

**KENT COUNTY LEVY COURT
KENT COUNTY, DELAWARE**

**PROJECT DEVELOPMENT REPORT
VINEYARD FARM
AGRICULTURAL UTILIZATION OF CLASS B BIOSOLIDS**

**OCTOBER 2014
REVISED MARCH 2016**



**CABE ASSOCIATES, INC.
CONSULTING ENGINEERS**

144 S. GOVERNORS AVENUE
P.O. BOX 877
DOVER, DELAWARE 19903-0877
302-674-9280

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PROJECT NO. 117-060.02

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EXECUTIVE SUMMARY

CHAPTER I

I. EXECUTIVE SUMMARY

The Kent County Levy Court operates a regional wastewater treatment facility at 139 Milford Neck Road just south of Frederica, Delaware. The facility serves approximately 130,000 residents, as well as businesses and industries throughout Kent County, Delaware. Current average flow is approximately 12,000,000 GPD resulting in the production of approximately 7,000 tons per year of end-process biosolids. Biosolids are removed using secondary clarifiers with wasted biosolids stored in holding tanks prior to further treatment. Further treatment processes include dewatering using belt filter presses and lime stabilization. Typically, biosolids are then either heat treated to greater than 45% solids or dried in a passive solar system to greater than 90% solids. The goal of both treatment methods is to achieve Class A requirements. Biosolids meeting Class A requirements used as a soil amendment, and those not meeting Class A but meeting Class B requirements may be either land applied to permitted farms in the area or disposed of in a landfill. On occasion, some Class B biosolids are neither heat treated or passively solar dried, but are dewatered to greater than 20% solids. Kent County is refining the treatment processes in an effort to make sludge handling more energy efficient. This Project Development Report (PDR) has been prepared so that Kent County can obtain a permit to apply Class B biosolids to a new site.

The area of investigation is shown on Exhibits I-1 and I-2, includes Tax Map Parcel No. SM-00-140.00-01-76.00-0001 and is commonly known as Vineyard Farm. The parcel is owned by Kent County and leased to farmers for agricultural use. The site plan and letter of intent are included as Attachment A.

The parcel's total area is 147.88 acres. Two (2) fields, identified as the North and South fields shown on Exhibit V-3 and totaling 132 acres are proposed to be permitted for the land application of biosolids. Upon review of the Soils Evaluation and Hydrogeologic Evaluation for Land Application of Biosolids, and the delineation of suitable biosolids

land application areas including buffer zones, it was determined that biosolids may be applied year round on 59.23 acres of the north field and 53.18 acres of the south field. The quantity of biosolids which may be applied to each field was calculated using information provided on current biosolids characteristics and current and planned farming operations. The analysis resulted in the following:

- North Field: 215.6 tons per year
- South Field: 193.6 tons per year

These fields will be managed using a corn-soybean-double cropped barley/soybean crop rotation, with biosolids providing the primary nutrients supplemented by other soil amendments as necessary. Please note that changes to biosolids characteristics and farming practices will result in the need to reexamine expected application rates. This practice is already part of the County's standard operating procedures.

This PDR is a result of the combined efforts of the following firms and persons:

Owner: Kent County Levy Court, Department of Public Works, 555 Bay Road, Dover, DE 19901, Contact: Diana Golt, P.E., Assistant Director of Public Works, Engineering Division

Engineer: CABB Associates, Inc., 144 S. Governors Ave., Dover DE 19904, Contact: Scott C. Hoffman, P.E.

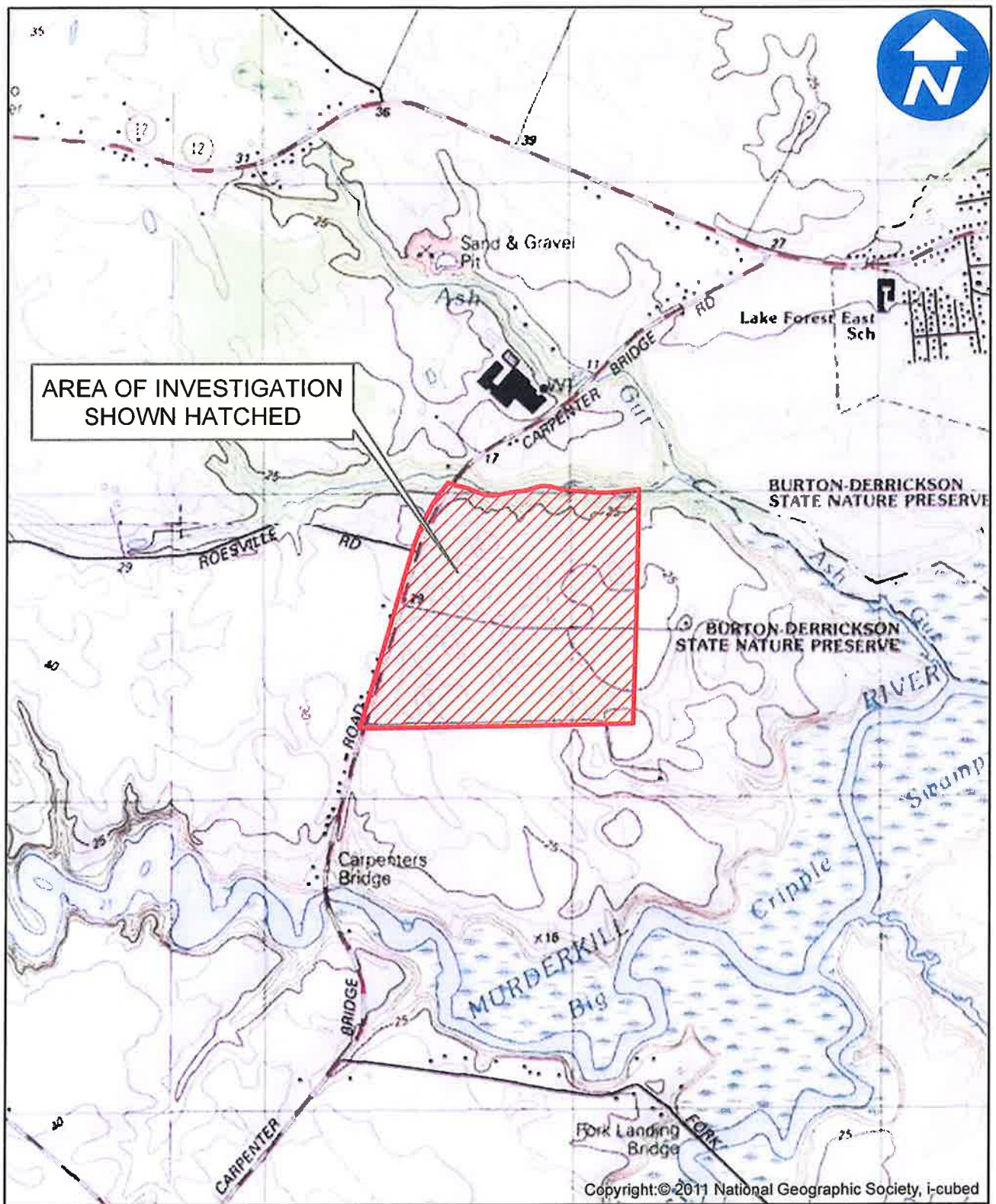
Hydrogeology: Maser Consulting Inc., 331 Newman Springs Road, Suite 203, Red Bank, NJ 07701, Contact: Thomas Dwyer, P.G.

Soils Investigation: Atlantic Resource Management Inc., PO Box 869, Ocean View, DE 19970, Contact: Laf Erickson, CPSS/SC

Questions regarding the PDR should be directed to Mr. Scott C. Hoffman, P.E. of CABA Associates, Inc.

EXHIBITS





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117-060
OCTOBER 2014
117 A

USGS TOPOGRAPHIC MAP

EXHIBIT

I-2

SOILS DESCRIPTION

CHAPTER II

II. SOILS DESCRIPTION

A Soils Evaluation for Land Application of Biosolids dated August 4, 2014 has been prepared by Atlantic Resource Management, Inc. for Vineyard Farm, Carpenters Bridge Road, Kent County, Delaware. The Soils Evaluation is submitted as Attachment B under separate cover. The report was prepared in accordance with the DNREC Guidelines and Regulations Governing the Land Treatment of Wastes as amended October 1999.

The Soils Evaluation includes the following:

- Parcel identification and mapping.
- Soil survey mapping including profile investigations.
- Definition of soil units.
- Soil characterization in each soil unit.
- Soil chemistry testing results.
- Tabulation and mapping of all wells within 1,000 feet of the parcels, and irrigation, commercial, industrial and public wells within 2,500 feet of the parcels.

The Soils Evaluation concluded that the soils mapped on the site are suitable for year long biosolids land application. The soils are very deep, moderately well drained, and moderately and slowly permeable. The depth to the high water table is greater than or equal to 20 inches below the depth of application. The Soils Evaluation also identifies two (2) sensitive areas: one (1) on the northeast corner and one (1) on the southeast corner of the farm fields. These areas along with soil identifications are provided in Exhibit II-1, Site Soil Mapping. While both areas meet the regulations for year long biosolids application, they have been labeled as sensitive areas for the following reasons.

- Northeast Sensitive Area: This is a small area located on the northeast corner of the north farm field. The current topography in this area lends itself to a drainage pathway for storm water to run into Ash Gut. Therefore, it is recommended that biosolids are

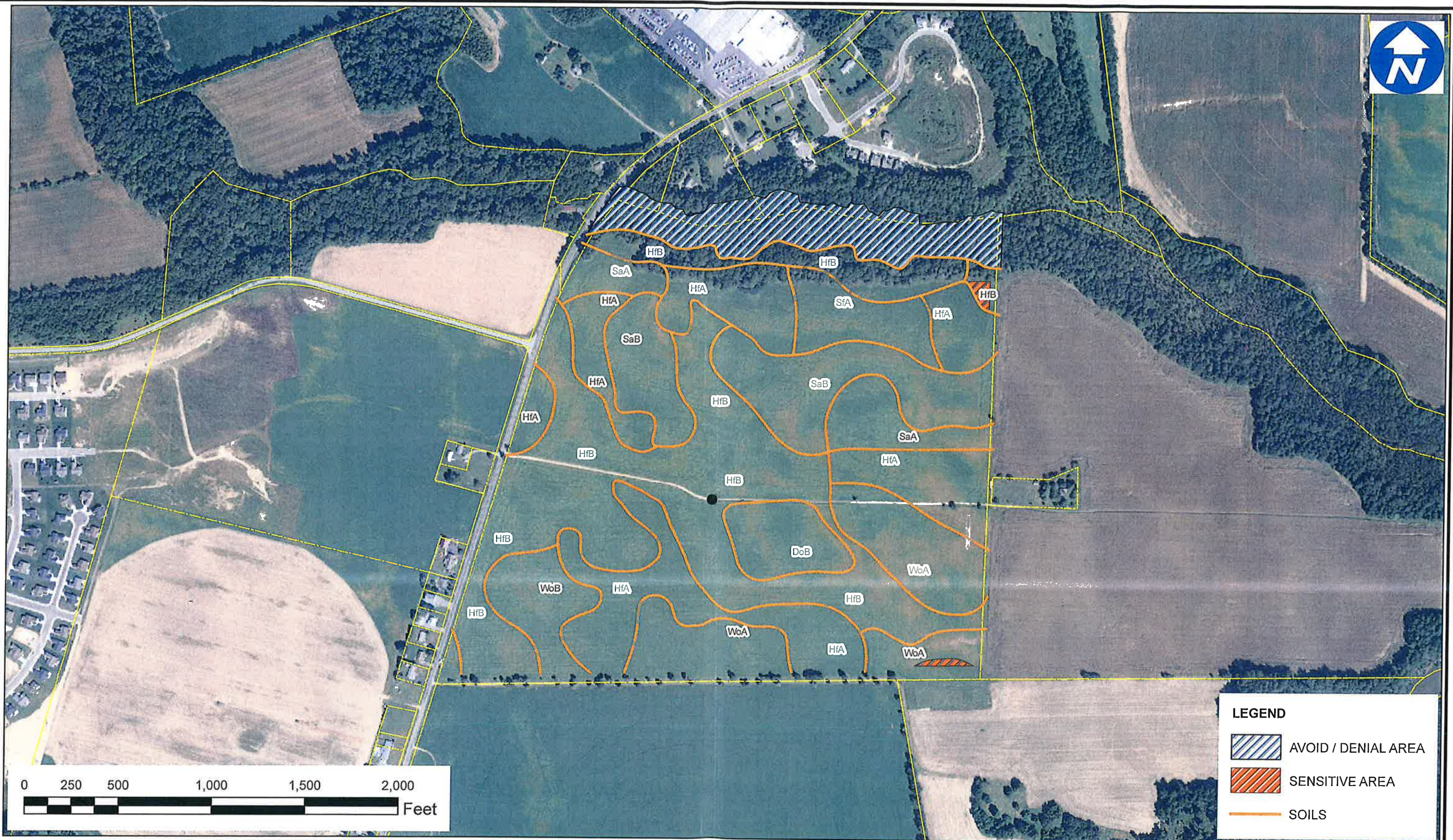
not applied to this area when a rain event is expected within 72 hours of the biosolids application.

- Southeast Sensitive Area: This area is a closed depressed land form and groundwater monitoring during the Soils Evaluation revealed free water levels as high as 5 inches below ground surface. However, there was no 2-week continuous period of saturation within 38 inches of the surface. It is recommended that the groundwater level be confirmed to be at least 20 inches below the depth of application prior to biosolids application in this area, if solids are applied during extended periods of above average precipitation.

The Soils Evaluation identified one (1) Avoid/Denial Area along Ash Gut in the northern portion of the property. This area is wooded, is not currently farmed, and there are no plans on farming in this area in the future.

EXHIBITS

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GROUNDWATER INFORMATION

CHAPTER III

III. GROUNDWATER INFORMATION

A hydrogeological evaluation for the Kent County land application site has been prepared by Maser Consulting, Inc. This report is submitted as Attachment C under separate cover. The report was prepared in accordance with the DNREC Guidelines and Regulations Governing the Land Treatment of Wastes as amended October 1999.

The hydrogeological evaluation includes the following:

- Parcel identification and mapping.
- Detailed description of the area's geology.
- Identification, thickness and depth to water of local seasonal high water table of the water table aquifer.
- Identification, thickness and lithology of the aquitard below the water table aquifer.
- Identification of the first confined aquifer.
- Determination of groundwater flow patterns.

The hydrogeological evaluation concluded the following:

- Water level measurements taken from May 14, 2014 to July 8, 2014 indicated that the water table surface ranged from approximately 11.4 to 23.6 feet below land surface. Water levels measured at MW3, located near the southeast sensitive area, were 11.38-12.42 feet below ground surface as shown in Figure 7 of the hydrogeological evaluation. This is further evidence that wet conditions in that area are indicative of a temporary, localized condition that does not affect the water table in other parts of the site.
- The report suggested that the on-site monitoring data were likely to be within about one (1) foot of the typical maximum wet-season conditions.
- The report concluded that the site is favorable for land application of biosolids.
- Groundwater flow was observed to be to the north, northeast and east away from

Carpenter Bridge Road and any potential domestic wells along that road.

SURFACE WATER INFORMATION

CHAPTER IV

IV. SURFACE WATER INFORMATION

The site is located within the Murderkill River Watershed. The Murderkill River flows approximately 0.5 miles south of the site in an easterly direction to its confluence with the Delaware Bay. The Murderkill River east of Route 113 is reported to be tidal. Section 3 of the State of Delaware Surface Water Quality Standards, as amended July 11, 2004, assigned the following designated uses for the waters of the Murderkill River watershed:

- Primary contact recreation.
- Secondary contact recreation.
- Fish aquatic life and wildlife.
- Industrial water supply.
- Agricultural water supply (fresh water segments only).

DNREC listed the Murderkill River and several of its tributaries and ponds on the State of Delaware's 1996, 1998 and 2000 303(d) List and proposed TMDLs for nitrogen, phosphorus, chemical biological oxygen demand and *enterococcus* bacteria. In December 2001, DNREC issued Secretary's Order No. 2001-A-0044 and adopted total maximum daily loads (TMDLs) for nutrients and oxygen consuming compounds for the entire Murderkill River Watershed. Following adoption of the TMDL, Kent County appealed the TMDL Regulation for the lower Murderkill River to the State Environmental Appeal Board and State Superior Court. The appeal resulted in a joint effort between the State of Delaware DNREC, Kent County and the University of Delaware to conduct a use attainability analysis for the Murderkill River.

The many years of extensive research on the possible impact on water quality resulted in DNREC Secretary's Order No. 2014-WS-0018. The Order is a proposed amendment to the TMDLs for nutrients in the Murderkill River watershed. The proposed amendment revises the waste load allocations for total nitrogen, total phosphorus and CBOD₅. If approved, the amendment will be published in the Delaware Register and the State will proceed with the

new NPDES permitting for the Kent County Regional Wastewater Treatment Facility.

PLAN OF OPERATION AND MANAGEMENT

CHAPTER V

V. PLAN OF OPERATION AND MANAGEMENT

A. Biosolids Characteristics

The Kent County regional wastewater treatment facility treats an average flow of approximately 12,000,000 GPD resulting in the production of approximately 7,000 tons per year of end-process biosolids. Biosolids are removed using secondary clarifiers with wasted biosolids stored in holding tanks prior to further treatment. Further treatment processes include dewatering using belt filter presses and lime stabilization. Typically, biosolids are then either heat treated to greater than 45% solids or dried in a passive solar system to greater than 90% solids. The goal of both treatment methods is to achieve Class A requirements. Biosolids meeting Class A requirements are used as a soil amendment, and those not meeting Class A but meeting Class B requirements may be either applied to permitted farms in the area or disposed of in a landfill. On occasion, some Class B biosolids are neither heat treated or passively solar dried, but are dewatered to greater than 20% solids. Kent County is refining the treatment processes in an effort to make sludge handling more energy efficient.

The physical and chemical characteristics of the greenhouse-dried biosolids from three (3) different sampling events is provided in Exhibit V-1. The samples were analyzed for physical characteristics, metals on a dry weight basis, percent nutrients (moist and dry), chlorides and PCBs. All samples were below the applicable ceiling and average concentrations as defined in the DNREC Guidance and Regulations Governing the Land Treatment of Wastes.

Biosolids samples are periodically analyzed for organic priority pollutants as defined in the DNREC Guidance and Regulations Governing the Land Treatment of Wastes. The organic priority pollutant data for the biosolids is provided in

Exhibit V-2. The sampling results have been compared with the organic priority pollutant standards. All samples are non-detect with the exception of toluene and bis(2-ethylhexyl)phthalate which are both lower than the standard.

All analytical results from recent sampling events along with chain of custody records have been provided in Attachment D.

B. Type of Operation

The parcel's total area is 147.88 acres; the area investigated for biosolids application is 132 acres, and has been used since at least the 1930's for agricultural fields. The parcel is currently farmed by Mr. Robert Garey, who leases the fields from Kent County. Agricultural operations occur in accordance with a Nutrient Management Plan (NMP) prepared by Willard Agri-Service for Mr. Garey. This plan, attached in Attachment E subdivides the parcels into two (2) fields.

After a review of soil and groundwater investigation results and considering existing nutrient levels, buffer requirements and farming operations, both fields were selected for year-long biosolids application. These fields were analyzed as part of the NMP for determination of biosolids land application rates. The NMP is discussed in detail herein under Crop Management.

The delineation of suitable biosolids land application areas is shown on Exhibit V-3. The buffer zones specified in Section 700, Subsection 702 of the DNREC Guidance and Regulations Governing the Land Treatment of Wastes for surface application are also shown on Exhibit V-3.

C. Land Application Method

The County will apply the biosolids to the farm fields in accordance with subsection 702.7(a), (c) and (d) of the DNREC Guidance and Regulations Governing the Land Treatment of Wastes. The County intends to use their multipurpose agricultural vehicle to broadcast the dried biosolids onto the agricultural fields. The vehicle includes a hopper for carrying the dried biosolids with spinning plate(s) on the back which broadcast the solids across the ground surface. The quantity of applied solids will be measured using a truck scale at the treatment plant.

The current tillage system used at the site is a no-till system which maximizes crop residue and minimizes soil erosion. Additionally, the Soils Evaluation for Land Application of Biosolids recommends retaining the no-till practice due to the fine-textured surface mantle found on the fields (See Attachment B). This presents a challenge for incorporation of the biosolids after broadcast surface application. The DNREC Guidelines and Regulations Governing the Land Treatment of Wastes as amended October 1999, Section 138.7.3.2 do recognize the value of no-till cropping systems and allow for relaxation of the incorporation requirements when no-till cropping systems are used. The regulations state that incorporation may not be required when site management plans such as no till farming or the presence of an established crop precludes sludge incorporation, adequate site features exist to preclude sludge migration from the site, odors and nuisances are controlled, and DNREC determines that there will be no adverse impact on the environment or public health.

DNREC should consider omitting or adjusting the incorporation requirements as allowed by the regulations. In considering this requirement DNREC should note the following:

1. The County's Class B biosolids treatment process for those biosolids that are heat treated or undergo passive solar drying includes multiple pathogen and vector attraction reduction processes prior to being land applied; therefore, incorporation is not required to meet vector attraction reduction requirements.
2. When Class B biosolids are not heat treated or passively solar dried and dewatered to greater than 20% solids, those biosolids will be incorporated into the soil.
3. It is in the best interest of the current farming operation to preserve the no-till cropping system to the greatest extent possible. Benefits include reduced soil erosion and improved soil fertility.

D. Crop Management

A Nutrient Management Plan (NMP) for Vineyard Farm has been prepared by Willard Agri-Service for Robert Garey. The NMP is based on a crop rotation of corn, soybeans and double-crop barley/soybeans from 2012 through 2014. The NMP includes yield goals for each crop as follows:

- Corn yield goal of 165 bushels/acre.
- Soybeans yield goal of 65 bushels/acre, and
- Barley/soybeans yield goal of 100 bushels/acre.

For calculation of nutrient agronomic rates for the double-crop barley/soybeans, it was assumed that 65 bushels/acre remained the soybean yield goal with the remaining 35 bushels/acre being the barley yield goal.

Nitrogen and phosphorus plant uptake rates in pounds/bushel were taken from the DNREC Delaware Biosolids and Residuals Reporting System (BARRS) Crop Report Sheet and used in calculating the nitrogen and phosphorus agronomic rates.

The NMP indicates that 2.5 tons/acre of poultry litter was applied to the corn fields in 2012. This resulted in a surplus of P205 phosphorus applied to the fields in 2012. Surplus phosphorus was expected to be used by the 2013 soybean crops and 2014 barley/soybean crops.

After reviewing both the 2012-2014 NMP and BARRS report, it appears that phosphorus is the limiting nutrient constituent for these fields. When applying biosolids at phosphorus agronomic rates, supplemental nitrogen will need to be applied for optimum crop production.

Generally, it is not recommended that biosolids be applied during years of full season soybean crops. Therefore, the first potential application of biosolids is during 2015 with the corn crop. The application of biosolids every three (3) years will allow mineralized organic nitrogen to be used by the crops. Biosolids should be applied at a rate that will provide enough phosphorus for three (3) years of crops. Fertility calculations completed as part of this PDR assume that a crop rotation of corn, soybeans and double crop barley/soybeans will continue through the year 2018.

Organic nitrogen mineralization is calculated using the following equation:

$$N_m = K_m \times N_0$$

where

N_m is organic nitrogen mineralized

K_m is the mineralization factor

And

N_0 is organic nitrogen

The calculation results are provided as Exhibit V-4. Assumed mineralization factors are as follows:

- Year 1 - 0.3
- Year 2 - 0.15
- Year 3 - 0.08
- Year 4 - 0.04

Plant available nitrogen in pounds per dry ton of biosolids is calculated as follows:

$$N_p = NO_3 + K_v \times NH_3 + K_m \times N_0$$

where :

N_p equals plant available nitrogen from the current year's biosolids application

NO_3^- equals nitrate concentration in the biosolids

K_v equals volatilization factor

NH_3^- equals ammonia concentration in the biosolids

K_m equals mineralization factor

And

N_0 is organic nitrogen concentration in the biosolids

Exhibit V-5 provides calculations of the plant available nitrogen per dry ton of biosolids and the nitrogen agronomic rate of biosolids in ton/acre. The nitrogen agronomic rate of biosolids accounted for nitrogen from previous legume crops, organic nitrogen mineralization and nitrogen from supplemental fertilizers.

Exhibit V-6 provides calculations of the phosphorus agronomic rate of biosolids in dry tons/acre. Based on the phosphorus uptake rates of corn, soybeans, and double crop barley/soybeans, a total of 7,280 lbs/acre (3.64 dry tons/acre) biosolids can be applied every three (3) years to the fields. For purposes of estimating site metal accumulations, the average annual rate is 1.21 dry tons/acre. Total site capacity is 215.6 dry tons and 193.6 dry tons biosolids per application on the north and south fields, respectively.

E. Land Limiting Constituent Analysis

Delaware regulations require consideration of permanent soil storage of phosphorus and metals. As described in the Soil Investigative Report, soil testing focused on soil test phosphorus (Mehlich 3-P). The amount of biosolids applied will provide phosphorus less than or equal to plant uptake rates. Therefore, phosphorus is not considered a land limiting constituent.

Maximum cumulative metal loadings for this site are based on Table 402.4 of the DNREC Guidance and Regulations Governing the Land Treatment of Wastes. Metals of interest include arsenic, chromium, mercury, molybdenum, selenium, lead, zinc, copper, nickel, and cadmium. Maximum allowable accumulation for the fields is shown below for the ten (10) aforementioned metal constituents.

<u>Constituents</u>	<u>Allowable Biosolids Application</u> <u>Dry Tons Per Acre</u>
Zinc	2,592
Nickel	6,774
Arsenic	1,407
Cadmium	1,886
Chromium	37,189

Copper	2,885
Lead	5,821
Mercury	9,483
Molybdenum	669
Selenium	6,259

Exhibit V-7 includes calculations for site metal loading based on the constituent data presented in Exhibit V-2 and the maximum loadings described above. The most limiting constituent is molybdenum and results in an estimated maximum site life of 553 years.

F. Control Plan

All biosolids are lime stabilized during storage and land application. Unless heat treated to greater than 45% solids or dried in a passive solar system to greater than 90% solids, biosolids will be incorporated into the soil to minimize the potential for odors. Buffers sized in accordance with the DNREC Guidance and Regulations Governing the Land Treatment of Wastes are provided adjacent to the proposed biosolids land application sites. In some areas buffers are larger than minimum requirements.

Specific Requirements

1. Compliance issues - the proposed land application of biosolids shall comply with all requirements of the Delaware Environmental Protection Act, 7 DEL. C., Chapter 60, as well as all requirements of the State of Delaware "Guidance and Regulations Governing the Land Treatment of Wastes" and any additional operating requirements for land application as set forth in the land application regulations.

The land application shall comply with all elements of the plans and specifications in the permit and any terms and conditions of the permit and any orders issued by the Department.

2. Stabilization - All biosolids shall be stabilized by lime stabilization (a Class B biosolids process to significantly reduce pathogens) in accordance with the DNREC Guidance and Regulations Governing the Land Treatment of Wastes. In accordance with these regulations, sufficient lime shall be added to the biosolids to reach and maintain a pH of 12 for two (2) hours of contact and a minimum pH of 11.5 for an additional 22 hours.
3. Specific Crop Requirements - Crops for direct human consumption will not be grown on the biosolids land application area unless in accordance with regulatory time lines.
4. Application - The treated biosolids shall be broadcast in a manner which prevents unreasonable nuisances or odor conditions in compliance with Subsection 702.7 (a), (c) and (d) of the DNREC Guidance and Regulations Governing the Land Treatment of Wastes. No spray irrigation equipment will be utilized for biosolids land application.
5. Livestock/Grazing - At this time there are no plans to allow livestock grazing at the site.
6. Delineation of Application Areas - Application areas will be delineated in the field by markers which identify the land application areas shown on Exhibit V-3.

7. Public access to the land application site will be restricted.
8. Limitations - Other than those outlined previously, there are no further limitations on the application of biosolids to the proposed land application site.

G. Biosolids Sampling Plan

The stabilized biosolids will be monitored in accordance with an approved permit. It is anticipated that the biosolids sampling requirements will be as tabulated in Exhibit V-8. Priority pollutants will be scanned annually and will include those pollutants presented in Exhibit V-2.

It is anticipated that biosolids stabilization process monitoring will be required for heated dried and thermally treated biosolids and included in the Monthly Report as defined in State Permit Number DM0902-K-03 (as amended).

It is anticipated that vector attraction reduction process monitoring will not be required. Prior Department approval is required if the vector attraction reduction process utilized at the Kent County Regional Wastewater Treatment Facility is changed.

H. Record Keeping and Reporting Requirements

1. Recording of Results

For each measurement or sample taken, the following information will be recorded:

- a. The exact place, date and time of sampling and/or measurement.
- b. The person(s) who performed the sampling and/or measurement.
- c. The dates the analyses were performed and the time the analyses were begun.
- d. The person(s) who performed the analyses.
- e. The results of each analysis, along with the original laboratory report; and
- f. The analytical methods employed.

2. Records Retention

All records and information resulting from the monitoring activities, including all records of analyses performed and calibration and maintenance of instrumentation and recording from continuous monitoring instrumentation, shall be retained for five (5) years.

3. Daily Operating Report - Kent County shall make and maintain an operational record for each day that Class B biosolids are applied and when any other management activities are conducted at the land application site. The daily operating report shall include at a minimum the following:

- a. The date, type, wet and dry weights of the biosolids applied.
- b. The facility from which the biosolids originated.
- c. The transporters of the biosolids.
- d. The particular map location of the area currently being used for land application of biosolids, and the areas where biosolids were previously applied within five (5) years.
- e. A record of any major deviations from the operating plan.

- f. General daily weather conditions.
 - g. The application rate for biosolids.
 - h. A record of all actions taken to correct violations of the Delaware Environmental Protection Act and the Department's regulations.
 - I. Management undertaken, such as planting and harvesting of crops, fertilizers and chemicals added, application methods, etc.
2. Annual Operational Report - Kent County shall, on or before February 1 of each year, submit an annual operations report. The report shall be submitted in a format supplied by DNREC. The report shall include the following:
- a. Volume or weight of biosolids received.
 - b. Copy of Kent County's current public liability insurance policy.
 - c. Any changes in ownership of the land application area.
 - d. Results of any groundwater monitoring if required by the Department.
 - e. Chemical analysis of soil from the biosolids land application area or constituents identified by DNREC.
 - f. Any other information required by DNREC.
 - g. The annual operations report shall also include a topographic map of the same scale and contour interval as the map required for the initial permit application showing the areas of land application site where biosolids have been applied.
 - h. The daily operational record.
 - i. If no sludge is applied, a letter to the Department stating that no land application of sludge occurred in the previous calendar year.
 - j. The cropping scheme followed during the previous year and anticipated for the coming year. The cropping scheme shall

include crop yield data and portion of plants that were harvested, results of plant tissue and grain analysis if required, and sludge application rates for the coming year based on nitrogen mineralization calculations from previous sludge applications.

I. Groundwater Monitoring

Groundwater monitoring shall be conducted in accordance with the agricultural utilization (AGU) permit for this site. Groundwater monitoring well locations are provided in the Hydrogeological Evaluation prepared by Maser Consulting, Inc.

J. Landowner Consent of Operation

Kent County owns parcel SM-00-140.00-01-76.00-000 where solids will be applied.

EXHIBITS

Physical and Chemical Characteristics of Biosolids

ND = Non-detect NS = Not sampled

Physical Characteristics

Date of Sample	12/3/2012	2/20/2013	4/17/2013	Average
% Moisture	18.9	10.2	3.12	10.74
% Solids	81.1	89.8	96.88	89.26
CaCO3 Equiv., %	34.2	29.3	27.9	30.47
pH	8.18	8.62	7.83	8.21
TVS, %	29.7	41.3	49.7	40.23

Metals - Dry Weight (mg/kg)

Date of Sample	12/3/2012	2/20/2013	4/17/2013	Average
Aluminum	4100	3570	3045	3571.67
Arsenic	14	13	12	13.00
Cadmium	4.8	9.9	13	9.23
Chromium	36	40	32	36.00
Copper	240	263	194	232.33
Iron	61000	50090	37130	49406.67
Lead	26	25	18	23.00
Mercury	0.944	0.979	0.473	0.80
Molybdenum	13	13	10	12.00
Nickel	31	29	23	27.67
Potassium	2000	2945	3750	2898.33
Selenium	8.4	7.9	5.1	7.13
Sodium	1200		1153	1176.50
Zinc	500	510	436	482.00

Nutrients (Moist)- Percent

Date of Sample	12/3/2012	2/20/2013	4/17/2013	Average
Ammonia as N	0.327	0.136	0.324	0.26
Nox as N	<0.0005	NS	0.00051	0.0005
Organic N as N	1.59	1.81	4.3	2.57
TKN	1.92	1.95	4.63	2.83
Total N as N	1.92	1.96	4.63	2.84
Total P as P	1.28	1.01	1.55	1.28

Nutrients (Dry)- Percent

Date of Sample	12/3/2012	2/20/2013	4/17/2013	Average
Ammonia as N	0.403	0.151	0.334	0.30
Nox as N	<0.0006		0.00052	0.00056
Organic N as N	1.97	2.02	4.44	2.81
TKN	2.37	2.17	4.78	3.11
Total N as N	2.37	2.19	4.78	3.11
Total P as P	1.58	1.12	1.6	1.43

Miscellaneous

Date of Sample	12/3/2012	2/20/2013	4/17/2013	Average
Chloride, mg/kg	1947	2040	1960	1982.33
PCBs, mg/kg	ND	NS	ND	ND

Organic Priority Pollutant Data of Biosolids

Volatile Compounds (Purgeable)

	ppm	Standard, ppm
Benzene	ND	0.29
Carbon tetrachloride	ND	0.9
Chlorobenzene	ND	0.23
Chloroform	ND	0.17
1,2-Dichloroethane	ND	5
Methylene chloride	ND	1.7
Tetrachloroethylene	ND	0.69
Toluene	0.0115	340
Trichlorethylene	ND	1.8
Vinyl chloride	ND	7.1

Acid Compounds

Pentachlorophenol	ND	2.1
Phenol	ND	39
2,4,6-Trichlorophenol	ND	0.46

Base/Neutral Compounds

Benzo (a) anthracene	ND	1.8
Benzo (a) pyrene	ND	51
bis(2-ethylhexyl)phthalate	8.79	32
Chrysene	ND	1.7
3,3-Dichlorobenzidine	ND	0.33
Hexachlorobenzene	ND	0.25
Hexachlorobutadiene	ND	0.9
n-Nitrosodimethylamine	ND	0.008
Phenanthrene	ND	1.2
Pyrene	ND	1.4

Pesticides and PCB's

PCB's	ND	6
-------	----	---



CARPENTER BRIDGE ROAD

ROESVILLE ROAD

NORTH
59.23 ACRES

SOUTH
53.18 ACRES

FARM LANE

CARPENTER BRIDGE ROAD

50' PERMANENT ACCESS EASEMENT AND BUFFER

BUFFER > 50' (TYPICAL)

50' BUFFER

BOUNDARY STAKE COORDINATES

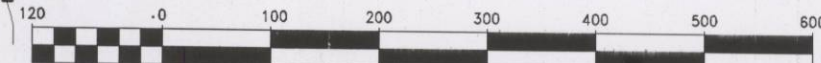
ID	NORTHING	EASTING
1	362160.0735	634761.9782
2	362528.9134	634872.3510
3	362897.7532	634982.7237
4	363266.0479	635092.9333
5	363134.5871	635821.1852
6	363057.3925	636023.7906
7	363077.3581	636027.5621
8	363153.9387	635826.5682
9	363285.3296	635098.7032
10	363962.0164	635301.1970
11	364290.5352	635275.4343
12	364451.9483	635519.0916
13	364419.6378	635658.8749
14	364336.4058	635643.5717
15	364283.2002	635677.4851
16	364163.6768	636291.9007
17	364220.6063	636353.8491
18	364230.2486	637532.0946
19	363063.5519	637500.6542
20	363043.5544	637500.2943
21	362344.1849	637487.7069
22	362341.5759	637030.7000
23	362187.1557	636949.9203

NOTES:

1. MONITORING WELL LOCATIONS WERE TAKEN FROM A SURVEY DONE BY CENTURY ENGINEERING DATED JUNE 23, 2013.
2. TOPOGRAPHIC SURVEY BY MORRIS, RITCHIE ASSOCIATES, INC. AS SHOWN ON THE DRAWING ENTITLED "BOUNDARY EXHIBIT AND EXISTING CONDITIONS PLAN" DATED SEPTEMBER 3, 2013.
3. DATUM:
HORIZONTAL - DELAWARE STATEPLANE NAD 83
VERTICAL - NAVD 88

LEGEND

- APPLICATION AREA BOUNDARY
- BUFFER AREA
- EASEMENT / BUFFER AREA
- MONITORING WELL LOCATION AND ID
- BOUNDARY STAKE
- FIELD / APPLICATION AREA ID
- EXISTING CONTOUR
- WOOD LINE
- PROPERTY LINE
- SENSITIVE AREA
- DOMESTIC WELL
- PROPOSED MONITORING WELL



SCALE: 1" = 120'

PRELIMINARY
NOT FOR
CONSTRUCTION

CABE ASSOCIATES, INC.
CONSULTING ENGINEERS
DOVER, DELAWARE

DRAWN BY: SMC
DESIGNED BY: SCH
DATE: 2-25-16
SCALE: 1" = 120'
CHECKED BY: LJB
FILE NO.: 117-060

KENT COUNTY LEVY COURT
VINEYARD FARM
FREDERICA, DELAWARE

EXHIBIT V-3
LAND APPLICATION
AREAS

SHEET NO.

1

FILE NO.:

DATE

SYM

REVISION

BY APPD.

Organic Nitrogen Mineralization Calculations

Field ID: North and South Fields

Year of Biosolids Application 2015
 Org N, % 2.81
 Org N, lb/ton 56.2
 Biosolids applic rate, ton/acre 3.64

Yr of Growing Season	Starting Org N, lb/acre	Mineralization rate, K	Mineralized Org N, lb/acre	Org N remaining lb/acre
2015	204.57	0.30	61.37	143.20
2016	143.20	0.15	21.48	121.72
2017	121.72	0.08	9.74	111.98
2018	111.98	0.04	4.48	107.50

Year of Biosolids Application 2016
 Org N, % 2.81
 Org N, lb/ton 56.2
 Biosolids applic rate, ton/acre 0.00

Yr of Growing Season	Starting Org N, lb/acre	Mineralization rate, K	Mineralized Org N, lb/acre	Org N remaining lb/acre
2016	0.00	0.30	0.00	0.00
2017	0.00	0.15	0.00	0.00
2018	0.00	0.08	0.00	0.00
2019	0.00	0.04	0.00	0.00

Year of Biosolids Application 2017
 Org N, % 2.81
 Org N, lb/ton 56.2
 Biosolids applic rate, ton/acre 0.00

Yr of Growing Season	Starting Org N, lb/acre	Mineralization rate, K	Mineralized Org N, lb/acre	Org N remaining lb/acre
2017	0.00	0.30	0.0	0.00
2018	0.00	0.15	0.00	0.00
2019	0.00	0.08	0.00	0.00
2020	0.00	0.04	0.00	0.00

Year of Biosolids Application 2018
 Org N, % 2.81
 Org N, lb/ton 56.2
 Biosolids applic rate, ton/acre 3.64

Yr of Growing Season	Starting Org N, lb/acre	Mineralization rate, K	Mineralized Org N, lb/acre	Org N remaining lb/acre
2018	204.57	0.30	61.4	143.20
2019	143.20	0.15	21.48	121.72
2020	121.72	0.08	9.74	111.98
2021	111.98	0.04	4.48	107.50

Nitrogen Agronomic Rate Calculations

Year	2015	<u>Assumptions/Notes:</u>
Crop	Corn	
N requirement of crop to be grown, lb/acre	165.00	Based on NMP yield goal by Willard Agri-Service
N from previous legume crop, lb/acre	30.0	From EPA Manual, added due to plantings of soybeans 2014
N from supplemental fertilizers, lb/acre	52.0	
N added from irrigation water, lb/acre	0.00	
N from previous biosolids applications, lb/acre	0.00	
N from previous manure applications, lb/acre	0.00	
Total N from existing, expected sources, lb/acre	82.0	
Adjusted fertilizer N requirement, lb/acre	83.0	
<u>Biosolids characteristics:</u>		
NO3, % in biosolids	0.001	Based upon an average of three biosolid samples
NH4, % in biosolids	0.30	Based upon an average of three biosolid samples
No, % in biosolids	2.81	Based upon an average of three biosolid samples
NO3 in biosolids, lb/ton	0.01	
NH4 in biosolids, lb/ton	6.00	
No in biosolids, lb/ton	56.2	
Volatilization factor, K	1.00	Assumes surface application of biosolids onto soil
Mineralization factor	0.30	
PAN/dry ton of applied biosolids	22.9	
Agronomic N rate of biosolids, ton/acre	3.64	
Total N Applied, lb/acre	165	

Nitrogen Agronomic Rate Calculations

Year	2016	<u>Assumptions/Notes:</u>
Crop	Soybeans	
N requirement of crop to be grown, lb/acre	0.0	
N from previous legume crop, lb/acre	0.0	
N from supplemental fertilizers, lb/acre	0.0	
N added from irrigation water, lb/acre	0.00	
N from previous biosolids applications, lb/acre	21.5	Assumes previous biosolids application in 2015
N from previous manure applications, lb/acre	0.00	
Total N from existing, expected sources, lb/acre	21.5	
Adjusted fertilizer N requirement, lb/acre	-21.5	
<u>Biosolids characteristics:</u>		
NO3, % in biosolids	0.001	Based upon an average of three biosolid samples
NH4, % in biosolids	0.30	Based upon an average of three biosolid samples
No, % in biosolids	2.81	Based upon an average of three biosolid samples
NO3 in biosolids, lb/ton	0.01	
NH4 in biosolids, lb/ton	6.00	
No in biosolids, lb/ton	56.2	
Volatilization factor, K	1.00	Assumes surface application of biosolids onto soil
Mineralization factor	0.30	
PAN/dry ton of applied biosolids	22.9	
Agronomic N rate of biosolids, ton/acre	-0.94	
Total N Applied, lb/acre	0	

Nitrogen Agronomic Rate Calculations

Year	2017	<u>Assumptions/Notes:</u>
Crop	Barley	
N requirement of crop to be grown, lb/acre	35.0	Based on NMP yield goal by Willard Agri-Service
N from previous legume crop, lb/acre	30.0	From EPA Manual, added due to plantings of soybeans 2016
N from supplemental fertilizers, lb/acre	0.00	
N added from irrigation water, lb/acre	0.00	
N from previous sludge applications, lb/acre	4.87	Assumes previous biosolids application in 2015
N from previous manure applications, lb/acre	0.00	
Total N from existing, expected sources, lb/acre	34.87	
Adjusted fertilizer N requirement, lb/acre	0	
<u>Biosolids characteristics:</u>		
NO3, % in biosolids	0.001	Based upon an average of three biosolid samples
NH4, % in biosolids	0.30	Based upon an average of three biosolid samples
No, % in biosolids	2.81	Based upon an average of three biosolid samples
NO3 in biosolids, lb/ton	0.01	
NH4 in biosolids, lb/ton	6.00	
No in biosolids, lb/ton	56.2	
Volatilization factor, K	1.00	Assumes surface application of biosolids onto soil
Mineralization factor	0.30	
PAN/dry ton of applied biosolids	22.9	
Agronomic N rate of biosolids, ton/acre	0.00	
Total N Applied, lb/acre	34.9	

Nitrogen Agronomic Rate Calculations

		<u>Assumptions/Notes:</u>
Year	2017	
Crop	Soybean	
N requirement of crop to be grown, lb/acre	0.00	
N from previous legume crop, lb/acre	0.00	
N from supplemental fertilizers, lb/acre	0.00	
N added from irrigation water, lb/acre	0.00	
N from previous sludge applications, lb/acre	4.87	Assumes previous biosolids application in 2015
N from previous manure applications, lb/acre	0.00	
Total N from existing, expected sources, lb/acre	4.87	
Adjusted fertilizer N requirement, lb/acre	-4.87	
<u>Biosolids characteristics:</u>		
NO3, % in biosolids	0.001	Based upon an average of three biosolid samples
NH4, % in biosolids	0.30	Based upon an average of three biosolid samples
No, % in biosolids	2.81	Based upon an average of three biosolid samples
NO3 in biosolids, lb/ton	0.01	
NH4 in biosolids, lb/ton	6.00	
No in biosolids, lb/ton	56.2	
Volatilization factor, K	1.00	Assumes surface application of biosolids onto soil
Mineralization factor	0.30	
PAN/dry ton of applied biosolids	22.9	
Agronomic N rate of biosolids, ton/acre	-0.21	
Total N Applied, lb/acre	0.00	

Nitrogen Agronomic Rate Calculations

Year	2018	<u>Assumptions/Notes:</u>
Crop	Corn	
N requirement of crop to be grown, lb/acre	165.00	Based on NMP yield goal by Willard Agri-Service
N from previous legume crop, lb/acre	30.0	
N from supplemental fertilizers, lb/acre	47.0	From EPA Manual, added due to plantings of soybeans 2017
N added from irrigation water, lb/acre	0.00	
N from previous sludge applications, lb/acre	4.48	Assumes previous biosolids application in 2015
N from previous manure applications, lb/acre	0.00	
Total N from existing, expected sources, lb/acre	81.5	
Adjusted fertilizer N requirement, lb/acre	83.5	
<u>Biosolids characteristics:</u>		
NO3, % in biosolids	0.001	Based upon an average of three biosolid samples
NH4, % in biosolids	0.30	Based upon an average of three biosolid samples
No, % in biosolids	2.81	Based upon an average of three biosolid samples
NO3 in biosolids, lb/ton	0.01	
NH4 in biosolids, lb/ton	6.00	
No in biosolids, lb/ton	56.2	
Volatilization factor, K	1.00	Assumes surface application of biosolids onto soil
Mineralization factor	0.30	
PAN/dry ton of applied biosolids	22.9	
Agronomic N rate of biosolids, ton/acre	3.64	
Total N Applied, lb/acre	165	

Phosphorus Agronomic Rate Calculations

Field: Vineyard Farm

Field	Year	Crop	Crop yield bushels per acre	Acreage	Plant P uptake rate, lbs/bushel	Plant P uptake rate lb/acre	Biosolids % TP	Allowable Biosolids applic. rate, lb/acre	Proposed Biosolids applic. rate, ton/acre	Total Biosolids applic, tons
North	2015	Corn	165	59.23	0.18	29.70	1.28%	2320	3.64	215.63
South		Corn	165	53.18	0.18	29.70	1.28%	2320	3.64	193.61
North	2016	Soybeans	65.0	59.23	0.44	28.60	1.28%	2234	0.00	0.00
South		Soybeans	65.0	53.18	0.44	28.60	1.28%	2234	0.00	0.00
North	2017	Barley DC	35.0	59.23	0.18	6.30	1.28%	492	0.00	0.00
South		Barley DC	35.0	53.18	0.18	6.30	1.28%	492	0.00	0.00
North		Soybean DC	65.0	59.23	0.44	28.60	1.28%	2234	0.00	0.00
South		Soybean DC	65.0	53.18	0.44	28.60	1.28%	2234	0.00	0.00
North	2018	Corn	165	59.23	0.18	29.70	1.28%	2320	3.64	215.60
South		Corn	165	53.18	0.18	29.70	1.28%	2320	3.64	193.58

Notes:

Allowable biosolids application rate is based upon phosphorus plant uptake rate.

Land Limiting Constituents

Average biosolids application rate 1.21 tons/acre/yr

Constituent	Average Biosolids Conc., mg/kg	CPLR, kg/ha DNREC Regulations	CPLR, lb/acre	Allowable Biosolids Application, dry tons/acre	Useful Life, yrs
Arsenic	13.00	41.00	36.59	1,407	1,163
Cadmium	9.23	39.00	34.81	1,886	1,558
Chromium	36.0	3,000.00	2,677.63	37,189	30,735
Copper	232	1,500.00	1,338.82	2,885	2,385
Lead	23.0	300.00	267.76	5,821	4,811
Mercury	0.80	17.00	15.17	9,483	7,837
Molybdenum	12.0	18.00	16.07	669	553
Nickel	27.67	420.00	374.87	6,774	5,598
Selenium	7.13	100.00	89.25	6,259	5,173
Zinc	482	2,800.00	2,499.13	2,592	2,143

Notes:

CPLR = Cumulative Pollutant Loading Rate

Sample Calculation Using Arsenic:

Allowable biosolids application, dry tons/acre = $[41 \text{ kg/ha} / (2.47 \text{ acre/ha} * 0.4536 \text{ kg/lb})] / (0.002 * 13 \text{ mg/kg}) = 1,407 \text{ dry tons/acre}$

Useful Life = $1,407 \text{ dry tons/acre} / 1.21 \text{ tons/acre/year} = 1,163 \text{ years}$

Biosolids Sampling Requirements

Parameter	Units	Min. Frequency	Sample Type
Moisture content	percent	Quarterly	Composite
Total Nitrogen as N (moist & dry weight basis)	percent	Quarterly	Composite
Organic Nitrogen as N (moist & dry weight basis)	percent	Quarterly	Composite
Ammonium as N (moist & dry weight basis)	percent	Quarterly	Composite
Nitrate Nitrogen as N (moist & dry weight basis)	percent	Quarterly	Composite
Phosphorus (dry weight basis)	percent	Quarterly	Composite
Potassium (dry weight basis)	percent	Quarterly	Composite
Volatile solids	percent	Quarterly	Composite
Fecal coliform (colonies/g)	MPN	Quarterly	Composite
pH	SU	Quarterly	Composite
Arsenic (dry weight basis)	mg/kg	Quarterly	Composite
Cadmium (dry weight basis)	mg/kg	Quarterly	Composite
Chromium (dry weight basis)	mg/kg	Quarterly	Composite
Copper (dry weight basis)	mg/kg	Quarterly	Composite
Lead (dry weight basis)	mg/kg	Quarterly	Composite
Mercury (dry weight basis)	mg/kg	Quarterly	Composite
Molybdenum (dry weight basis)	mg/kg	Quarterly	Composite
Nickel (dry weight basis)	mg/kg	Quarterly	Composite
Selenium (dry weight basis)	mg/kg	Quarterly	Composite
Zinc (dry weight basis)	mg/kg	Quarterly	Composite
PCB's (dry weight basis)	mg/kg	Annually	Composite
Cyanide (dry weight basis)	mg/kg	Annually	Composite
Priority pollutant scan	--	Annually	Composite

ENDANGERED SPECIES ASSESSMENT

CHAPTER VI

VI. ENDANGERED SPECIES ASSESSMENT

The areas to receive land application of biosolids have been in use as agricultural farm fields since at least the 1930's. The application of the biosolids does not change the use of the agricultural fields. Therefore, existing habitats are not changed and there is no threat or endangerment to endangered species.

ATTACHMENTS

LETTER OF INTENT

ATTACHMENT A

December 11, 2013

Mr. Brian Churchill
Department of Natural Resources
and Environmental Control
Surface Water Discharges Section
89 Kings Highway
Dover DE 19901

Re: Kent County, Delaware
Carpenter Bridge Road Biosolids
Land Application Site
Letter of Intent

Dear Mr. Churchill:

Please be advised that the Kent County Department of Public Works intends to permit Parcel SM-00-140.00-01-76.00-000 located at the intersection of Carpenter Bridge Road and Roesville Road for Class B biosolids disposal. The parcel is currently in agricultural production on a regular basis and is shown on Exhibit 1, attached. This parcel is located in the Murderkill River Watershed and Ash Gut (HUC Code 020402070404) minor watersheds. No projected loadings or application rates have been determined at this point. The County has retained the following firms to assist with the project:

1. Consulting Engineer - CABB Associates, Inc., Mr. Scott C. Hoffinan, P.E.
2. Professional Geologist - Maser Consulting, Inc., Tom Dwyer, P.G.
3. Class D Soil Scientist - Atlantic Resource Management Inc., Laf Erickson, CPSS/SC.

Due to agricultural operations that will be occurring on site in the near future, the County intends to begin hydrogeological and soils investigations as soon as possible. Preliminary soils investigations, including wet season water level testing, are scheduled to begin the week of December 16, 2013.

Mr. Brian Churchill
Department of Natural Resources
and Environmental Control
Page 2

December 13, 2013

The property owner point of contact is:

Ms. Diana Golt, P.E.
Kent County Department of Public Works
555 Bay Road
Dover DE 19901
302-744-2430

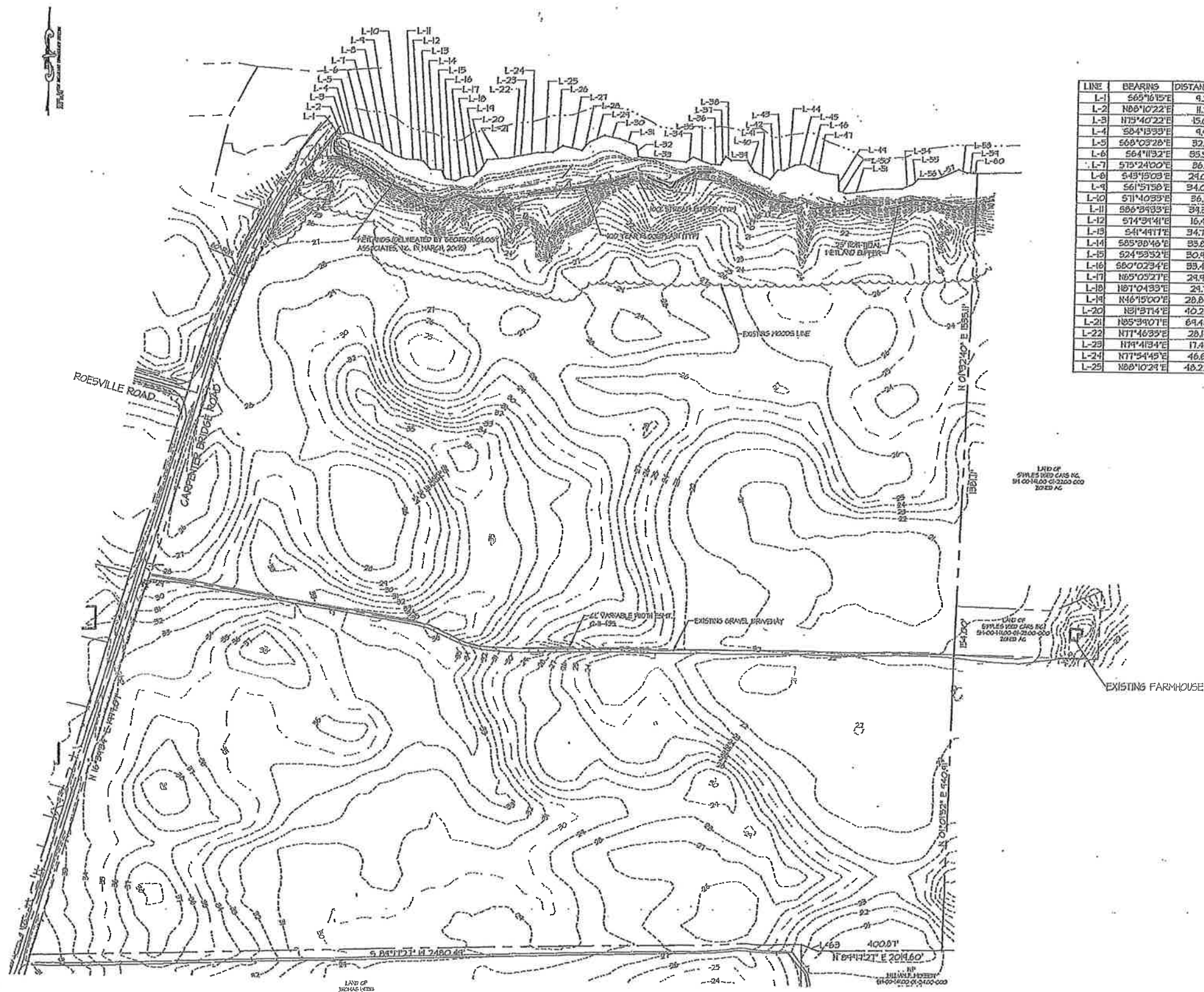
After the preliminary site investigations are completed we will contact your office to schedule a meeting to discuss the project in further detail. We look forward to working with you on this project. If you have any questions or would like to discuss the project in further detail, please contact me.

Very truly yours,

CABE ASSOCIATES, INC.

Scott C. Hoffman, P.E.

SCH./cjk
117-060
cc: Ms. Diana Golt
Kent County (W/Attach)
Attachments



CURVE	DELTA	RADIUS	ARC	CHORD BEARING	CHORD	TANGENT
C-1	85°10'	2245.00'	623.16'	N24°10'E	621.16'	98.40'
C-2	65°36'	1571.02'	142.02'	N86°10'E	141.41'	46.18'

LINE	BEARING	DISTANCE
L-1	S65°16'E	4.24'
L-2	N85°10'22"E	11.24'
L-3	N75°40'22"E	15.04'
L-4	S84°13'33"E	4.42'
L-5	S68°03'28"E	32.12'
L-6	S64°11'32"E	55.50'
L-7	S75°24'00"E	86.11'
L-8	S43°15'03"E	24.04'
L-9	S61°51'50"E	34.08'
L-10	S71°40'33"E	36.16'
L-11	S86°34'33"E	34.37'
L-12	S74°34'41"E	16.43'
L-13	S41°44'17"E	34.70'
L-14	S85°30'46"E	33.85'
L-15	S24°53'32"E	30.86'
L-16	S60°02'34"E	33.46'
L-17	N65°03'27"E	24.86'
L-18	N87°04'33"E	24.71'
L-19	N46°15'00"E	28.88'
L-20	N81°37'14"E	10.26'
L-21	N85°34'07"E	64.48'
L-22	N77°46'35"E	28.14'
L-23	N77°41'34"E	17.45'
L-24	N77°54'45"E	46.61'
L-25	N88°10'24"E	48.22'

LINE	BEARING	DISTANCE
L-26	N57°04'02"E	37.96'
L-27	S76°01'10"E	64.03'
L-28	N60°14'51"E	36.24'
L-29	N67°08'27"E	54.77'
L-30	S77°04'44"E	50.01'
L-31	S68°34'14"E	57.32'
L-32	S11°16'14"E	37.64'
L-33	S83°34'21"E	151.21'
L-34	N54°15'06"E	26.25'
L-35	S68°07'37"E	62.05'
L-36	S87°55'34"E	27.54'
L-37	N24°34'51"E	30.44'
L-38	S34°34'54"E	21.52'
L-39	N86°13'26"E	55.47'
L-40	S32°58'30"E	45.69'
L-41	S61°56'35"E	56.23'
L-42	N40°24'05"E	38.88'
L-43	S87°38'37"E	20.10'
L-44	N64°51'52"E	37.86'
L-45	N82°54'22"E	32.66'
L-46	S60°43'21"E	36.05'
L-47	S64°41'50"E	26.71'
L-48	S81°20'51"E	44.41'
L-49	S02°03'28"E	51.21'
L-50	S68°12'21"E	22.21'

LINE	BEARING	DISTANCE
L-51	N82°30'05"E	67.46'
L-52	N82°04'56"E	51.12'
L-53	N86°18'36"E	62.71'
L-54	N87°32'02"E	37.51'
L-55	N45°52'35"E	25.47'
L-56	N84°30'44"E	60.37'
L-57	N67°09'36"E	76.21'
L-58	S68°21'35"E	27.72'
L-59	S88°48'44"E	20.80'
L-60	S82°54'31"E	12.13'
L-61	N88°51'04"E	56.10'

NOT TO SCALE



117-060
DECEMBER 2013
117C

CARPENTER BRIDGE ROAD BIOSOLIDS LAND APPLICATION SITE
KENT COUNTY DEPARTMENT OF PUBLIC WORKS
SITE PLAN

EXHIBIT

SOILS EVALUATION FOR LAND
APPLICATION OF BIOSOLIDS
(BOUND SEPARATELY)

ATTACHMENT B

HYDROGEOLOGIC EVALUATION FOR
LAND APPLICATION OF BIOSOLIDS
(BOUND SEPARATELY)

ATTACHMENT C

SLUDGE SAMPLE ANALYTICAL RESULTS

ATTACHMENT D



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility

139 Milford Neck Road

Milford, DE 19963

Attention: Allan Thomas

Lab ID: 137042 Matrix: Soil/Sludge Sample Start: 12/3/12 10:15
Description: Site: Solar Dryer 008-12 Sample End:
Type: Grab Date Received: 12/3/12 11:13

Parameters	Units	Results	Analyzed	By	Method
Biological					
Fecal Coliform MPN (As Received Basis)	#/100 grs	>1600000	12/3/12 13:40	RD	SM9221-E
Salmonella (As Received Basis)	#/100 grs	<20	12/3/12 13:40	RD	EPA 1682
Metals					
Metals Digestion for AA		Completed	12/10/12 15:00	HJG	EPA 200.2
Metals -Dry Weight					
Aluminum (Dry Weight)	mg/kg	4100	12/20/12 17:41	HJG3	EPA 6020
Arsenic (Dry Weight)	mg/kg	14	12/20/12 17:41	HJG3	EPA 6020
Cadmium (Dry Weight)	mg/kg	4.8	12/20/12 17:41	HJG3	EPA 6020
Chromium (Dry Weight)	mg/kg	36	12/20/12 17:41	HJG3	EPA 6020
Copper (Dry Weight)	mg/kg	240	12/20/12 17:41	HJG3	EPA 6020
Iron (Dry Weight)	mg/kg	61000	12/20/12 17:41	HJG3	EPA 6020
Lead (Dry Weight)	mg/kg	26	12/20/12 17:41	HJG3	EPA 6020
Mercury (Dry Weight)	mg/kg	0.944	12/11/12 15:17	QCL	SW-846 7471B
Molybdenum (Dry Weight)	mg/kg	13	12/20/12 17:41	HJG3	EPA 6020
Nickel (Dry Weight)	mg/kg	31	12/20/12 17:41	HJG3	EPA 6020
Potassium (Dry Weight)	mg/kg	2000	12/20/12 17:41	HJG3	EPA 6020
Selenium (Dry Weight)	mg/kg	8.4	12/20/12 17:41	HJG3	EPA 6020
Sodium (Dry Weight)	mg/kg	1200	12/20/12 17:41	HJG3	EPA 6020
Zinc (Dry Weight)	mg/kg	500	12/20/12 17:41	HJG3	EPA 6020
Minerals					
Chloride	mg/kg	1947	12/12/12 9:44	HJG	EPA 300.0
Nutrient - As Received					
Ammonia as N (As Received)	%	0.327	12/5/12 12:20	CC	SM4500-NH3-G
Nitrate+Nitrite as N (As Received)	%	<0.0005	12/10/12 13:06	CC	SM4500-NO3-H
Organic Nitrogen as N (As Received)	%	1.59	12/6/12 10:51	KLS	Calc
Total Kjeldahl Nitrogen (As Received)	%	1.92	12/4/12 13:13	CC	SM4500-Norg-C
Total Nitrogen as N (As Received)	%	1.92	12/12/12 9:11	SLB	Calc
Total Phosphorus as P (As Received)	%	1.28	12/6/12 11:52	CC	SM4500-P-F(w/Dig)

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit

Jully B...



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility

139 Milford Neck Road

Milford, DE 19963

Attention: Allan Thomas

Lab ID: 137042

Matrix: Soil/Sludge

Sample Start: 12/3/12 10:15

Description:

Site: Solar Dryer 008-12

Sample End:

Type: Grab

Date Received: 12/3/12 11:13

Parameters	Units	Results	Analyzed	By	Method
Nutrient-Dry Weight					
Ammonia as N (Dry Weight-Sludge)	%	0.403	12/5/12 12:20	CC	SM4500-NH3-G
Nitrate+Nitrite as N (Dry Weight - Sludge)	%	<0.0006	12/10/12 13:06	CC	SM4500-NO3-H
Organic Nitrogen as N (Dry Weight - Sludge)	%	1.97	12/6/12 10:51	KLS	Calc
Total Kjeldahl Nitrogen (Dry Weight)	%	2.37	12/4/12 13:13	CC	SM4500-Norg-C
Total Nitrogen as N (Dry Weight)	%	2.37	12/12/12 9:11	SLB	Calc
Total Phosphorus as P (Dry Weight)	%	1.58	12/6/12 11:52	CC	SM4500-P-F(w/Dig)
Physical					
% Moisture	%	18.9	12/3/12 17:40	HJG	SM2540-G
% Solids	%	81.1	12/3/12 17:40	HJG	SM2540-G
Calcium Carbonate Equivalency	%	34.2	12/6/12 13:45	A&L	AOAC 1.004
pH	SU	8.18	12/3/12 14:36	DRP	SM4500-H+/B
Total Vol. Solids @ 550 C	%	29.7	12/3/12 17:40	HJG	160.4
Synthetic Organic Comp					
Polychlorinated biphenyls (PCB's) Soils	mg/kg	ND	12/14/12 19:49	QCL	SW-846 8082A

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit

Report Number: 12-340-0202

Account Number: 15145

**A&L Eastern Laboratories, Inc.**

7621 Whiteline Road Richmond, Virginia 23237 (804) 743-9401 Fax (804) 271-6446

Send To: ENVIROCORP INC
51 CLARK ST
HARRINGTON, DE 19952

Project : 137042

Lab Number : 90705

Sample Id : 137042

REPORT OF ANALYSIS

Date Sampled: 12/3/2012 10:15:00

Date Received: 12/05/2012 00:00

Date Reported: 12/11/2012

PARAMETER	RESULT (%)	RESULT (mg/kg)	QUANTITATION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE/TIME	METHOD
Total Solids *	79.29	792900	100.0	JM	12/05/2012 15:09	SM-2540G
Moisture *	20.71		100.0	JM	12/05/2012 15:09	SM-2540G
Calcium Carbonate Equivalent	34.20	342000	100	JM	12/06/2012 13:45	AOAC 955.01

Comments:

All values are on a dry weight basis except as noted by asterisk. Detection limit on all N series is on a wet basis.

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Debbie Holt

QC Laboratories

Analytical Report

KELLY SALMON
ENVIROCORP, INC.
51 CLARK STREET
HARRINGTON, DE 19952

Regarding:
KELLY SALMON
ENVIROCORP, INC.
51 CLARK STREET
HARRINGTON, DE 19952

Account No: AL0354, ENVIROCORP, INC.
Project No: AL0354, ENVIROCORP, INC.

P.O. No:

Inv. No: 1478294
PWSID No:

Sample Number	Sample Description	Samp. Date/Time/Temp Sampled by		
L4416234-1	KENT COUNTY 137042 BATCH 008-12	12/03/12 10:15am	NA	C Customer
Received Date/Time/Temp 12/06/12 04:30pm 3.1 C		Iced (Y/N): Y		
Parameter	Method	Result	RLs	Test Date, Time, Analyst
GENERAL CHEMISTRY				
TOTAL SOLIDS PERCENT	SM 2540G	78.39 %	0.01000 %	12/07/12 05:26PM JTE
METALS				
MERCURY	EPA 7471B	0.944 mg/kg DRY	0.123 mg/kg	12/11/12 03:17PM RMP
GAS CHROMATOGRAPHY				
AROCLOR-1016	EPA 8082	ND ug/kg DRY	6.66 ug/kg*	12/14/12 07:49PM BET
AROCLOR-1221	EPA 8082	ND ug/kg DRY	21.0 ug/kg*	12/14/12 07:49PM BET
AROCLOR-1232	EPA 8082	ND ug/kg DRY	14.0 ug/kg*	12/14/12 07:49PM BET
AROCLOR-1242	EPA 8082	ND ug/kg DRY	6.74 ug/kg*	12/14/12 07:49PM BET
AROCLOR-1248	EPA 8082	ND ug/kg DRY	7.65 ug/kg*	12/14/12 07:49PM BET
AROCLOR-1254	EPA 8082	ND ug/kg DRY	7.12 ug/kg*	12/14/12 07:49PM BET
AROCLOR-1260	EPA 8082	ND ug/kg DRY	7.08 ug/kg*	12/14/12 07:49PM BET

Notes:

A result of "ND" indicates that the analyte tested was either not detected or the concentration was below the RLs.

Definitions: NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; LA=laboratory accident; TNTC= Too numerous to count; pres=presumptive

A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

MCL= EPA recommended "maximum contaminant level", PLs = Customer-specific permit limits.

The test results meet all requirements of NELAC unless otherwise specified.

The report shall not be reproduced except in full without the written consent of the laboratory.

Unless otherwise specified, the Environmental and Food Chemistry testing except Field Parameters were performed by QC Inc. located at 1205 Industrial Blvd., Southampton, PA 18966; Pharmaceutical, Dairy and Food Microbiological tests were performed by QC Inc. located at 702 Electronic Dr., Horsham, PA 19044. QCL Accreditations: Southampton Div: EPA ID PA00018; NELAP ID's: PA 09-00131, NJ PA166, NY 11223 State ID's: CT PH-0768, DE PA-018, MD 206, SC 89021001; FDA Reg. # : 2515238

ACL Div: State ID's: DE 00011, MD 138; Wind Gap Div: State ID's: PA 48-01334, NJ PA001

E. Rutherford Div: State ID: NJ 02015; Vineland Div: State ID: NJ 06005; Reading Div: State ID: PA 06-03543

The reported results relate only to the samples.

QC Laboratories

Analytical Report

Account No:AL0354, ENVIROCORP, INC.
Project No: AL0354, ENVIROCORP, INC.

P.O. No:

Inv. No: 1478294
PWSID No:

All samples are collected as "grab" samples unless otherwise identified.

* - The "RLs" represents a reporting/quantitation limit. When an "" is present in the column identified as the "RLs", it is being reported as a Method Detection Limit (MDL).



137042

KENT COUNTY WASTEWATER FACILITIES
LABORATORY139 Milford Neck Rd.
Milford DE 19963Tel:302-335-6000
Fax:302-335-0365

CHAIN OF CUSTODY

Lab ID.	Time	Date	Sample	Preservation	Analysis
3753g	10:5	12/3/12	Composite of S.D. A, B, C Batch 008-12	none	see attached list

Comments:

Sampled By: A. Thomas, R. Washington 12/3/121. Relinquished By: Alan F. Thomas 12/3/12 10:45 Received By: Markus 12/3/12 10:452. Relinquished By: Markus 12/3/12 11:13 Received By: E. Bailey 12/3/12 11:13

3. Relinquished By: _____

Received By: _____

4. Relinquished By: _____

Received By: _____

B. MONITORING REQUIREMENTS

During the period beginning on the effective date and lasting through the expiration date the permittee is authorized to conduct a Limited Distribution and Marketing program for the pasteurized sludge product generated at the Kent County Wastewater Treatment Facility. Pasteurized sludge product for distribution and marketing shall be monitored by the permittee as specified below:

B.1 PASTEURIZED SLUDGE

0/05
TKN

Parameter	Unit Measurement	Minimum Frequency	Sample Type
✓ Moisture content	percent	Monthly	Composite
✓ Total Nitrogen as N (dry weight basis)	percent	Monthly	Composite
✓ Organic Nitrogen as N (dry weight basis)	percent	Monthly	Composite
✓ Ammonium as N (dry weight basis)	percent	Monthly	Composite
✓ Nitrate Nitrogen as N (dry weight basis)	percent	Monthly	Composite
✓ Phosphorus (dry weight basis)	percent	Monthly	Composite
✓ Potassium (dry weight basis)	percent	Monthly	Composite
✓ Volatile solids	percent	Monthly	Composite
✓ Calcium Carbonate Equivalence	percent	Monthly	Composite
✓ Fecal Coliform (Colonies/gm)	MPN	Monthly	Composite
✓ Salmonella (sp) (Colonies/4gm)	MPN	Monthly	Composite
✓ pH	S.U.	Monthly	Composite
✓ Aluminum (dry weight basis)	mg/kg	Monthly	Composite
✓ Arsenic (dry weight basis)	mg/kg	Monthly	Composite
✓ Cadmium (dry weight basis)	mg/kg	Monthly	Composite
✓ Chromium (dry weight basis)	mg/kg	Monthly	Composite
✓ Chlorides (dry weight basis)	mg/kg	Monthly	Composite
✓ Copper (dry weight basis)	mg/kg	Monthly	Composite
✓ Iron (dry weight basis)	mg/kg	Monthly	Composite
✓ Lead (dry weight basis)	mg/kg	Monthly	Composite
✓ Mercury (dry weight basis)	mg/kg	Monthly	Composite
✓ Molybdenum (dry weight basis)	mg/kg	Monthly	Composite
✓ Nickel (dry weight basis)	mg/kg	Monthly	Composite
✓ Selenium (dry weight basis)	mg/kg	Monthly	Composite
✓ Sodium (dry weight basis)	mg/kg	Monthly	Composite
✓ Zinc (dry weight basis)	mg/kg	Monthly	Composite
✓ PCB's (dry weight basis)	mg/kg	Monthly	Composite
Priority pollutants (see NOTE)		Every 6 months	Composite

*Pasteurized sludge samples shall be collected at the following location: the dryer discharge chute. All processed sludge shall be collected and analyzed in accordance with the Quality Assurance Program. See Part I, F.1. for reporting requirements. The Department may modify the sampling frequency based upon review of continuing or additional analyses.

NOTE: A list of the 126 priority pollutants can be found in 40 CFR, Part 423, Appendix A, 1987.



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility

139 Milford Neck Road

Milford, DE 19963

Attention: Allan Thomas

Lab ID: 139837 Matrix: Soil/Sludge Sample Start: 2/4/13 8:15
Description: Site: Kentorganite Sample End:
Type: Grab Date Received: 2/4/13 10:21

Parameters	Units	Results	Analyzed	By	Method
Biological					
Fecal Coliform MPN (As Received Basis)	#/100 grs	<20.0	2/4/13 13:15	RD	SM9221-E
Salmonella (As Received Basis)	#/100 grs	<20.0	2/4/13 13:15	RD	EPA 1682
Metals					
Metals Digestion for AA		Completed	3/4/13 13:00	HJG	EPA 200.2
Metals -Dry Weight					
Aluminum (Dry Weight)	mg/kg	2747	3/5/13 15:15	HJG3	EPA 6020
Antimony (Dry Weight)	mg/kg	1.2	3/5/13 15:15	HJG3	EPA 6020
Arsenic (Dry Weight)	mg/kg	11.1	3/5/13 15:15	HJG3	EPA 6020
Beryllium (Dry Weight)	mg/kg	<1	3/5/13 15:15	HJG3	EPA 6020
Cadmium (Dry Weight)	mg/kg	15.7	3/5/13 15:15	HJG3	EPA 6020
Chromium (Dry Weight)	mg/kg	32	3/5/13 15:15	HJG3	EPA 6020
Copper (Dry Weight)	mg/kg	179	3/5/13 15:15	HJG3	EPA 6020
Iron (Dry Weight)	mg/kg	34581	3/5/13 15:15	HJG3	EPA 6020
Lead (Dry Weight)	mg/kg	16.9	3/5/13 15:15	HJG3	EPA 6020
Mercury (Dry Weight)	mg/kg	0.43	2/18/13 14:51	ALSI	SW-846 7471B
Molybdenum (Dry Weight)	mg/kg	9.1	3/5/13 15:15	HJG3	EPA 6020
Nickel (Dry Weight)	mg/kg	20.9	3/5/13 15:15	HJG3	EPA 6020
Potassium (Dry Weight)	mg/kg	2730	3/5/13 15:15	HJG3	EPA 6020
Selenium (Dry Weight)	mg/kg	5.2	3/5/13 15:15	HJG3	EPA 6020
Silver (Dry Weight)	mg/kg	5.3	3/5/13 15:15	HJG3	EPA 6020
Sodium (Dry Weight)	mg/kg	843	3/5/13 15:15	HJG3	EPA 6020
Thallium (Dry Weight)	mg/kg	<1	3/5/13 15:15	HJG3	EPA 6020
Zinc (Dry Weight)	mg/kg	345	3/5/13 15:15	HJG3	EPA 6020
Minerals					
Chloride	mg/kg	894	3/12/13 22:23	HJG	EPA 300.0
Miscellaneous/Other					
SHIP		Completed	2/19/13 14:43	ALSI	None

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility
139 Milford Neck Road
Milford, DE 19963

Attention: Allan Thomas

Lab ID: 139837

Matrix: Soil/Sludge

Sample Start: 2/4/13 8:15

Description:

Site: Kentorganite

Sample End:

Type: Grab

Date Received: 2/4/13 10:21

Parameters	Units	Results	Analyzed	By	Method
Nutrient - As Received					
Ammonia as N (As Received)	%	0.0445	2/6/13 14:27	HJG	SM4500-NH3-G
Nitrate+Nitrite as N (As Received)	%	<0.0005	2/6/13 21:41	HJG	SM4500-NO3-H
Organic Nitrogen as N (As Received)	%	2.09	2/11/13 9:51	ERB	Calc
P2O5 (As Received)	%	3.29	2/14/13 12:16	KLS	Calc
Total Kjeldahl Nitrogen (As Received)	%	2.14	2/9/13 19:01	HJG	SM4500-Norg-C
Total Nitrogen as N (As Received)	%	2.14	2/11/13 9:51	ERB	Calc
Total Phosphorus as P (As Received)	%	1.44	2/7/13 17:48	HJG	SM4500-P-F(w/Dig)
Nutrient-Dry Weight					
Ammonia as N (Dry Weight-Sludge)	%	0.101	2/6/13 14:27	HJG	SM4500-NH3-G
Nitrate+Nitrite as N (Dry Weight - Sludge)	%	<0.0011	2/6/13 21:41	HJG	SM4500-NO3-H
Organic Nitrogen as N (Dry Weight - Sludge)	%	4.76	2/11/13 9:51	ERB	Calc
P2O5 (Dry Weight - Sludge)	%	7.49	2/14/13 12:16	KLS	Calc
Total Kjeldahl Nitrogen (Dry Weight)	%	4.87	2/9/13 19:01	HJG	SM4500-Norg-C
Total Nitrogen as N (Dry Weight)	%	4.87	2/11/13 9:51	ERB	Calc
Total Phosphorus as P (Dry Weight)	%	3.27	2/7/13 17:48	HJG	SM4500-P-F(w/Dig)
Physical					
% Moisture	%	56.12	2/4/13 14:36	HJG	SM2540-G
% Solids	%	43.88	2/4/13 14:36	HJG	SM2540-G
Calcium Carbonate Equivalency	%	24.3	2/7/13 14:30	A&L	AO-955.01
pH	SU	12.17	2/4/13 14:52	DRP	SM4500-H+/B
Total Vol. Solids @ 550 C	%	22.0	2/7/13 14:36	HJG	160.4
Synthetic Organic Comp					
Polychlorinated biphenyls (PCB's) Soils	mg/kg	<0.078	2/9/13 14:11	ALSI	SW-846 8082A

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit

Report Number: 13-037-0212

Account Number: 15145

**A&L Eastern Laboratories, Inc.**

7821 Whitelake Road, Richmond, Virginia 23237 (804) 743-6401 Fax (804) 271-8448

Send To: ENVIROCORP INC
51 CLARK ST
HARRINGTON, DE 19952

Project : 139837

Lab Number : 91749
Sample Id : 139837

REPORT OF ANALYSIS

Date Sampled: 2/4/2013 08:15:00

Date Received: 02/06/2013 00:00

Date Reported: 02/11/2013

PARAMETER	RESULT	RESULT	QUANTITATION LIMIT	ANALYST	ANALYSIS	METHOD
		UNITS	mg/kg		DATE TIME	
Total Solids *	42.38	423800	100.0	JM	02/06/2013 15:00	SM-2540G
Moisture *	57.62		100.0	JM	02/06/2013 15:00	SM-2540G
Calcium Carbonate Equivalent	24.30	243000	100	JM	02/07/2013 14:30	AOAC 955.01

Comments:

All values are on a dry weight basis except as noted by asterisk. Detection limit on all N series is on a wet basis.

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Debbie Holt



34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: CT PH-0224, DE ID 11, GA 914, MA PA0102, MD 128, LA 04162, VA 421, WY EPA Region 8, WV 343

February 19, 2013

Ms. Shelly Bloom
EnviroCorp Labs
51 Clark Street
Harrington, DE 19952

Certificate of Analysis

Client Name:	Building Canopy Commission	Order Number:	1010730
Project Name:		Workorder ID:	100187

Dear Ms. Bloom,

Enclosed are the analytical results for samples received by the laboratory on Wednesday, February 06, 2013.

The ALS Environmental laboratory in Middletown, Pennsylvania (formerly Analytical Laboratory Services, Inc.) is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Denise Brooks (Project Coordinator) or Anna G Milliken (Technical Manager) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

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This page is included as part of the Analytical Report and must be retained as a permanent record thereof.


Anna G Milliken
Technical Manager

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ALS Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: CT PH-0224, DE ID 11, GA 914, MA PA0102, MD 128, LA 04162, VA 421, WY EPA Region 8, WV 343

SAMPLE SUMMARY

Workorder: 1010730 139837

Discard Date: 03/05/2013

Workorder	Sample ID	Matrix	Lab Sampled	Date Received	Client/Ref
1010730001	139837	Solid	2/4/13 08:15	2/6/13 10:25	Customer

Workorder Comments:

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 138.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.

Standard Acronyms/Flags

J, B	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference

ALS Environmental Laboratory Locations Across North America

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Vancouver • Waterloo • Winnipeg • Yellowknife United States: Cincinnati • Everett • Fort Collins • Holland • Houston • Middletown • Salt Lake City • Spring City • York Mexico: Monterrey



34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: CT PH-0224, DE ID 11, GA 914, MA PA0102, MD 128, LA 04162, VA 421, WY EPA Region 8, WV 343

ANALYTICAL RESULTS

Workorder: 1010730 139837

Lab ID: 1010730001

Date Collected: 2/4/2013 08:15

Matrix: Solid

Sample ID: 139837

Date Received: 2/6/2013 10:25

Compound	Result	Unit	Value	Lab	Reference	Analysis	By	QA
VOLATILE ORGANICS								
Acrolein	ND	ug/kg	182	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Acrolein	ND	ug/kg	4330	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Acrylonitrile	ND	ug/kg	36.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Acrylonitrile	ND	ug/kg	885	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Benzene	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Benzene	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Bromodichloromethane	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Bromodichloromethane	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Bromoform	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Bromoform	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Bromomethane	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Bromomethane	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
2-Butanone	2140	ug/kg	1730	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Carbon Tetrachloride	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Carbon Tetrachloride	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Chlorobenzene	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Chlorobenzene	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Chlorodibromomethane	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Chlorodibromomethane	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Chloroethane	ND	ug/kg	18.2	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Chloroethane	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
2-Chloroethylvinyl ether	ND	ug/kg	348	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Chloroform	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Chloroform	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Chloromethane	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Chloromethane	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
1,1-Dichloroethane	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
1,1-Dichloroethane	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
1,2-Dichloroethane	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
1,2-Dichloroethane	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
1,1-Dichloroethene	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
1,1-Dichloroethene	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
trans-1,2-Dichloroethene	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
trans-1,2-Dichloroethene	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
1,2-Dichloropropene	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
1,2-Dichloropropene	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
1,3-Dichloropropene, Total	ND	ug/kg	14.5	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
1,3-Dichloropropene, Total	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1
Ethylbenzene	ND	ug/kg	7.3	8260/5035	2/6/13	TMP 2/8/13 22:37	TMP	A2
Ethylbenzene	ND	ug/kg	173	8260/5035	2/6/13	JAH 2/15/13 08:59	DD	A1

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ANALYTICAL RESULTS

Workorder: 1010730 139837

Lab ID: 1010730001
Sample ID: 139837

Date Collected: 2/4/2013 08:15
Date Received: 2/6/2013 10:25

Matrix: Solid

Compound	Results	Flag	Units	Limit	Method	Prepared	By	Analyzed	By	Cntr
Methylene Chloride	189	1,2,3	ug/kg	7.3	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
Methylene Chloride	ND		ug/kg	173	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
1,1,2,2-Tetrachloroethane	ND		ug/kg	7.3	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
1,1,2,2-Tetrachloroethane	ND		ug/kg	173	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
Tetrachloroethane	ND		ug/kg	7.3	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
Tetrachloroethane	ND		ug/kg	173	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
Toluene	11.5		ug/kg	7.3	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
Toluene	ND		ug/kg	173	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
1,1,1-Trichloroethane	ND		ug/kg	7.3	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
1,1,1-Trichloroethane	ND		ug/kg	173	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
1,1,2-Trichloroethane	ND		ug/kg	7.3	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
1,1,2-Trichloroethane	ND		ug/kg	173	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
Trichloroethane	ND		ug/kg	7.3	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
Trichloroethane	ND		ug/kg	173	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
Vinyl Chloride	ND		ug/kg	7.3	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
Vinyl Chloride	ND		ug/kg	173	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	70.2	8	%	71-148	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
4-Bromofluorobenzene (S)	61.8		%	48-138	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
Dibromofluoromethane (S)	3.27	6	%	42-143	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
Toluene-d8 (S)	70.5		%	54-141	8260/5035	2/6/13	JAH	2/15/13 08:59	DD	A1
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	129	7	%	58-124	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
4-Bromofluorobenzene (S)	144	10	%	51-128	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
Dibromofluoromethane (S)	128	5	%	82-123	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2
Toluene-d8 (S)	135	9	%	59-131	8260/5035	2/6/13	TMP	2/8/13 22:37	TMP	A2

SEMI-VOLATILES

Acenaphthene	ND		ug/kg	486	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Acenaphthylene	ND		ug/kg	486	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Anthracene	ND		ug/kg	486	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Benzidine	ND		ug/kg	5030	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Benzo(a)anthracene	ND		ug/kg	486	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Benzo(a)pyrene	ND		ug/kg	486	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Benzo(b)fluoranthene	ND		ug/kg	486	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Benzo(g,h,i)perylene	ND		ug/kg	486	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Benzo(k)fluoranthene	ND		ug/kg	486	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
4-Bromophenyl-phenylether	ND		ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Butylbenzylphthalate	ND		ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A

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ANALYTICAL RESULTS

Workorder: 1010730 139837

Lab ID: 1010730001

Date Collected: 2/4/2013 08:15

Matrix: Solid

Sample ID: 139837

Date Received: 2/6/2013 10:25

Concentration	Unit	Result	Method	Prepared	By	Analyzed	By	Unit
4-Chloro-3-methylphenol	ND	ug/kg	2520	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
bis(2-Chloroethoxy)methane	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
bis(2-Chloroethyl)ether	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
bis(2-Chloroisopropyl)ether	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
2-Chloronaphthalene	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
2-Chlorophenol	ND	ug/kg	2520	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
4-Chlorophenyl-phenylether	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Chrysene	ND	ug/kg	466	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Di-n-Butylphthalate	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Di-n-Octylphthalate	ND	ug/kg	2520	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Dibenzo(a,h)anthracene	ND	ug/kg	466	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
1,2-Dichlorobenzene	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
1,3-Dichlorobenzene	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
1,4-Dichlorobenzene	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
3,3-Dichlorobenzidine	ND	ug/kg	1400	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
2,4-Dichlorophenol	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Diethylphthalate	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
2,4-Dimethylphenol	ND	ug/kg	2520	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Dimethylphthalate	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
2,4-Dinitrophenol	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
2,4-Dinitrotoluene	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
2,6-Dinitrotoluene	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
1,2-Diphenylhydrazine	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
bis(2-Ethylhexyl)phthalate	8790	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Fluoranthene	ND	ug/kg	466	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Fluorene	ND	ug/kg	466	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Hexachlorobenzene	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Hexachlorobutadiene	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Hexachlorocyclopentadiene	ND	ug/kg	2520	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Hexachloroethane	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Indeno(1,2,3-cd)pyrene	ND	ug/kg	466	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Isophorone	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
2-Methyl-4,6-dinitrophenol	ND	ug/kg	2520	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Naphthalene	ND	ug/kg	466	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Nitrobenzene	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
2-Nitrophenol	ND	ug/kg	2520	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
4-Nitrophenol	ND	ug/kg	2520	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
N-Nitrosodimethylamine	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
N-Nitroso-di-n-propylamine	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
N-Nitrosodiphenylamine	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A
Pentachlorophenol	ND	ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF A

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ANALYTICAL RESULTS

Workorder: 1010730 139837

Lab ID: 1010730001

Date Collected: 2/4/2013 08:15

Matrix: Solid

Sample ID: 139837

Date Received: 2/6/2013 10:25

Parameter	Results	Flag	Units	Limit	Method	Prepared	By	Analyzed	By	Cntr
Phenanthrene	ND		ug/kg	466	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Phenol	ND		ug/kg	2520	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Pyrene	ND		ug/kg	466	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
1,2,4-Trichlorobenzene	ND		ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
2,4,6-Trichlorophenol	ND		ug/kg	932	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
2,4,6-Tribromophenol (S)	30.1	12	%	37-123	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
2-Fluorobiphenyl (S)	76.5		%	45-105	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
2-Fluorophenol (S)	30.1	11	%	35-104	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Nitrobenzene-d5 (S)	66.5		%	41-110	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Phenol-d5 (S)	67.6		%	40-100	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A
Terphenyl-d14 (S)	75.7		%	38-113	SW846 8270D	2/12/13	RMP	2/13/13 20:35	DHF	A

PCBs

Total Polychlorinated Biphenyl	ND		mg/kg	0.078	SW846 8082A	2/7/13	RMP	2/9/13 14:11	EGO	A
Aroclor-1016	ND		mg/kg	0.078	SW846 8082A	2/7/13	RMP	2/9/13 14:11	EGO	A
Aroclor-1221	ND		mg/kg	0.078	SW846 8082A	2/7/13	RMP	2/9/13 14:11	EGO	A
Aroclor-1232	ND		mg/kg	0.078	SW846 8082A	2/7/13	RMP	2/9/13 14:11	EGO	A
Aroclor-1242	ND		mg/kg	0.078	SW846 8082A	2/7/13	RMP	2/9/13 14:11	EGO	A
Aroclor-1248	ND		mg/kg	0.078	SW846 8082A	2/7/13	RMP	2/9/13 14:11	EGO	A
Aroclor-1254	ND		mg/kg	0.078	SW846 8082A	2/7/13	RMP	2/9/13 14:11	EGO	A
Aroclor-1260	ND		mg/kg	0.078	SW846 8082A	2/7/13	RMP	2/9/13 14:11	EGO	A
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
Decachlorobiphenyl (S)	112		%	30-150	SW846 8082A	2/7/13	RMP	2/9/13 14:11	EGO	A
Tetrachloro-m-xylene (S)	88.2		%	30-150	SW846 8082A	2/7/13	RMP	2/9/13 14:11	EGO	A

WET CHEMISTRY

Moisture	57.6		%	0.1	SM20-2540 G			2/11/13 20:30	CF	A
Phenolics	1.2		mg/kg	1.2	SW846 9088	2/14/13	JPA	2/14/13 22:08	JPA	A
Total Solids	42.4		%	0.1	SM20-2540 G			2/11/13 20:30	CF	A

METALS

Mercury, Total	0.43		mg/kg	0.12	SW846 7471B	2/18/13	MNP	2/18/13 14:51	MNP	A1
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
Decachlorobiphenyl (S)	66.7		%	30-150	SW846 8081B	2/7/13	RMP	2/18/13 10:00	KJH	A
Tetrachloro-m-xylene (S)	59.1		%	30-131	SW846 8081B	2/7/13	RMP	2/18/13 10:00	KJH	A

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ANALYTICAL RESULTS

Workorder: 1010730 139837

Lab ID: 1010730001

Date Collected: 2/4/2013 08:15

Matrix: Solid

Sample ID: 139837

Date Received: 2/8/2013 10:25

Parameter	Sample	Flag	Units	EDL	Method	Prepared By	Analyzed By	Unit
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Sample Comments:

The sodium bisulfate preservative specified for the 8260 soil analysis results in the loss of 2-Chloroethylvinyl ether by acidification.

This sample was collected in a soil jar for the volatile analysis. The sample was received and prepared by Method 5035 after the 48-hour holding time.

One or more of the method 8270 surrogates were recovered outside of the control limits.

This sample was analyzed at a dilution in the 8081 Pesticide analysis due to sample matrix interference. Reporting limits were adjusted accordingly.

Anna G Milliken

Technical Manager

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34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: CT PH-0224, DE ID 11, GA 914, MA PA0102, MD 128, LA 04162, VA 421, WY EPA Region 8, WV 343

ANALYTICAL RESULTS QUALIFIERS\FLAGS

Workorder: 1010730 139837

PARAMETER QUALIFIERS\FLAGS

- [1] The Method Blank for method 8260/5035 reported a value greater than the reporting level for the analyte Methylene Chloride.
- [2] The QC sample type LCS for method 8260/5035 was outside the control limits for the analyte Methylene Chloride. The % Recovery was reported as 192 and the control limits were 68 to 133.
- [3] The QC sample type LCSD for method 8260/5035 was outside the control limits for the analyte Methylene Chloride. The % Recovery was reported as 192 and the control limits were 68 to 133.
- [5] The surrogate Dibromofluoromethane for method 8260/5035 was outside of control limits. The % Recovery was reported as 128 and the control limits were 82 to 123. This result was reported at a dilution of 1.
- [6] The surrogate Dibromofluoromethane for method 8260/5035 was outside of control limits. The % Recovery was reported as 3.27 and the control limits were 42 to 143. This result was reported at a dilution of 50.
- [7] The surrogate 1,2-Dichloroethane-d4 for method 8260/5035 was outside of control limits. The % Recovery was reported as 129 and the control limits were 58 to 124. This result was reported at a dilution of 1.
- [8] The surrogate 1,2-Dichloroethane-d4 for method 8260/5035 was outside of control limits. The % Recovery was reported as 70.2 and the control limits were 71 to 148. This result was reported at a dilution of 50.
- [9] The surrogate Toluene-d8 for method 8260/5035 was outside of control limits. The % Recovery was reported as 135 and the control limits were 59 to 131. This result was reported at a dilution of 1.
- [10] The surrogate 4-Bromofluorobenzene for method 8260/5035 was outside of control limits. The % Recovery was reported as 144 and the control limits were 51 to 128. This result was reported at a dilution of 1.
- [11] The surrogate 2-Fluorophenol for method SW846 8270D was outside of control limits. The % Recovery was reported as 30.1 and the control limits were 35 to 104. This result was reported at a dilution of 4.
- [12] The surrogate 2,4,6-Tribromophenol for method SW846 8270D was outside of control limits. The % Recovery was reported as 30.1 and the control limits were 37 to 123. This result was reported at a dilution of 4.

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ALS Environmental

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ANALYST'S INFORMATION

Client Name: **Environmental, Inc.**
 Address: **101 Clark Street**
 City: **Harrisburg, PA 17101**
 Phone: **717-651-1111**
 Fax: **717-651-1112**

ANALYSIS INFORMATION

Project Name: **York County WWTP**
 Date Received: **2/19/2013**
 Date Analyzed: **2/19/2013**
 Analyzed By: **ALS**

ANALYSIS METHOD REQUESTED

Parameter	Method	Units	Time
Lead	100	mg/L	0.15
Copper	100	mg/L	0.15
Chromium	100	mg/L	0.15
Mercury	100	mg/L	0.15
Vanadium	100	mg/L	0.15
Antimony	100	mg/L	0.15
As	100	mg/L	0.15
Co	100	mg/L	0.15
Cr	100	mg/L	0.15
Cd	100	mg/L	0.15
Mn	100	mg/L	0.15
Pb	100	mg/L	0.15
Se	100	mg/L	0.15
Si	100	mg/L	0.15
Sr	100	mg/L	0.15
Ti	100	mg/L	0.15
V	100	mg/L	0.15
Zn	100	mg/L	0.15

CHAIN OF CUSTODY

Step	Name	Date	Signature
1	Client	2/19/2013	[Signature]
2	Transporter	2/19/2013	[Signature]
3	Analyst	2/19/2013	[Signature]
4	Reviewer	2/19/2013	[Signature]
5	Manager	2/19/2013	[Signature]

ANALYSIS RESULTS

Parameter	Result	Units
Lead	0.015	mg/L
Copper	0.015	mg/L
Chromium	0.015	mg/L
Mercury	0.015	mg/L
Vanadium	0.015	mg/L
Antimony	0.015	mg/L
As	0.015	mg/L
Co	0.015	mg/L
Cr	0.015	mg/L
Cd	0.015	mg/L
Mn	0.015	mg/L
Pb	0.015	mg/L
Se	0.015	mg/L
Si	0.015	mg/L
Sr	0.015	mg/L
Ti	0.015	mg/L
V	0.015	mg/L
Zn	0.015	mg/L

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 Vancouver • Waterloo • Winnipeg • Yellowknife
 United States: Cincinnati • Everett • Fort Collins • Holland • Houston • Middletown • Salt Lake City • Springfield • York
 Mexico: Monterrey

13983+

KENT COUNTY WASTEWATER FACILITIES
LABORATORY

139 Milford Neck Rd.
Milford DE 19963

Tel:302-335-6015
Fax:302-335-0365

CHAIN OF CUSTODY

Lab ID.	Time	Date	Sample	Preservation	Analysis
38024	0815	2/4/13	Kentonapeta composite from pile	none	annual list (see attached)

Comments:

+ annual priority pollutant scan

Sampled By: R. Washington, A. Thomas

1. Relinquished By: Mr. J. Thomas 2/4/13 0822 Received By: Albarky 2/4/13 0928

2. Relinquished By: Albarky 2/4/13 10:21 Received By: E. Boy 2/4/13 1021

3. Relinquished By: _____ Received By: _____

4. Relinquished By: _____ Received By: _____

B. MONITORING REQUIREMENTS

During the period beginning on the effective date and lasting through the expiration date the permittee is authorized to conduct a Limited Distribution and Marketing program for the EQ biosolids product generated at the Kent County Wastewater Treatment Facility. Product for distribution and marketing shall be monitored by the permittee as specified below:

B.1 THERMALLY TREATED AND HEAT DRIED SLUDGE PRODUCT

Parameter	Measurement	Minimum Frequency	Sample Type
✓ Moisture content ✓ % Solids	percent	Monthly	Composite
✓ Total Nitrogen as N (dry weight basis)	percent	Monthly	Composite
✓ Organic Nitrogen as N (dry weight basis)	percent	Monthly	Composite
✓ Ammonium as N (dry weight basis)	percent	Monthly	Composite
✓ Nitrate Nitrogen as N (dry weight basis)	percent	Monthly	Composite
✓ Phosphorus (dry weight basis)	percent	Monthly	Composite
✓ Potassium (dry weight basis)	percent	Monthly	Composite
✓ Volatile solids	percent	Monthly	Composite
✓ Calcium Carbonate Equivalence	percent	Monthly	Composite
✓ Fecal Coliform (Colonies/gm)	MPN	Monthly	Composite
✓ Salmonella (sp) (Colonies/4gm)	MPN	Monthly	Composite
✓ pH	S.U.	Monthly	Composite
✓ Aluminum (dry weight basis)	mg/kg	Monthly	Composite
✓ Arsenic (dry weight basis)	mg/kg	Monthly	Composite
✓ Cadmium (dry weight basis)	mg/kg	Monthly	Composite
✓ Chromium (dry weight basis)	mg/kg	Monthly	Composite
✓ Chlorides (dry weight basis)	mg/kg	Monthly	Composite
✓ Copper (dry weight basis)	mg/kg	Monthly	Composite
✓ Iron (dry weight basis)	mg/kg	Monthly	Composite
✓ Lead (dry weight basis)	mg/kg	Monthly	Composite
✓ Mercury (dry weight basis)	mg/kg	Monthly	Composite
✓ Molybdenum (dry weight basis)	mg/kg	Monthly	Composite
✓ Nickel (dry weight basis)	mg/kg	Monthly	Composite
✓ Selenium (dry weight basis)	mg/kg	Monthly	Composite
✓ Sodium (dry weight basis)	mg/kg	Monthly	Composite
✓ Zinc (dry weight basis)	mg/kg	Monthly	Composite
✓ PCB's (dry weight basis)	mg/kg	Monthly	Composite
✓ Priority pollutant scan (see NOTE)	—	Every 3 years	Composite

* Thermally treated sludge samples shall be collected at the following location: Dryer three (3) discharge belt. Sampling for the above parameters shall not be required for heat dried sludge unless monthly thermally treated sludge is not produced and samples are not collected in which case every batch of heat dried sludge shall be tested. If one batch sample has already been collected for the month, additional batch samples are not required.

Note: Every batch sample collected for heat dried sludge shall be analyzed for fecal coliform and salmonella.

All processed sludge samples shall be collected and analyzed in accordance with the Quality Assurance Program.

See Part I, F.1. for reporting requirements. The Department may modify the sampling frequency based upon review of continuing or additional analyses.

NOTE: A list of the 126 priority pollutants can be found in 40 CFR, Part 423, Appendix A, 1987.

2b
2c
2d



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility

139 Milford Neck Road

Milford, DE 19963

Attention: Allan Thomas

Lab ID: 140613 Matrix: Soil/Sludge Sample Start: 2/20/13 7:40
Description: Batch 009-121 Site: 38135 - Composite of A,B,C, Sample End:
Type: Grab Date Received: 2/20/13 12:40

Parameters	Units	Results	Analyzed	By	Method
Metals					
Metals Digestion for AA		Completed	3/19/13 16:00	HJG	EPA 200.2
Metals -Dry Weight					
Aluminum (Dry Weight)	mg/kg	3570	3/22/13 13:29	HJG3	EPA 6020
Arsenic (Dry Weight)	mg/kg	13	3/22/13 13:29	HJG3	EPA 6020
Cadmium (Dry Weight)	mg/kg	9.9	3/22/13 13:29	HJG3	EPA 6020
Chromium (Dry Weight)	mg/kg	40	3/22/13 13:29	HJG3	EPA 6020
Copper (Dry Weight)	mg/kg	263	3/22/13 13:29	HJG3	EPA 6020
Iron (Dry Weight)	mg/kg	50090	3/22/13 13:29	HJG3	EPA 6020
Lead (Dry Weight)	mg/kg	25	3/22/13 13:29	HJG3	EPA 6020
Mercury (Dry Weight)	mg/kg	0.979	2/25/13 13:06	QCL	SW-846 7471B
Molybdenum (Dry Weight)	mg/kg	13	3/22/13 13:29	HJG3	EPA 6020
Nickel (Dry Weight)	mg/kg	29	3/22/13 13:29	HJG3	EPA 6020
Potassium (Dry Weight)	mg/kg	2945	3/22/13 13:29	HJG3	EPA 6020
Selenium (Dry Weight)	mg/kg	7.9	3/22/13 13:29	HJG3	EPA 6020
Zinc (Dry Weight)	mg/kg	510	3/22/13 13:29	HJG3	EPA 6020
Minerals					
Chloride	mg/kg	2040	3/15/13 17:19	HJG	EPA 300.0
Miscellaneous/Other					
SHIP		Completed	3/1/13 16:54	QCL	None
Nutrient - As Received					
Ammonia as N (As Received)	%	0.136	2/22/13 11:37	CC	SM4500-NH3-G
Nitrate as N (As Received)	%	0.0165	2/22/13 15:23	CC	SM4500-NO3-H
Organic Nitrogen as N (As Received)	%	1.81	2/26/13 11:49	KLS	Calc
Total Kjeldahl Nitrogen (As Received)	%	1.95	2/25/13 13:20	CC	SM4500-Norg-C
Total Nitrogen as N (As Received)	%	1.96	2/26/13 11:49	KLS	Calc
Total Phosphorus as P (As Received)	%	1.01	2/27/13 13:21	CC	SM4500-P-F(w/Dig)

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility
139 Milford Neck Road
Milford, DE 19963

Attention: Allan Thomas

Lab ID: 140613 Matrix: Soil/Sludge Sample Start: 2/20/13 7:40
Description: Batch 009-121 Site: 38135 - Composite of A,B,C Sample End:
Type: Grab Date Received: 2/20/13 12:40

Parameters	Units	Results	Analyzed	By	Method
Nutrient-Dry Weight					
Ammonia as N (Dry Weight-Sludge)	%	0.151	2/22/13 11:37	CC	SM4500-NH3-G
Nitrate as N (Dry Weight)	%	0.018	2/22/13 15:23	CC	SM4500-NO3-H
Organic Nitrogen as N (Dry Weight - Sludge)	%	2.02	2/26/13 11:49	KLS	Calc
Total Kjeldahl Nitrogen (Dry Weight)	%	2.17	2/25/13 13:20	CC	SM4500-Norg-C
Total Nitrogen as N (Dry Weight)	%	2.19	2/26/13 11:49	KLS	Calc
Total Phosphorus as P (Dry Weight)	%	1.12	2/27/13 13:21	CC	SM4500-P-F(w/Dlg)
Physical					
% Moisture	%	10.2	2/21/13 15:20	RON	SM2540-G
Calcium Carbonate Equivalency	%	29.3	2/25/13 11:44	A&L	AO-955.01
pH	SU	8.62	2/22/13 13:15	MJM	SM4500-H+/B
Total Vol. Solids @ 550 C	%	41.3	2/21/13 15:20	RON	160.4

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit

QC Laboratories

Analytical Report

KELLY SALMON
ENVIROCORP, INC.
51 CLARK STREET
HARRINGTON, DE 19952

Regarding:
KELLY SALMON
ENVIROCORP, INC.
51 CLARK STREET
HARRINGTON, DE 19952

Account No: AL0354, ENVIROCORP, INC.
Project No: AL0354, ENVIROCORP, INC.

P.O. No:

Inv. No: 1495823
PWSID No:

Sample ID Sample Description
L4499214-1 140613 38135 COMP OF A,B,C BATCH 009-12, KENT CO WTF
Received Date/Time/Temp 02/21/13 10:30am 2.9 C Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
02/20/13 07:40am NA C Customer

Parameter	Method	Result	RLs	Test Date, Time, Analyst
GENERAL CHEMISTRY				
TOTAL SOLIDS PERCENT	SM 2540G	87.80 %	0.01000 %	02/22/13 03:41PM JTE
METALS				
MERCURY	EPA 7471B	0.979 mg/kg DRY	0.114 mg/kg	02/25/13 01:06PM RMP
GAS CHROMATOGRAPHY				
AROCLOR-1016	EPA 8082	ND ug/kg DRY	5.95 ug/kg*	02/28/13 12:16AM GMA
AROCLOR-1221	EPA 8082	ND ug/kg DRY	18.8 ug/kg*	02/28/13 12:16AM GMA
AROCLOR-1232	EPA 8082	ND ug/kg DRY	12.5 ug/kg*	02/28/13 12:16AM GMA
AROCLOR-1242	EPA 8082	ND ug/kg DRY	6.01 ug/kg*	02/28/13 12:16AM GMA
AROCLOR-1248	EPA 8082	ND ug/kg DRY	6.83 ug/kg*	02/28/13 12:16AM GMA
AROCLOR-1254	EPA 8082	ND ug/kg DRY	6.36 ug/kg*	02/28/13 12:16AM GMA
AROCLOR-1260	EPA 8082	ND ug/kg DRY	6.32 ug/kg*	02/28/13 12:16AM GMA

Notes:

A result of "ND" indicates that the analyte tested was either not detected or the concentration was below the RLs.

Definitions: NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC= Too numerous to count; pres=presumptive

A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

MCL= EPA recommended "maximum contaminant level", PLs = Customer-specific permit limits.

The test results meet all requirements of NELAP unless otherwise specified.

The report shall not be reproduced except in full without the written consent of the laboratory.

Unless otherwise specified, the Environmental and Food Chemistry testing except Field Parameters were performed by QC Inc. located at 1205 Industrial Blvd., Southampton, PA 18966; Pharmaceutical, Dairy and Food Microbiological tests were performed by QC Inc. located at 702 Electronic Dr., Horsham, PA 19044.

QCL Accreditations: Southampton Div: EPA ID PA00018; NELAP ID's: PA 09-00131, NJ PA166, NY 11223

State ID's: CT PH-0768, DE PA-018, MD 206, SC 89021001; FDA Reg. #: 2515238

ACL Div: State ID's: DE 00011, MD 138; Wind Gap Div: State ID's: PA 48-01334, NJ PA001

E. Rutherford Div: State ID: NJ 02015; Vineland Div: State ID: NJ 06005; Reading Div: State ID: PA 06-03543

The reported results relate only to the samples.

QC Laboratories

Analytical Report

Account No: AL0354, ENVIROCORP, INC.
Project No: AL0354, ENVIROCORP, INC.

P.O. No:

Inv. No: 1495823
PWSID No:

All samples are collected as "grab" samples unless otherwise identified.

* - The "RLs" represents a reporting/quantitation limit. When an "***" is present in the column identified as the "RLs", it is being reported as a Method Detection Limit (MDL).



Report Number: 13-052-0205

Account Number: 15145

Submitted By: SHELLY BLOOM

Send To: ENVIROCORP INC
51 CLARK ST
HARRINGTON, DE 19952

**A&L Eastern Laboratories, Inc.**

7821 Whiting Road Richmond, Virginia 23237 (804) 743-6401 Fax (804) 271-8646

Project : 140613

Lab Number : 91976

Sample Id : 140613

REPORT OF ANALYSIS

Date Sampled: 2/20/2013 07:40:00

Date Received: 02/21/2013 00:00

Date Reported: 02/26/2013

PARAMETER	RESULT	RESULT (mg/kg)	QUANTITATION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE TIME	METHOD
Total Solids *	88.68	886800	100.0	JM	02/21/2013 14:10	SM-2540G
Moisture *	11.32		100.0	JM	02/21/2013 14:10	SM-2540G
Calcium Carbonate Equivalent	29.30	293000	100	JM	02/25/2013 11:44	AOAC 955.01

Comments:

All values are on a dry weight basis except as noted by asterisk. Detection limit on all N series is on a wet basis.

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Debbie Holt

KENT COUNTY WASTEWATER FACILITIES
LABORATORY

140613

139 Milford Neck Rd.
Milford DE 19963

Tel:302-335-6000
Fax:302-335-0365

CHAIN OF CUSTODY

Lab ID.	Time	Date	Sample	Preservation	Analysis
38135	740	2-20-13	composite of R, B, C Batch 009-12	none	see attached list

Comments:

Sampled By: A. Thomas 2/20/13

1. Relinquished By: Alan F. Thomas 2/20/13 Received By: Jack Webb 2/20/13 12:17PM

2. Relinquished By: Jack Webb 2/20/13 12:40PM Received By: E. B. 2/20/13 1240

3. Relinquished By: _____ Received By: _____

4. Relinquished By: _____ Received By: _____

B. MONITORING REQUIREMENTS

During the period beginning on the effective date and lasting through the expiration date the permittee is authorized to conduct a Limited Distribution and Marketing program for the EQ biosolids product generated at the Kent County Wastewater Treatment Facility. Product for distribution and marketing shall be monitored by the permittee as specified below:

B.1 THERMALLY TREATED AND HEAT DRIED SLUDGE PRODUCT

Parameter	Measurement	Minimum Frequency	Sample Type
Moisture content	percent	Monthly	Composite
Total Nitrogen as N (dry weight basis)	percent	Monthly	Composite
Organic Nitrogen as N (dry weight basis)	percent	Monthly	Composite
Ammonium as N. (dry weight basis)	percent	Monthly	Composite
Nitrate Nitrogen as N (dry weight basis)	percent	Monthly	Composite
Phosphorus (dry weight basis)	percent	Monthly	Composite
Potassium (dry weight basis)	percent	Monthly	Composite
Volatile solids	percent	Monthly	Composite
Calcium Carbonate Equivalence	percent	Monthly	Composite
Fecal Coliform (Colonies/gm)	MPN	Monthly	Composite
Salmonella (sp) (Colonies/gm)	MPN	Monthly	Composite
pH	S.U.	Monthly	Composite
Aluminum (dry weight basis)	mg/kg	Monthly	Composite
Arsenic (dry weight basis)	mg/kg	Monthly	Composite
Cadmium (dry weight basis)	mg/kg	Monthly	Composite
Chromium (dry weight basis)	mg/kg	Monthly	Composite
Chlorides (dry weight basis)	mg/kg	Monthly	Composite
Copper (dry weight basis)	mg/kg	Monthly	Composite
Iron (dry weight basis)	mg/kg	Monthly	Composite
Lead (dry weight basis)	mg/kg	Monthly	Composite
Mercury (dry weight basis)	mg/kg	Monthly	Composite
Molybdenum (dry weight basis)	mg/kg	Monthly	Composite
Nickel (dry weight basis)	mg/kg	Monthly	Composite
Selenium (dry weight basis)	mg/kg	Monthly	Composite
Sodium (dry weight basis)	mg/kg	Monthly	Composite
Zinc (dry weight basis)	mg/kg	Monthly	Composite
PCB's (dry weight basis)	mg/kg	Monthly	Composite
Barium (dry weight basis)	mg/kg	Monthly	Composite

* Thermally treated sludge samples shall be collected at the following location: Dryer three (3) discharge belt. Sampling for the above parameters shall not be required for heat dried sludge unless monthly thermally treated sludge is not produced and samples are not collected in which case every batch of heat dried sludge shall be tested. If one batch sample has already been collected for the month, additional batch samples are not required.

Note: Every batch sample collected for heat dried sludge shall be analyzed for fecal coliform and salmonella. All processed sludge samples shall be collected and analyzed in accordance with the Quality Assurance Program.

See Part I, F.1. for reporting requirements. The Department may modify the sampling frequency based upon review of continuing or additional analyses.

NOTE: A list of the 126 priority pollutants can be found in 40 CFR, Part 423, Appendix A, 1987.



51 Clark St. Harrington, DE 19952
PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility
139 Milford Neck Road
Milford, DE 19963
Attention: Allan Thomas

Lab ID: 141203 Matrix: Soil/Sludge Sample Start: 3/4/13 10:45
Description: Site: Kentorganite Sample End:
Type: Grab Date Received: 3/4/13 11:35

Parameter	Unit	Result	Time	By	Notes
Biological					
Fecal Coliform MPN (Dry Weight Basis)	#/gr ts	<0.44	3/4/13 14:10	RD	SM9221-E
Biological (Dry Weight)					
Salmonella (Dry Weight Basis)	#/4 grs ts	<1.79	3/4/13 14:10	RD	EPA 1682
Metals					
Metals Digestion for AA		Completed	3/19/13 16:00	HJG	EPA 200.2
Metals -Dry Weight					
Aluminum (Dry Weight)	mg/kg	2773	3/22/13 14:01	HJG3	EPA 6020
Arsenic (Dry Weight)	mg/kg	11	3/22/13 14:01	HJG3	EPA 6020
Cadmium (Dry Weight)	mg/kg	5.1	3/22/13 14:01	HJG3	EPA 6020
Chromium (Dry Weight)	mg/kg	33	3/22/13 14:01	HJG3	EPA 6020
Copper (Dry Weight)	mg/kg	196	3/22/13 14:01	HJG3	EPA 6020
Iron (Dry Weight)	mg/kg	36940	3/22/13 14:01	HJG3	EPA 6020
Lead (Dry Weight)	mg/kg	18	3/22/13 14:01	HJG3	EPA 6020
Mercury (Dry Weight)	mg/kg	0.999	3/8/13 16:13	QCL	SW-846 7471B
Molybdenum (Dry Weight)	mg/kg	9.3	3/22/13 14:01	HJG3	EPA 6020
Nickel (Dry Weight)	mg/kg	25	3/22/13 14:01	HJG3	EPA 6020
Potassium (Dry Weight)	mg/kg	3587	3/22/13 14:01	HJG3	EPA 6020
Selenium (Dry Weight)	mg/kg	5.8	3/22/13 14:01	HJG3	EPA 6020
Sodium (Dry Weight)	mg/kg	915	3/22/13 14:01	HJG3	EPA 6020
Zinc (Dry Weight)	mg/kg	400	3/22/13 14:01	HJG3	EPA 6020
Minerals					
Chloride	mg/L	898	4/4/13 10:20	HJG	EPA 300.0
Nutrient - As Received					
Ammonia as N (As Received)	%	0.0348	3/6/13 11:39	CC	SM4500-NH3-G
Nitrate+Nitrite as N (As Received)	%	0.00067	3/6/13 10:21	CC	SM4500-NO3-H
Organic Nitrogen as N (As Received)	%	3.19	3/8/13 10:33	KLS	Calc
P205 (As Received)	%	1.60	3/14/13 10:32	KLS	Calc

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility

139 Milford Neck Road

Milford, DE 19963

Attention: Allan Thomas

Lab ID: 141203	Matrix: Soil/Sludge	Sample Start: 3/4/13 10:45
Description:	Site: Kentorganite	Sample End:
Type: Grab		Date Received: 3/4/13 11:35

Parameter	Unit	Result	Analysis	By	Notes
Nutrient - As Received					
Total Kjeldahl Nitrogen (As Received)	%	3.22	3/6/13 16:23	CC	SM4500-Norg-C
Total Nitrogen as N (As Received)	%	3.22	3/8/13 10:33	KLS	Calc
Total Phosphorus as P (As Received)	%	0.697	3/8/13 12:46	CC	SM4500-P-F(w/Dig)
Nutrient-Dry Weight					
Ammonia as N (Dry Weight-Sludge)	%	0.078	3/6/13 11:39	CC	SM4500-NH3-G
Nitrate+Nitrite as N (Dry Weight - Sludge)	%	0.0015	3/6/13 10:21	CC	SM4500-NO3-H
Organic Nitrogen as N (Dry Weight - Sludge)	%	7.14	3/8/13 10:33	KLS	Calc
P205 (Dry Weight - Sludge)	%	3.58	3/14/13 10:32	KLS	Calc
Total Kjeldahl Nitrogen (Dry Weight)	%	7.22	3/6/13 16:23	CC	SM4500-Norg-C
Total Nitrogen as N (Dry Weight)	%	7.22	3/8/13 10:33	KLS	Calc
Total Phosphorus as P (Dry Weight)	%	1.56	3/8/13 12:46	CC	SM4500-P-F(w/Dig)
Physical					
% Moisture	%	65.36	3/5/13 15:37	RON	SM2540-G
% Solids	%	44.64	3/5/13 15:37	RON	SM2540-G
Calcium Carbonate Equivalency	%	24.6	3/7/13 12:15	A&L	AO-955.01
pH	SU	4.60	3/4/13 14:43	DRP	SM4500-H+/B
Total Vol. Solids @ 550 C	%	83.08	3/5/13 15:37	RON	160.4
Synthetic Organic Comp					
Polychlorinated biphenyls (PCB's) Soils	mg/kg	ND	3/13/13 13:07	QCL	SW-846 8082A

ND = Not Detected
 * = Above Specified Limit
 ** = Above Client Limit

QC Laboratories

Analytical Report

KELLY SALMON
ENVIROCORP, INC.
51 CLARK STREET
HARRINGTON, DE 19952

Regarding:
KELLY SALMON
ENVIROCORP, INC.
51 CLARK STREET
HARRINGTON, DE 19952

Account No: AL0354, ENVIROCORP, INC.
Project No: AL0354, ENVIROCORP, INC.

P.O. No:

Inv. No: 1498650
PWSID No:

Sample ID L4517869-1	Sample Description 141203 KENTORGANITE, KENT CO WWTF	Samp. Date/Time/Temp Sampled by 03/04/13 10:45am NA C Customer		
Received Date/Time/Temp 03/06/13 12:00pm 4.6 C Iced (Y/N): Y				
Parameter	Method	Result	RLs	Test Date, Time, Analyst
GENERAL CHEMISTRY				
TOTAL SOLIDS PERCENT	SM 2540G	42.34 %	0.01000 %	03/08/13 03:31PM JTE
METALS				
MERCURY	EPA 7471B	0.999 mg/kg DRY	0.236 mg/kg	03/08/13 04:13PM RMP
GAS CHROMATOGRAPHY				
AROCLOR-1016	EPA 8082	ND ug/kg DRY	12.3 ug/kg*	03/13/13 01:07PM GMA
AROCLOR-1221	EPA 8082	ND ug/kg DRY	39.0 ug/kg*	03/13/13 01:07PM GMA
AROCLOR-1232	EPA 8082	ND ug/kg DRY	25.9 ug/kg*	03/13/13 01:07PM GMA
AROCLOR-1242	EPA 8082	ND ug/kg DRY	12.5 ug/kg*	03/13/13 01:07PM GMA
AROCLOR-1248	EPA 8082	ND ug/kg DRY	14.2 ug/kg*	03/13/13 01:07PM GMA
AROCLOR-1254	EPA 8082	ND ug/kg DRY	13.2 ug/kg*	03/13/13 01:07PM GMA
AROCLOR-1260	EPA 8082	ND ug/kg DRY	13.1 ug/kg*	03/13/13 01:07PM GMA

Notes:

A result of "ND" indicates that the analyte tested was either not detected or the concentration was below the RLs.
Definitions: NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC= Too numerous to count; pres=presumptive
A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.
MCL= EPA recommended "maximum contaminant level", PLs = Customer-specific permit limits.
The test results meet all requirements of NELAP unless otherwise specified.
The report shall not be reproduced except in full without the written consent of the laboratory.
Unless otherwise specified, the Environmental and Food Chemistry testing except Field Parameters were performed by QC Inc. located at 1205 Industrial Blvd., Southampton, PA 18966; Pharmaceutical, Dairy and Food Microbiological tests were performed by QC Inc. located at 702 Electronic Dr., Horsham, PA 19044.
QCL Accreditations: Southampton Div: EPA ID PA00018; NELAP ID's: PA 09-00131, NJ PA166, NY 11223
State ID's: CT PH-0768, DE PA-018, MD 206, SC 89021001; FDA Reg. #: 2515238
ACL Div: State ID's: DE 00011, MD 138; Wind Gap Div: State ID's: PA 48-01334, NJ PA001
E. Rutherford Div: State ID: NJ 02015; Vineland Div: State ID: NJ 06005; Reading Div: State ID: PA 06-03543
The reported results relate only to the samples.

Report Number: 13-065-0209

Account Number: 15145

**A&L Eastern Laboratories, Inc.**

7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401 Fax (804) 271-8446

Send To: ENVIROCORP INC
51 CLARK ST
HARRINGTON, DE 19952

Project : 141203

Lab Number : 92199

Sample Id : 141203

REPORT OF ANALYSIS

Date Sampled:

Date Received: 03/06/2013 00:00

Date Reported: 03/07/2013

PARAMETER	RESULT (%)	RESULT (mg/kg)	QUANTITATION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE/TIME	METHOD
Total Solids *	43.14	431400	100.0	JM	03/06/2013 13:09	SM-2540G
Moisture *	56.86		100.0	JM	03/06/2013 13:09	SM-2540G
Calcium Carbonate Equivalent	24.60	246000	100	JM	03/07/2013 12:15	AOAC 955.01

Comments:

All values are on a dry weight basis except as noted by asterisk. Detection limit on all N series is on a wet basis.

Our reports and letters are for the exclusive and confidential use of our clients, and may not be reproduced in whole or part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.

Debbie Holt

141203

KENT COUNTY WASTEWATER FACILITIES
LABORATORY139 Milford Neck Rd.
Milford DE 19963Tel:302-335-6000
Fax:302-335-0365

CHAIN OF CUSTODY

Lab ID.	Time	Date	Sample	Preservation	Analysis
38217	10 ⁴⁵	3/4/13	Kent organic composite from pile	none	see list

Comments:

Sampled By: A. Morris, R. Washington1. Relinquished By: Alan J. Morris 3/4/13 11:00Received By: Al Barker 3/4/13 11:112. Relinquished By: Al Barker 3/4/13 11:35Received By: E. Boy 3/4/13 11:35

3. Relinquished By: _____

Received By: _____

4. Relinquished By: _____

Received By: _____



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility

139 Milford Neck Road

Milford, DE 19963

Attention: Allan Thomas

Lab ID: 142759 Matrix: Soil/Sludge Sample Start: 4/1/13 9:35
Description: Site: Kentorganite Sample End:
Type: Grab Date Received: 4/1/13 10:53

Parameters	Units	Results	Analyzed	By	Method
Biological					
Fecal Coliform MPN (As Received Basis)	#/gr ts	<0.40	4/1/13 13:30	RD	SM9221-E
Salmonella (As Received Basis)	#/4 grs ts	<1.6	4/1/13 13:30	RD	EPA 1682
Metals					
Metals Digestion for AA		Completed	4/22/13 13:00	HJG	EPA 200.2
Metals -Dry Weight					
Aluminum (Dry Weight)	mg/kg	2950	4/23/13 13:57	HJG3	EPA 6020
Arsenic (Dry Weight)	mg/kg	11	4/23/13 13:57	HJG3	EPA 6020
Cadmium (Dry Weight)	mg/kg	4.3	4/23/13 13:57	HJG3	EPA 6020
Chromium (Dry Weight)	mg/kg	30	4/23/13 13:57	HJG3	EPA 6020
Copper (Dry Weight)	mg/kg	190	4/23/13 13:57	HJG3	EPA 6020
Iron (Dry Weight)	mg/kg	36570	4/23/13 13:57	HJG3	EPA 6020
Lead (Dry Weight)	mg/kg	19	4/23/13 13:57	HJG3	EPA 6020
Mercury (Dry Weight)	mg/kg	0.346	4/11/13 14:25	QCL	SW-846 7471B
Molybdenum (Dry Weight)	mg/kg	9.5	4/23/13 13:57	HJG3	EPA 6020
Nickel (Dry Weight)	mg/kg	22	4/23/13 13:57	HJG3	EPA 6020
Potassium (Dry Weight)	mg/kg	3570	4/23/13 13:57	HJG3	EPA 6020
Selenium (Dry Weight)	mg/kg	7	4/23/13 13:57	HJG3	EPA 6020
Sodium (Dry Weight)	mg/kg	889	4/23/13 13:57	HJG3	EPA 6020
Zinc (Dry Weight)	mg/kg	470	4/23/13 13:57	HJG3	EPA 6020
Minerals					
Chloride	mg/L	916	4/4/13 10:20	HJG	EPA 300.0
Nutrient - As Received					
Ammonia as N (As Received)	%	0.185	4/3/13 10:51	CC	SM4500-NH3-G
Nitrate+Nitrite as N (As Received)	%	<0.0005	4/3/13 11:21	CC	SM4500-NO3-H
Organic Nitrogen as N (As Received)	%	1.83	4/4/13 9:07	KLS	Calc
P205 (As Received)	%	0.502	4/9/13 15:45	SLB	Calc
Total Kjeldahl Nitrogen (As Received)	%	2.01	4/3/13 12:55	CC	SM4500-Norg-C
Total Nitrogen as N (As Received)	%	2.01	4/4/13 9:07	KLS	Calc

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit

July B



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility

139 Milford Neck Road

Milford, DE 19963

Attention: Allan Thomas

Lab ID: 142759 Matrix: Soil/Sludge Sample Start: 4/1/13 9:35
Description: Site: Kentorganite Sample End:
Type: Grab Date Received: 4/1/13 10:53

Parameters	Units	Results	Analyzed	By	Method
Nutrient - As Received					
Total Phosphorus as P (As Received)	%	0.219	4/3/13 13:35	CC	SM4500-P-F(w/Dig)
Nutrient-Dry Weight					
Ammonia as N (Dry Weight-Sludge)	%	0.416	4/3/13 10:51	CC	SM4500-NH3-G
Nitrate+Nitrite as N (Dry Weight - Sludge)	%	<0.0011	4/3/13 11:21	CC	SM4500-NO3-H
Organic Nitrogen as N (Dry Weight - Sludge)	%	4.11	4/4/13 9:07	KLS	Calc
P205 (Dry Weight - Sludge)	%	1.13	4/9/13 15:45	SLB	Calc
Total Kjeldahl Nitrogen (Dry Weight)	%	4.52	4/3/13 12:55	CC	SM4500-Norg-C
Total Nitrogen as N (Dry Weight)	%	4.52	4/4/13 9:07	KLS	Calc
Total Phosphorus as P (Dry Weight)	%	0.492	4/3/13 13:35	CC	SM4500-P-F(w/Dig)
Physical					
% Moisture	%	55.5	4/1/13 17:30	HJG	SM2540-G
% Solids	%	44.5	4/1/13 17:30	HJG	SM2540-G
Calcium Carbonate Equivalency	%	23	4/8/13 13:00	A&L	AO-955.01
pH	SU	11.81	4/1/13 16:02	DRP	SM4500-H+/B
Total Vol. Solids @ 550 C	%	22.9	4/1/13 17:30	HJG	160.4
Synthetic Organic Comp					
Polychlorinated biphenyls (PCB's) Soils	mg/kg	ND	4/6/13 12:07	QCL	SW-846 8082A

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit

Report Number: 13-095-0216

Account Number: 15145

**A&L Eastern Laboratories, Inc.**

7821 Whitepine Road Richmond, Virginia 23237 (804) 743-8401 Fax (804) 271-8446

www.alessen.com

Send To: ENVIROCORP INC
51 CLARK ST
HARRINGTON, DE 19952

Project : 142759

Lab Number : 92849

Sample Id : 142759

REPORT OF ANALYSIS

Date Sampled: 4/1/2013 00:00:00

Date Received: 04/05/2013 00:00

Date Reported: 04/10/2013

PARAMETER	RESULT mg/kg	RESULT (mg/kg)	QUANTITATION LIMIT mg/kg	ANALYST	ANALYSIS DATE, TIME	METHOD
Total Solids *	44.27	442700	100.0	BW	04/05/2013 15:29	SM-2540G
Moisture *	55.73		100.0	BW	04/05/2013 15:29	SM-2540G
Calcium Carbonate Equivalent	23.00	230000	100	MW	04/08/2013 13:00	AOAC 955.01

Comments:

All values are on a dry weight basis except as noted by asterisk. Detection limit on all N series is on a wet basis.

Our reports and letters are for the exclusive and confidential use of our clients, and may not be reproduced in whole or part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.

Debbie Holt

QC Laboratories

Analytical Report

KELLY SALMON
ENVIROCORP, INC.
51 CLARK STREET
HARRINGTON, DE 19952

Regarding:
KELLY SALMON
ENVIROCORP, INC.
51 CLARK STREET
HARRINGTON, DE 19952

Account No: ALO354, ENVIROCORP, INC.
Project No: ALO354, ENVIROCORP, INC.

P.O. No:

Inv. No: 1505341
PWSID No:

Sample ID	Sample Description	Samp. Date/Time/Temp Sampled by		
L4552851-1	142759 KENTORGANITE	04/01/13 09:35am NA C Customer		
Received Date/Time/Temp		04/04/13 04:25pm 2.2 G	Iced (Y/N):	Y
Parameter	Method	Result	RLs	Test Date, Time, Analyst
GENERAL CHEMISTRY				
TOTAL SOLIDS PERCENT	SM 2540G	43.06 %	0.01000 %	04/05/13 04:33PM JTE
METALS				
MERCURY	EPA 7471B	0.346 mg/kg DRY	0.232 mg/kg	04/11/13 02:25PM RMP
GAS CHROMATOGRAPHY				
AROCLOR-1016	EPA 8082	ND ug/kg DRY	12.1 ug/kg*	04/06/13 12:07PM GMA
AROCLOR-1221	EPA 8082	ND ug/kg DRY	38.3 ug/kg*	04/06/13 12:07PM GMA
AROCLOR-1232	EPA 8082	ND ug/kg DRY	25.5 ug/kg*	04/06/13 12:07PM GMA
AROCLOR-1242	EPA 8082	ND ug/kg DRY	12.3 ug/kg*	04/06/13 12:07PM GMA
AROCLOR-1248	EPA 8082	ND ug/kg DRY	13.9 ug/kg*	04/06/13 12:07PM GMA
AROCLOR-1254	EPA 8082	ND ug/kg DRY	13.0 ug/kg*	04/06/13 12:07PM GMA
AROCLOR-1260	EPA 8082	ND ug/kg DRY	12.9 ug/kg*	04/06/13 12:07PM GMA

Notes:

A result of "ND" indicates that the analyte tested was either not detected or the concentration was below the RLs.

Definitions: NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC= Too numerous to count; pres=presumptive

A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

MCL= EPA recommended "maximum contaminant level", PLs = Customer-specific permit limits.

The test results meet all requirements of NELAC unless otherwise specified.

The report shall not be reproduced except in full without the written consent of the laboratory.

Unless otherwise specified, the Environmental and Food Chemistry testing except Field Parameters were performed by QC Inc. located at 1205 Industrial Blvd., Southampton, PA 18966; Pharmaceutical, Dairy and Food Microbiological tests were performed by QC Inc. located at 702 Electronic Dr., Horsham, PA 19044.

QCL Accreditations: Southampton Div: EPA ID PA00018; NELAP ID's: PA 09-00131, NJ PA166, NY 11223

State ID's: CT PH-0768, DE PA-018, MD 206, SC 89021001; FDA Reg. #: 2515238

ACL Div: State ID's: DE 00011, MD 138; Wind Gap Div: State ID's: PA 48-01334, NJ PA001

E. Rutherford Div: State ID: NJ 02015; Vineland Div: State ID: NJ 06005; Reading Div: State ID: PA 06-03543

The reported results relate only to the samples.

142759

KENT COUNTY WASTEWATER FACILITIES LABORATORY

139 Milford Neck Rd.
Milford DE 19963

Tel:302-335-6000
Fax:302-335-0365

CHAIN OF CUSTODY

Lab ID.	Time	Date	Sample	Preservation	Analysis
38441	0935	4/1/13	Kent organite Composite Sample	none	see list

Comments:

Sampled By: Richard D. Washington

1. Relinquished By: Richard D. Washington 4/1/13

Received By: Sharker 4/1/13 10:09

2. Relinquished By: Sharker 4/1/13 10:53

Received By: E. Boag 4/1/13 10:53

3. Relinquished By: _____

Received By: _____

4. Relinquished By: _____

Received By: _____

B. MONITORING REQUIREMENTS

During the period beginning on the effective date and lasting through the expiration date the permittee is authorized to conduct a Limited Distribution and Marketing program for the pasteurized sludge product generated at the Kent County Wastewater Treatment Facility. Pasteurized sludge product for distribution and marketing shall be monitored by the permittee as specified below:

B.1 PASTEURIZED SLUDGE

Parameter	Unit Measurement	Minimum Frequency	Sample Type
Moisture content ^{TKN} 905	percent	Monthly	Composite
Total Nitrogen as N (dry weight basis)	percent	Monthly	Composite
Organic Nitrogen as N (dry weight basis)	percent	Monthly	Composite
Ammonium as N (dry weight basis)	percent	Monthly	Composite
Nitrate Nitrogen as N (dry weight basis)	percent	Monthly	Composite
Phosphorus (dry weight basis)	percent	Monthly	Composite
Potassium (dry weight basis)	percent	Monthly	Composite
Volatile solids	percent	Monthly	Composite
Calcium Carbonate Equivalence	percent	Monthly	Composite
Fecal Coliform (Colonies/gm)	MPN	Monthly	Composite
Salmonella (sp) (Colonies/4gm)	MPN	Monthly	Composite
pH	S.U.	Monthly	Composite
Aluminum (dry weight basis)	mg/kg	Monthly	Composite
Arsenic (dry weight basis)	mg/kg	Monthly	Composite
Cadmium (dry weight basis)	mg/kg	Monthly	Composite
Chromium (dry weight basis)	mg/kg	Monthly	Composite
Chlorides (dry weight basis)	mg/kg	Monthly	Composite
Copper (dry weight basis)	mg/kg	Monthly	Composite
Iron (dry weight basis)	mg/kg	Monthly	Composite
Lead (dry weight basis)	mg/kg	Monthly	Composite
Mercury (dry weight basis)	mg/kg	Monthly	Composite
Molybdenum (dry weight basis)	mg/kg	Monthly	Composite
Nickel (dry weight basis)	mg/kg	Monthly	Composite
Selenium (dry weight basis)	mg/kg	Monthly	Composite
Sodium (dry weight basis)	mg/kg	Monthly	Composite
Zinc (dry weight basis)	mg/kg	Monthly	Composite
PCB's (dry weight basis)	mg/kg	Monthly	Composite
Prior pollutants (see NOTE)		Five years	Composite

*Pasteurized sludge samples shall be collected at the following location: the dryer discharge chute. All processed sludge shall be collected and analyzed in accordance with the Quality Assurance Program. See Part I, F.1. for reporting requirements. The Department may modify the sampling frequency based upon review of continuing or additional analyses.

NOTE: A list of the 126 priority pollutants can be found in 40 CFR, Part 423, Appendix A, 1987.



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility

139 Milford Neck Road

Milford, DE 19963

Attention: Allan Thomas

Lab ID: 143710 Matrix: Soil/Sludge Sample Start: 4/17/13 8:00
Description: Site: 38649 - Greenhouse Sample 001 - 13 A Sample End:
Type: Grab Date Received: 4/17/13 9:39

Parameters	Units	Results	Analyzed	By	Method
Metals					
Metals Digestion for AA		Completed	4/30/13 11:00	HJG	EPA 200.2
Metals -Dry Weight					
Aluminum (Dry Weight)	mg/kg	3045	5/2/13 15:02	HJG3	EPA 6020
Arsenic (Dry Weight)	mg/kg	12	5/2/13 15:02	HJG3	EPA 6020
Cadmium (Dry Weight)	mg/kg	13	5/2/13 15:02	HJG3	EPA 6020
Chromium (Dry Weight)	mg/kg	32	5/2/13 15:02	HJG3	EPA 6020
Copper (Dry Weight)	mg/kg	194	5/2/13 15:02	HJG3	EPA 6020
Iron (Dry Weight)	mg/kg	37130	5/2/13 15:02	HJG3	EPA 6020
Lead (Dry Weight)	mg/kg	18	5/2/13 15:02	HJG3	EPA 6020
Mercury (Dry Weight)	mg/kg	0.473	4/24/13 15:10	QCL	SW-846 7471B
Molybdenum (Dry Weight)	mg/kg	10	5/2/13 15:02	HJG3	EPA 6020
Nickel (Dry Weight)	mg/kg	23	5/2/13 15:02	HJG3	EPA 6020
Potassium (Dry Weight)	mg/kg	3750	5/2/13 15:02	HJG3	EPA 6020
Selenium (Dry Weight)	mg/kg	5.1	5/2/13 15:02	HJG3	EPA 6020
Sodium (Dry Weight)	mg/kg	1153	5/2/13 15:02	HJG3	EPA 6020
Zinc (Dry Weight)	mg/kg	436	5/2/13 15:02	HJG3	EPA 6020
Minerals					
Chloride	mg/kg	1960	5/10/13 19:36	HJG	EPA 300.0
Nutrient - As Received					
Ammonia as N (As Received)	%	0.324	4/23/13 11:02	CC	SM4500-NH3-G
Nitrate+Nitrite as N (As Received)	%	0.00051	4/23/13 12:25	CC	SM4500-NO3-H
Organic Nitrogen as N (As Received)	%	4.30	4/23/13 13:21	SLB	Calc
Total Kjeldahl Nitrogen (As Received)	%	4.63	4/19/13 12:40	CC	SM4500-Norg-C
Total Nitrogen as N (As Received)	%	4.63	4/26/13 10:36	KLS	Calc
Total Phosphorus as P (As Received)	%	1.55	4/19/13 13:05	CC	SM4500-P-F(w/Dig)
Nutrient-Dry Weight					
Ammonia as N (Dry Weight-Sludge)	%	0.334	4/23/13 11:02	CC	SM4500-NH3-G
Nitrate+Nitrite as N (Dry Weight - Sludge)	%	0.00052	4/23/13 12:25	CC	SM4500-NO3-H

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit

Shelly Brown



51 Clark St. Harrington, DE 19952

PH: 302.398.4313 FX: 302.398.4312

ANALYTICAL SERVICES: NPDES, RCRA, GROUND WATER MONITORING

ANALYTICAL RESULTS

Kent County Waste Treatment Facility

139 Milford Neck Road

Milford, DE 19963

Attention: Allan Thomas

Lab ID: 143710 Matrix: Soil/Sludge Sample Start: 4/17/13 8:00
Description: Site: 38649 - Greenhouse Sample 001 - 13 A/ Sample End:
Type: Grab Date Received: 4/17/13 9:39

Parameters	Units	Results	Analyzed	By	Method
Nutrient-Dry Weight					
Organic Nitrogen as N (Dry Weight - Sludg	%	4.44	4/23/13 13:21	SLB	Calc
Total Kjeldahl Nitrogen (Dry Weight)	%	4.78	4/19/13 12:40	CC	SM4500-Norg-C
Total Nitrogen as N (Dry Weight)	%	4.78	4/26/13 10:36	KLS	Calc
Total Phosphorus as P (Dry Weight)	%	1.60	4/19/13 13:05	CC	SM4500-P-F(w/Dig)
Physical					
% Moisture	%	3.12	4/17/13 11:36	HJG	SM2540-G
Calcium Carbonate Equivalancy	%	27.9	4/23/13 12:54	A&L	AO-955.01
pH	SU	7.83	4/17/13 14:23	DRP	SM4500-H+/B
Total Vol. Solids @ 550 C	%	49.7	4/17/13 11:36	HJG	160.4
Synthetic Organic Comp					
Polychlorinated biphenyls (PCB's) Soils	mg/kg	ND	4/23/13 23:14	QCL	SW-846 8082A

ND = Not Detected
* = Above Specified Limit
** = Above Client Limit

Report Number: 13-109-0206

Account Number: 15145

Submitted By: KELLY

**A&L Eastern Laboratories, Inc.**

7621 Whiteline Road Richmond, Virginia 23237 (804) 743-8401 Fax (804) 271-8446

Send To: ENVIROCORP INC
51 CLARK ST
HARRINGTON, DE 19952

Project : 143710

REPORT OF ANALYSIS

Date Sampled: 4/17/2013 00:00:00

Date Received: 04/19/2013 00:00

Date Reported: 04/24/2013

Lab Number : 93121

Sample Id : 143710

PARAMETER	RESULT (%)	RESULT (mg/kg)	QUANTITATION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE/TIME	METHOD
Total Solids *	93.01	930100	100.0	BW	04/19/2013 13:59	SM-2540G
Moisture *	6.99		100.0	BW	04/19/2013 13:59	SM-2540G
Calcium Carbonate Equivalent	27.90	279000	100	JM	04/23/2013 12:54	AOAC 955.01

Comments:

All values are on a dry weight basis except as noted by asterisk. Detection limit on all N series is on a wet basis.

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Debbie Holt

QC Laboratories

Analytical Report

KELLY SALMON
ENVIROCORP, INC.
51 CLARK STREET
HARRINGTON, DE 19952

Regarding:
KELLY SALMON
ENVIROCORP, INC.
51 CLARK STREET
HARRINGTON, DE 19952

Account No: AL0354, ENVIROCORP, INC.
Project No: AL0354, ENVIROCORP, INC.

P.O. No:

Inv. No: 1509333
PWSID No:

Sample ID	Sample Description	Samp. Date/Time/Temp Sampled by		
L4565426-1	143710 38649 GREENHOUSE SAMPLE COMP, KENT CO	04/17/13 08:00am NA C	Customer	
Received Date/Time/Temp 04/19/13 10:00am 4.6 C		Iced (Y/N): Y		
Parameter	Method	Result	RLs	Test Date, Time, Analyst
GENERAL CHEMISTRY				
TOTAL SOLIDS PERCENT	SM 2540G	91.66 %	0.01000 %	04/22/13 01:51PM JTE
METALS				
MERCURY	EPA 7471B	0.473 mg/kg DRY	0.109 mg/kg	04/24/13 03:10PM RMP
GAS CHROMATOGRAPHY				
AROCLOR-1016	EPA 8082	ND ug/kg DRY	5.69 ug/kg*	04/23/13 11:14PM GMA
AROCLOR-1221	EPA 8082	ND ug/kg DRY	18.0 ug/kg*	04/23/13 11:14PM GMA
AROCLOR-1232	EPA 8082	ND ug/kg DRY	12.0 ug/kg*	04/23/13 11:14PM GMA
AROCLOR-1242	EPA 8082	ND ug/kg DRY	5.76 ug/kg*	04/23/13 11:14PM GMA
AROCLOR-1248	EPA 8082	ND ug/kg DRY	6.55 ug/kg*	04/23/13 11:14PM GMA
AROCLOR-1254	EPA 8082	ND ug/kg DRY	6.09 ug/kg*	04/23/13 11:14PM GMA
AROCLOR-1260	EPA 8082	ND ug/kg DRY	6.05 ug/kg*	04/23/13 11:14PM GMA

Notes:

A result of "ND" indicates that the analyte tested was either not detected or the concentration was below the RLs.

Definitions: NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC= Too numerous to count; pres=presumptive

A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

MCL= EPA recommended "maximum contaminant level", PLs = Customer-specific permit limits.

The test results meet all requirements of NELAP unless otherwise specified.

The report shall not be reproduced except in full without the written consent of the laboratory.

Unless otherwise specified, the Environmental and Food Chemistry testing except Field Parameters were performed by QC Inc. located at 1205 Industrial Blvd., Southampton, PA 18966; Pharmaceutical, Dairy and Food Microbiological tests were performed by QC Inc. located at 702 Electronic Dr., Horsham, PA 19044.

QCL Accreditations: Southampton Div: EPA ID PA00018; NELAP ID's: PA 09-00131, NJ PA165, NY 11223

State ID's: CT PH-0768, DE PA-018, MD 206, SC 89021001; FDA Reg. #: 2515238

ACL Div: State ID's: DE 00011, MD 138; Wind Gap Div: State ID's: PA 48-01334, NJ PA001

E. Rutherford Div: State ID: NJ 02015; Vineland Div: State ID: NJ 06006; Reading Div: State ID: PA 06-03543

The reported results relate only to the samples.

KENT COUNTY WASTEWATER FACILITIES LABORATORY

143710

139 Milford Neck Rd.
Milford DE 19963

Tel:302-335-6000
Fax:302-335-0365

CHAIN OF CUSTODY

Lab ID.	Time	Date	Sample	Preservation	Analysis
38649	800	4/17/13	Greenhouse Sample 001-13 A/B/C	none	See list

Comments:

Sampled By: A. F. Thomas 4/17/13

1. Relinquished By: A. F. Thomas 4/17/13 0815

Received By: Jack Wilt 4/17/13 9:10AM

2. Relinquished By: Jack Wilt 4/17/13 9:30

Received By: Kelly Salmon 4/17/13 0939

3. Relinquished By: _____

Received By: _____

4. Relinquished By: _____

Received By: _____

B. MONITORING REQUIREMENTS

During the period beginning on the effective date and lasting through the expiration date the permittee is authorized to conduct a Limited Distribution and Marketing program for the pasteurized sludge product generated at the Kent County Wastewater Treatment Facility. Pasteurized sludge product for distribution and marketing shall be monitored by the permittee as specified below:

B.1 PASTEURIZED SLUDGE

Parameter	Unit Measurement	Minimum Frequency	Sample Type
Moisture content	percent	Monthly	Composite
Total Nitrogen as N (dry weight basis)	percent	Monthly	Composite
Organic Nitrogen as N (dry weight basis)	percent	Monthly	Composite
Ammonium as N (dry weight basis)	percent	Monthly	Composite
Nitrate Nitrogen as N (dry weight basis)	percent	Monthly	Composite
Phosphorus (dry weight basis)	percent	Monthly	Composite
Potassium (dry weight basis)	percent	Monthly	Composite
Volatile solids	percent	Monthly	Composite
Calcium Carbonate Equivalence	percent	Monthly	Composite
Coliforms (Colonies/gm)	CFU	Monthly	Composite
Salmonella (sp.) (Colonies/gm)	CFU	Monthly	Composite
pH	S.U.	Monthly	Composite
Aluminum (dry weight basis)	mg/kg	Monthly	Composite
Arsenic (dry weight basis)	mg/kg	Monthly	Composite
Cadmium (dry weight basis)	mg/kg	Monthly	Composite
Chromium (dry weight basis)	mg/kg	Monthly	Composite
Chlorides (dry weight basis)	mg/kg	Monthly	Composite
Copper (dry weight basis)	mg/kg	Monthly	Composite
Iron (dry weight basis)	mg/kg	Monthly	Composite
Lead (dry weight basis)	mg/kg	Monthly	Composite
Mercury (dry weight basis)	mg/kg	Monthly	Composite
Molybdenum (dry weight basis)	mg/kg	Monthly	Composite
Nickel (dry weight basis)	mg/kg	Monthly	Composite
Selenium (dry weight basis)	mg/kg	Monthly	Composite
Sodium (dry weight basis)	mg/kg	Monthly	Composite
Zinc (dry weight basis)	mg/kg	Monthly	Composite
PCB's (dry weight basis)	mg/kg	Monthly	Composite
Priority pollutants (see NOTE)	Various	Every 6 months	Composite

*Pasteurized sludge samples shall be collected at the following location: the dryer discharge chute. All processed sludge shall be collected and analyzed in accordance with the Quality Assurance Program. See Part I, F.1. for reporting requirements. The Department may modify the sampling frequency based upon review of continuing or additional analyses.

NOTE: A list of the 126 priority pollutants can be found in 40 CFR, Part 423, Appendix A, 1987.

CROP MANAGEMENT PLAN

ATTACHMENT E



Robert Garey

Vineyard Farm

Nutrient Management Plan
2012 - 2014

HighQ[®]

Because the more you learn, the more you earn



Willard Agri-Service of Greenwood
22272 S. Dupont Hwy.
Greenwood, DE 19950
Phone: 302-349-4100
Fax: 302-349-4300

Plan prepared for:

Robert Garey
4191 Hopkins Cemetery Rd
Felton, De

Plan prepared by:

Bill Wright, De Certification # 2360
Willard Agri-Service
22272 So. Dupont Hwy
Greenwood, De 19950



Bill Wright

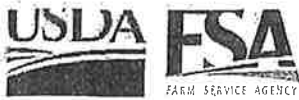
Duration of Plan: This plan is written for crop years 2012 - 2014

Description of Plan: Mr. Garey farms 132 acres in Kent county Delaware. The crops grown are corn, soybeans and small grain. Raw poultry manure is used on this farm. As manure is used the rate will be adjusted. Commercial fertilizer will be adjusted accordingly. The farm in this plan is in the : Murderkill #26 water shed.

Certification Statement:

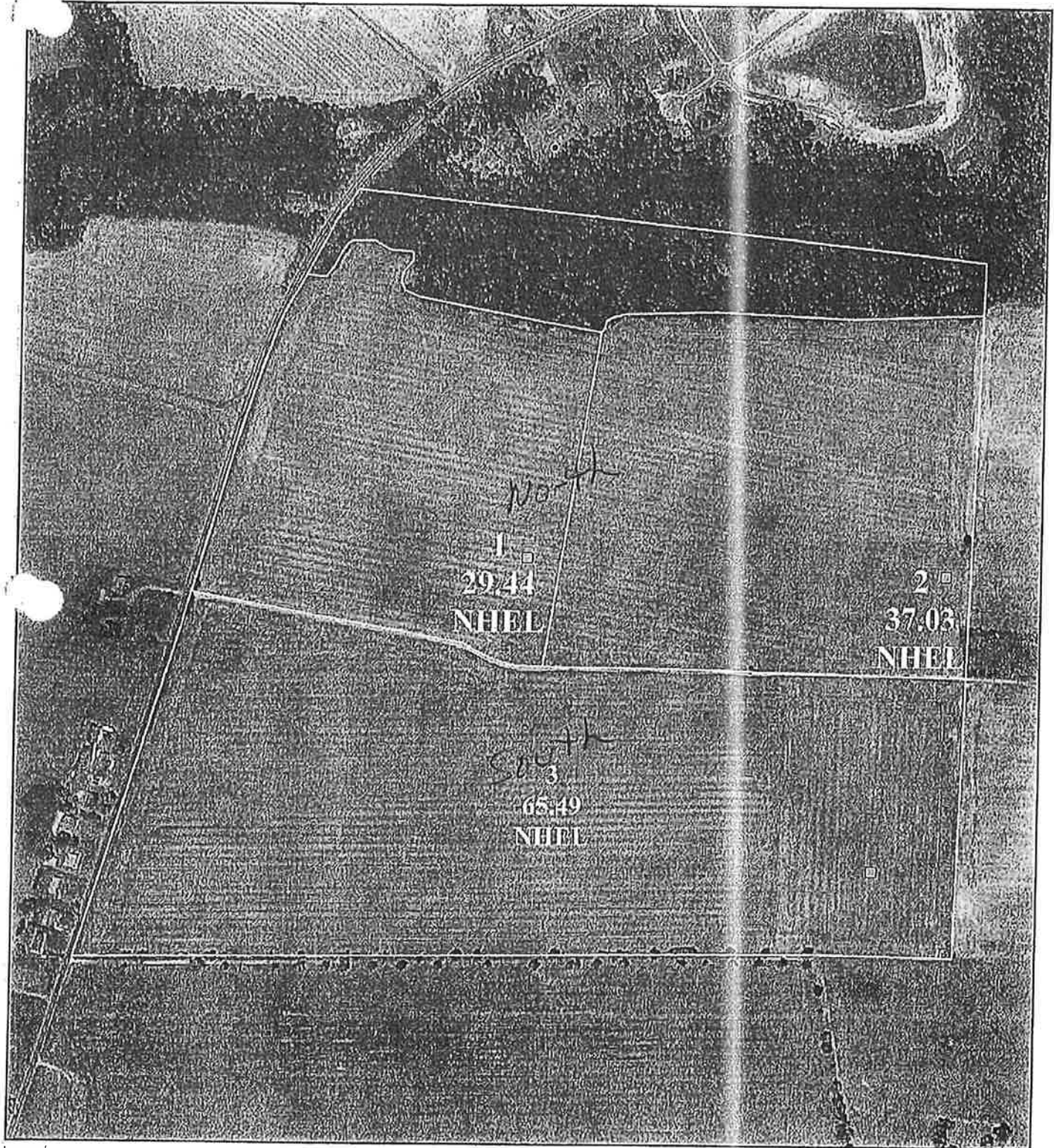
I, Robert Garey acknowledge receipt of this plan and intend to implement it to the best of my ability on my farming operation.

Robert Garey



United States Department of Agriculture
Kent County Farm Service Agency

FARM: 2126 TRACT: 1843
CROPLAND ACRES: 132.0



Legend

- W.S.D.E. Wet_P_de001
- Wetland Determination Identifiers
 - Restricted Use
 - ▽ Limited Restrictions
 - Exempt from Conservation Compliance Provisions



Prepared by Kent, DE FSA

Date:

November 08, 2011

Disclaimer: Wetland identifiers do not represent the size, shape or specific determination of the area. Refer to your original determination (CPA-026 and attached maps) for exact wetland boundaries and determinations, or contact NRCS.

Soil Map—Kent County, Delaware
(Robert G. ... / Vineyard)



Soil Map—Kent County, Delaware
(Robert Garey / Vineyard)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot

 Very Stony Spot

 Wet Spot

 Other

Special Line Features

-  Gully
-  Short Steep Slope
-  Other

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

MAP INFORMATION

Map Scale: 1:6,400 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Kent County, Delaware
Survey Area Data: Version 6, Oct 17, 2006

Date(s) aerial images were photographed: 7/17/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Kent County, Delaware (DE001)			
Map Unit Symbol	Map Unit Name	Acres In AOI	Percent of AOI
DnC	Downer loamy sand, 5 to 10 percent slopes	0.1	0.1%
DoC	Downer sandy loam, 5 to 10 percent slopes	5.7	4.4%
EvD	Evesboro loamy sand, 5 to 15 percent slopes	0.9	0.7%
FmB	Fort Mott loamy sand, 2 to 5 percent slopes	2.6	2.0%
HbA	Hambrook sandy loam, 0 to 2 percent slopes	33.4	25.8%
HbB	Hambrook sandy loam, 2 to 5 percent slopes	71.7	55.5%
SaA	Sassafras sandy loam, 0 to 2 percent slopes	1.4	1.1%
WdA	Woodstown sandy loam, 0 to 2 percent slopes	13.5	10.4%
Totals for Area of Interest		129.4	100.0%

Spectrum Analytic

1087 Jamison Road NW
Washington Court House, OH 43160-8748

www.spectrumanalytic.com

Report To
WILLARD AGRI-SERVICE 11523 LYNCH ROAD WORTON, MD 21678

Prepared For
BOB - VINYARD

Sampled	03-21-2012
Tested	03-22-2012

Sample Number	Lab Number	pH		Organic Matter %	P-FV Fertility Index Value	lbs/A - Rating			CEC	Base Saturation			ppm - Rating				Index - Rating	
		Soil pH	Buffer pH			Potassium K	Magnesium Mg	Calcium Ca		K %	Mg %	Ca %	Sulfur S	Boron B	Zinc Zn	Iron Fe	Copper Cu	Manganese Mn
NORTH	G16685	6.1	7.0	0.9	86 O	178 M	141 M	1104 G	3.6	6.4	16.4	77.2	17 M	0.2 L	3.2 M			
SOUTH	G16686	5.6	7.0	1.1	105 O	139 M	121 M	1062 G	3.3	5.4	15.2	79.5	19 M	0.3 L	3.8 M			

Sample Number	Year	Acres	Previous Crop	Nitrogen Credit	Crop to be Grown	Tillage Method	Yield Goal
NORTH	2012	67	Corn	-29	Corn	No-Till	165 bu
NORTH	2013	67	Corn	0	Soybeans	No-Till	65 bu
NORTH	2014	67	Soybeans	20	Barley-Soybean (DC)	No-Till	100 bu
SOUTH	2012	65	Corn	-29	Corn	No-Till	165 bu
SOUTH	2013	65	Corn	0	Soybeans	No-Till	65 bu
SOUTH	2014	65	Soybeans	20	Barley-Soybean (DC)	No-Till	100 bu

Sample Number	Year	CaCO3 Lime Tons	Recommendations			Manure Type and Analysis % NP2O5/K2O	Amt To Apply	Remainder			Nutrient recommendations expressed in broadcast rates of lbs/A except						
			N	P2O5	K2O			N	P2O5	K2O	Mg	S	B	Cu	Fe Foliar	Mn Row	Zn
NORTH	2012	0.4 D	252	62	152	Poultry - 0.95/2.8/1.5	2.5 ton/A	224	0	77	28	14	0.50				5
NORTH	2013		20	58	131						15	14	0.50				5
NORTH	2014		116	104	132						25	7	0.50				5
SOUTH	2012	0.7 D	250	36	185	Poultry - 0.95/2.8/1.5	2.5 ton/A	222	0	110	31	13	0.50				4
SOUTH	2013		20	35	151						17	13	0.50				4
SOUTH	2014		115	64	144						21	5	0.50				4

Spectrum Analytic

1087 Jamison Road NW
Washington Court House, OH 43160-8748

www.spectrumanalytic.com

**WILLARD AGRI-SERVICE
11523 LYNCH ROAD
WORTON, MD 21678**

Prepared For

BOB - HOME

Sample Information

Lab Number	FF26068	Sampled	03-22-2012
Sample	HOME	Tested	03-29-2012
Manure Type	Poultry, Solid without litter		

**Certificate of Analysis
Manure**

Analysis	Result	Unit	Nutrients lbs/Ton	Available 1st Yr ³ lbs/Ton		
Moisture	50.06	%				
Nitrogen, Total	2.87	%	57.4	49.2 ⁴		
Nitrogen, Ammonium	1.85	%	37.0	37.0 ⁴		
Nitrogen, Organic	1.02	%	20.4	12.2 ⁴		
Phosphorus [P2O5], Total	2.27	%	45.4	45.4 ⁴		
Potassium [K2O]	2.7	%	54.0	54.0 ⁴		
Calcium	1.74	%	34.8	19.1 ⁵		
Magnesium	.46	%	9.2	5.1 ⁵		
Sulfur	1.01	%	20.2	11.1 ⁵		
Boron	65	ppm	0.1	0.1 ⁵		
Copper	176	ppm	0.4	0.3 ⁵		
Iron	2791	ppm	5.6	3.6 ⁵		
Manganese	339	ppm	0.7	0.5 ⁵		
Zinc	457	ppm	0.9	0.6 ⁵		
Aluminum	398	ppm				
Sodium	7801	ppm				

(1) Estimates of 1st year nutrient availability are unavailable if manure type is not specified.

(2) Estimates of 1st year nutrient availability of "Total Nitrogen" are unavailable if no "Ammonium Nitrogen" test is run.

(3) Estimates of 1st year nutrient availability do not take into consideration losses in handling and storage prior to incorporation. Nutrient Management Plan guidelines use 100% availability the 1st year for phosphorus and potassium. Actual 1st year availability varies from 40-90% depending on manure type, soil temperature, moisture and other factors. When using manure credits in fertility programs other than NMP, consult state publications, MWP-18, "Livestock Waste Facilities Handbook" or Spectrum Analytic for more specific 1st year availability percentages.

(4) Source: MWP-18, "Livestock Waste Facilities Handbook"

(5) Source: A3411, "Manure Nutrient Credit Worksheet", University of Wisconsin