES

(a) **Site Hydrogeologic Report.** An investigation is required to assess the geologic and hydrogeologic characteristics of the proposed site to determine: the suitability of the site for solid waste management activities; which areas of the site are most suitable for MSWLF units; and the general ground-water flow paths and rates for the uppermost aquifer. The report shall provide an understanding of the relationship of the site ground-water flow regime to local and regional hydrogeologic features, with special emphasis on the relationship of MSWLF units to ground-water receptors (especially drinking water wells) and to ground-water discharge features. Additionally, the scope of the investigation shall include the general geologic information necessary to address compliance with the pertinent location restrictions described in Rule .1622 of this Section. The Site Hydrogeologic Report shall provide, at a minimum, the following information:

☐ ☐ (1) A report on local and regional geology and hydrogeology based on research of available literature for the area. This information is to be used in planning the field investigation. For sites located in piedmont or mountain regions, this report shall include a fracture trace analysis and Rose Diagram, based at a minimum on an evaluation of structurally controlled features identified on a topographic map of the area.

Location of information: Plate 3A & 3B.
Comments: 1 Rose diagram covers 2 sides of fault, is this diagram used in report? Shows no likelihood @ fault

(2) A report on field observations of the site that includes information on the following:

☐ ☐ (A) Topographic setting, springs, streams, drainage features, existing or abandoned wells, rock outcrops, (including trends in strike and dip), and other features that may affect site suitability or the ability to effectively monitor the site; and

Location of information:
Comments: pumping from wells upgradient could have an impact on the water levels @ the site. Pg. 7. could this cause gw table to be reduced enough that it would be in rock?

☐ ☐ (B) Ground-water discharge features. A more extensive hydrogeologic investigation may be required for a proposed site where the owner or operator does not control the property from any landfill unit boundary to the controlling, downgradient, ground-water discharge feature(s).

Location of information:
Comments:

☐ ☐ (3) Borings for which the numbers, locations, and depths are sufficient to provide an adequate understanding of the subsurface conditions and ground-water flow regime of the uppermost aquifer at the site. The number and depths of borings required will depend on the hydrogeologic characteristics of the site. At a minimum, there shall be an average of one boring for each ten acres of the proposed landfill facility, unless otherwise authorized by the Division. All borings intersecting the water table shall be converted to piezometers or monitoring wells.

Location of information: 21 boring / 225 acres
Comments: fracturing w/ layering pg. 4.

☐ ☐ (4) A testing program for the borings which describes the frequency, distribution, and type of samples taken and the methods of analysis (standard ASTM test methods or methods approved by the Division) used to obtain, at a minimum, the following information:

Location of information: _____

Comments: _____

☐ ☐ (A) Standard penetration - resistance;

☐ ☐ (B) Particle size analysis; P40, 100, 115, 120

☐ ☐ (C) Soil classification: Unified Soil Classification System; ✓

☐ ☐ (D) Formation descriptions; and

☐ ☐ (E) Saturated hydraulic conductivity, porosity, and effective porosity for each lithologic unit of the uppermost aquifer.

① saprolite ② Fractured Gneiss.

Location of information: _____

Comments: hc - rock = .1-1% ne of saprolite = 20-30. p.7 says this is from Table 4 but this is not what he says. RQD levels quite low & rec to in indicates hc fracturing - But does it matter? "Rock in a fault shear zone may be extensively fractured."

☐ ☐ (5) In addition to borings, other techniques may be used to investigate the subsurface conditions at the site, including but not limited to: geophysical well logs, surface geophysical surveys, ~~and tracer studies~~. No

Location of information: _____

Comments: _____

☐ ☑ (6) Stratigraphic cross-sections identifying hydrogeologic and lithologic units, and stabilized water table elevations.

Location of information: _____

Comments: _____

(7) Water table information, including:

☐ ☑ (A) Tabulations of water table elevations measured at the time of boring, 24 hours, and stabilized readings for all borings (measured within a period of time short enough to avoid temporal variations in ground-water flow which could preclude accurate determination of ground-water flow direction and rate);

~~Location of information~~: on site 12-99 to 4-00 sreadings. No

Comments: Please include the seasonal water level data from the phase 3 (ref. P9) report to substantiate the 3 foot fluctuation on site

Redo

☐ ☐ (B) Tabulations of stabilized water table elevations over time in order to develop an understanding of seasonal fluctuations in the water table;

Location of information: Include data from USGS observation well use this for LTSH

Comments: in order to substantiate seasonal high.

☐ ☐ (C) An estimation of the long-term seasonal high water table based on stabilized water table readings, hydrographs of wells in the area, meteorological and climatological data, and any other information available; and

Location of information: Need this information - What is

Comments: L-T-S Hi on site?

☐ ☐ (D) A discussion of any natural or man-made activities that have the potential for causing water table fluctuations, including tidal variations, river stage changes, flood pool changes of reservoirs, high volume production wells, injection wells, etc.

Location of information: Water wells @ homes upgradient within
Comments: site ? see p.8 explain scenario of excessive
pumping during times of low groundwater levels
and effect to landfill ? Will this lower aquifer equal so
flow which rock?

☐ ☐ (8) The horizontal and vertical dimensions of ground-water flow, including flow directions, rates, and gradients.

Location of information: Where is this - provide table & calculation
Comments:

☐ ☑ (9) Ground-water contour map(s) to show the occurrence and direction of ground-water flow in the uppermost aquifer, and any other aquifers identified in the hydrogeologic investigation. The ground-water contours shall be superimposed on a topographic map. The location of all borings and rock cores, and the water table elevations or potentiometric data at each location used to generate the ground-water contours shall be shown on the ground-water contour map(s). OK

Location of information:
Comments: P-8 Dry @ 805.27

☐ ☐ (10) A topographic map of the site locating soil borings with accurate horizontal and vertical control which are tied to a permanent onsite bench mark.

Location of information: Where is perm onsite bench mark.
Comments:

☐ ☐ (11) Boring logs, field logs and notes, well construction records, and piezometer construction records.

Location of information: Submit copy of field logs & notes
Comments:

☐ ☑ (12) Identification of other geologic and hydrologic considerations, including but not limited to: slopes, streams, springs, gullies, trenches, solution features, karst terranes, sinkholes, dikes, sills, faults, mines, ground-water discharge features, and ground-water recharge/discharge areas.

Location of information:
Comments:

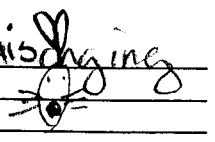
(13) A report summarizing the geological and hydrogeological evaluation of the site that includes the following:

☐ ☑ (A) A description of the relationship between the uppermost aquifer of the site to local and regional geologic and hydrogeologic features.

Location of information:
Comments:

☐ ☐ (B) A discussion of the ground-water flow regime of the site focussing on the relationship of MSWLF units to ground-water receptors and to ground-water discharge features.

Location of information: Whole site is shown to be discharging
Comments: (into stream)



☐ ☑ (C) A discussion of the overall suitability of the proposed site for solid waste management activities and which areas of the site are most suitable for MSWLF units.

Location of information: _____

Comments: _____

☐ ☑ (D) A discussion of the ground-water flow regime of the uppermost aquifer at the site and the ability to effectively monitor the MSWLF units in order to ensure early detection of any release of hazardous constituents to the uppermost aquifer.

Location of information: _____

Comments: _____

(b) **Design Hydrogeologic Report.**

☐ ☐ (1) A geological and hydrogeological report shall be submitted in the application for the Permit to Construct. This report shall contain the information required by Subparagraphs (2) and (3) of this Paragraph. The number and depths of borings required shall be based on the geologic and hydrogeologic characteristics of the landfill facility. At a minimum, there shall be an average of one boring for each acre of the area of investigation, unless otherwise authorized by the Division, where the area of investigation shall be defined by the Division's review of the Site Study and by the scope and purpose of the investigation as follows:

Location of information: _____

Comments: _____

☐ ☐ (A) The investigation shall provide adequate information to demonstrate compliance with the vertical separation and foundation standards set forth in Subparagraphs (b)(4) and (b)(7) of Rule .1624 of this Section, and Paragraph (e) of Rule .1680 of this Section.

Location of information: _____

Comments: _____

☐ ☐ (B) The report shall include an investigation of the hydrogeologic characteristics of the uppermost aquifer for the proposed phase of landfill development and any leachate surface impoundment or leachate disposal facility. The purpose of this investigation is to provide more detailed and localized data on the hydrogeologic regime for this area in order to design an effective water quality monitoring system.

Location of information: _____

Comments: _____

(2) The Design Hydrogeologic Report shall provide, at a minimum, the following information:

☐ ☐ (A) The information required in Subparagraphs (a)(4) through (a)(12) of this Rule.

☐ ☐ (B) All technical information necessary to determine the design of the monitoring system as required by Rule .1631(c) of this Section.

Location of information: _____

Comments: _____

☐ ☐ (C) All technical information necessary to determine the relevant point of compliance as required by Rule .1631(a)(2)(B) of this Section.

Location of information: _____

Comments: _____

☐ ☐ (D) Rock corings (for sites located in the piedmont or mountain regions) for which the numbers, locations, and depths are adequate to provide an understanding of the fractured bedrock conditions and ground-water flow characteristics of at least the upper 10 feet of the bedrock. Testing for the corings shall provide, at a minimum, the following information:

Location of information: _____

Comments: _____

☐ ☐ (i) Rock types;

☐ ☐ (ii) Recovery values;

☐ ☐ (iii) Rock Quality Designation (RQD) values;

☐ ☐ (iv) Saturated hydraulic conductivity and secondary porosity values; and

☐ ☐ (v) Rock descriptions, including fracturing and jointing patterns, etc..

Location of information: _____

Comments: _____

☐ ☐ (E) A ground-water contour map based on the estimated long-term seasonal high water table that is superimposed on a topographic map and includes the location of all borings and rock cores and the water table elevations or potentiometric data at each location used to generate the ground-water contours.

Location of information: _____

Comments: _____

☐ ☐ (F) A bedrock contour map (for sites located in piedmont or mountain regions) illustrating the contours of the upper surface of the bedrock that is superimposed on a topographic map and includes the location of all borings and rock cores and the top of rock elevations used to generate the upper surface of bedrock contours.

Location of information: _____

Comments: _____

☐ ☐ (G) A three dimensional ground-water flow net or several hydrogeologic cross-sections that characterize the vertical ground-water flow regime for this area.

Location of information: _____

Comments: _____

☐ ☐ (H) A report on the ground-water flow regime for the area including ground-water flow paths for both horizontal and vertical components of ground-water flow, horizontal and vertical gradients, flow rates, ground-water recharge areas and discharge areas, etc.

Location of information:_____

Comments:_____

☐ ☐ (I) A certification by a Licensed Geologist that all borings at the site that have not been converted to permanent monitoring wells will be properly abandoned in accordance with the procedures for permanent abandonment of wells, as delineated in 15A NCAC 2C Rule .0113(a)(2).

Location of information:_____

Comments:_____

(3) A Water Quality Monitoring Plan shall be submitted that contains the following information.

☐ ☐ (A) A ground-water monitoring plan including information on the proposed ground-water monitoring system(s), sampling and analysis requirements, and detection monitoring requirements that fulfills the requirements of Rules .1630 through .1637 of this Section.

Location of information:_____

Comments:_____

(i) The Division may require the use of alternative monitoring systems in addition to ground-water monitoring wells at sites:

☐ ☐ (I) Where the owner or operator does not control the property from any landfill unit to the ground-water discharge feature(s); or

☐ ☐ (II) Sites with hydrogeologic conditions favorable to detection monitoring by alternative methods.

☐ ☐ (ii) The ground-water monitoring plan shall provide a detailed discussion of the geologic and hydrogeologic criteria used to determine the number, spacing, location, and screen depths of proposed monitoring wells.

Location of information:_____

Comments:_____

☐ ☐ (B) A surface water monitoring plan in accordance with Rule .0602 of Section .0600.

Location of information:_____

Comments:_____

☐ ☐ (C) The final water quality monitoring plan shall be certified by a Licensed Geologist to be effective in providing early detection of any release of hazardous constituents (from any point in a MSWLF unit or leachate surface impoundment) to the uppermost aquifer, so as to be protective of public health and the environment.

Location of information:_____

Comments:_____

Table 2.1
Range in values of porosity (in part from Davis, 1969, and Johnson and Morris, 1962)

Material	Porosity (%)
SEDIMENTARY	
Gravel, coarse	24–36
Gravel, fine	25–38
Sand, coarse	31–46
Sand, fine	26–53
Silt	34–61
Clay	34–60
SEDIMENTARY ROCKS	
Sandstone	5–30
Siltstone	21–41
Limestone, dolomite	0–20
Karst limestone	5–50
Shale	0–10
CRYSTALLINE ROCKS	
Fractured crystalline rocks	0–10
Dense crystalline rocks	0–5
Basalt	3–35
Weathered granite	34–57
Weathered gabbro	42–45

Table 2.2
Range in values of total porosity and effective porosity

	Total porosity (%)	Effective porosity (%)
Anhydrite[1]	0.5–5	0.05–0.5
Chalk[1]	5–20	0.05–0.5
Limestone, dolomite[1]	5–15	0.1–5
Sandstone[1]	5–15	0.5–10
Shale[1]	1–10	0.5–5
Salt[1]	0.5	0.1
Granite[2]	0.1	0.0005
Fracture crystalline rock[2]	—	0.00005–0.01

[1]Data from Croff and others (1985).
[2]Data from Norton and Knapp (1977).

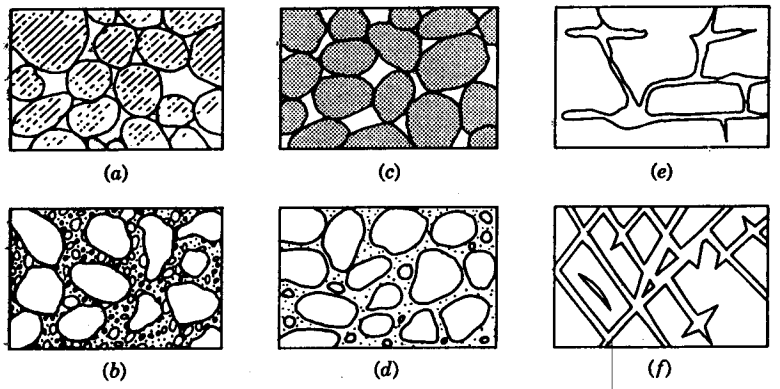


Figure 2.1
Relation between texture and porosity. (*a*) Well-sorted sedimentary deposit having high porosity; (*b*) poorly sorted sedimentary deposit having low porosity; (*c*) well-sorted sedimentary deposit consisting of pebbles that are themselves porous, so that the deposit as a whole has a very high porosity; (*d*) well-sorted sedimentary deposit whose porosity has been diminished by the deposition of mineral matter in the interstices; (*e*) rock rendered porous by solution; (*f*) rock rendered porous by fracturing (from Meinzer, 1923).

Porosity can range from zero or near zero to more than 60% (Table 2.1). The latter value is reflective of recently deposited sediments whereas the former value is for dense crystalline rocks or highly compacted soft rocks such as shales. In general, for sedimentary materials, the smaller the particle size, the higher the porosity. This is best demonstrated by comparing the porosity of coarse gravels with fines, and the total gravel assemblage with silts and clays.

An important distinction is the difference between total porosity, which does not require pore connections, and effective porosity, which is defined as the percentage of interconnected pore space. Many rocks, crystallines in particular, have a high total porosity, most of which may be unconnected. Effective porosity implies some connectivity through the solid medium, and is more closely related to permeability than is total porosity. Some data on effective porosity are shown in Table 2.2. As noted, effective porosity can be over one order of magnitude smaller than total porosity, with the greatest difference occurring for fractured rocks.

Heath (1982) recognizes five types of porosity in dominant water-bearing bodies at or near the Earth's surface in the United States and attempts to map their distribution (Figure 2.2). There are some difficulties with this map because of the necessity of mapping a single type of opening in areas where two or more types are present. However, this is a useful presentation and one to which we will refer frequently in this chapter. Each pattern on Figure 2.2 is associated with one or more major water-yielding formations in the United States. Thus, the solution-enlarged openings in carbonate rocks that make up the Florida peninsula are known as the Floridian system; the sands and gravels stretching from New Jersey into Texas are sediments of the Atlantic and Gulf coastal plains; the sand and gravel in the Midwest represents glacial deposits; the sandstones in the northern mid-continent represent several formations, including the Dakota sandstone and the Cambrian-Ordovician system; the sands and gravels in the western part of the

APPROVED
DIVISION OF SOLID WASTE MANAGEMENT
DATE 5/31/00 BY [illegible]

Alternate Daily Cover
Iredell County Permit No. 49-03

Scope of Work:

- Demonstrate that the use of auto shredder residue (ASR) in conjunction with soil can be used as an alternative daily cover instead of the utilization of soil alone. This daily cover must comply with 15 NCAC .1626(2)(b) which requires Iredell County as the owner/operator to demonstrate that the alternative cover controls disease vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment.

- Provide an operational plan for permanent approval that includes all methods, procedures and practices involved.

Background:

ASR is the light weight fluff, plastic and foam components, generated during the recovery of metals from automobiles. This waste has typically been part of the waste stream that has been disposed in the Iredell County Landfill. The County operates a bale fill and ASR cannot be baled directly. Due to its light weight, it must be mixed with other waste prior to baling. The use of this material as daily cover can be viewed as a savings of available air space at the landfill and also as a savings in operating costs at the baler facility. The soil used for daily cover, which is being replaced by the ASR, would be taking up air space that could be used for municipal solid waste.

Demonstration:

The proposed synthetic or alternate daily cover will consist of three inches of ASR covered with three inches of soil.

The ASR is a homogenous material in particle sizes because it has been ground up in the process of metal recovery. Therefore, this material can be easily and uniformly spread across the surface of a bale fill which has very little protruding material. The three inches of soil cover can then be spread over the ASR. However, this is not true across an area fill where the waste has not been baled because spreading the ASR does not uniformly cover the uneven waste. Consequently, considerable additional soil is required to properly cover the protruding waste in the unbaled areas.

The ASR is dumped at or near the working area of the bale fill. It is then distributed across the surface using a loader and then spread using a dozer. This process covers the bales adequately so that organic material cannot be reached by vectors, and other materials are covered so scavenging is not possible. Once the three inches of soil is placed, the ASR is

covered so that very little of it protrudes through the soil. The three inches of soil covers the ASR better than the six inches of soil cover would cover the normal work area without the ASR. Consequently, blowing litter and odors are kept to a minimum. The soil that is used will act as a fire break along with the fact that the bale fill itself also acts as a deterrent to fire.

The attached photographs show the ASR in a stockpile and then being distributed across the working area with a front end loader. The photos also show the finished cover with the three inches of soil spread across the three inches of fluff (ASR). The photographs depict bale fill area only.

Operation Plan:

1. The ASR will be delivered to the working area as directed by County Personnel.

2. At the end of each working day the ASR will be distributed over the daily working area with a front end loader and spread out with a dozer to a minimum depth of three inches.

3. Once the ASR is spread, the soil can then be placed over it at a minimum depth of three inches. This can be done by several methods such as, but not limited to, a pan spreading the soil out over the entire area or just dropping its load and the soil being pushed out by a dozer. During wet weather conditions, the soil could be stockpiled and sprinkled over the ASR with a front end loader. Whichever method is used, a minimum of three inches of soil will be used.

4. If there is more ASR delivered to the site than can be used for that day's cover, the remaining stockpile will be covered with a tarp or similar synthetic cover until it is used for daily cover. If the stockpile remains for longer than a week, it will be disposed as if it were regular MSW.

5. Areas which will not have additional waste placed on them for twelve months or more, but where final termination of disposal operations has not occurred, will be covered with a minimum of one foot of intermediate soil cover.

Stockpiled auto shredder residue (ASR).

Loader dumping ASR on working surface.

ASR dumped on working surface of balefill.

Another view of ASR dumped on working surface.

Dozer spreading ASR over working surface.

Working surface after 3 inches of soil has been spread over 3 inches (minimum) of ASR.

Note: Very little ASR protruding through soil.

View from above of working surface with soil and ASR mixture.

View from below bale fill at corner of soil and ASR mix.

CF
49-03

NCDENR

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

WILLIAM L. MEYER
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WASTE MANAGEMENT

May 31, 2000

Ronald Weatherman
Iredell County
P. O. Box 788
Statesville, North Carolina 28677

Re: Alternate Daily Cover
Iredell County MSWLF
Permit No. 49-03

Dear Mr. Weatherman:

The Solid Waste Section hereby approves the use of alternative daily cover in accordance with the plan provided on March 9, 2000. The approved alternate daily cover plan has been added to Solid Waste Permit 49-03, Attachment 3, List of Approved Documents. Please replace the existing Attachment 3 with the enclosed 5/31/00 revision.

If you have any questions or comments, please contact me at (919) 733-0692, ext. 259.

Sincerely,

James C Coffey

James C. Coffey
Permitting Engineer
Solid Waste Section

cc: Wayne Sullivan, MESCO
Brent Rockett, DWM
Tim Jewett, DWM
Anthony Foster, DWM

1646 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27699-1646
401 OBERLIN ROAD, SUITE 150, RALEIGH, NC 27605
PHONE 919-733-4996 FAX 919-715-3605

ATTACHMENT 3

Revised May 31, 2000

Approved Documents

PART I: GENERAL FACILITY CONDITIONS

PART II: MUNICIPAL SOLID WASTE LANDFILL CONDITIONS

1. Construction Quality Assurance Report, Municipal Solid Waste Landfill Facility, Phase 2, Iredell County, North Carolina, Volumes 1 & 2, prepared by Municipal Engineering Services Co., Inc., as revised through March 30, 2000.
2. Report, Alternative Daily Cover, Iredell County Permit No. 49-03, prepared by Municipal Engineering Services Co., submitted on March 9, 2000.

PART III: CONSTRUCTION AND DEMOLITION LANDFILL CONDITIONS

1. Correspondence from Municipal Engineering Services, Co., (MESCO) dated December 13, 1999, requesting expansion of C&D Landfill Area.
2. Correspondence from MESCO dated February 14, 2000 in response to questions regarding groundwater elevations and groundwater monitoring well relocation.
3. Correspondence from MESCO in response to section hydrogeological review.
4. Letter revising C&D Landfill base grades.
5. Facility Plan Drawing No.'s 4 and 6 as revised through March 30, 2000.
6. Drawings PM-1 and PM-2 dated 3/13/00.

PART IV: LAND CLEARING AND INERT DEBRIS LANDFILL CONDITIONS
(NOT APPLICABLE)

PART V: YARD WASTE CONDITIONS
(NOT APPLICABLE)

PART VI: MISCELLANEOUS TREATMENT AND PROCESSING FACILITIES CONDITIONS
(NOT APPLICABLE)

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

May 26, 2000

Ms. Sherri Coghill, *Environmental Engineer*
Solid Waste Section
Mail Service Center 1646
Raleigh, NC 27699.1646

Re: Iredell County Site Suitability

Dear Ms. Coghill:

Please find enclosed three (3) copies of the following that pertain to the above referenced site suitability:

1. Affidavits from the newspaper and radio advertising the public meeting;
2. Minutes from the Public Meeting that was held by the City Council of Statesville;
3. Resolution from the City Council of Statesville accepting the landfill;
4. US Army Corps of Engineers acceptance of the Survey defining Waters of the US; and,
5. The Community Notice of the meeting that was held by Iredell County prior to the purchase of the property.

The letters from the State Agencies approving the cultural resources and endangered species will be forwarded to you as soon as we receive them. As you are aware, we had an independent study done on these items and we are awaiting the States approval of these studies. If you have any questions or need additional information, please do not hesitate to call.

Sincerely yours;
Municipal Engineering Services Co., PA

D. Wayne Sullivan
Project Manager

cc: Joel Mashburn
Ron Weatherman

Iredell
49-03

IREDELL COUNTY
SOLID WASTE FACILITY

354 Twin Oaks Road
Statesville, N.C. 28625

(704) 878-5430
Fax (704) 878-5429

Sherri Coghill
1646 Mail Service Center
Raleigh, NC 27699-1646

May 23, 2000

Dear Sherri:

I'm writing to give you some background on property purchased by Iredell County for our next cell that you are reviewing for site suitability. The County made a decision two years ago to purchase 61 acres that adjoins our present landfill property. The property is ideally suited for two lined cells that will benefit Iredell County for approximately 11additional years.

Iredell County already has site suitability for our next cell that was obtained in 1993, and we could have constructed on that property, thereby saving approximately a year or more of engineering work and review time, after the adjoining land was offered to the county, a decision was made to use this property first while we can efficiently get to it with municipal solid waste. One of our main concerns about not utilizing the new property now, was a very long haul road that would have had to be constructed over a mountain of municipal solid waste to get to the site, which would have caused numerous problems with our heavy truck traffic, not to mention the cost associated with maintenance of the road.

Our waste stream has increased by over 10 percent this past year which is closing the window at an accelerated rate in our present cell, and I'm concerned that we will fill the cell sooner than the projected life of early 2000. If we start construction during the winter months we could be facing a real dilemma.

Sherri I plan to work very closely with our Engineering Firm and would like to visit with you on occasion to keep abreast of review and possible questions. It is vitally important that we keep this project on a timely schedule.

I would like to take this opportunity to say that I'm pleased you are the review engineer working on our project. You respond to questions in a professional & timely manner and I have enjoyed working with you.

Sincerely,

Ron Weatherman

Ron Weatherman
Iredell County Solid Waste Director

rw/sg

cc: Joel Mashburn, Iredell County Manager
Wayne Sullivan, Municipal Engineering Services

Iredell
49-03

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

April 26, 2000

Ms. Sherri Coghill, Environmental Engineer
Solid Waste Section
NC DENR
401 Oberlin Road
Raleigh, NC 27699

Re: Iredell County Site Suitability

Dear Ms. Coghill:

Please find enclosed three copies of the Site Suitability Study for Iredell County. We sent Mr. Jim Coffey our schedule at an earlier date, and we are within the scheduled time for submission of the Site Suitability Study. The Public Meeting will be held at the City of Statesville on May 1, 2000 and the Minutes of that meeting along with the Resolution and Affidavits of Advertisement will be forwarded as soon as we receive them.

If you have any questions or need additional information, please do not hesitate to call.

Sincerely yours,
MUNICIPAL ENGINEERING SERVICES CO., PA

D. Wayne Sull.

D. Wayne Sullivan
Project Manager

Enclosures

Copy: Mr. Ronald Weatherman, Solid Waste Director
Mr. Joel Mashburn, Manager

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

April 19, 2000

Ms. Ellen Lorscheider
Solid Waste Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
401 Oberlin Road, Suite 150
Raleigh, NC 27605

Re: Site Hydrogeologic Study, Phase 3 & 4
Iredell County Lined Landfill, Iredell County, North Carolina
MESCO Project No. G99087.0

Dear Ms. Lorscheider:

Enclosed you will find three copies of the Site Hydrogeologic Study for the proposed Phase 3 & 4 Sites, Iredell County Subtitle D Landfill. This report has been completed to meet the requirements as described in *15A NCAC 13B Rule .1623(a).*

Please feel free to contact me should you have any questions or concerns regarding this report.

Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., P.A.

Kohei Yoshida
Hydrogeologist

Enclosures

cc: Mr. Ron Weatherman, Iredell County
Dr. Edward S. Custer, Jr., P.G.

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

April 6, 2000

Ms. Sherri Coghill
NCDENR
Solid Waste Section
401 Oberlin Road
Raleigh, NC 27611-7687

Re: Revision to Iredell County Facility Plan Drawings
Project No. G 96099

corrected monitoring well locations

Dear Ms. Coghill:

Per your conversation with Mrs. Carol Woodie this morning, you will find enclosed three (3) copies of revised sheets 4 and 6 of the Facility Plan.

If you have any question or need any additional information, please don't hesitate to call.

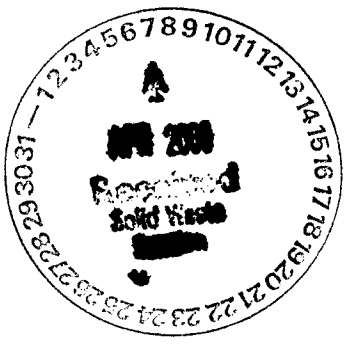
Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., PA

Lisa C. Hampton

Lisa C. Hampton

LCH:lch

cc: Joel Mashburn, County Manager
Ronald Weatherman, Solid Waste Director



NCDENR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WASTE MANAGEMENT

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

WILLIAM L. MEYER
DIRECTOR

April 3, 2000

Ronald Weatherman
Iredell County
P. O. Box 788
Statesville, North Carolina 28677

Re: Modification to Facility Permit No. 49-03
for C&D Landfill Expansion
Iredell County

Dear Mr. Weatherman:

The Solid Waste Section has modified Permit to Operate No. 49-03 to include operational conditions for Iredell County's C&D Landfill expansion. Please refer to Attachment 4, Part III for conditions of permit for the C&D Unit. Condition No. 3 list pre-operative requirements for the expansion.

If you have any questions or comments, please contact me at (919) 733-0692, ext. 259.

Sincerely,

Sherri Coghill
Permitting Engineer
Solid Waste Section

cc: Wayne Sullivan, MESCO
Brent Rockett, DWM
Tim Jewett, DWM
Anthony Foster, DWM

1646 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27699-1646
401 OBERLIN ROAD, SUITE 150, RALEIGH, NC 27605
PHONE 919-733-4996 FAX 919-715-3605

NCDENR

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

WILLIAM L. MEYER
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WASTE MANAGEMENT

FACILITY PERMIT NO: 49-03
Part 2-Permit to Operate
Date of Issue: November 19, 1997
Date of Original Permit Issue: October 8, 1993
Permit Renewal Date: September 28, 1998
Modification to Permit (C&D Landfill expansion): March 31, 2000
Amendment Date: Not Applicable

MUNICIPAL SOLID WASTE LANDFILL

FACILITY PERMIT

COUNTY OF IREDELL
is hereby issued a PERMIT to OPERATE a
MUNICIPAL SOLID WASTE LANDFILL FACILITY

located on SR 2319, Iredell County, North Carolina in accordance with Article 9, Chapter 130A, of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit. The facility is located and described by the legal description of the site or the property map contained within the approved application.

James C Coffey

James C. Coffey, Head
Permitting Branch
Solid Waste Section

1646 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27699-1646
401 OBERLIN ROAD, SUITE 150, RALEIGH, NC 27605
PHONE 919-733-4996 FAX 919-715-3605

ATTACHMENT 3

Approved Documents

PART I: GENERAL FACILITY CONDITIONS

PART II: MUNICIPAL SOLID WASTE LANDFILL CONDITIONS

1. Construction Quality Assurance Report, Municipal Solid Waste Landfill Facility, Phase 2, Iredell County, North Carolina, Volumes 1 & 2, prepared by Municipal Engineering Services Co., Inc., as revised through March 30, 2000.

PART III: CONSTRUCTION AND DEMOLITION LANDFILL CONDITIONS

1. Correspondence from Municipal Engineering Services, Co., (MESCO) dated December 13, 1999, requesting expansion of C&D Landfill Area.
2. Correspondence from MESCO dated February 14, 2000 in response to questions regarding groundwater elevations and groundwater monitoring well relocation.
3. Correspondence from MESCO in response to section hydrogeological review.
4. Letter revising C&D Landfill base grades.
5. Facility Plan Drawing No.'s 4 and 6 as revised through March 30, 2000.
6. Drawings PM-1 and PM-2 dated 3/13/00.

PART IV: LAND CLEARING AND INERT DEBRIS LANDFILL CONDITIONS
(NOT APPLICABLE)

PART V: YARD WASTE CONDITIONS
(NOT APPLICABLE)

PART VI: MISCELLANEOUS TREATMENT AND PROCESSING FACILITIES CONDITIONS
(NOT APPLICABLE)

ATTACHMENT 4

Conditions of Permit to Operate

PART I:
GENERAL FACILITY CONDITIONS

1. This permit shall be reviewed, pursuant to 15A NCAC 13B.0201(e), five (5) years from the issuance date of this permit to operate or the latest amendment.

2. In the event of conflicts between this Permit to Operate and previously issued conditions, the conditions of this Permit to Operate shall supersede previously issued conditions.

3. The solid waste management units within this facility shall conform to all operating procedures described in the approved plans, 15A NCAC 13B, and the conditions specified herein.

4. Additional conditions and revision of the approved documents or changes during the operation of the landfill require approval by the North Carolina Solid Waste Section.

5. On or before August 1 of each year, the permittee shall report the amount of waste received (in tons) at this facility and disposed of in the landfill units to the Solid Waste Section, on forms prescribed by the Section. This report shall include the following information:

   a. The reporting period shall be for the previous year, beginning July 1 and ending on June 30.

   b. The amount of waste received and landfilled in tons, compiled on a monthly basis and by specific waste type if diverted to a specific unit within the permitted facility; and

   c. The completed report shall be forwarded to the Regional Waste Management Specialist for the facility. A copy of the completed report shall be forwarded to the County Manager of each county from which waste was received.

6. Ground water quality at this facility is subject to the "Classifications and Water Quality Standards Applicable To The Groundwater of North Carolina", 15A NCAC 2L. This includes, but is not limited to, provisions for detection monitoring, assessment, and

corrective action.

PART II:
MUNICIPAL LANDFILL UNIT SPECIFIC CONDITIONS

GENERAL CONDITIONS

1. This permit approves the operation of Phase 2 of the municipal solid waste landfill unit as well as the on-site environmental management and protection facilities as described in the approved plans.

2. This permit is for operational approval of a five year permitted disposal capacity of approximately 960,000 cubic yards, consistent with the final contours as shown on Drawing No. P5 of Document 1, Part II, Attachment 1. This capacity is based on an average annual disposal rate of approximately 123,000 tons (approximately 430 tons per day based on 300 operating days per year) facility total as set forth in Document 1, Part II, Attachment 1.

MONITORING AND REPORTING

3. Ground water monitoring at this unit shall be as prescribed by the appropriate requirements of 15A NCAC 13B .1630-.1637 and the approved monitoring plan.

4. A readily accessible unobstructed path shall be cleared and maintained so that four-wheel drive vehicles may access monitoring well locations at all times.

5. A field log book which details all development, sampling, repair, and all other pertinent activities associated with each monitoring well and all sampling activities associated with each surface water and leachate sampling location shall be kept as part of the permanent facility record.

6. Records of all ground-water, surface water and leachate analytical data shall be kept as part of the permanent facility record.

7. Ground water monitoring wells and surface water sampling locations must be sampled for Appendix I constituents at least semi-annually according to the specifications outlined in the approved water quality monitoring plan and the current policies and guidelines of the Section in effect at the time of sampling.

8. Reports of the analytical data for each water quality sampling event

shall be submitted to the Section within 60 days of the respective sampling event. Analytical data shall be submitted in a manner prescribed by the Section.

9. The four independent samples which comprise the initial baseline sampling event shall be collected from each ground water monitoring well and the report shall be submitted to the Section within six months after issuance of the Permit to Operate.

10. Untreated leachate shall be sampled and analyzed at least semi-annually concurrently with the ground and surface water sampling. The leachate shall be analyzed for all Appendix I constituents, pH, specific conductance, BOD and COD, phosphate, nitrate, and sulfate. Test results shall be submitted to the Section along with ground and surface water test results. In the event leachate is recirculated, additional leachate sampling may be required.

OPERATIONAL CONDITIONS

11. The landfill unit shall conform to all operating requirements described in the approved plans, 15A NCAC 13B .1626, and the conditions specified herein.

12. The use of alternative daily cover requires approval, prior to implementation, by the Solid Waste Section. Requests for alternative daily cover approval must include a comprehensive use and demonstration of effectiveness plan developed according to Section guidelines and consistent with the approved plan. Plans which are approved by the Section will be incorporated into, and made a part of, the approved documents found in Attachment 3.

13. The use of leachate recirculation as a leachate management tool requires approval, by the Solid Waste Section, prior to implementation. Requests for leachate recirculation approval must include a comprehensive management plan developed according to Section guidelines and which is consistent with the approved operation plan. Plans which are approved by the Section will be incorporated into, and made a part of, the approved documents found in Attachment 3.

14. Co-disposal of wastewater treatment sludges requires approval by the Solid Waste Section prior to implementation. Requests for co-disposal of sludges must include a comprehensive management plan developed in accordance with Section rules and guidelines. Plans which are approved by the Section will be incorporated into, and made a part of, the approved documents found in Attachment 3.

15. Closure or partial closure of any MSWLF unit shall be in accordance with the Closure Plans described in the approved plans and 15A NCAC 13B .1629. Final Closure Plans shall be submitted to the Division at least 90 days prior to implementation. Closure and Post-closure plans, including financial instruments shall be updated annually pursuant to 15A NCAC 13B .1628.

PART III:
CONSTRUCTION AND DEMOLITION DEBRIS UNIT SPECIFIC CONDITIONS

1. This C&D unit is approved for a disposal capacity consistent with the approved contours as shown on Drawing F4 of Document 1, Part III, Attachment 1.

2. The permit for the CDLF shall be reviewed, pursuant to 15A NCAC 13B.0201(e), five (5) years from the issuance date of this permit to operate or the latest amendment/modification.

3. The following requirements shall be met prior to operation of the expansion area:

   a. The owner/operator shall provide documentation to the division that site preparation (grading and/or placement of fill maintaining 4 feet of separation between waste and groundwater) has occurred in accordance with the construction plan and the conditions specified herein.
   b. Surface water monitoring locations shall be established and groundwater monitoring wells shall be installed and a baseline sampling event performed. Well construction records, boring logs, and evidence that a baseline sampling has been conducted shall be submitted to the Section Hydrogeologist for review and approval.

4. Operation of the C&D unit shall be in accordance with 15A NCAC 13B .0505, the approved plan, and the following specific conditions:

   a. Waste Acceptance and Disposal:
   The C&D unit is permitted to receive the following waste types:
      A. Land Clearing Debris as defined in G.S. 130A-290, specifically, solid waste which is generated solely from land-clearing activities, such as stumps, trees, etc.;
      B. Inert Debris defined as solid waste which consists solely of material that is virtually inert, such as brick, concrete, rock and clean soil;

C. Asphalt in accordance with G.S. 130A-294(m); and
D. Construction and Demolition Debris defined as solid waste resulting solely from construction, remodeling, repair or demolition operations on pavement, buildings or other structures.

b. Cover Material Requirements:
Waste shall be covered with six inches (6) of suitable cover at least once per week, or when the active working area reaches one-half acre (½) in size, or more often as necessitated by the nature of the waste, so as to prevent the site from becoming a visual nuisance and to prevent fire, windblown materials, vectors or water infiltration. Areas that will not receive additional waste on them for twelve months or more, but where final elevations have not been reached, shall be covered with one (1) foot of soil cover.

c. Monitoring Requirements: Ground water monitoring wells (MW-1A, MW-1B, MW-10R, MW-9R, and MW-16) and surface water sampling location SW-3 shall be sampled for Appendix I constituents at least semi-annually according to the specifications outlined in the approved water quality monitoring plan and the current policies and guidelines of the Section in effect at the time of sampling. Sampling events shall be conducted at the time of MSWLF and leachate sampling events.

5. Closure Requirements - The C&D unit shall be closed in accordance with the approved plan and the requirements of the Solid Waste Section at the time of closure. A final closure plan shall be submitted for review at least ninety (90) days prior to closure of any phase of the C&D landfill unit.

PART IV:
LAND CLEARING AND INERT DEBRIS UNIT SPECIFIC CONDITIONS
(NOT APPLICABLE)
PART V:
YARD WASTE UNIT SPECIFIC CONDITIONS
(NOT APPLICABLE)
PART VI:
MISCELLANEOUS TREATMENT AND PROCESSING UNIT SPECIFIC CONDITIONS (Specify Unit Type)
NOT APPLICABLE)

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

March 24, 2000

Ms. Sherri Coghill
NCDENR
Solid Waste Section
401 Oberlin Road
Raleigh, NC 27611-7687

Re: Revision to Iredell County Facility Plan Drawings
Project No. G 96099

Dear Ms. Coghill:

Enclosed you will find five (5) copies of revised sheets 4 and 6 of the Facility Plan.

Due to adjustments in the groundwater mapping , for the C & D area, the cut contours on the previously mentioned sheets had to be revised.

If you have any question or need any additional information, please don't hesitate to call.

Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., PA

D. Wayne Sullivan
Project Manager

DWS:lch

cc: Joel Mashburn, County Manager
Ronald Weatherman, Solid Waste Director

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

March 21, 2000

Ms. Ellen Lorscheider
Solid Waste Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
401 Oberlin Road, Suite 150
Raleigh, NC 27605

Re: Iredell County Construction and Demolition Area Expansion
Iredell County Lined Landfill, Iredell County, North Carolina
MESCO Project No. G99070.0

Dear Ms. Lorscheider:

This letter is drafted in response to your letter dated February 22, 2000 pertaining to the Iredell County Construction and Demolition (C&D) Area Expansion. As requested in your previous letter, the following items are included herein.

- A revised map of the proposed C&D area showing the water table surface, the existing monitoring well locations in the vicinity of the C&D area, the locations of the proposed monitoring wells (MW-16, MW-9R and MW-10), and the new waste limit. This map shows that well MW-9R will be placed immediately to the east of the eastern edge of the waste limit. The potentiometric contour lines are now tied to the stream flowing northward on the east side of the C&D area. The resulting surface covers the entire proposed area, which will provide sufficient information of the area without the need of installing additional piezometers.

- A table listing historical ground water level readings of wells in the vicinity of the C&D area. Data from five monitoring wells (MW-1A, MW-1B, MW-9, MW-10 and MW-11) and two piezometers (PZ-1S and PZ-1D) are provided in the table. Water level readings at surface water monitoring points are not available. However, elevations of the stream have not shown any drastic change over the measurement period. This, coupled with the fact that this stream is a permanent feature with a only marginal flow depth, it is a reasonable assumption that the elevations can be well represented by the topographic elevations.

- A map depicting two cross-sections. Each cross-section provides the elevations of the proposed fill, existing grade, and the water table surface measured during the July 1999 sampling event.

Because of the proximity of the proposed monitoring wells to the local discharge point, the water table will likely show a seasonal fluctuation similar to those of MW-9 and MW-10. The enclosed table shows that the highest levels during the measurement period were recorded in 1994 and 1995, and the levels immediately declined thereafter. The head observed head differences at MW-9 and MW-10 locations are 6.03 and 6.58 feet, respectively. The levels also seem to have stabilized in recent years.

Please contact me by phone at (919)772-5393, or by fax at (919)772-1176 if you have any questions or need more information.

Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., P.A.

Kohei Yoshida
Hydrogeologist

Enclosures

cc: Mr. Ron Weatherman
Iredell County

Table 1. Water Table Elevations at Monitoring Well Locations – Iredell County Landfill C&D Area Expansion

Well	Date Installed	Top of Casing	Ground Elevation	10/28/93	9/16/94	3/6/95	12/20/95	7/10/96	12/6/96	7/1/97	12/10/97
MW-1A	04/27/93	874.30	871.38	856.29	858.72	859.05	–	856.73	856.41	855.79	854.97
MW-1B	04/28/93	873.42	871.38	855.61	858.05	–	871.07	856.12	870.92	855.22	854.45
PZ-1S	03/04/98	867.74	865.24	–	–	–	–	–	–	–	–
PZ-1D	03/04/98	867.93	865.24	–	–	–	–	–	–	–	–
MW-9	09/01/93	844.11	841.61	–	817.62	817.51	–	813.76	813.39	–	812.79
MW-10	09/01/93	828.63	826.13	–	808.64	809.93	–	805.97	805.63	–	804.78
MW-11	02/16/98	821.46	819.05	–	–	–	–	–	–	–	–

* All presented data are expressed in feet.

Table 1. Water Table Elevations at Monitoring Well Locations – Iredell County Landfill C&D Area Expansion

Well	4/2/98	5/19/98	6/30/98	10/26/98	12/17/98	7/7/99	High	Low	Difference
MW-1A	874.30	–	855.82	854.15	853.68	852.66	874.30	852.66	21.64
MW-1B	–	–	855.01	853.62	866.52	852.08	871.07	852.08	18.99
PZ-1S	833.34	–	–	–	–	844.50	844.50	833.34	11.16
PZ-1D	834.35	–	–	–	–	846.77	846.77	834.35	12.42
MW-9	–	–	813.62	–	811.93	811.59	817.62	811.59	6.03
MW-10	–	–	805.97	–	803.38	803.35	809.93	803.35	6.58
MW-11	814.03	813.24	811.41	809.61	–	809.37	814.03	809.37	4.66

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

March 9, 2000

Mr. Tim Jewett, *Regional Engineer*
Solid Waste Section
585 Waughtown Street
Winston Salem, NC 27107.2241

Re: Alternate Daily Cover for Iredell County Landfill
Permit No. 49-03

Dear Mr. Jewett:

Please find enclosed 4 copies of the recent study we did on the use of auto shredder residue (ASR) for the Iredell County Landfill. As we discussed, Anthony Foster has viewed the operation and did not have a problem with it. The enclosed report includes photographs of the material being stockpiled, spread and covered with soil. Also, as part of the report, an operation plan has been developed that can be used to revise the existing permit to operate.

The County is looking to finalize this operation so that any consideration that can be given the revision of the permit to operate would be appreciated. If you have any questions or need additional information, please do not hesitate to call.

Sincerely yours,

Municipal Engineering Services Co., PA

D. Wayne Sullivan
Project Manager

cc: Joel Mashburn
Ron Weatherman

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

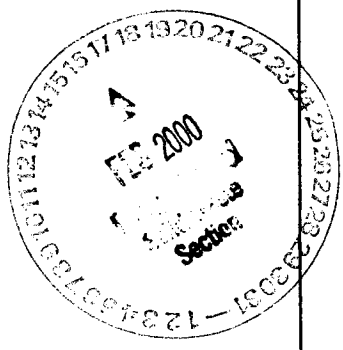
CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

February 14, 2000

Ms. Ellen Lorscheider
Solid Waste Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
401 Oberlin Road, Suite 150
Raleigh, NC 27605



Re: Monitoring Well Relocation for C&D Area
Iredell County Lined Landfill, Iredell County, North Carolina
MESCO Project No. G99070.0

Dear Ms. Lorscheider:

Iredell County would like to expand the construction demolition (C&D) area on the southeast side of the landfill property. There are two existing monitoring wells MW-9 and MW-10 located to the immediate east of this area, which is hydraulically downgradient. As the County wishes to expand this area beyond the locations of these two downgradient monitoring wells, alternate wells need to be established in order to maintain continual detection monitoring for the C&D area. The new monitoring wells will be installed to the immediate east of the proposed waste boundary in order to allow effective monitoring of groundwater migrating through the proposed area.

Subsurface soil at the site generally consist of clay sands/sandy silts overlain by 0 to 12 inches of topsoil. Layers of the cohesive soil near the ground surface are generally thicker where ground surface elevations are higher or surface slopes are less steep. Deeper soils at the site are predominantly comprised of fine sand and silt. The sandy and silty soils vary significantly in percentages of sand and silt and sand particle size. Clay-sized particles occur in minor amounts in the sand and silt soils other than the near-surface cohesive soils. Mica particles were found in varying amounts in soils sampled across the site.*

Both wells MW-9 and MW-10 monitor groundwater in the uppermost aquifer in a soil stratum composed of a mixture of medium to fine sand and silt. The site as a whole is characterized by the abundance of clay lenses, which, in some occasions, may result in high turbidity in water samples. Groundwater in this particular area, however, is relatively "clean" as indicated by low turbidity in samples from MW-9 and MW-10.

*GAI Consultants, Inc., 1992, Geological and hydrogeological study, Iredell County landfill expansion, Iredell County, North Carolina, Project No. 92101.02.

Two proposed monitoring wells MW-9R and MW-10R will be installed as replacements for MW-9 and MW-10 at locations shown in the enclosed map. An additional monitoring well MW-16 will be installed to monitor the northeast portion of the proposed waste boundary directly across from the tire processing area. All monitoring wells will be constructed in accordance with *15A NCAC 02C .0108*. The following table summarizes estimated ground elevations and water table elevations at the proposed monitoring well locations.

Table 1. Estimated ground and water table elevations

Proposed Well	Ground Elevation (ft.)	Water Table Elevation (ft.)
MW-9R	807.0	795.0
MW-10R	820.0	800.0
MW-16	785.0	775.0

NOTE: These water table elevations are extrapolated from head values taken during the July 1999 sampling event, and may differ from their actual elevations.

Upon Section's approval, the new monitoring wells will be incorporated into the existing groundwater monitoring plan for the Iredell County landfill. Wells MW-9 and MW-10 will be abandoned in accordance with *15A NCAC 02C .0113* before the initiation of the C&D area expansion.

Well construction records for MW-9 and MW-10 are included in this report in addition to the above mentioned map. Please contact us of any changes necessary for approval so that the plan can be implemented in a timely fashion.

Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., P.A.

Kohei Yoshida
Hydrogeologist

encl: Single-day potentiometric map with proposed monitoring well locations
Boring logs for wells MW-9 and MW-10
Turbidity results map (July 1999)

cc: Mr. Ron Weatherman
Iredell County

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO. _____
Lat. _____ Long. _____ RO _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GMI Consultants-N.C., Inc.

STATE WELL CONSTRUCTION PERMIT NUMBER: NA

DRILLER REGISTRATION NUMBER: 446

1. WELL LOCATION: (Show sketch of the location below)
   Nearest Town: Statesville County: Iredell Co.
   S.R. 2405
   (Road, Community, or Subdivision and Lot No.)
2. OWNER Iredell Co.
   ADDRESS P.O. Box 788
   (Street or Route No.)
   Statesville N.C. 28677
   City or Town State Zip Code
3. DATE DRILLED 9-1-93 USE OF WELL G.W. monitoring
4. TOTAL DEPTH 36'
5. CUTTINGS COLLECTED YES ☐ NO ☑
6. DOES WELL REPLACE EXISTING WELL? YES ☐, NO ☑
7. STATIC WATER LEVEL Below Top of Casing: 28.5 FT.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.5' FT. Above Land Surface*

* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118

9. YIELD (gpm): NA METHOD OF TEST _____
10. WATER ZONES (depth): 26' - bottom
11. CHLORINATION: Type NA Amount _____
12. CASING:

	Depth From	Depth To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	2.5'	20'		2 in	Sch 40	PVC

13. GROUT:

	Depth From	Depth To	Ft.	Material	Method
	0	14		Cement	Dump
	14	17		Bentonite	pellet

14. SCREEN:

	Depth From	Depth To	Ft.	Diameter	Slot Size	Material
	20	35		2 in.	.010 in.	PVC
				in.	in.	
				in.	in.	

15. SAND/GRAVEL PACK:

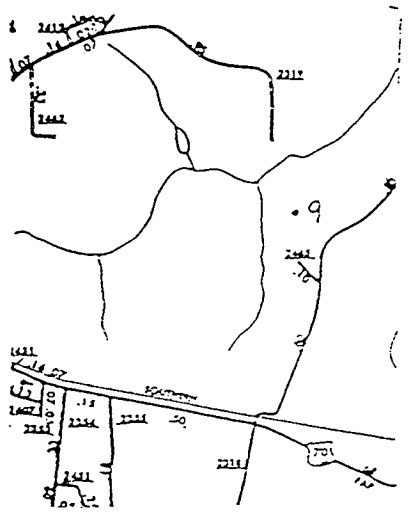
	Depth From	Depth To	Ft.	Size	Material
	17	36		concrete	Sand

16. REMARKS: M.W #9 26' after 24 hrs

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	3'	Red fine sandy silt w/ mica
3'	36'	tan fine to med sandy silt w/ mica grades sandier denser

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)
SEE LANDFILL PLANS



I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Gary J. Thomas 9-9-93
SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 REV. 9/91

Submit original to Division of Environmental Management and copy to well owner

North Carolina - Department of Environment, Health, and Natural Resources
Division of Environmental Management - Groundwater Section
P.O. Box 29535 - Raleigh, N.C. 27626-0535
Phone (919) 733-3221

FOR OFFICE USE ONLY
QUAD. NO. _____ SERIAL NO. _____
Lat. _____ Long. _____ RO _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: GAI Consultants-N.C. Inc.

STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

DRILLER REGISTRATION NUMBER: 446

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Statesville County: Iredell Co
S.R. 2465
(Road, Community, or Subdivision and Lot No.)

2. OWNER Iredell Co.
ADDRESS P.O. Box 788
(Street or Route No.)
Statesville N.C. 28677
City or Town State Zip Code

3. DATE DRILLED 9-1-93 USE OF WELL G.W monitoring
4. TOTAL DEPTH 31'
5. CUTTINGS COLLECTED YES ☐ NO ☑
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☑
7. STATIC WATER LEVEL Below Top of Casing: 22.5 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.5' FT. Above Land Surface*
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .0118
9. YIELD (gpm): NA METHOD OF TEST _____
10. WATER ZONES (depth): 20' - bottom
_____ _____
11. CHLORINATION: Type NA Amount _____
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	+2.5	To 15' Ft.	2in	Sch 40	PVC
From		To Ft.			
From		To Ft.			

13. GROUT:

	Depth		Material	Method
From	0	To 10.5 Ft.	Cement	pump
From	10.5'	To 13.5 Ft.	bentonite	pellet

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From	15'	To 30 Ft.	2 in.	.010 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

15. SAND/GRAVEL PACK:

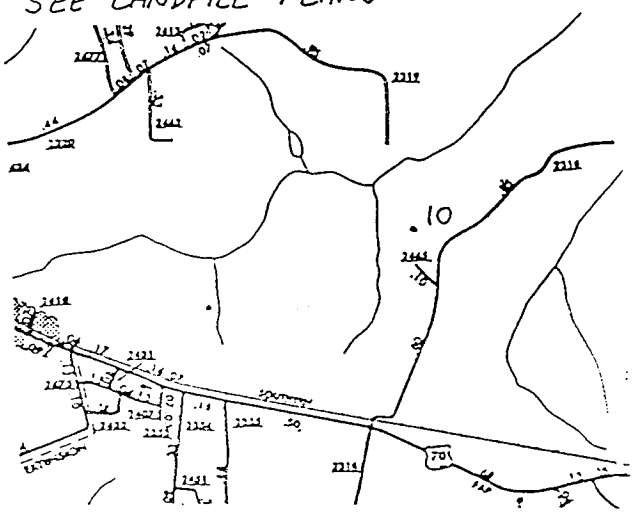
	Depth		Size	Material
From	13.5'	To 31 Ft.	concrete	Sand
From		To Ft.		

16. REMARKS: M.W #10 20' after 24 hrs

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	5'	Red fine sandy silt w/ mica
5	11'	tan fine sandy silt w/ mica
11'	31	grades from silt to clay w/ fine - to med coarse sand

If additional space is needed use back of form

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)
SEE LANDFILL PLANS



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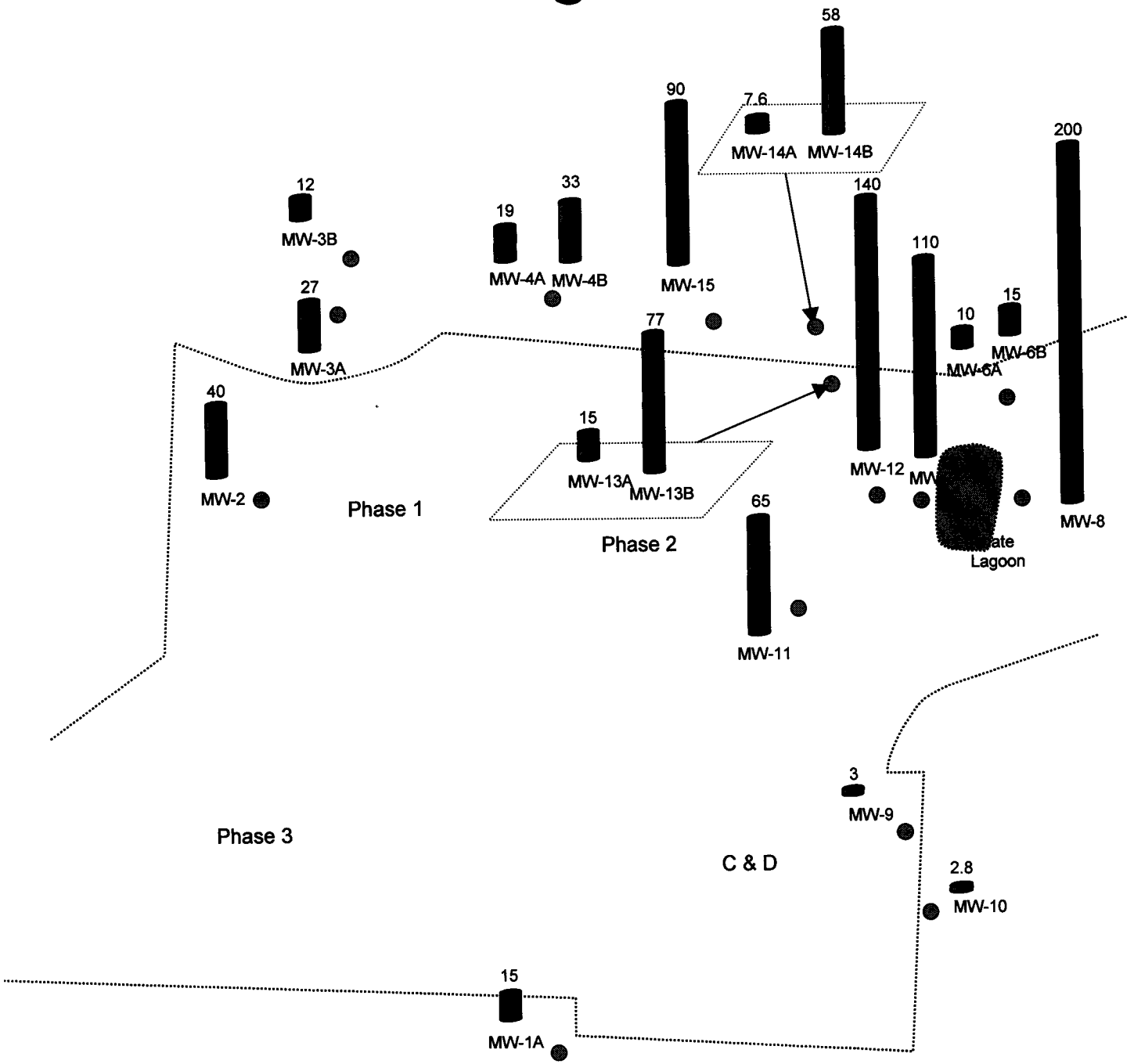
Gary J. Thomas 9-9-93
SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 REV. 9/91

Submit original to Division of Environmental Management; and copy to well owner.



Distribution of turbidity in Iredell Co. Lined Landfill. All values are expressed in NTU.

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

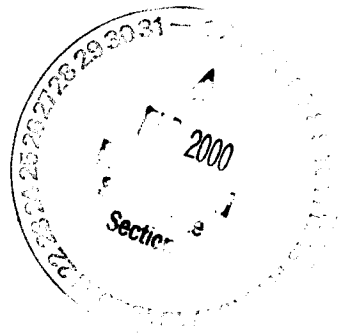
PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

January 31, 2000



Ms. Sherry Coghill
Environmental Engineer
Solid Waste Section
Mail Service Center -1646
Raleigh, NC 27699-1646

Re: Iredell County C & D Landfill

Dear Ms. Coghill:

I am writing on behalf of Iredell County concerning the removal of the timber on the expansion area of the existing Construction and Demolition Landfill. The County is upgrading their erosion control devices in this area and needs your permission to remove the timber from this area so the improvements to the existing erosion control can be completed.

I would like to thank you for any consideration that can be given. If you have any questions or need additional information, please do not hesitate to call.

Very truly yours,
MUNICIPAL ENGINEERING SERVICES CO., PA

D. Wayne Sullivan
Project Manager

DWS:cw

Copy: Mr. Ronald Weatherman