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October 7, 2011

Mayor Joseph Champagne, Jr. &
Borough Council Members
Borough of South Toms River
144 Mill Street
South Toms River, NJ 08757

Re: Borough of South Toms River Landfill
MC Project No. STB-007

Dear Mayor Champagne & Borough Council Members:

It is our understanding that the Borough of South Toms River desires to properly close and possibly develop the existing South Toms River Landfill.

In order to understand and gather information regarding the history of the landfill, we performed the following tasks:

1. Meeting held with the NJDEP Solid Waste Department personnel to discuss the landfill status. They confirmed that municipal landfills are not currently subject to administrative penalties and our dealing will be with the Solid Waste Bureau. NJDEP personnel suggested that we file for an OPRA request so we can review their files.
2. Maser Consulting P.A. submitted an OPRA request and was granted access to NJDEP files. Mr. Moustafa Gouda of our office reviewed the files and requested copies of important documents.
3. Maser Consulting also met with the staff of O'Donnell, Stanton & Associates, the former Borough Engineer to review their files. Several documents were copied.
4. Materials and documents received from NJDEP and O'Donnell, Stanton were reviewed by our staff.
5. Based on our review of existing documents, we were able to construct the history of the landfill, past activities and concluded the need for a course of action to bring the landfill in compliance and evaluate the method of landfill closure.

Landfill History

1. The application and engineering plans dated 1971 were submitted to NJDEP in 1974. The original plans of 1971 are included in this report as Appendix 1.
2. The landfill is about 15 acres. However, the first pit was about five (5) acres.

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3. An inspection report dated September 28, 1979 indicted that filling the first five (5) acres was in progress; however, fill was mounded 5 to 10 feet higher than the surrounding areas.
4. In January 1979, the NJDEP issued a letter indicting that the engineering plans and operation plans prepared by the Borough engineer, Mr. Mackle, were not acceptable.
5. In March 1979, Mr. Mackle wrote to the NJDEP stating that the landfill is only used for domestic waste. No sludge, chemical or industrial waste was deposited in the landfill.
6. In March 1979, the NJDEP indicated that the original plan showed five (5) acres as landfill; however, new plans submitted by the Borough indicate that the landfill is over 15 acres. Since the landfill is within the Pinelands, the New Jersey Pinelands Commission must approve the plans first.
7. Mr. Mackle submitted a Public Need Exception Application to the Pinelands Commission in March 1979.
8. Pinelands deferred to the NJDEP for approval.
9. In July 1979, NJDEP approved the plans and allowed two (2) more years of operation, pending revision of the plans.
10. Final plans were submitted in December 1979. A letter from Mr. Mackle explaining the discrepancy in the plans between 1971 and 1979 is included in Appendix 2.
11. The NJDEP accepted submission of the plans as "Complete" in January 1980.
12. In February 1980, the NJDEP Solid Waste Department indicated that the site needs a CAFRA permit and requested that the NJDEP Bureau of Costal Enforcement issue the required permit.
13. The NJDEP Bureau of Costal Enforcement indicated that vertical expansion of an existing landfill does not require a CAFRA permit. Only horizontal expansion requires such permit.
14. The NJDEP Division of Water Resources issued a NJPDES #005610 on October, 1, 1985. The permit required the installation of four (4) groundwater monitoring wells. Sampling of ground water and analyzing of water from the wells was required to take

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place every quarter. The permit was for three (3) years. A copy of the permit is in Appendix 3.

15. Survey of the landfill is stated to be based on top of Hydrant El. 44.45.
16. A survey of the landfill was performed on October 1, 1985. The NJDEP issued a memo on October 24, 1985. The landfill was surveyed to determine if the facility had any approved capacity remaining. **Elevations were established throughout the landfill and compared to the final contours, 42 feet and 44 feet in areas where the final elevations ranged from 40 to 42 feet.** Filling activity outside the limit of fill area has previously occurred along the southwestern portion of the site as well as northern most area of the site. The acreage covered by these overfills is approximately 2/3 of an acre. The only area where the landfill is below the final elevations was along the eastern end. An existing drainage swale is present. This swale ranged from elevation 34 feet to 36 feet. The final elevation for this was approximately 40 feet. The width of the swale was less than 20 feet wide. This swale was required to remain for drainage. A pit exists at the northeastern end of the landfill. This pit was more than 50% outside the limit of fill area. The bottom elevation was approximately 20 feet. Very little, if any solid waste could be deposited because of the proximity to the limit of fill area.
17. On November 14, 1985, the NJDEP requested a closure plan for the facility and ordered the Borough to cease disposal of more fill as of December 3, 1985. **In addition, specify in order that final cover shall consist of either twelve (12) inches of clay, or a geomembrane material having a minimum thickness of twenty (20) mils, or alternative materials (i.e., hydraulic asphalt, concrete, bentonite, soil cement or composite systems) which have a demonstrated hydraulic conductivity not to exceed 1.0×10^{-7} cm/sec.** An impermeable cap of clay or geomembrane material shall be constructed over a six (6) inch sand bedding material and shall be overlain by a six (6) inch or twelve (12) inch drainage layer of well drained sand for the clay cap or the geomembrane cap, respectively. The system shall be overlain by a minimum of twelve (12) inches of compacted soil of which the upper six (6) inches shall consist of top soil. In addition, the minimum required depth of eighteen (18) inches of soil above the impermeable cap may be increased to insure that the impermeable cap is situated below the average frost depth. The closure plan was also supposed to address the Methane gas issues in and around the landfill.
18. On January 24, 1986, the Borough attorney requested that the NJDEP grant an extension for closure plan submission.

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19. The Borough wrote to the NJDEP on March 31, 1986 declaring that the landfill is officially closed.
20. On September 5, 1986, Mr. Mackle wrote to the NJDEP indicating that he is preparing a closure plan and specifications.
21. Four (4) monitoring wells were installed in 1985-1986. The Well Data Plan is enclosed with this letter in Appendix 4.
22. On Feb 29, 1988, NJDEP stated that a closure plan had not been submitted. A penalty was assessed in September 12, 1988.
23. **A pre-application meeting regarding a closure plan was held on October 12th, 1988. The NJDEP directed the Borough to monitor methane gas via explosimeter. If methane is within acceptable limits, that can eliminate the need for an expensive methane gas venting system. In addition, the NJDEP advised the Borough engineer that if ground water testing indicated that water is not contaminated, this will eliminate the need for an impervious cap as part of the landfill closure. The NJDEP requested a topographic map and soil borings in the proposed retention basin. Due to the importance of this meeting, we are including a copy of meeting minutes and Mr. Mackle's letter to the Borough dated February 28, 1989. A copy of this letter is attached with this Memo in Appendix No. 5.**
24. Test borings were performed in December 1989. Logs of these borings are included with this letter in Appendix 6.
25. The four (4) ground water monitoring wells testing performed in October, 1990 indicated that ground water had Manganese, Iron and Ammonia Nitrogen exceeding NJDEP's permit limits. **Based on available records, it appears that the ground water monitoring well sampling and analysis had ceased as of 1995.** The NJDEP complained several times about the lack of ground water monitoring. Current ground water conditions are unknown.
26. The NJPDES Permit expired in 1988; however, the Borough only submitted a request to renew the permit in October 1990. A plan showing water wells in the area and surface water as part of the renewal submission is included in Appendix 7.
27. It appears that the Borough retained O'Donnell Stanton as the Borough Engineer to replace Mr. Mackle. Mr. O'Donnell wrote a letter requesting information about the



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landfill to assist with preparing plans for the landfill closure. O'Donnell's letter of February 22, 1991 is included in Appendix 8.

28. On August 19, 1991, O'Donnell submitted an estimate of the closure cost at about \$1,000,000. This value does not include cost of 30 years of maintenance of the landfill closure. A copy of the letter is included in Appendix 9.
29. **On November 16, 1992, O'Donnell Stanton submitted Scope of Services and engineers estimates for the landfill closure engineering and construction.** Per Mr. O'Donnell this scope was not authorized. A copy of the letter and Scope of services are enclosed in Appendix 10.
30. O'Donnell assumed that they can use the preliminary grading plan and a grading plan for the landfill closure prepared by Mr. Mackle dated October 11, 1989. A copy of these two plans is enclosed in Appendix 11. The plan was supposed to be accompanied by a stormwater management and drainage report. Maser Consulting did not find a copy of this report.

DISCUSSION

Based on review of the available information, it is apparent that the current ground water conditions and the current level of Methane gas along with the current contour map of the site are unknown. Site grades, ground water and level of methane gas level conditions will dramatically affect the cost of the Closure Plan.

Maser Consulting is recommending that this missing information be obtained first before we prepare a closure plan procedure and before we prepare a list of required documents for submission to the NJDEP.

Maser Consulting is recommending that Phase I of our work include the following:

1. Site Reconnaissance;
2. Prepare a current contour map of site;
3. Measurements of the levels of Methane gas in an around the landfill (if Methane Gas levels are below the lower Explosion Limits, we can eliminate the need for expensive methane gas venting system);
4. Activation of the existing wells which have not been sampled since 1995;

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5. Perform one round of sampling and analysis of the ground water. If ground water meets the NJDEP cleanup standards, we can eliminate the need for an expensive impervious cap.
6. Prepare a summary report with recommendations for the scope and budget of Phase II to prepare and submit a Closure Plan.

SCOPE OF SERVICES

1. Site Reconnaissance

Maser recommends that a site reconnaissance be performed to check for potential gaps or compromises in the cover, locate potential leachate seeps, potential monitoring well protection issues and other potential issues that may be present at the site. Maser will provide a field team to walk the site and note potential environmental issues. Should leachate seeps be encountered, Maser will collect samples for laboratory analysis. We have included \$1,000 of laboratory analysis. We estimate that one (1) day will be required to conduct the site reconnaissance and collected leachate seep sampled (if encountered).


2. Topographic Survey

Maser Consulting will obtain an aerial survey of the site utilizing a new flight from an aerial survey company at a 1"=50' scale and will show contours at one-(1) foot intervals. This data will be used to prepare a topographic map of the site. Our services will include a 200-foot overlap beyond the subject lot. The horizontal and vertical control will be relative to NAD 1983 (NJPCS) and NAVD 1988.

Exclusions and Understanding

Services relating to the following items are not considered for the project or cannot be quantified at this time. Therefore, any service associated with the following items is specifically excluded from the scope of professional services within this agreement:

- Construction Stake-Out and/or additional field surveying information except as noted;
- Wetland delineation, reports, or surveys;
- Flood plain analysis and Flood Hazard Area Application;
- Tree Location Plan and/or survey;
- Utility Survey;
- Supplemental road or highway surveys; and
- Subdivision or Consolidation Plans, Legal Boundary Descriptions and/or Parcel Maps.



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If an item listed herein, or otherwise not specifically mentioned within this agreement, is deemed necessary, Maser Consulting may prepare an addendum to this agreement for your review outlining the scope of additional services and associated professional fees with regard to the extra services.

3. Landfill Gas Investigation

Maser recommends that a landfill gas investigation be completed at the site to evaluate soil gas conditions. Maser Consulting will provide a field team to conduct the gas survey at the landfill. Slam bar probes will be completed at various locations around the perimeter and interior of the landfill. A GEM 2000 Plus Gas Analyzer designed for landfill gas investigations will be utilized for this task. The meter will detect the following parameters:

- Methane: 0 to 100%
- Carbon Dioxide: 0 to 100%
- Carbon Monoxide: parts per million
- Hydrogen Sulfide: parts per million
- Oxygen: 0 to 25%
- Differential pressure: 0 to 10" w.c.
- Static pressure: 0 to 100" w.c.

Logs of the field reading will be completed and included in the final report. We estimate that one (1) day will be required to conduct the landfill gas investigation.

4. Monitoring Well Redevelopment

Based on the information we have received on the project, there are four monitoring wells which are used to monitoring groundwater quality around the landfill. These wells have not been sampled since 1995. Therefore, we recommend that the wells be re-developed to remove sediment and clean-up the screened well intervals. This is needed because the wells have not been sampled and pumped for approximately 16 years. Maser will provide a field team to purge and surge block each well in an effort to remove sediment and clean the well screens. Our re-development field methods have proven to be an effective process for wells which have not seen activity (pumping or sampling) in over 10 years. Water pumped from the wells will be discharged directly to the ground and will not be containerized. We estimate that two (2) days will be required to properly redevelop the four existing monitoring wells.

5. Ground Water Sampling and Report

A minimum of two (2) weeks after the wells have been redeveloped, Maser Consulting will collect one round of representative groundwater samples from the four existing wells. The samples will be submitted to a New Jersey Certified Laboratory for analysis.

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We have reviewed a copy of the September 11, 1991 submittal to the NJDEP for a list of parameters to be tested for each well. Based on that review, the following parameters will be analyzed: Copper, Iron, Lead, Selenium, Silver, Sodium & Zinc, Biological Oxygen Demand, Dissolved Chloride, Dissolved Chemical Oxygen Demand, Total Coliform, Color, MBAS, Dissolved Ammonia, Dissolved Nitrate, Odor, Phenols, Dissolved Sulfate, Total Dissolved Solids, Total Organic Carbon and Turbidity. We estimate that one day will be needed to sample the four (4) existing wells at the landfill.

Once the field work has been completed and all final laboratory reports have been received, Maser will prepare a letter report. The report will document the groundwater sampling event conducted at the subject site and contain summary analytical tables. Laboratory analytical results will be compared to the most recent NJDEP Ground Water Quality Criteria (GWQC). Groundwater quality and flow direction will also be discussed.

6. Phase I – Final Report

The result of Phase I will be summarized in a report which will include field test results along with scope and budget for Phase II.

Please review the above and enclosed at your convenience and advise us should you have any questions or desire additional information. We request your authorization prior to proceeding with the Scope of Services recommended for Phase 1 of the landfill closing.

Very truly yours,

MASER CONSULTING P.A.



Chris A. Theodos, P.E., P.P., CME
Borough Engineer



Moustafa A. Gouda, P.E., D.GE, F.ASCE
Director of Geotechnical/Environmental Services

MAG/sab
Attachments

cc: Elizabeth Silvestri, Borough Clerk
Guy Ryan, Esq., Borough Attorney

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