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NTC Great Lakes

# Technical Memorandum
for
# Sediment Coring Activities
# Naval Training Center
Great Lakes, Illinois

## Northern Division
## Naval Facilities Engineering Command
**Contract No. N62472-90-D-1298**
**Contract Task Order 0063**

January 1993

HALLIBURTON NUS
*Environmental Corporation*

5298-4.1-3

SEC DONOHUE
Environment & Infrastructure

January 29, 1993
**DNCH/93-0004**

Ms. Adrienne Wilson
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Code 185ND
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Re: Contract No. N62472-90-D-1298 "CLEAN"
Site Inspection at Pettibone Creek, Boat Basin and Harbor Areas
CTO 0063, Naval Training Center (NTC), Great Lakes, Illinois
SEC Donohue Project No. 20612

Dear Ms. Wilson:

Enclosed please find one copy of the final Technical Memorandum for Sediment Coring Activities, dated January 1993. One copy has also been sent to Nancy Kuntzelman and to Bob Ogrodowski.

Please do not hesitate to contact me with any questions or problems.

Sincerely,

SEC DONOHUE INC.

Mansour Ghiasi

Mansour Ghiasi, P.E.
Project Manager

cc: Nancy Kuntzelman, NORTHDIV (1 copy)
Bob Ogrodowski, Activity Point of Contact (1 copy)
Debra Wroblewski, HALLIBURTON NUS (1 copy)
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# TECHNICAL MEMORANDUM
# FOR
# SEDIMENT CORING ACTIVITIES
# NAVAL TRAINING CENTER
# GREAT LAKES, ILLINOIS

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION (CLEAN) CONTRACT)

Submitted to:
Southern Division
Environmental Branch, Code 18
Naval Facilities Engineering Command
2155 Eagle Drive, Box 10068
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Submitted by:
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Contract No. N62472-90-D-1298
Contract Task Order 0063

January 1993


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**TECHNICAL MEMORANDUM**
**SEDIMENT CORING ACTIVITIES**
**NAVAL TRAINING CENTER**
**GREAT LAKES, ILLINOIS**
**JANUARY 1993**

## 1.0 INTRODUCTION

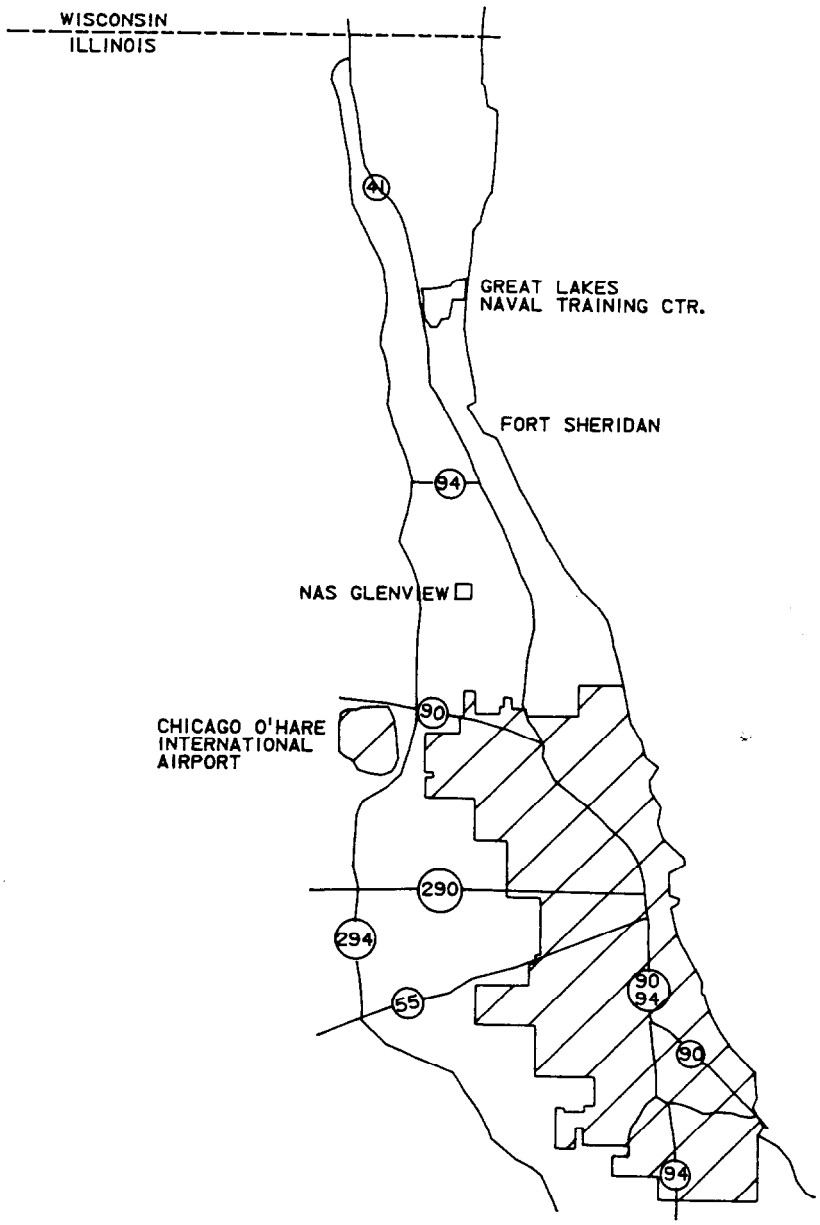
This project is being performed under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract No. N62472-90-D-1298, Contract Task Order (CTO) No. 0063. The activities under the CLEAN contract are performed by a team of contractors comprised of HALLIBURTON NUS Corporation (HALLIBURTON NUS), the prime contractor, and SEC Donohue Inc. (SEC Donohue) and ENSR Consulting and Engineering, both team subcontractors. SEC Donohue is the lead technical firm for this CTO.

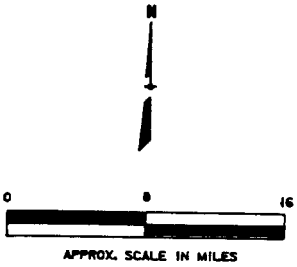
The HALLIBURTON NUS Team is submitting this Technical Memorandum as a part of the Site Inspection (SI) performed at Pettibone Creek, the Boat Basin, and the Harbor Areas at the Naval Training Center (NTC) in Great Lakes, Illinois (Figure 1). The standard scope of work for the SI does not require the preparation of a Technical Memorandum. However, the Navy requested that the HALLIBURTON NUS Team prepare a Technical Memorandum describing the portion of the field work and laboratory analysis performed in conjunction with the pending dredging and disposal of the sediments in the Boat Basin and Harbor Areas. The areas under study were sampled August 17-21, 1992.

## 2.0 SCOPE OF WORK

This Technical Memorandum presents the HALLIBURTON NUS Team's technical scope of work, methodology, sampling procedures and laboratory results from the sampling. The main objective of this Technical Memorandum is to present the laboratory results of the field samples to allow the Navy to evaluate dredging and disposal options for the sediments in the Boat Basin and the Harbor Areas.

During field work, eight sediment samples were taken from four vibracore locations in the Boat Basin, two sediment samples were taken from one vibracore location in the Inner Harbor, and seven sediment samples were taken from four vibracore locations in the Outer Harbor. These samples were subjected to elutriate, supernatant, Toxicity Characteristic Leaching Procedure (TCLP), and particle size testing at the HALLIBURTON NUS laboratory in Pittsburgh, Pennsylvania. Elutriate, supernatant, TCLP, and particle size testing procedures are included in Appendix A.




| NAMES | DATE |
|---|---|
| DR. | |
| DSGN. | |
| CK. | |
| PE | |
| PP'D | |
| APP'D | |

FIGURE 1
GENERAL LOCATION MAP

NAVAL TRAINING CENTER
ILLINOIS

SEC DONOHUE
Environment & Infrastructure

PROJECT NUMBER
CLIENT DWG. NUMBER
SECD DWG.

DATE PLOTTED 01/28/93

## 3.0 METHODOLOGY

The HALLIBURTON NUS Team and a coring subcontractor, Ocean Surveys, Inc., conducted vibracore drilling in the Boat Basin, Inner Harbor and Outer Harbor areas of the NTC Harbor at the locations shown in Figure 2.

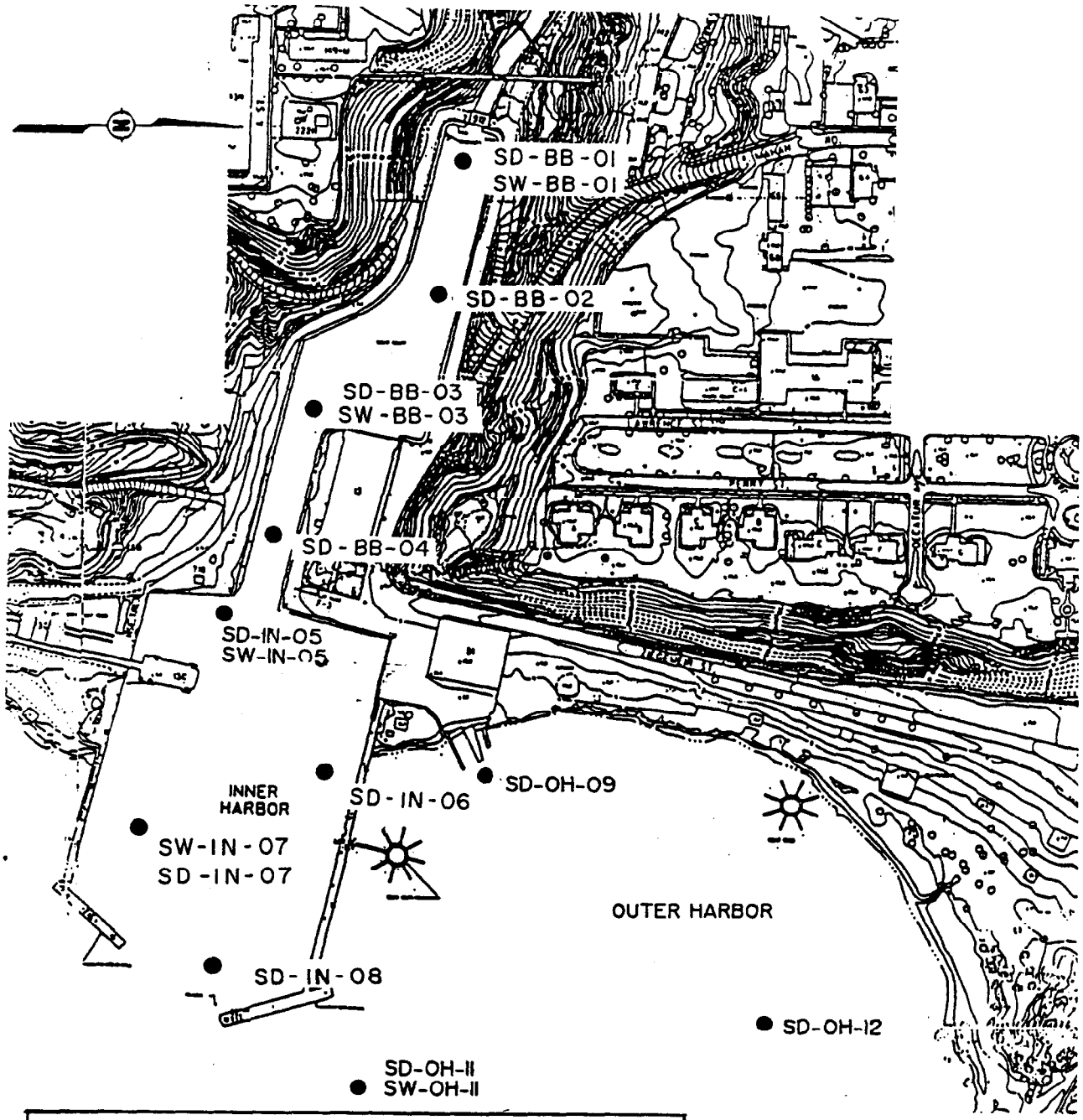
Each vibracore location was surveyed using a HYDRO I Range Azimuth Optical Navigation System. HYDRO I is a laser based, short-range dynamic navigation system with a stated position accuracy of 2 feet at ranges of up to 5,000 feet. HYDRO I was positioned over a shore-based control point with known coordinates (provided in Table 1). The coordinates of the shore-based control point and the desired coordinates of the sample location were entered in the HYDRO I computer. The HYDRO I operator then sighted a prism mounted on the coring vessel and continuously tracked the vessel as it maneuvered into location. The ship's position was relayed from the shore to the shipboard computer via a digital radio link. Based on this data, the desired vibracore location was reached. The coordinates for the vibracore sampling locations are provided in Table 1.

Once the location was reached, the vessel was anchored and vibracore drilling was performed. Vibratory cores were attempted to a depth of 6 feet below the sediment-water interface or to vibracore refusal, whichever was encountered first.

## 4.0 SAMPLING PROCEDURES

Sediment and surface water sampling was done after the boat had been securely anchored at the designated location. Surface water was collected just prior to vibratory coring using a Kemmerer sampler. The Kemmerer sampler was lowered half way to the harbor bottom at each location, then opened and allowed to fill with water. The filled Kemmerer sampler was then pulled up and the water collected in the sampler was poured directly into sample bottles.

Sediment cores were collected from a boat using the vibracore technique. Once a core was collected, a drill was used to place holes in the core to determine the length of sediment retrieved. A tape measure was then used to measure the top three feet of collected sediment. The core was then divided into 0 to 3-foot and 3 to 6-foot sections using a hack saw. Once divided, the core sections were brought into the shore for classification and sampling. The contents of each core were emptied on a plastic liner. Photographs of the cores were taken and descriptions of the cores were recorded on Sediment Core Logs (included in Appendix B) using a Munsell Soil Color Chart and the Unified Soil Classification System. Sediment samples for volatile organic compound




LEGEND

- -BB- BOAT BASIN SAMPLING LOCATION
- -IN- INNER HARBOR SAMPLING LOCATION
- -OH- OUTER HARBOR SAMPLING LOCATION

0 200 400

SCALE: FEET

SCALE IS APPROXIMATE

INNER HARBOR, BOAT BASIN, AND OUTER HARBOR SAMPLE LOCATIONS

FIGURE 2

GREAT LAKES NAVAL TRAINING CENTER
GREAT LAKES, ILLINOIS

Donohue ENGINEERS ARCHITECTS SCIENTISTS

## TABLE 1

## SHORE-BASED CONTROL POINTS AND SAMPLE LOCATION COORDINATES
## SEDIMENT CORING ACTIVITIES
## NAVAL TRAINING CENTER
## GREAT LAKES, ILLINOIS
## JANUARY 1993

| SHORE-BASED CONTROL POINTS | NORTHING | EASTING |
|---|---|---|
| PT-1 | 2,055,375 | 635,041 |
| PT-3 | 2,055,334 | 635,315 |
| PT-5 | 2,056.343 | 636,592 |
| PT-B-1 | 2,054,392 | 637,591 |

| SAMPLE LOCATION | NORTHING | EASTING |
|---|---|---|
| GL63-SD-BB-01 | 2,055,548 | 634,614 |
| GL63-SD-BB-02 | 2,055,591 | 634,781 |
| GL63-SD-BB-03 | 2,055,378 | 634,964 |
| GL63-SD-BB-04 | 2,055,304 | 635,189 |
| GL63-SD-IN-05 | 2,055,226 | 635,338 |
| GL63-SD-OH-09 | 2,055,649 | 635,623 |
| GL63-SD-OH-10 | 2,056,097 | 636,371 |
| GL63-SD-OH-11 | 2,055,452 | 636,138 |
| GL63-SD-OH-12 | 2,056,104 | 635,997 |

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analysis were collected directly from the top three inches of each sediment core without mixing. The remaining core sediment was then mixed in a stainless steel compositing bowl with a decontaminated stainless steel mixing spoon until a visually homogenous sample was obtained. The resultant mixed sediment composite was spread evenly at the bottom of the bowl and divided into quadrants. Portions were taken from each quadrant using the stainless steel spoon and loaded directly into sample bottles. Sediment samples were stored in a cooler iced to 4°C and then shipped to the HALLIBURTON NUS laboratory in Pittsburgh.

As shown on Table 2, all sediment samples were subjected to elutriate, supernatant, and particle size testing. Elutriate and supernatant testing parameters included: arsenic, copper, lead, mercury, nickel, zinc, percent solids, ammonia, total suspended solids (TSS), total volatile solids, and total solids. In addition, select sediment samples were analyzed for TCLP volatiles, semivolatiles, pesticides, herbicides and metals. Table 3 provides the analytical methods followed by the laboratory to perform this testing.

## 5.0 RESULTS

A tabular summary of the elutriate, supernatant and TCLP analytical results is included in Appendix C. The analysis reports received from the laboratory are included in Appendices D, E, F, and G.

With one exception, elutriate testing was done in triplicate in accordance with the analytical procedure provided in Appendix D (inadequate sample volume was recovered to run sample GL63-SD-OH-09A in triplicate). The precision of the triplicate analyses for the elutriate tests was considered acceptable except for the following:

| Sample | Parameter | Triplicate Results (mg/L) |
|---|---|---|
| GL63-SD-BB-01B | Ammonia | 27, <u>0.8</u>, 13 |
| GL63-SD-BB-02B | TSS | <10, <u>42</u>, <10 |
| GL63-SD-BB-03A | Lead | 0.008, <u>0.22</u>, 0.006 |
| GL63-SD-IN-05A | Lead | <u>2.4</u>, 0.021, 0.028 |
| GL63-SD-OH-10B | Ammonia | 3.5, 4.5, <u>44</u> |
| GL63-SD-OH-12B | Zinc | <u>0.24</u>, 0.04, 0.04 |

The outlier in each triplicate set has been underlined. In all of these instances, the laboratory reanalyzed the outliers. The underlined outlier values were replaced with the re-analyses results in the analytical data summary tables provided in Appendix C. The re-analysis reports received from the laboratory are included in Appendix H.

Appendix I provides the quality control reports provided by the laboratory.

## TABLE 2

## ANALYTICAL PARAMETERS
## SEDIMENT CORING ACTIVITIES
## NAVAL TRAINING CENTER
## GREAT LAKES, ILLINOIS
## JANUARY 1993

| SAMPLE LOCATIONS | TCLP | SUPERNATANT | ELUTRIATE | PARTICLE SIZE |
|---|---|---|---|---|
| SD-BB-01A | X | X | X | X |
| SD-BB-01B | | X | X | X |
| SD-BB-02A | | X | X | X |
| SD-BB-02B | | X | X | X |
| SD-BB-03A | X | X | X | X |
| SD-BB-03B | | X | X | X |
| SD-BB-04A | | X | X | X |
| SD-BB-04B | | X | X | X |
| SD-IN-05A | X | X | X | X |
| SD-IN-05B | | X | X | X |
| SD-OH-09A | X | X | X | X |
| SD-OH-10A | | X | X | X |
| SD-OH-10B | | X | X | X |
| SD-OH-11A | X | X | X | X |
| SD-OH-11B | | X | X | X |
| SD-OH-12A | | X | X | X |
| SD-OH-12B | | X | X | X |

Abbreviations

SD-OH - Sediment - Outer Harbor
SD-IN - Sediment - Inner Harbor
SD-BB - Sediment - Boat Basin
TCLP - Toxicity Characteristic Leaching Procedure

Notes:

(1) "A" designates 0 to 3-foot samples. "B" designates 3 to 6-foot samples.

(2) Sample location OH-09 was near the edge of a concrete boat launch in the Outer Harbor. The vibracore was refused at a sediment depth of approximately 2 feet at this location. Consequently, a 3 to 6-foot sample (OH-09B) was not collected.

# TABLE 3

## ANALYTICAL METHODS
## SEDIMENT CORING ACTIVITIES
## NAVAL TRAINING CENTER
## GREAT LAKES, ILLINOIS
## JANUARY 1993

| Parameter | Reference | Method |
|---|---|---|
| TCLP | | |
| Volatiles | SW846 | 1311/8240 |
| Base/Neutrals and Acids | SW846 | 1311/8270 |
| Herbicides | SW846/SM | 1311/509B |
| Pesticides | SW846 | 1311/8080 |
| Metals | SW846 | 1311/6010 (Hg 7470) |
| Supernatant | (1) | |
| Arsenic | SW846 | 6010 |
| Copper | SW846 | 6010 |
| Lead | SW846 | 7421 |
| Mercury | SW846 | 7470 |
| Nickel | SW846 | 6010 |
| Zinc | SW846 | 6010 |
| Percent Solids | EPA | 160.3 |
| Ammonia-Nitrogen | EPA | 350.2 |
| Total Suspended Solids (TSS) | EPA | 160.2 |
| Total Volatile Residue | EPA | 160.4 |
| Elutriate | (2) | |
| Arsenic | SW846 | 6010 |
| Copper | SW846 | 6010 |
| Lead | SW846 | 6010 |
| Mercury | SW846 | 7470 |
| Nickel | SW846 | 6010 |
| Zinc | SW846 | 6010 |
| Percent Solids | EPA | 160.3 |
| Ammonia-Nitrogen | EPA | 350.2 |
| Total Suspended Solids (TSS) | EPA | 160.2 |
| Total Volatile Residue | EPA | 160.4 |
| Particle Size | ASTM | D422 |

## TABLE 3 (Continued)

## ANALYTICAL METHODS
## SEDIMENT CORING ACTIVITIES
## NAVAL TRAINING CENTER
## GREAT LAKES, ILLINOIS
## JANUARY 1993

SW846 - Test Methods for Evaluating Solid Waste, November 1986.

SM - Standard Methods for Water and Wastewater Analysis, 17th edition, 1989.

EPA - Methods for Chemical Analysis of Water and Wastes, EPA 4/79/020, March 1983.

(1) Supernatant samples were prepared following the procedure provided in Appendix A. This procedure was derived from Material Analysis for Dredge and Fill Activities, Section 401 Water Quality Certification, Illinois EPA.

(2) The procedure for elutriate testing was derived from Procedures for Handling and Chemical Analysis of Sediment and Water Samples, U.S. EPA/U.S. Army Corps of Engineers Technical Committee on Criteria for Dredged and Fill Material, May 1981.

ASTM - Standard Method for Particle-Size Analysis of Soils, ASTM D422.

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# APPENDIX A

# ELUTRIATE, SUPERNATANT, TCLP AND PARTICLE SIZE TESTING PROCEDURES

# ELUTRIATE TEST PROCEDURE

SOURCE: "Procedures for Handling and Chemical Analysis of Sediment and Water Samples," USEPA/USACE Technical Committee on Criteria for Dredged and Fill Material, May 1981.

## ELUTRIATE TEST

The elutriate test is a simplified simulation of the dredging and disposal process wherein predetermined amounts of dredging site water and sediment are mixed together to approximate a dredged material slurry. The elutriate in the supernatant resulting from the vigorous 30-min shaking of one part sediment from the dredging site with four parts water (vol/vol) collected from the dredging site followed by a 1-hour settling time and appropriate centrifugation and 0.45-micron filtration. Thus, it will be necessary to collect both water and sediment samples to perform the elutriate test. When evaluating a dredging operation, the sediment should be collected at the dredging site and the water should be collected at the dredging and the disposal site. To evaluate a fill material activity, samples should be collected from the source of the fill material and the water should be collected from the disposal site.

### Water Sample Collection

Collection should be made with an appropriate noncontaminating water sampling device. Either discrete samplers such as Kemmerer or Van Dorn samplers or continuous collectors such as submersible pumps may be used. The volume of water required will depend on the number of analyses to be performed. For each sample to be subjected to elutriate testing, it is suggested that a minimum of 4 L be collected at the disposal site and 8 L be collected at the dredging site to evaluate a dredging operation and/or 12 L be collected at the disposal site to evaluate a fill material disposal operation. This will provide 4 L of water for analyses and sufficient water to prepare triplicate 3 L elutriates. (Each elutriate should yield 2.0 to 2.2 L of standard elutriate for analysis.) If the samples are to be analyzed for trace organics or a large number of constituents, a proportionately larger initial sample should be collected.

Samples must be stored in glass containers if trace organic analyses are to be performed. Generally, either plastic or glass containers may be used for other parameters. The samples should be maintained at 4° C until analyzed but never frozen. The storage period should be as short as possible to minimize changes in the characteristics of the water. Disposal site water should be analyzed or split and preserved immediately. The remainder of the water should be used in the elutriate test, which should be processed within one week of collection.

## Sediment Sample Collection

Samples should be taken from the fill or the dredging site with a grab or a corer. Approximately 3 L of sediment or fill material would provide sufficient sample to prepare triplicate 3 L elutriates. Again, if the resultant standard elutriates are to be analyzed for trace organics or a large number of constituents, a proportionately larger initial sample should be collected.

Samples may be stored in plastic bags, jars, or glass containers. However, if trace organic analyses are to be performed, glass containers with teflon-lined lids are required. A special precaution that must be taken with sediment samples is to ensure that the containers are completely filled with sample and that air bubbles are not trapped in the container. This step is necessary to minimize sample oxidation that could influence elutriate test results.

The samples should be stored immediately at 4° C. They must not be frozen or dried prior to use. The storage should be as short as possible to minimize changes in the characteristics of the sediment. It is recommended that samples be processed within one week of collection.

## Apparatus

The following apparatus are required to perform the elutriate test. Prior to use, all glassware, filtration equipment, and filters should be washed with 5 to 10 percent (or stronger) hydrochloric acid (HCl) and then rinsed thoroughly with deionized water. The necessary apparatus include:

a. Acid-rinsed plastic bottles for collection of water samples.

b. Plastic jars or bags ("Whirl-Pak," plastic freezer containers, etc.) for collecting dredged or fill material samples.

c. Laboratory shaker capable of shaking 2 L flasks at approximately 100 excursions/minute. Box type or wrist-action shakers are acceptable.

d. Several 1 L graduated cylinders.

e. Large (15 cm) powder funnels.

f. Several 2 L, large-mouth graduated Erlenmeyer flasks.

g. Vacuum or pressure filtration equipment, including vacuum pump or compressed air source, and an appropriate filter holder capable of accommodating 47-, 105-, or 155-m-diameter filters.

h. Membrane filters with a 0.45-micron pore-size diameter. The filters should be soaked in 5 M HCl for at least 2 hours prior to use.

i. Centrifuge capable of handling six 1- or 0.5-L centrifuge bottles at 3000 to 5000 rpm. International Model K or Sorval Super Speed are acceptable models.

j. Wide-mouth 1-gallon capacity glass jars with teflon-lined screw-top lids for use as sample containers when samples are to be analyzed for trace organics. (It may be necessary to purchase jars and teflon sheets separately; in this case, the teflon lid liners may be prepared by the laboratory personnel.)

## Test Procedure

The stepwise test procedure is given below:

a. Subsample a minimum volume of 1 L each of dredging site and disposal site water. If it is known in advance that a large number of measurements are to be performed, the site of each subsample should be increased to meet the anticipated needs.

b. Filter an appropriate portion of the disposal site water through an acid-soaked 0.45-micron pore-size membrane filter that has been prerinsed with approximately 100 ml of disposal site water. The filtrate from the rinsing procedure should be discarded.

c. Analyze the filtered disposal site sample as soon as possible. If necessary, the samples may be stored at 4°C after splitting and the appropriate preservatives have been added. Filtered water samples may also be frozen with no apparent destruction of sample integrity.

d. Repeat steps a, b, and c with dredging site water. This step is omitted with a fill material sample.

e. Subsample approximately 1 L of sediment from the well-mixed original sample. Mix the sediments and unfiltered dredging site water in a volumetric sediment-to-water ratio of 1:4 at room temperature (22 ± 2° C). This is best done by the method of volumetric displacement. One hundred mililiters of unfiltered dredging site water is placed into a graduated Erlenmeyer flask. The sediment subsample is then carefully added via a powder funnel to obtain a total volume of 300 ml. (A 200 ml volume of sediment will now be in the flask.) The flask is then filled to the 1000 ml mark with unfiltered dredging site water, which produces a slurry with a final ratio of one volume sediment to four volumes water.

This method should provide 700 to 800 ml of water for analysis. If the analyses to be run require a larger volume of water, the initial volumes used to prepare the elutriate slurry may be proportionately increased as long as the solid-to-liquid ratio remains constant (e.g. mix 400 ml sediment and 1600 ml unfiltered dredging site water). Alternately, several 1 L sediment/dredging site water slurries may be prepared as outlined above and the filtrates combined to provide sufficient water for analysis. The procedure continues as follows:

f. (1) Cap the flask tightly with a noncontaminating stopper and shake vigorously on an automatic shaker at both 100 excursions per minute for 30 min. A polyfilm-covered rubber stopper is acceptable for minimum contamination.

(2) During the mixing step given above, the oxygen demand of the dredged material may cause the dissolved oxygen concentration in the elutriate to be reduced to zero. This change can alter the release of chemical contaminants form dredged material to the disposal site water and reduce the reproducibility of the elutriate test. If it is known that anoxic conditions (zero dissolved oxygen) will not occur at the disposal site or if reproducibility of the elutriate test is a potential problem, the mixing may be accomplished by using a compressed air-mixing* procedure instead of the mechanical mixing described in Step f (1). After preparation of the elutriate slurry, an air-diffuser tube is inserted almost to the bottom of the flask. Compressed air should be passed through a deionized water trap and then through the diffuser tube and the slurry. The flow rate should be adjusted to agitate the mixture vigorously for 30 min. In addition, the flasks should be stirred manually at 10-min intervals to ensure complete mixing.

* This procedure can cause the loss of highly volatile chemical constituents. If volatile materials are of concern, compressed air mixing should not be used.

g. After 30 min of shaking or mixing with air, allow the suspension to settle for one hour.

h. After settling, carefully decant the supernatant into appropriate centrifuge bottles and then centrifuge. The time and revolutions per minute during centrifugation should be selected to reduce the suspended solids concentration substantially and, therefore, shorten the final filtration process. After centrifugation, vacuum or pressure filter approximately 100 ml of sample through a 0.45-micron membrane filter and discard the filtrate. Filter the remainder of the sample to give a clear final solution (the standard elutriate) and store at 4°C in a clean, noncontaminating container in the dark. The filtration process is intended for use when the standard elutriate is to be analyzed for conventional chemical contaminants. When the elutriate is to be analyzed for organic contaminants and PCB's, filtration should not be used since organic concentrations can be reduced by sorption. Centrifugation should be used to remove particulate matter when the standard elutriate is to be analyzed for specific organics.

i. Analyze the standard elutriate as soon as possible. If necessary, the samples may be stored at 4°C after splitting and the appropriate preservatives have been added.

j. Prepare and analyze the elutriate in triplicate. The average of the three replicates should be reported as the concentration of the standard elutriate.

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# SUPERNATANT TEST PROCEDURE

## SUPERNATANT TEST

SOURCE: Patricia Lynch, Laboratory Manager, HALLIBURTON NUS Environmental Laboratory, Pittsburgh, Pennsylvania, via facsimile 1/21/93.

Test derived from: "Material Analysis for Dredge and Fill Activities," Section 401 Water Quality Certification, Illinois EPA.

## TEST PROCEDURE

1. Sample Preservation and Storage

   - One pint of sediment and 2 liters of surface water will be provided per sample location.

   - Store samples at 4 degrees celsius until the test is initiated. No specific holding time for supernatant preparation is available.

2. Sample Preparation

   - Prepare slurries of one part sediment to four parts surface water for each sampling point. Imhoff cones are recommended.

   - Allow the slurry to settle for 4 hours.

   - Decant off supernatant and place in preserved bottles for ammonia, TOC, metals, and solids. Store, as appropriate, at 4 degrees celsius until analyzed.

   - Analyze the 4-hour supernatants for ammonia, TOC, arsenic, copper, lead, mercury, nickel, zinc, TSS, and TVS. Depending on the results of the 4-hour test, a 24-hour test may be requested. Reserve some sample (sediment and water) should this be needed.

# TCLP TEST PROCEDURE

SOURCE: "Test Methods for Evaluating Solid Waste," SW846, November 1986.

## 7.4 TOXICITY CHARACTERISTIC LEACHING PROCEDURE

### 7.4.1 Introduction

The Toxicity Characteristic Leaching Procedure (TCLP) is designed to simulate the leaching a waste will undergo if disposed of in a sanitary landfill. This test is designed to simulate leaching that takes place in a sanitary landfill only. The extraction fluid employed is a function of the alkalinity of the solid phase of the waste. A subsample of a waste is extracted with the appropriate buffered acetic acid solution for 18 ± 2 hours. The extract obtained from the TCLP (the "TCLP extract") is then analyzed to determine if any of the thresholds established for the 40 Toxicity Characteristic (TC) constituents (listed in Table 7-1) have been exceeded or if the treatment standards established for the constituents listed in 40 CFR §268.41 have been met for the Land Disposal Restrictions (LDR) program. If the TCLP extract contains any one of the TC constituents in an amount equal to or exceeding the concentrations specified in 40 CFR §261.24, the waste possesses the characteristic of toxicity and is a hazardous waste. If the TCLP extract contains LDR constituents in an amount exceeding the concentrations specified in 40 CFR §268.41, the treatment standard for that waste has not been met, and further treatment is necessary prior to land disposal.

### 7.4.2 Summary of Procedure

The TCLP consists of five steps (refer to Figure 3):

1. Separation Procedure

For liquid wastes (i.e., those containing less than 0.5% dry solid material), the waste, after filtration through a 0.6 to 0.8 μm glass fiber filter, is defined as the TCLP extract.

For wastes containing greater than or equal to 0.5% solids, the liquid, if any, is separated from the solid phase and stored for later analysis.

2. Particle Size Reduction

Prior to extraction, the solid material must pass through a 9.5-mm (0.375-in.) standard sieve, have a surface area per gram of material equal to or greater than 3.1 $cm^2$, or, be smaller than 1 cm in its narrowest dimension. If the surface area is smaller or the particle size larger than described above, the solid portion of the waste is prepared for extraction by crushing, cutting, or grinding the waste to the surface area or particle size described above. (Special precautions must be taken if the solids are prepared for organic volatiles extraction.)

3. Extraction of Solid Material

The solid material from Step 2 is extracted for 18 ± 2 hours with an amount of extraction fluid equal to 20 times the weight of the solid phase. The extraction fluid employed is a function of the alkalinity of the solid phase of the waste. A special extractor vessel is used when testing for volatile analytes.

4. Final Separation of the Extraction from the Remaining Solid

Following extraction, the liquid extract is separated from the solid phase by filtration through a 0.6 to 0.8 $\mu m$ glass fiber filter. If compatible, the initial liquid phase of the waste is added to the liquid extract, and these are analyzed together. If incompatible, the liquids are analyzed separately and the results are mathematically combined to yield a volume-weighted average concentration.

5. Testing (Analysis) of TCLP Extract

Inorganic and organic species are identified and quantified using the appropriate methods in the 7000 and 8000 series of methods in this manual or by equivalent methods approved by the Administrator under the procedures set forth in 40 CFR 260.20 and 260.21.

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7.4.3 Regulatory Definition

Under the Toxicity Characteristic, a solid waste exhibits the characteristic of toxicity if, using the appropriate test methods described in this manual or equivalent methods approved by the Administrator under the procedures set forth in 40 CFR 260.20 and 260.21, the extract from a subsample of the waste contains any of the contaminants listed in Table 7-1 at a concentration greater than or equal to the respective value given in that table. If a waste contains <0.5% filterable solids, the waste itself, after filtering, is considered to be the extract for the purposes of analysis.

Under the Land Disposal Restrictions program, a restricted waste identified in 40 CFR §268.41 may be land disposed only if an extract of the waste or of the treatment residue of the waste (TCLP extract) does not exceed the value shown in Table CCWE of 40 CFR §268.41 for any hazardous constituent listed in Table CCWE for that waste. The constituent concentrations in the TCLP extract may be achieved by using the appropriate test methods described in this manual or equivalent methods approved by the Administrator under the procedures set forth in 40 CFR 260.20 and 260.21. If a waste contains <0.5% filterable solids, the waste itself, after filtering, is considered to be the extract for the purposes of analysis.

TABLE 7-1.

MAXIMUM CONCENTRATION OF CONTAMINANTS FOR TOXICITY CHARACTERISTIC

| Contaminant | Regulatory Level (mg/L) |
|---|---|
| Arsenic | 5.0 |
| Barium | 100.0 |
| Benzene | 0.5 |
| Cadmium | 1.0 |
| Carbon tetrachloride | 0.5 |
| Chlordane | 0.03 |
| Chlorobenzene | 100.0 |
| Chloroform | 6.0 |
| Chromium | 5.0 |
| o-Cresol | 200.0[1] |
| m-Cresol | 200.0[1] |
| p-Cresol | 200.0[1] |
| Cresol | 200.0[1] |
| 2,4-D | 10.0 |
| 1,4-Dichlorobenzene | 7.5 |
| 1,2-Dichloroethane | 0.5 |
| 1,1-Dichloroethylene | 0.7 |
| 2,4-Dinitrotoluene | 0.13[2] |
| Endrin | 0.02 |
| Heptachlor (and its hydroxide) | 0.008 |
| Hexachlorobenzene | 0.13[2] |
| Hexachlorobutadiene | 0.5 |
| Hexachloroethane | 3.0 |
| Lead | 5.0 |
| Lindane | 0.4 |
| Mercury | 0.2 |
| Methoxychlor | 10.0 |
| Methyl ethyl ketone | 200.0 |
| Nitrobenzene | 2.0 |
| Pentachlorophenol | 100.0 |
| Pyridine | 5.0[2] |
| Selenium | 1.0 |
| Silver | 5.0 |
| Tetrachloroethylene | 0.7 |
| Toxaphene | 0.5 |

TABLE 7-1.

MAXIMUM CONCENTRATION OF CONTAMINANTS FOR TOXICITY CHARACTERISTIC

| Contaminant | Regulatory Level (mg/L) |
|---|---|
| Trichloroethylene | 0.5 |
| 2,4,5-Trichlorophenol | 400.0 |
| 2,4,6-Trichlorophenol | 2.0 |
| 2,4,5-TP (Silvex) | 1.0 |
| Vinyl chloride | 0.2 |

[1]If o-, m-, and p-cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/L.

[2]Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

FIGURE 3.

TOXICITY CHARACTERISTIC LEACHATE PROCEDURE FLOWCHART

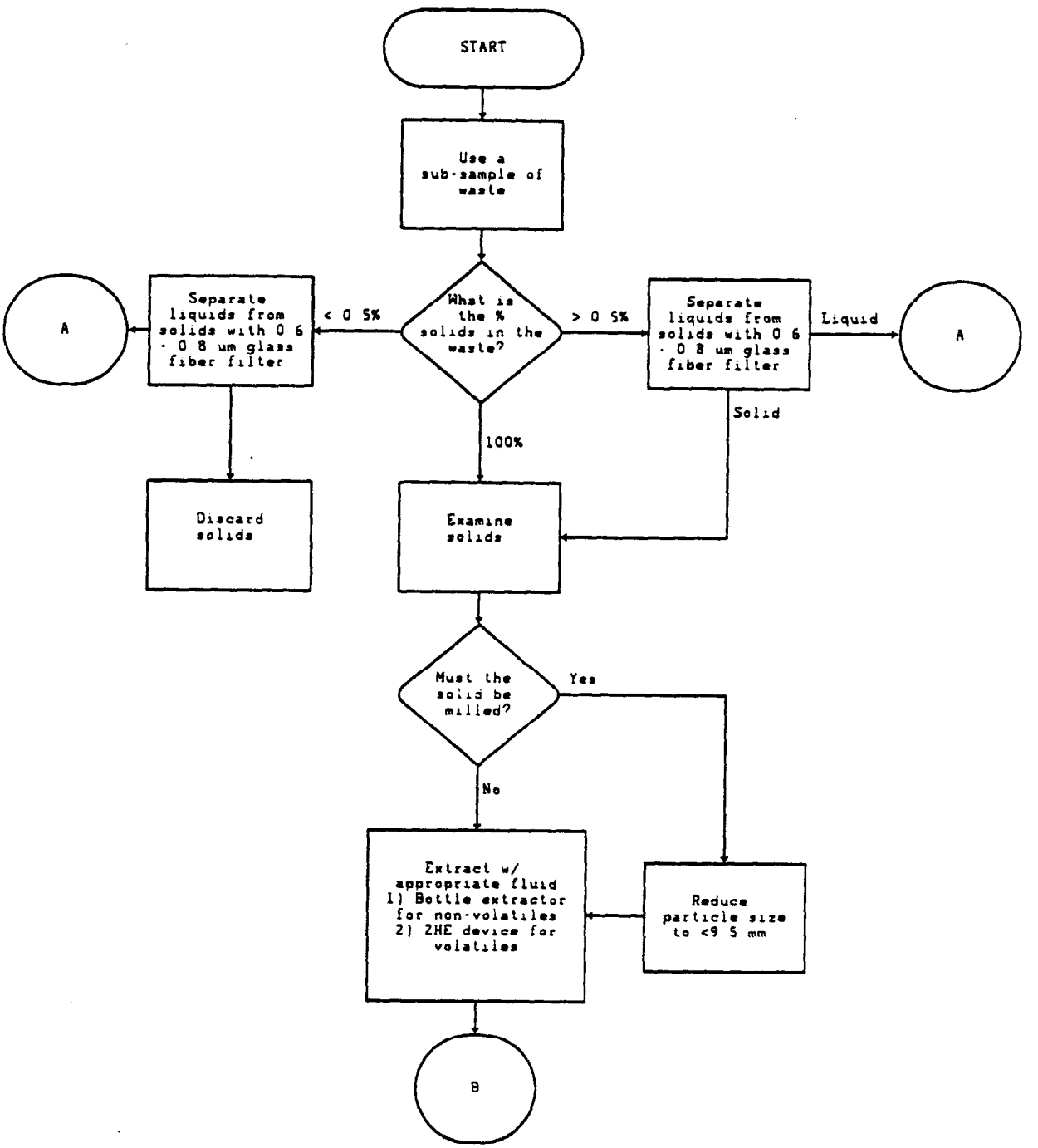
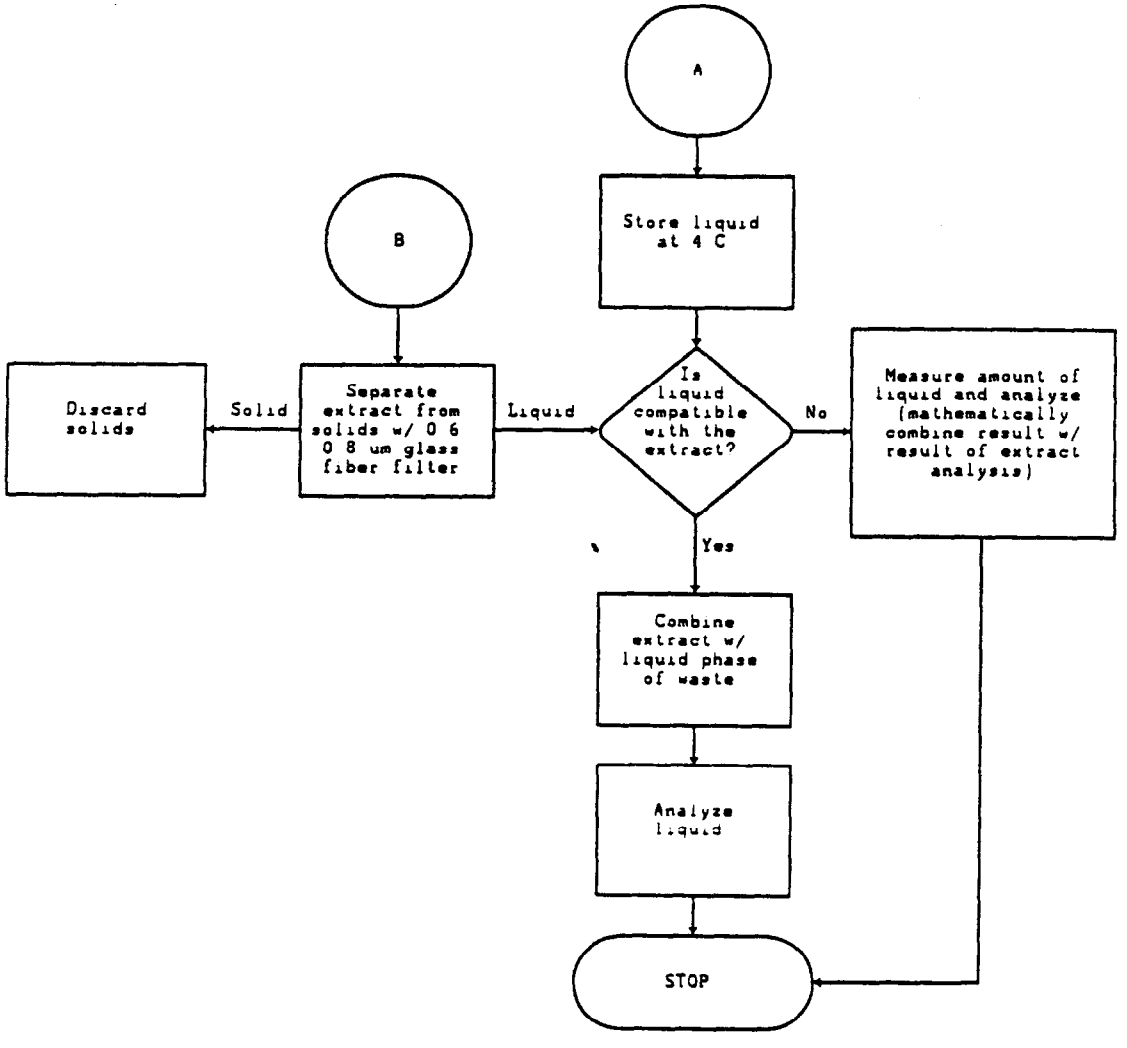


FIGURE 3.

TOXICITY CHARACTERISTIC LEACHATE PROCEDURE FLOWCHART



# PARTICLE SIZE TEST PROCEDURE

Designation: D 422 – 63 (Reapproved 1972)[ε1]

# Standard Method for Particle-Size Analysis of Soils[1]

This standard is issued under the fixed designation D 422; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

[ε1] NOTE—Section 2 was added editorially and subsequent sections renumbered in July 1984.

## 1. Scope

1.1 This method covers the quantitative determination of the distribution of particle sizes in soils. The distribution of particle sizes larger than 75 μm (retained on the No. 200 sieve) is determined by sieving, while the distribution of particle sizes smaller than 75 μm is determined by a sedimentation process, using a hydrometer to secure the necessary data (Notes 1 and 2).

NOTE 1—Separation may be made on the No. 4 (4.75-mm), No. 40 (425-μm), or No. 200 (75-μm) sieve instead of the No. 10. For whatever sieve used, the size shall be indicated in the report.

NOTE 2—Two types of dispersion devices are provided: (*1*) a high-speed mechanical stirrer, and (*2*) air dispersion. Extensive investigations indicate that air-dispersion devices produce a more positive dispersion of plastic soils below the 20-μm size and appreciably less degradation on all sizes when used with sandy soils. Because of the definite advantages favoring air dispersion, its use is recommended. The results from the two types of devices differ in magnitude, depending upon soil type, leading to marked differences in particle size distribution, especially for sizes finer than 20 μm.

## 2. Referenced Documents

2.1 *ASTM Standards:*

D 421 Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants[2]

E 11 Specification for Wire-Cloth Sieves for Testing Purposes[3]

E 100 Specification for ASTM Hydrometers[4]

## 3. Apparatus

3.1 *Balances*—A balance sensitive to 0.01 g for weighing the material passing a No. 10 (2.00-mm) sieve, and a balance sensitive to 0.1 % of the mass of the sample to be weighed for weighing the material retained on a No. 10 sieve.

3.2 *Stirring Apparatus*—Either apparatus A or B may be used.

3.2.1 Apparatus A shall consist of a mechanically operated stirring device in which a suitably mounted electric motor turns a vertical shaft at a speed of not less than 10 000 rpm without load. The shaft shall be equipped with a replaceable stirring paddle made of metal, plastic, or hard rubber, as shown in Fig. 1. The shaft shall be of such length that the stirring paddle will operate not less than ¾ in. (19.0 mm) nor more than 1½ in. (38.1 mm) above the bottom of the dispersion cup. A special dispersion cup conforming to either of the designs shown in Fig. 2 shall be provided to hold the sample while it is being dispersed.

3.2.2 Apparatus B shall consist of an air-jet dispersion cup[5] (Note 3) conforming to the general details shown in Fig. 3 (Notes 4 and 5).

NOTE 3—The amount of air required by an air-jet dispersion cup is of the order of 2 $ft^3$/min; some small air compressors are not capable of supplying sufficient air to operate a cup.

NOTE 4—Another air-type dispersion device, known as a dispersion tube, developed by Chu and Davidson at Iowa State College, has been shown to give results equivalent to those secured by the air-jet dispersion cups. When it is used, soaking of the sample can be done in the sedimentation cylinder, thus eliminating the need for transferring the slurry. When the air-dispersion tube is used, it shall be so indicated in the report.

NOTE 5—Water may condense in air lines when not in use. This water must be removed, either by using a water trap on the air line, or by blowing the water out of the line before using any of the air for dispersion purposes.

3.3 *Hydrometer*—An ASTM hydrometer, graduated to read in either specific gravity of the suspension or grams per litre of suspension, and conforming to the requirements for hydrometers 151H or 152H in Specifications E 100. Dimensions of both hydrometers are the same, the scale being the only item of difference.

3.4 *Sedimentation Cylinder*—A glass cylinder essentially 18 in. (457 mm) in height and 2½ in. (63.5 mm) in diameter, and marked for a volume of 1000 mL. The inside diameter shall be such that the 1000-mL mark is 36 ± 2 cm from the bottom on the inside.

3.5 *Thermometer*—A thermometer accurate to 1°F (0.5°C).

3.6 *Sieves*—A series of sieves, of square-mesh woven-wire cloth, conforming to the requirements of Specification E 11. A full set of sieves includes the following (Note 6):

[1] This method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.03 on Texture, Plasticity, and Density Characteristics of Soils.

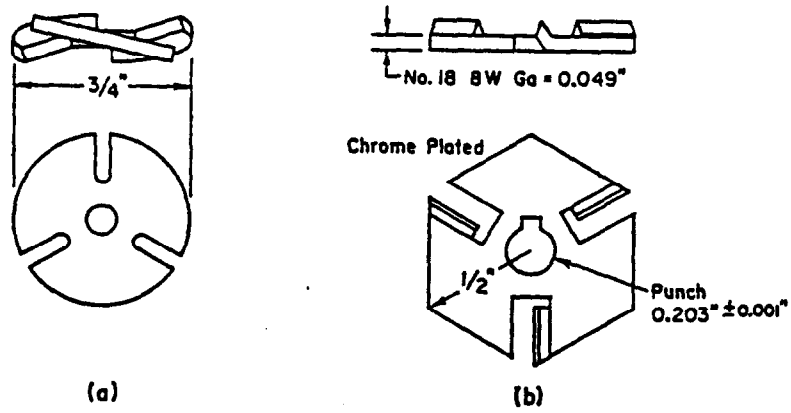
Current edition approved Nov. 21, 1963. Originally published 1935. Replaces D 422 – 62.

[2] *Annual Book of ASTM Standards*, Vol 04.08.

[3] *Annual Book of ASTM Standards*, Vol 14.02.

[4] *Annual Book of ASTM Standards*, Vol 14.03.

[5] Detailed working drawings for this cup are available at a nominal cost from the American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103. Order Adjunct No. 12-404220-00.




| Metric Equivalents | | | | | |
|---|---|---|---|---|---|
| in. | 0.001 | 0.049 | 0.203 | ½ | ¾ |
| mm | 0.03 | 1.24 | 5.16 | 12.7 | 19.0 |

FIG. 1 Detail of Stirring Paddles

| | |
|---|---|
| 3-in. (75-mm) | No. 10 (2.00-mm) |
| 2-in. (50-mm) | No. 20 (850-µm) |
| 1½-in. (37.5-mm) | No. 40 (425-µm) |
| 1-in. (25.0-mm) | No. 60 (250-µm) |
| ¾-in. (19.0-mm) | No. 140 (106-µm) |
| ⅜-in. (9.5-mm) | No. 200 (75-µm) |
| No. 4 (4.75-mm) | |

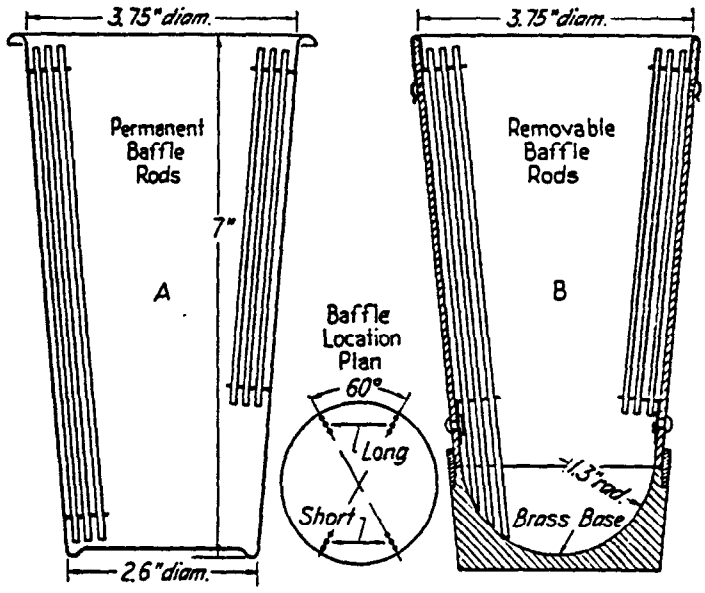
NOTE 6—A set of sieves giving uniform spacing of points for the graph, as required in Section 17, may be used if desired. This set consists of the following sieves:

| | |
|---|---|
| 3-in. (75-mm) | No. 16 (1.18-mm) |
| 1½-in. (37.5-mm) | No. 30 (600-µm) |
| ¾-in. (19.0-mm) | No. 50 (300-µm) |
| ⅜-in. (9.5-mm) | No. 100 (150-µm) |
| No. 4 (4.75-mm) | No. 200 (75-µm) |
| No. 8 (2.36-mm) | |

3.7 *Water Bath or Constant-Temperature Room*—A water bath or constant-temperature room for maintaining the soil suspension at a constant temperature during the hydrometer analysis. A satisfactory water tank is an insulated tank that maintains the temperature of the suspension at a convenient constant temperature at or near 68°F (20°C). Such a device is illustrated in Fig. 4. In cases where the work is performed in a room at an automatically controlled constant temperature, the water bath is not necessary.

3.8 *Beaker*—A beaker of 250-mL capacity.

3.9 *Timing Device*—A watch or clock with a second hand.




| Metric Equivalents | | | |
|---|---|---|---|
| in. | 1.3 | 2.6 | 3.75 |
| mm | 33 | 66 | 95.2 |

FIG. 2 Dispersion Cups of Apparatus

## 4. Dispersing Agent

4.1 A solution of sodium hexametaphosphate (sometimes called sodium metaphosphate) shall be used in distilled or demineralized water, at the rate of 40 g of sodium hexametaphosphate/litre of solution (Note 7).

NOTE 7—Solutions of this salt, if acidic, slowly revert or hydrolyze back to the orthophosphate form with a resultant decrease in dispersive action. Solutions should be prepared frequently (at least once a month) or adjusted to pH of 8 or 9 by means of sodium carbonate. Bottles containing solutions should have the date of preparation marked on them.

4.2 All water used shall be either distilled or demineralized water. The water for a hydrometer test shall be brought to the temperature that is expected to prevail during the hydrometer test. For example, if the sedimentation cylinder is to be placed in the water bath, the distilled or demineralized water to be used shall be brought to the temperature of the controlled water bath; or, if the sedimentation cylinder is used in a room with controlled temperature, the water for the test shall be at the temperature of the room. The basic temperature for the hydrometer test is 68°F (20°C). Small variations of temperature do not introduce differences that are of practical significance and do not prevent the use of corrections derived as prescribed.

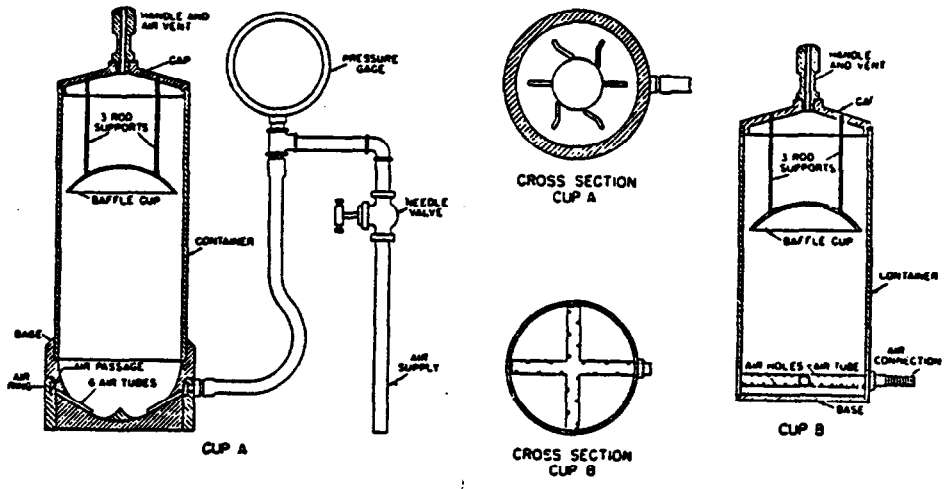



FIG. 3 Air-Jet Dispersion Cups of Apparatus B

## 5. Test Sample

5.1 Prepare the test sample for mechanical analysis as outlined in Practice D 421. During the preparation procedure the sample is divided into two portions. One portion contains only particles retained on the No. 10 (2.00-mm) sieve while the other portion contains only particles passing the No. 10 sieve. The mass of air-dried soil selected for purpose of tests, as prescribed in Practice D 421, shall be sufficient to yield quantities for mechanical analysis as follows:

5.1.1 The size of the portion retained on the No. 10 sieve shall depend on the maximum size of particle, according to the following schedule:

| Nominal Diameter of Largest Particles, in. (mm) | Approximate Minimum Mass of Portion, g |
|---|---|
| ⅜ (9.5) | 500 |
| ¾ (19.0) | 1000 |
| 1 (25.4) | 2000 |
| 1½ (38.1) | 3000 |
| 2 (50.8) | 4000 |
| 3 (76.2) | 5000 |

5.1.2 The size of the portion passing the No. 10 sieve shall be approximately 115 g for sandy soils and approximately 65 g for silt and clay soils.

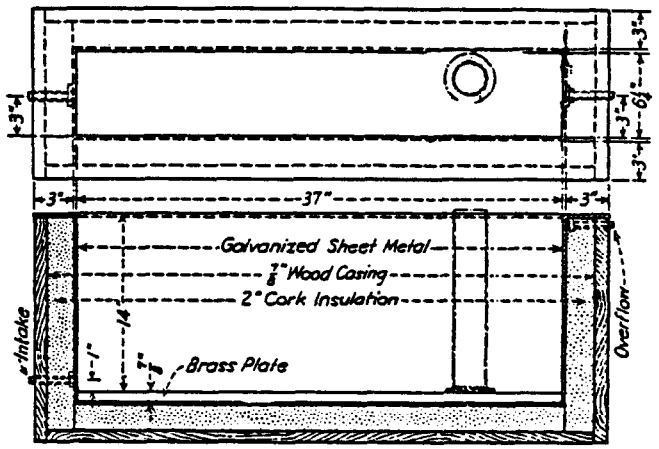
5.2 Provision is made in Section 5 of Practice D 421 for weighing of the air-dry soil selected for purpose of tests, the separation of the soil on the No. 10 sieve by dry-sieving and washing, and the weighing of the washed and dried fraction retained on the No. 10 sieve. From these two masses the percentages retained and passing the No. 10 sieve can be calculated in accordance with 12.1.

NOTE 8—A check on the mass values and the thoroughness of pulverization of the clods may be secured by weighing the portion passing the No. 10 sieve and adding this value to the mass of the washed and oven-dried portion retained on the No. 10 sieve.

### SIEVE ANALYSIS OF PORTION RETAINED ON NO. 10 (2.00-mm) SIEVE

## 6. Procedure

6.1 Separate the portion retained on the No. 10 (2.00-mm) sieve into a series of fractions using the 3-in. (75-mm), 2-in. (50-mm), 1½-in. (37.5-mm), 1-in. (25.0-mm), ¾-in. (19.0-mm), ⅜-in. (9.5-mm), No. 4 (4.75-mm), and No. 10 sieves, or as many as may be needed depending on the sample, or upon the specifications for the material under test.




Metric Equivalents

| in. | ⅞ | 1 | 3 | 6¼ | 14 | 37 |
|---|---|---|---|---|---|---|
| mm | 22.2 | 25.4 | 76.2 | 158.2 | 356 | 940 |

FIG. 4 Insulated Water Bath

6.2 Conduct the sieving operation by means of a lateral and vertical motion of the sieve, accompanied by a jarring action in order to keep the sample moving continuously over the surface of the sieve. In no case turn or manipulate fragments in the sample through the sieve by hand. Continue sieving until not more than 1 mass % of the residue on a sieve passes that sieve during 1 min of sieving. When mechanical sieving is used, test the thoroughness of sieving by using the hand method of sieving as described above.

6.3 Determine the mass of each fraction on a balance conforming to the requirements of 3.1. At the end of weighing, the sum of the masses retained on all the sieves used should equal closely the original mass of the quantity sieved.

## HYDROMETER AND SIEVE ANALYSIS OF PORTION PASSING THE NO. 10 (2.00-mm) SIEVE

### 7. Determination of Composite Correction for Hydrometer Reading

7.1 Equations for percentages of soil remaining in suspension, as given in 14.3, are based on the use of distilled or demineralized water. A dispersing agent is used in the water, however, and the specific gravity of the resulting liquid is appreciably greater than that of distilled or demineralized water.

7.1.1 Both soil hydrometers are calibrated at 68°F (20°C), and variations in temperature from this standard temperature produce inaccuracies in the actual hydrometer readings. The amount of the inaccuracy increases as the variation from the standard temperature increases.

7.1.2 Hydrometers are graduated by the manufacturer to be read at the bottom of the meniscus formed by the liquid on the stem. Since it is not possible to secure readings of soil suspensions at the bottom of the meniscus, readings must be taken at the top and a correction applied.

7.1.3 The net amount of the corrections for the three items enumerated is designated as the composite correction, and may be determined experimentally.

7.2 For convenience, a graph or table of composite corrections for a series of 1° temperature differences for the range of expected test temperatures may be prepared and used as needed. Measurement of the composite corrections may be made at two temperatures spanning the range of expected test temperatures, and corrections for the intermediate temperatures calculated assuming a straight-line relationship between the two observed values.

7.3 Prepare 1000 mL of liquid composed of distilled or demineralized water and dispersing agent in the same proportion as will prevail in the sedimentation (hydrometer) test. Place the liquid in a sedimentation cyclinder and the cylinder in the constant-temperature water bath, set for one of the two temperatures to be used. When the temperature of the liquid becomes constant, insert the hydrometer, and, after a short interval to permit the hydrometer to come to the temperature of the liquid, read the hydrometer at the top of the meniscus formed on the stem. For hydrometer 151H the composite correction is the difference between this reading and one; for hydrometer 152H it is the difference between the reading and zero. Bring the liquid and the hydrometer to the other temperature to be used, and secure the composite correction as before.

### 8. Hygroscopic Moisture

8.1 When the sample is weighed for the hydrometer test, weigh out an auxiliary portion of from 10 to 15 g in a small metal or glass container, dry the sample to a constant mass in an oven at 230 ± 9°F (110 ± 5°C), and weigh again. Record the masses.

### 9. Dispersion of Soil Sample

9.1 When the soil is mostly of the clay and silt sizes, weigh out a sample of air-dry soil of approximately 50 g. When the soil is mostly sand the sample should be approximately 100 g.

9.2 Place the sample in the 250-mL beaker and cover with 125 mL of sodium hexametaphosphate solution (40 g/L). Stir until the soil is thoroughly wetted. Allow to soak for at least 16 h.

9.3 At the end of the soaking period, disperse the sample further, using either stirring apparatus A or B. If stirring apparatus A is used, transfer the soil - water slurry from the beaker into the special dispersion cup shown in Fig. 2, washing any residue from the beaker into the cup with distilled or demineralized water (Note 9). Add distilled or demineralized water, if necessary, so that the cup is more than half full. Stir for a period of 1 min.

NOTE 9—A large size syringe is a convenient device for handling the water in the washing operation. Other devices include the wash-water bottle and a hose with nozzle connected to a pressurized distilled water tank.

9.4 If stirring apparatus B (Fig. 3) is used, remove the cover cap and connect the cup to a compressed air supply by means of a rubber hose. A air gage must be on the line between the cup and the control valve. Open the control valve so that the gage indicates 1 psi (7 kPa) pressure (Note 10). Transfer the soil - water slurry from the beaker to the air-jet dispersion cup by washing with distilled or demineralized water. Add distilled or demineralized water, if necessary, so that the total volume in the cup is 250 mL, but no more.

NOTE 10—The initial air pressure of 1 psi is required to prevent the soil - water mixture from entering the air-jet chamber when the mixture is transferred to the dispersion cup.

9.5 Place the cover cap on the cup and open the air control valve until the gage pressure is 20 psi (140 kPa). Disperse the soil according to the following schedule:

| Plasticity Index | Dispersion Period, min |
|---|---|
| Under 5 | 5 |
| 6 to 20 | 10 |
| Over 20 | 15 |

Soils containing large percentages of mica need be dispersed for only 1 min. After the dispersion period, reduce the gage pressure to 1 psi preparatory to transfer of soil - water slurry to the sedimentation cylinder.

### 10. Hydrometer Test

10.1 Immediately after dispersion, transfer the soil - water slurry to the glass sedimentation cylinder, and add distilled or demineralized water until the total volume is 1000 mL.

10.2 Using the palm of the hand over the open end of the cylinder (or a rubber stopper in the open end), turn the cylinder upside down and back for a period of 1 min to complete the agitation of the slurry (Note 11). At the end of 1 min set the cylinder in a convenient location and take hydrometer readings at the following intervals of time (measured from the beginning of sedimentation), or as many as may be needed, depending on the sample or the specification for the material under test: 2, 5, 15, 30, 60, 250, and 1440 min. If the controlled water bath is used, the sedimentation cylinder should be placed in the bath between the 2- and 5-min readings.

NOTE 11—The number of turns during this minute should be approximately 60, counting the turn upside down and back as two turns.

Any soil remaining in the bottom of the cylinder during the first few turns should be loosened by vigorous shaking of the cylinder while it is in the inverted position.

10.3 When it is desired to take a hydrometer reading, carefully insert the hydrometer about 20 to 25 s before the reading is due to approximately the depth it will have when the reading is taken. As soon as the reading is taken, carefully remove the hydrometer and place it with a spinning motion in a graduate of clean distilled or demineralized water.

NOTE 12—It is important to remove the hydrometer immediately after each reading. Readings shall be taken at the top of the meniscus formed by the suspension around the stem, since it is not possible to secure readings at the bottom of the meniscus.

10.4 After each reading, take the temperature of the suspension by inserting the thermometer into the suspension.

## 11. Sieve Analysis

11.1 After taking the final hydrometer reading, transfer the suspension to a No. 200 (75-μm) sieve and wash with tap water until the wash water is clear. Transfer the material on the No. 200 sieve to a suitable container, dry in an oven at 230 ± 9°F (110 ± 5°C) and make a sieve analysis of the portion retained, using as many sieves as desired, or required for the material, or upon the specification of the material under test.

## CALCULATIONS AND REPORT

## 12. Sieve Analysis Values for the Portion Coarser than the No. 10 (2.00-mm) Sieve

12.1 Calculate the percentage passing the No. 10 sieve by dividing the mass passing the No. 10 sieve by the mass of soil originally split on the No. 10 sieve, and multiplying the result by 100. To obtain the mass passing the No. 10 sieve, subtract the mass retained on the No. 10 sieve from the original mass.

12.2 To secure the total mass of soil passing the No. 4 (4.75-mm) sieve, add to the mass of the material passing the No. 10 sieve the mass of the fraction passing the No. 4 sieve and retained on the No. 10 sieve. To secure the total mass of soil passing the ⅜-in. (9.5-mm) sieve, add to the total mass of soil passing the No. 4 sieve, the mass of the fraction passing the ⅜-in. sieve and retained on the No. 4 sieve. For the remaining sieves, continue the calculations in the same manner.

12.3 To determine the total percentage passing for each sieve, divide the total mass passing (see 12.2) by the total mass of sample and multiply the result by 100.

## 13. Hygroscopic Moisture Correction Factor

13.1 The hydroscopic moisture correction factor is the ratio between the mass of the oven-dried sample and the air-dry mass before drying. It is a number less than one, except when there is no hygroscopic moisture.

## 14. Percentages of Soil in Suspension

14.1 Calculate the oven-dry mass of soil used in the hydrometer analysis by multiplying the air-dry mass by the hygroscopic moisture correction factor.

TABLE 1 Values of Correction Factor, $a$, for Different Specific Gravities of Soil Particles[A]

| Specific Gravity | Correction Factor[A] |
|---|---|
| 2.95 | 0.94 |
| 2.90 | 0.95 |
| 2.85 | 0.96 |
| 2.80 | 0.97 |
| 2.75 | 0.98 |
| 2.70 | 0.99 |
| 2.65 | 1.00 |
| 2.60 | 1.01 |
| 2.55 | 1.02 |
| 2.50 | 1.03 |
| 2.45 | 1.05 |

[A] For use in equation for percentage of soil remaining in suspension when using Hydrometer 152H.

14.2 Calculate the mass of a total sample represented by the mass of soil used in the hydrometer test, by dividing the oven-dry mass used by the percentage passing the No. 10 (2.00-mm) sieve, and multiplying the result by 100. This value is the weight $W$ in the equation for percentage remaining in suspension.

14.3 The percentage of soil remaining in suspension at the level at which the hydrometer is measuring the density of the suspension may be calculated as follows (Note 13): For hydrometer 151H:

$$P = [(100\,000/W) \times G/(G - G_1)](R - G_1)$$

NOTE 13—The bracketed portion of the equation for hydrometer 151H is constant for a series of readings and may be calculated first and then multiplied by the portion in the parentheses.

For hydrometer 152H:

$$P = (Ra/W) \times 100$$

where:

$a$ = correction faction to be applied to the reading of hydrometer 152H. (Values shown on the scale are computed using a specific gravity of 2.65. Correction factors are given in Table 1),

$P$ = percentage of soil remaining in suspension at the level at which the hydrometer measures the density of the suspension,

$R$ = hydrometer reading with composite correction applied (Section 7),

$W$ = oven-dry mass of soil in a total test sample represented by mass of soil dispersed (see 14.2), g,

$G$ = specific gravity of the soil particles, and

$G_1$ = specific gravity of the liquid in which soil particles are suspended. Use numerical value of one in both instances in the equation. In the first instance any possible variation produces no significant effect, and in the second instance, the composite correction for $R$ is based on a value of one for $G_1$.

## 15. Diameter of Soil Particles

15.1 The diameter of a particle corresponding to the percentage indicated by a given hydrometer reading shall be calculated according to Stokes' law (Note 14), on the basis that a particle of this diameter was at the surface of the suspension at the beginning of sedimentation and had settled to the level at which the hydrometer is measuring the density of the suspension. According to Stokes' law:

$$D = \sqrt{[30n/980(G - G_1)] \times L/T}$$

where:

$D$ = diameter of particle, mm,

$n$ = coefficient of viscosity of the suspending medium (in this case water) in poises (varies with changes in temperature of the suspending medium),

$L$ = distance from the surface of the suspension to the level at which the density of the suspension is being measured, cm. (For a given hydrometer and sedimentation cylinder, values vary according to the hydrometer readings. This distance is known as effective depth (Table 2)),

$T$ = interval of time from beginning of sedimentation to the taking of the reading, min,

$G$ = specific gravity of soil particles, and

$G_1$ = specific gravity (relative density) of suspending medium (value may be used as 1.000 for all practical purposes).

NOTE 14—Since Stokes' law considers the terminal velocity of a single sphere falling in an infinity of liquid, the sizes calculated represent the diameter of spheres that would fall at the same rate as the soil particles.

15.2 For convenience in calculations the above equation may be written as follows:

$$D = K\sqrt{L/T}$$

where:

$K$ = constant depending on the temperature of the suspension and the specific gravity of the soil particles. Values of $K$ for a range of temperatures and specific gravities are given in Table 3. The value of $K$ does not change for a series of readings constituting a test, while values of $L$ and $T$ do vary.

15.3 Values of $D$ may be computed with sufficient accuracy, using an ordinary 10-in. slide rule.

NOTE 15—The value of $L$ is divided by $T$ using the $A$- and $B$-scales, the square root being indicated on the $D$-scale. Without ascertaining the value of the square root it may be multiplied by $K$, using either the $C$- or $CI$-scale.

## 16. Sieve Analysis Values for Portion Finer than No. 10 (2.00-mm) Sieve

16.1 Calculation of percentages passing the various sieves used in sieving the portion of the sample from the hydrometer test involves several steps. The first step is to calculate the mass of the fraction that would have been retained on the No. 10 sieve had it not been removed. This mass is equal to the total percentage retained on the No. 10 sieve (100 minus total percentage passing) times the mass of the total sample represented by the mass of soil used (as calculated in 14.2), and the result divided by 100.

16.2 Calculate next the total mass passing the No. 200 sieve. Add together the fractional masses retained on all the sieves, including the No. 10 sieve, and subtract this sum from the mass of the total sample (as calculated in 14.2).

16.3 Calculate next the total masses passing each of the other sieves, in a manner similar to that given in 12.2.

16.4 Calculate last the total percentages passing by dividing the total mass passing (as calculated in 16.3) by the total mass of sample (as calculated in 14.2), and multiply the result by 100.

**TABLE 2 Values of Effective Depth Based on Hydrometer and Sedimentation Cylinder of Specified Sizes[A]**

| Hydrometer 151H | | Hydrometer 152H | | | |
|---|---|---|---|---|---|
| Actual Hydrometer Reading | Effective Depth, $L$, cm | Actual Hydrometer Reading | Effective Depth, $L$, cm | Actual Hydrometer Reading | Effective Depth, $L$, cm |
| 1.000 | 16.3 | 0 | 16.3 | 31 | 11.2 |
| 1.001 | 16.0 | 1 | 16.1 | 32 | 11.1 |
| 1.002 | 15.8 | 2 | 16.0 | 33 | 10.9 |
| 1.003 | 15.5 | 3 | 15.8 | 34 | 10.7 |
| 1.004 | 15.2 | 4 | 15.6 | 35 | 10.6 |
| 1.005 | 15.0 | 5 | 15.5 | | |
| 1.006 | 14.7 | 6 | 15.3 | 36 | 10.4 |
| 1.007 | 14.4 | 7 | 15.2 | 37 | 10.2 |
| 1.008 | 14.2 | 8 | 15.0 | 38 | 10.1 |
| 1.009 | 13.9 | 9 | 14.8 | 39 | 9.9 |
| 1.010 | 13.7 | 10 | 14.7 | 40 | 9.7 |
| 1.011 | 13.4 | 11 | 14.5 | 41 | 9.6 |
| 1.012 | 13.1 | 12 | 14.3 | 42 | 9.4 |
| 1.013 | 12.9 | 13 | 14.2 | 43 | 9.2 |
| 1.014 | 12.6 | 14 | 14.0 | 44 | 9.1 |
| 1.015 | 12.3 | 15 | 13.8 | 45 | 8.9 |
| 1.016 | 12.1 | 16 | 13.7 | 46 | 8.8 |
| 1.017 | 11.8 | 17 | 13.5 | 47 | 8.6 |
| 1.018 | 11.5 | 18 | 13.3 | 48 | 8.4 |
| 1.019 | 11.3 | 19 | 13.2 | 49 | 8.3 |
| 1.020 | 11.0 | 20 | 13.0 | 50 | 8.1 |
| 1.021 | 10.7 | 21 | 12.9 | 51 | 7.9 |
| 1.022 | 10.5 | 22 | 12.7 | 52 | 7.8 |
| 1.023 | 10.2 | 23 | 12.5 | 53 | 7.6 |
| 1.024 | 10.0 | 24 | 12.4 | 54 | 7.4 |
| 1.025 | 9.7 | 25 | 12.2 | 55 | 7.3 |
| 1.026 | 9.4 | 26 | 12.0 | 56 | 7.1 |
| 1.027 | 9.2 | 27 | 11.9 | 57 | 7.0 |
| 1.028 | 8.9 | 28 | 11.7 | 58 | 6.8 |
| 1.029 | 8.6 | 29 | 11.5 | 59 | 6.6 |
| 1.030 | 8.4 | 30 | 11.4 | 60 | 6.5 |
| 1.031 | 8.1 | | | | |
| 1.032 | 7.8 | | | | |
| 1.033 | 7.6 | | | | |
| 1.034 | 7.3 | | | | |
| 1.035 | 7.0 | | | | |
| 1.036 | 6.8 | | | | |
| 1.037 | 6.5 | | | | |
| 1.038 | 6.2 | | | | |

[A] Values of effective depth are calculated from the equation:

$$L = L_1 + \tfrac{1}{2}[L_2 - (V_B/A)]$$

where:

$L$ = effective depth, cm,

$L_1$ = distance along the stem of the hydrometer from the top of the bulb to the mark for a hydrometer reading, cm,

$L_2$ = overall length of the hydrometer bulb, cm,

$V_B$ = volume of hydrometer bulb, $cm^3$, and

$A$ = cross-sectional area of sedimentation cylinder, $cm^2$

Values used in calculating the values in Table 2 are as follows:

For both hydrometers, 151H and 152H:

$L_2$ = 14.0 cm

$V_B$ = 67.0 $cm^3$

$A$ = 27.8 $cm^2$

For hydrometer 151H:

$L_1$ = 10.5 cm for a reading of 1.000

= 2.3 cm for a reading of 1.031

For hydrometer 152H:

$L_1$ = 10.5 cm for a reading of 0 g/litre

= 2.3 cm for a reading of 50 g/litre

## 17. Graph

17.1 When the hydrometer analysis is performed, a graph

TABLE 3 Values of K for Use in Equation for Computing Diameter of Particle in Hydrometer Analysis

| Temperature, °C | Specific Gravity of Soil Particles | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2.45 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 |
| 16 | 0.01510 | 0.01505 | 0.01481 | 0.01457 | 0.01435 | 0.01414 | 0.01394 | 0.01374 | 0.01356 |
| 17 | 0.01511 | 0.01486 | 0.01462 | 0.01439 | 0.01417 | 0.01396 | 0.01376 | 0.01356 | 0.01338 |
| 18 | 0.01492 | 0.01467 | 0.01443 | 0.01421 | 0.01399 | 0.01378 | 0.01359 | 0.01339 | 0.01321 |
| 19 | 0.01474 | 0.01449 | 0.01425 | 0.01403 | 0.01382 | 0.01361 | 0.01342 | 0.1323 | 0.01305 |
| 20 | 0.01456 | 0.01431 | 0.01408 | 0.01386 | 0.01365 | 0.01344 | 0.01325 | 0.01307 | 0.01289 |
| 21 | 0.01438 | 0.01414 | 0.01391 | 0.01369 | 0.01348 | 0.01328 | 0.01309 | 0.01291 | 0.01273 |
| 22 | 0.01421 | 0.01397 | 0.01374 | 0.01353 | 0.01332 | 0.01312 | 0.01294 | 0.01276 | 0.01258 |
| 23 | 0.01404 | 0.01381 | 0.01358 | 0.01337 | 0.01317 | 0.01297 | 0.01279 | 0.01261 | 0.01243 |
| 24 | 0.01388 | 0.01365 | 0.01342 | 0.01321 | 0.01301 | 0.01282 | 0.01264 | 0.01246 | 0.01229 |
| 25 | 0.01372 | 0.01349 | 0.01327 | 0.01306 | 0.01286 | 0.01267 | 0.01249 | 0.01232 | 0.01215 |
| 26 | 0.01357 | 0.01334 | 0.01312 | 0.01291 | 0.01272 | 0.01253 | 0.01235 | 0.01218 | 0.01201 |
| 27 | 0.01342 | 0.01319 | 0.01297 | 0.01277 | 0.01258 | 0.01239 | 0.01221 | 0.01204 | 0.01188 |
| 28 | 0.01327 | 0.01304 | 0.01283 | 0.01264 | 0.01244 | 0.01255 | 0.01208 | 0.01191 | 0.01175 |
| 29 | 0.01312 | 0.01290 | 0.01269 | 0.01249 | 0.01230 | 0.01212 | 0.01195 | 0.01178 | 0.01162 |
| 30 | 0.01298 | 0.01276 | 0.01256 | 0.01236 | 0.01217 | 0.01199 | 0.01182 | 0.01165 | 0.01149 |

of the test results shall be made, plotting the diameters of the particles on a logarithmic scale as the abscissa and the percentages smaller than the corresponding diameters to an arithmetic scale as the ordinate. When the hydrometer analysis is not made on a portion of the soil, the preparation of the graph is optional, since values may be secured directly from tabulated data.

## 18. Report

18.1 The report shall include the following:

18.1.1 Maximum size of particles,

18.1.2 Percentage passing (or retained on) each sieve, which may be tabulated or presented by plotting on a graph (Note 16),

18.1.3 Description of sand and gravel particles:

18.1.3.1 Shape—rounded or angular,

18.1.3.2 Hardness—hard and durable, soft, or weathered and friable,

18.1.4 Specific gravity, if unusually high or low,

18.1.5 Any difficulty in dispersing the fraction passing the No. 10 (2.00-mm) sieve, indicating any change in type and amount of dispersing agent, and

18.1.6 The dispersion device used and the length of the dispersion period.

NOTE 16—This tabulation of graph represents the gradation of the sample tested. If particles larger than those contained in the sample were removed before testing, the report shall so state giving the amount and maximum size.

18.2 For materials tested for compliance with definite specifications, the fractions called for in such specifications shall be reported. The fractions smaller than the No. 10 sieve shall be read from the graph.

18.3 For materials for which compliance with definite specifications is not indicated and when the soil is composed almost entirely of particles passing the No. 4 (4.75-mm) sieve, the results read from the graph may be reported as follows:

(1) Gravel, passing 3-in. and retained on No. 4 sieve ..... %
(2) Sand, passing No. 4 sieve and retained on No. 200 sieve ..... %
  (a) Coarse sand, passing No. 4 sieve and retained on No. 10 sieve ..... %
  (b) Medium sand, passing No. 10 sieve and retained on No. 40 sieve ..... %
  (c) Fine sand, passing No. 40 sieve and retained on No. 200 sieve ..... %
(3) Silt size, 0.074 to 0.005 mm ..... %
(4) Clay size, smaller than 0.005 mm ..... %
  Colloids, smaller than 0.001 mm ..... %

18.4 For materials for which compliance with definite specifications is not indicated and when the soil contains material retained on the No. 4 sieve sufficient to require a sieve analysis on that portion, the results may be reported as follows (Note 17):

SIEVE ANALYSIS

| Sieve Size | Percentage Passing |
|---|---|
| 3-in. | ..... |
| 2-in. | ..... |
| 1½-in. | ..... |
| 1-in. | ..... |
| ¾-in. | ..... |
| ⅜-in. | ..... |
| No. 4 (4.75-mm) | ..... |
| No. 10 (2.00-mm) | ..... |
| No. 40 (425-μm) | ..... |
| No. 200 (75-μm) | ..... |
| HYDROMETER ANALYSIS | |
| 0.074 mm | ..... |
| 0.005 mm | ..... |
| 0.001 mm | ..... |

NOTE 17—No. 8 (2.36-mm) and No. 50 (300-μm) sieves may be substituted for No. 10 and No. 40 sieves.

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# IEPA GUIDANCE

# MATERIAL ANALYSIS FOR DREDGE AND FILL ACTIVITIES

# MATERIAL ANALYSIS FOR DREDGE AND FILL ACTIVITIES
For Section 401 Water Quality Certification
From the Illinois Environmental Protection Agency

Generally, a particle size analysis (sand/fine split) is required for all projects or activities involving the movement of any material. This analysis is necessary for the issuance of a Section 401 Water Quality Certification in conjunction with the US Army Corps of Engineers Section 404 Dredge and Fill permit. IF YOUR PROPOSED PROJECT INVOLVES THE MOVEMENT OF MATERIAL INTO OR OUT OF A WATERWAY, YOU MUST PROVIDE THE FOLLOWING INFORMATION:

Excluded from the following analysis are concrete, commercially graded sand and gravel, and other nondegradable, nontoxic, clean fill materials. For further clarification on these exclusions, contact the IEPA.

1. Provide the results of particle size analysis (sand/fine split). The analysis will follow procedures detailed below for the separation of sand from fines, and results will be reported as the percentage by weight passing a 62 micron sieve (#230 US sieve). The physical characteristics of the material should be noted.

a. Significant organic matter should be removed as follows: Add 5 ml of 6-percent solution of hydrogen peroxide for each gram of dry sample which is in 40 ml water. Stir and cover. Large fragments may be skimmed off if they are free of sediment. If oxidation is slow or has slowed, the mixture is heated to 93 degrees C and stirred. More hydrogen peroxide solution may be necessary to complete oxidation. After the reaction has completely stopped, wash with distilled water.

b. The composited sediment is placed in the soil dispersion cup and diluted to 250-300 ml with distilled water. Mix for 5 minutes at 10,000 RPM.

c. The sediment is then wet-sieved using distilled water and a #230 US sieve (62 micron mesh). Washing should be continued until no sediment passes the screen. Material is then over-dried at 103 degrees - 105 degrees C prior to weighing.

2. If the particle size analysis shows 20 percent or greater passage of material through a #230 US sieve (or 20 percent of the material has settling velocities of particles with diameters of 62 microns or less), chemical constituent testing of the sediment and receiving disposal waters will be required and must demonstrate that the sediment does not contain significant levels of toxic materials.

a. For hydraulically moved material, a supernatant test for nonsettleable material from 2540 of Standard Methods for Water and Wastewater Analysis (17th edition, 1989) is required. This analysis for a four-hour settling of 1:4 sediment to natural background water slurry (vol./vol.) is to be compared to the receiving disposal waters. Provide laboratory analysis on sediment/background water slurry and on receiving disposal water for the following parameters: total suspended solids (TSS), total volatile solids (TVS), ammonia-nitrogen as N, lead (total), and zinc. Additional parameters may be required. If supernatant test results exceed background or standards of Subtitle C: Water Pollution of the Illinois Pollution Control Board Rules and Regulations, a supernatant test with 24-hour settlement or a 24-hour settleability test is recommended. These detailed suspended phase tests should be undertaken at the applicant's discretion. Consideration should be given to background variability with differences in flow volume and flow rate, and subsequent project scheduling. Contact the IEPA for further information concerning additional suspended phase testing.

b. For mechanically moved material placed out of the water, an elutriate test using 2540 of Standard Methods is required for lead, zinc, and ammonia-nitrogen as N. Additional testing and/or additional parameters may be required. Testing is not necessary for mechanically excavated material used for fill in upland areas, which is nonpollutional, placed away from public water supplies, and is prevented from returning to a waterway.

c. For mechanically moved material placed in a waterway, follow procedures in 2a.

[Revised: 8/90]

SOURCE: "Standard Methods for Water and Wastewater Analysis," 17th edition, 1989.



### 4. Reagents

*a. 1,1,2-trichloro-1,2,2-trifluoroethane**: See Section 5520B.3*b*.

*b. Hydrochloric acid*, HCl, 6*N*.

*c. Filter paper.*†

### 5. Procedure

*a. Sampling:* Collect samples at a place where there is a strong turbulence in the water and where floating material is not trapped at the surface. Fill floatable oil tube to mark by dipping into water. *Do not use samples taken to the laboratory in a bottle, because oil and grease cannot be redispersed to their original condition.*

*b. Flotation:* Support tube in a vertical position. Start flotation period at sampling site immediately after filling tube. The standard flotation time is 30 min. If a different time is used, state this variation in reporting results. At end of flotation period, discharge the first 900 mL of water carefully through bottom stopcock, stopping before any surface oil or other floating material escapes. Rotate tube slightly back and forth about its vertical axis to dislodge sludge from sides, and let settle for 5 min. Completely discharge sludge that has settled to the bottom or that comes down from the sides with the liquid. Scum on top of the liquid may mix with the water as it moves down the tube. If mixing occurs, stop drawing off water before any floatables have been lost. Let settle for 5 min before withdrawing remainder of water. After removing water, return tube to laboratory to complete test.

*c. Extraction:* Acidify to pH 2 or lower with a few drops of 6*N* HCl, add 50 to 100 mL trichlorotrifluoroethane, and shake vigorously. Let settle and draw off solvent into a clean dry beaker. Filter solvent through a dry filter paper into a tared 300-mL conical flask, taking care not to get any water on filter paper. Add a second 50-mL portion of trichlorotrifluoroethane and repeat extraction, settling, and filtration into the same 300-mL flask. A third extraction may be needed if the amount of floatables in sample exceeds 4 mg/L. Wash filter paper carefully with fresh solvent discharged from a wash bottle with a fine tip. Evaporate solvent from flask as described in Section 5520B.4. For each solvent batch, determine weight of residue left after evaporation from the same volume as used in the analysis.

### 6. Calculations

Report results as "soluble floatable oil and grease, 30 min (or other specified) settling time, mg/L."

Trichlorotrifluoroethane-soluble floatable oil and grease, 30 min settling time, mg/L

$$= \frac{(A - B) \times 1000}{\text{mL sample}}$$

where:

$A$ = total gain in weight of tared flask, mg, and

$B$ = calculated residue from solvent blank of the same volume as that used in the test, mg.

### 6. Precision and Bias

There is no standard against which bias of this test can be determined. Variability of replicates is influenced by sample heterogeneity. If large grease particles are present, the element of change in sampling may be a major factor. One municipal wastewater discharge and two meat-packing plant discharges, both containing noticeable particles of grease, were analyzed in triplicate. Averages for the three wastewaters were 48, 57, and 25 mg/L; standard deviations averaged 11%. An oil refinery made duplicate determinations of its separator effluent on 15 consecutive days, obtaining results ranging from 5.1 to 11.2 mg/L. The average difference between pairs of samples was 0.37 mg/L.

*From or equivalent.

†Whatman No. 40 or equivalent.



### 7. Bibliography

POMEROY, R.D. 1953. Floatability of oil and grease in wastewaters. *Sewage Ind. Wastes* 25:1304.

# 2540 SOLIDS*

## 2540 A. Introduction

The terms "solids," "suspended," and "dissolved," as used herein, replace the terms "residue," "nonfiltrable," and "filtrable" of editions previous to the 16th. Solids refer to matter suspended or dissolved in water or wastewater. Solids may affect water or effluent quality adversely in a number of ways. Waters with high dissolved solids generally are of inferior palatability and may induce an unfavorable physiological reaction in the transient consumer. For these reasons, a limit of 500 mg dissolved solids/L is desirable for drinking waters. Highly mineralized waters also are unsuitable for many industrial applications. Waters high in suspended solids may be esthetically unsatisfactory for such purposes as bathing. Solids analyses are important in the control of biological and physical wastewater treatment processes and for assessing compliance with regulatory agency wastewater effluent limitations.

### 1. Definitions

"Total solids" is the term applied to the material residue left in the vessel after evaporation of a sample and its subsequent drying in an oven at a defined temperature. Total solids includes "total suspended solids," the portion of total solids retained by a filter, and "total dissolved solids," the portion that passes through the filter.

The type of filter holder, the pore size, porosity, area, and thickness of the filter and the physical nature, particle size, and amount of material deposited on the filter are the principal factors affecting separation of suspended from dissolved solids.

"Fixed solids" is the term applied to the residue of total, suspended, or dissolved solids after ignition for a specified time at a specified temperature. The weight loss on ignition is called "volatile solids." Determinations of fixed and volatile solids do not distinguish precisely between inorganic and organic matter because the loss on ignition is not confined to organic matter. It includes losses due to decomposition or volatilization of some mineral salts. Better characterization of organic matter can be made by such tests as total organic carbon (Section 5310), BOD (Section 5210), and COD (Section 5220).

"Settleable solids" is the term applied to the material settling out of suspension within a defined period. It may include floating material, depending on the technique (2540F.3*b*).

### 2. Sources of Error and Variability

The temperature at which the residue is dried has an important bearing on results, because weight losses due to volatilization of organic matter, mechanically occluded water, water of crystallization, and gases from heat-induced chemical decompos-

*Approved by Standard Methods Committee, 1985.

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## 2540 F. Settleable Solids

### 1. General Discussion

Settleable solids in surface and saline waters as well as domestic and industrial wastes may be determined and reported on either a volume (mL/L) or a weight (mg/L) basis.

### 2. Apparatus

The volumetric test requires only an Imhoff cone. The gravimetric test requires all the apparatus listed in Section 2540D.2 and a glass vessel with a minimum diameter of 9 cm.

### 3. Procedure

*a. Volumetric:* Fill an Imhoff cone to the 1-L mark with a well-mixed sample. Settle for 45 min, gently stir sides of cone with a rod or by spinning, settle 15 min longer, and record volume of settleable solids in the cone as milliliters per liter. If the settled matter contains pockets of liquid between large settled particles, estimate volume of these and subtract from volume of settled solids. The practical lower limit of measurement depends on sample composition and generally is in the range of 0.1 to 1.0 mL/L. Where a separation of settleable and floating materials occurs, do not estimate the floating material as settleable matter.

*b. Gravimetric:*

1) Determine total suspended solids of well-mixed sample (Section 2540D).

2) Pour a well-mixed sample into a glass vessel of not less than 9 cm diam using not less than 1 L and sufficient to give a depth of 20 cm. Alternatively use a glass vessel of greater diameter and a larger volume of sample. Let stand quiescent for 1 h and, without disturbing the settled or floating material, siphon 250 mL from center of container at a point halfway between the surface of the settled material and the liquid surface. Determine total suspended solids (milligrams per liter) of this supernatant liquor (Section 2540D). These are the nonsettleable solids.

### 4. Calculation

mg settleable solids/L

= mg total suspended solids/L

− mg nonsettleable solids/L

### 5. Precision and Bias

Precision and bias data are not now available.

### 6. Bibliography

FISCHER, A.J. & O.E. SYMONS. 1944. The determination of settleable sewage solids by weight. *Water Sewage Works* 91:37.

## 2540 G. Total, Fixed, and Volatile Solids in Solid and Semisolid Samples

### 1. General Discussion

*a. Applicability:* This method is applicable to the determination of total solids and its fixed and volatile fractions in such solid and semisolid samples as river and lake sediments, sludges separated from [illegible] and sludge cakes from vacuum filtration, centrifugation, or other sludge dewatering processes.

*b. Interferences:* The determination of both total and volatile solids in these materials is subject to negative error due to loss of ammonium carbonate and volatile organic matter during drying. Although



this is true also for wastewater, the effect tends to be more pronounced with sediments, and especially with sludges and sludge cakes. The mass of organic matter recovered from sludge and sediment requires a longer ignition time than that specified for wastewaters, effluents, or polluted waters. Carefully observe specified ignition time and temperature to control losses of volatile inorganic salts. Make all weighings quickly because wet samples tend to lose weight by evaporation. After drying or ignition, residues often are very hygroscopic and rapidly absorb moisture from the air.

### 2. Apparatus

All the apparatus listed in Section 2540B.2 is required except that a balance capable of weighing to 10 mg may be used.

### 3. Procedure

*a. Total solids:*

1) Preparation of evaporating dish—If volatile solids are to be measured, ignite a clean evaporating dish at 550 ± 50°C for 1 h in a muffle furnace. If only total solids are to be measured, heat dish at 103 to 105°C for 1 h in an oven. Cool in desiccator, weigh, and store in desiccator until ready for use.

2) Sample analysis

a) Fluid samples—If the sample contains enough moisture to flow more or less readily, stir to homogenize, place 25 to 50 g in a prepared evaporating dish, and weigh. Evaporate to dryness on a water bath, dry at 103 to 105°C for 1 h, cool to balance temperature in an individual desiccator containing fresh desiccant, and weigh.

b) Solid samples—If the sample consists of discrete pieces of solid material (dewatered sludge, for example), take cores from each piece with a No. 7 cork borer or pulverize the entire sample coarsely on a clean surface by hand, using rubber gloves. Place 25 to 50 g in a prepared evaporating dish and weigh. Place in an oven at 103 to 105°C overnight. Cool to balance temperature in an individual desiccator containing fresh desiccant and weigh.

*b. Fixed and volatile solids:* Transfer to a cool muffle furnace, heat furnace to 550 ± 50°C, and ignite for 1 h. (If the residue from 2) above contains large amounts of organic matter, first ignite the residue over a gas burner and under an exhaust hood in the presence of adequate air to lessen losses due to reducing conditions and to avoid odors in the laboratory.) Cool in desiccator to balance temperature and weigh.

### 4. Calculation

$$\% \text{ total solids} = \frac{(A - B) \times 100}{C - B}$$

$$\% \text{ volatile solids} = \frac{(A - D) \times 100}{A - B}$$

$$\% \text{ fixed solids} = \frac{(D - B) \times 100}{A - B}$$

where:

$A$ = weight of dried residue + dish, mg,
$B$ = weight of dish,
$C$ = weight of wet sample + dish, mg, and
$D$ = weight of residue + dish after ignition, mg.

### 5. Precision and Bias

Precision and bias data are not now available.

### 6. Bibliography

GOODMAN, B.L. 1964. Processing thickened sludge with chemical conditioners. Pages 7 et seq. *In* Sludge Concentration, Filtration and Incineration. Univ. Michigan Continuing Education Ser. No. 113, Ann Arbor.

GRATTEAU, J.C. & R.I. DICK. 1968. Activated sludge suspended solids determination. *Water Sewage Works* 115:468.

01/21/93 10:28 ☎317 884 3141 SEC DONOHUE →→→ CHICAGO 003

## 2540 C. Total Dissolved Solids Dried at 180°C

### ıeral Discussion

*rinciple:* A well-mixed sample is filhrough a standard glass fiber filter, e filtrate is evaporated to dryness in ghed dish and dried to constant at 180°C. The increase in dish represents the total dissolved solids. results may not agree with the the- l value for solids calculated from :al analysis of sample (see above). ximate methods for correlating :al analysis with dissolved solids are ıle.[1] The filtrate from the total sus- l solids determination (Section ) may be used for determination of lissolved solids.

*Interferences:* Highly mineralized with a considerable calcium, mag- ı, chloride, and/or sulfate content e hygroscopic and require prolonged proper desiccation, and rapid ng. Samples high in bicarbonate re- careful and possibly prolonged drying °C to insure complete conversion of onate to carbonate. Because exces- sidue in the dish may form a water- ng crust, limit sample to no more :00 mg residue.

### oaratus

ıaratus listed in 2540B.2*a-d* is re- , and in addition:

*Glass-fiber filter disks** without or- binder.

*Filtration apparatus:* One of the fol- ;, suitable for filter disk selected:

*Membrane filter funnel.*

2) *Gooch crucible,* 25-mL to 40-mL capacity, with Gooch crucible adapter.

3) *Filtration apparatus* with reservoir and coarse (40- to 60-µm) fritted disk as filter support.

*c. Suction flask,* of sufficient capacity for sample size selected.

*d. Drying oven,* for operation at 180 ± 2°C.

### 3. Procedure

*a. Preparation of glass-fiber filter disk:* Insert disk with wrinkled side up into filtration apparatus. Apply vacuum and wash disk with three successive 20-mL volumes of distilled water. Continue suction to remove all traces of water. Discard washings.

*b. Preparation of evaporating dish:* If volatile solids are to be measured, ignite cleaned evaporating dish at 550 ± 50°C for 1 h in a muffle furnace. If only total dissolved solids are to be measured, heat clean dish to 180 ± 2°C for 1 h in an oven. Store in desiccator until needed. Weigh immediately before use.

*c. Selection of filter and sample sizes:* Choose sample volume to yield between 2.5 and 200 mg dried residue. If more than 10 min are required to complete filtration, increase filter size or decrease sample volume but do not produce less than 2.5 mg residue.

*d. Sample analysis:* Filter measured volume of well-mixed sample through glass-fiber filter, wash with three successive 10-mL volumes of distilled water, allowing complete drainage between washings, and continue suction for about 3 min after filtration is complete. Transfer filtrate to a weighed evaporating dish and evaporate to dryness on a steam bath. If filtrate volume exceeds dish capacity add successive portions to the same dish after evaporation. Dry for at least 1 h in an oven at 180 ± 2°C, cool in a desiccator to balance temperature, and weigh. Repeat drying cycle of drying, cooling, desiccating, and weighing until a constant weight is obtained or until weight loss is less than 4% of previous weight or 0.5 mg, whichever is less.

ıon grade 934AH; Gelman type A/E; Millipore 40; E-D Scientific Specialties grade 161; or equiv- vailable in diameters of 2.2 cm to 4.7 cm.



### 4. Calculation

$$\text{mg total dissolved solids/L} = \frac{(A - B) \times 1000}{\text{sample volume, mL}}$$

where:

$A$ = weight of dried residue + dish, mg, and
$B$ = weight of dish, mg.

### 5. Precision

Single-laboratory analyses of 77 samples of a known of 293 mg/L were made with a standard deviation of differences of 21.20 mg/L.

### 6. Reference

1. SOKOLOFF, V.P. 1933. Water of crystallization in total solids of water analysis. *Ind. Eng. Chem.,* Anal. Ed. 5:336.

### 7. Bibliography

HOWARD, C.S. 1933. Determination of total dissolved solids in water analysis. *Ind. Eng. Chem.,* Anal. Ed. 5:4.

U.S. GEOLOGICAL SURVEY. 1974. Methods for Collection and Analysis of Water Samples for Dissolved Minerals and Gases. Techniques of Water-Resources Investigations, Book 5, Chap. A1. U.S. Geological Surv., Washington, D.C.

## 2540 D. Total Suspended Solids Dried at 103–105°C

### 1. General Discussion

*a. Principle:* A well-mixed sample is filtered through a weighed standard glass-fiber filter and the residue retained on the filter is dried to a constant weight at 103 to 105°C. The increase in weight of the filter represents the total suspended solids. If the suspended material clogs the filter and prolongs filtration, the difference between the total solids and the total dissolved solids may provide an estimate of the total suspended solids.

*b. Interferences:* Exclude large floating particles or submerged agglomerates of nonhomogeneous materials from the sample if it is determined that their inclusion is not desired in the final result. Because excessive residue on the filter may form a water-entrapping crust, limit the sample size to that yielding no more than 200 mg residue. For samples high in dissolved solids thoroughly wash the filter to ensure removal of the dissolved material. Prolonged filtration times resulting from filter clogging may produce high results owing to excessive solids capture on the clogged filter.

### 2. Apparatus

Apparatus listed in Sections 2540B.2 and 2540C.2 is required, except for evaporating dishes, steam bath, and 180°C drying oven. In addition:

*Planchet,** aluminum or stainless steel, 65-mm diam.

### 3. Procedure

*a. Preparation of glass-fiber filter disk:* Insert disk with wrinkled side up in filtra-

*Available from New England Nuclear, Boston, Mass., or equivalent.

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tion apparatus. Apply vacuum and wash disk with three successive 20-mL portions of distilled water. Continue suction to remove all traces of water, and discard washings. Remove filter from filtration apparatus and transfer to an aluminum or stainless steel planchet as a support. Alternatively remove crucible and filter combination if a Gooch crucible is used. Dry in an oven at 103 to 105°C for 1 h. If volatile solids are to be measured, ignite at 550 ± 50°C for 15 min in a muffle furnace. Cool in desiccator to balance temperature and weigh. Repeat cycle of drying or igniting, cooling, desiccating, and weighing until a constant weight is obtained or until weight loss is less than 0.5 mg between successive weighings. Store in desiccator until needed. Weigh immediately before use.

*b. Selection of filter and sample sizes:* See Section 2540C.3c. For nonhomogeneous samples such as raw wastewater, use a large filter to permit filtering a representative sample.

*c. Sample analysis:* Assemble filtering apparatus and filter and begin suction. Wet filter with a small volume of distilled water to seat it. Filter a measured volume of well-mixed sample through the glass fiber filter. Wash with three successive 10-mL volumes of distilled water, allowing complete drainage between washings and continue suction for about 3 min after filtration is complete. Carefully remove filter from filtration apparatus and transfer to an aluminum or stainless steel planchet as a support. Alternatively, remove the crucible and filter combination from the crucible adapter if a Gooch crucible is used. Dry for at least 1 h at 103 to 105°C in an oven, cool in a desiccator to balance temperature, and weigh. Repeat the cycle of drying, cooling, desiccating, and weighing until a constant weight is obtained or until the weight loss is less than 4% of the previous weight or 0.5 mg, whichever is less.

## 4. Calculation

$$\text{mg total suspended solids/L} = \frac{(A - B) \times 1000}{\text{sample volume, mL}}$$

where:

$A$ = weight of filter + dried residue, mg, and
$B$ = weight of filter, mg.

## 5. Precision

The standard deviation was 5.2 mg/L (coefficient of variation 33%) at 15 mg/L, 24 mg/L (10%) at 242 mg/L, and 13 mg/L (0.76%) at 1707 mg/L in studies by two analysts of four sets of 10 determinations each.

Single-laboratory duplicate analyses of 50 samples of water and wastewater were made with a standard deviation of differences of 2.8 mg/L.

## 6. Bibliography


DEGEN, J. & F.E. NUSSBERGER. 1956. Notes on the determination of suspended solids. *Sewage Ind. Wastes* 28:237.

CHANIN, G., E.H. CHOW, R.B. ALEXANDER & J. POWERS. 1958. Use of glass fiber filter medium in the suspended solids determination. *Sewage Ind. Wastes* 30:1062.

NUSBAUM, I. 1958. New method for determination of suspended solids. *Sewage Ind. Wastes* 30:1066.

SMITH, A.L. & A.E. GREENBERG. 1963. Evaluation of methods for determining suspended solids in wastewater. *J. Water Pollut. Control Fed.* 35:940.

WYCKOFF, B.M. 1964. Rapid solids determination using glass fiber filters. *Water Sewage Works* 111:277.

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT. 1975. A Preliminary Review of Analytical Methods for the Determination of Suspended Solids in Paper Industry Effluents for Compliance with EPA-NPDES Permit Terms. Spec. Rep. No. 75-01. National Council of the Paper Industry for Air & Stream Improvement, New York, N.Y.

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT. 1977. A Study of the Effect of Alternate Procedures on Effluent Suspended Solids Measurement. Stream Improvement Tech. Bull. No. 291. National Council of the Paper Industry for Air & Stream Improvement, New York, N.Y.

TREES, C.C. 1979. Analytical analysis of the effect of dissolved solids on suspended solids determination. *J. Water Pollut. Control Fed.* 50:2370.




# 2540 E. Fixed and Volatile Solids Ignited at 550°C

## 1. General Discussion

*a. Principle:* The residue from Method B, C, or D is ignited to constant weight at 550 ± 50°C. The remaining solids represent the fixed total, dissolved, or suspended solids while the weight lost on ignition is the volatile solids. The determination is useful in control of wastewater treatment plant operation because it offers a rough approximation of the amount of organic matter present in the solid fraction of wastewater, activated sludge, and industrial wastes.

*b. Interferences:* Negative errors in the volatile solids may be produced by loss of volatile matter during drying. Determination of low concentrations of volatile solids in the presence of high fixed solids concentrations may be subject to considerable error. In such cases, measure for suspect volatile components by another test, for example, total organic carbon (Section 5310).

## 2. Apparatus

See Sections 2540B.2, 2540C.2, and 2540D.2.

## 3. Procedure

Ignite residue produced by Method B, C, or D to constant weight in a muffle furnace at a temperature of 550 ± 50°C. Have furnace up to temperature before inserting sample. Usually, 15 to 20 min ignition are required. Let dish or filter disk cool partially in air until most of the heat has been dissipated. Transfer to a desiccator for final cooling in a dry atmosphere. Do not overload desiccator. Weigh dish or disk as soon as it has cooled to balance temperature. Repeat cycle of igniting, cooling, desiccating, and weighing until a constant weight is obtained or until weight loss is less than 4% of previous weight.

## 4. Calculation

$$\text{mg volatile solids/L} = \frac{(A - B) \times 1000}{\text{sample volume, mL}}$$

$$\text{mg fixed solids/L} = \frac{(B - C) \times 1000}{\text{sample volume, mL}}$$

where:

$A$ = weight of residue + dish before ignition, mg,
$B$ = weight of residue + dish or filter after ignition, mg, and
$C$ = weight of dish or filter, mg.

## 5. Precision

The standard deviation was 11 mg/L at 170 mg/L volatile total solids in studies by three laboratories on four samples and replicates. Bias data on actual samples cannot be obtained.

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# APPENDIX B

# SEDIMENT CORE LOGS

SHEET ____ OF ____

**Donohue**

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## SEDIMENT CORE LOG

BORING NO. BB01A

SITE: CTO 63 DATE: 08-21-92

BY: Ahmed PROJECT NO.: 20612.020

SAMPLE DEPTH 0 TO 3

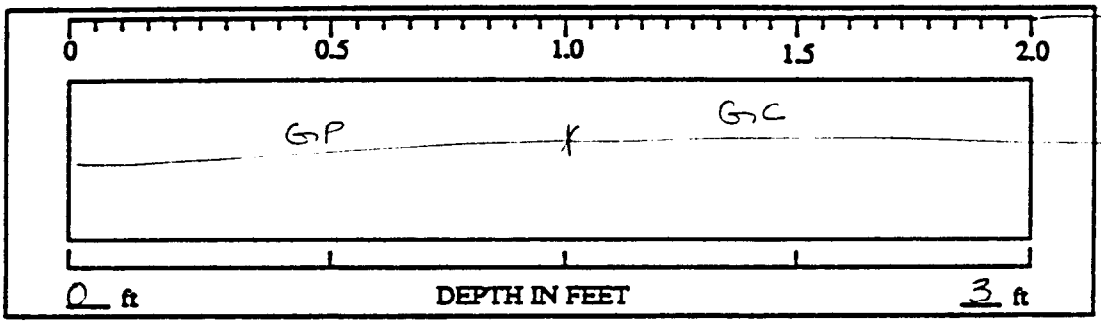
DRILLING METHOD: VIBRACORE SAMPLER TYPE: VIBRACORE DATE START: 08-21-92

CORING FOREMAN: S. GADZEKI LOG BY: ZAFAR AHMED DATE COMPLETE: 08-21-92

ASSISTANT: S. Nichols LORAN-C COOR.: ____ LAT. DATE CORE COLLECTED: 08-21-92

: ____ LONG. DATE CORE ANALYZED: ____

### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: 0-1' GP 5YR 2.5/1

1'-3' GC 5YR 2.5/1

High organic matter, No plasticity Sand and silt mostly sand pebbles

% CORE RECOVERY: 100%

NUMBER OF VARVE SEQUENCES/INCH 0.0-0.5' ____ 0.5'-1.0' ____ 1.0'-1.5' ____ 1.5-2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0-0.5' ____ 0.5'-1.0' ____ 1.0'-1.5' ____ 1.5-2.0 ____

SEDIMENTATION RATE = 1 INCH/NO. OF VARVE SEQUENCES

BB-01A

SHEET ____ OF ____

**Donohue**

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## SEDIMENT CORE LOG

BORING NO. BB01B

SITE: CTC 63 DATE: 08-21-92

BY: Z. Ahmed PROJECT NO.: 20612.020

SAMPLE DEPTH 3' TO 6'

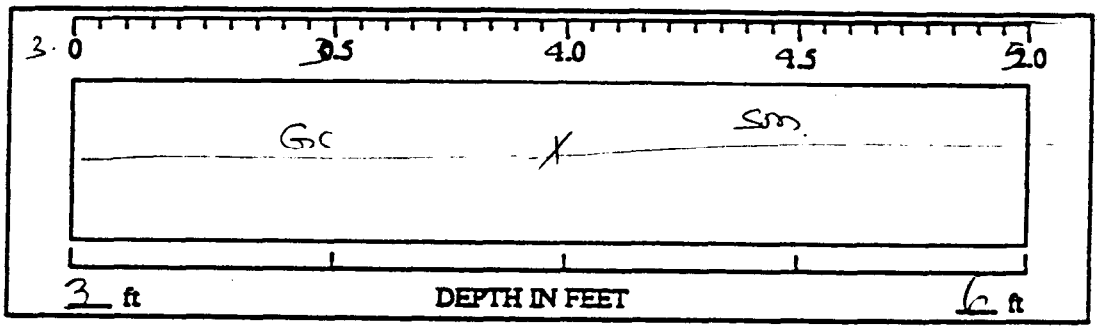
DRILLING METHOD: VIBRACORE SAMPLER TYPE: VIBRACORE DATE START: 08-21-92

CORING FOREMAN: S. GAMMELL LOG BY: ZAFAR AHMED DATE COMPLETE: 08-21-92

ASSISTANT: S. Nichols LORAN-C COOR.: _____ LAT. DATE CORE COLLECTED: 08-21-92

: _____ LONG. DATE CORE ANALYZED: _____

## SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: 3'-4' GC 5YR 2.5/1

4-6' SM 5YR 2.5/1

High Organic matter mostly Sands at the latter 4'-6'

Pebbles

% CORE RECOVERY: 100%

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATION RATE = 1 INCH/NO. OF VARVE SEQUENCES

BB-01B

SHEET ____ OF ____

**Donohue**

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## SEDIMENT CORE LOG

BORING NO. BB02A

SITE: CTO 63 DATE: 08.21-92

BY: Z. Ahmed PROJECT NO.: 20612.020

SAMPLE DEPTH 0 TO 3'

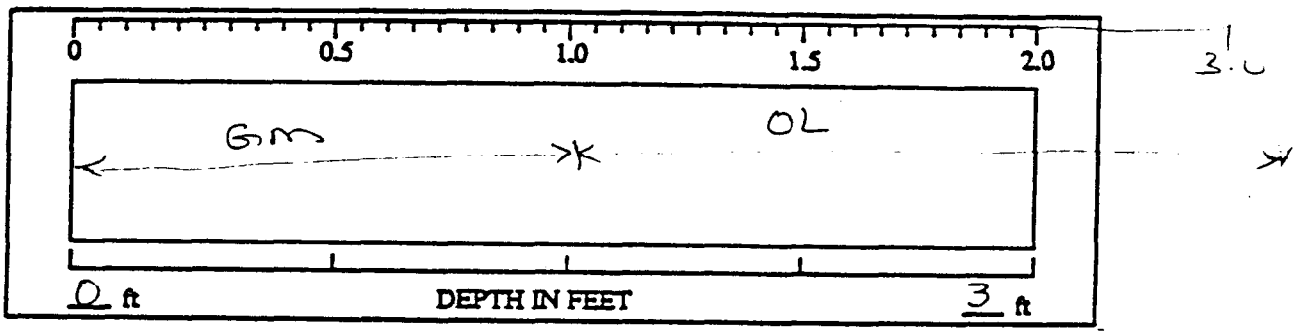
DRILLING METHOD: Vibracore SAMPLER TYPE: Vibracore DATE START: 08 21-92

CORING FOREMAN: S. Godfrey LOG BY: Z - Ahmed DATE COMPLETE: 08-21-92

ASSISTANT: S. Nichols LORAN-C COOR.: ____ LAT. DATE CORE COLLECTED: 08-21-92

: ____ LONG. DATE CORE ANALYZED: ____

## SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: 0-1' Poorly graded gravel with mixture of Gravel - sand - silt and Clay

1-3' clay silt combination with low plasticity

Wooden chips at 2.7' ft. Pebbles

% CORE RECOVERY: 100 %

NUMBER OF VARVE SEQUENCES/INCH 0.0-0.5' ____ 0.5'-1.0' ____ 1.0'-1.5' ____ 1.5-2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0-0.5' ____ 0.5'-1.0' ____ 1.0'-1.5' ____ 1.5-2.0 ____

SEDIMENTATION RATE = 1 INCH/NO. OF VARVE SEQUENCES

BB-02A →

SHEET ____ OF ____

**Donohue**

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## SEDIMENT CORE LOG

**BORING NO.** BB02B

SITE: CTO 63 DATE: 02-21-92

BY: Z-Ahmed PROJECT NO.: 20612.020

SAMPLE DEPTH 3' TO 5'

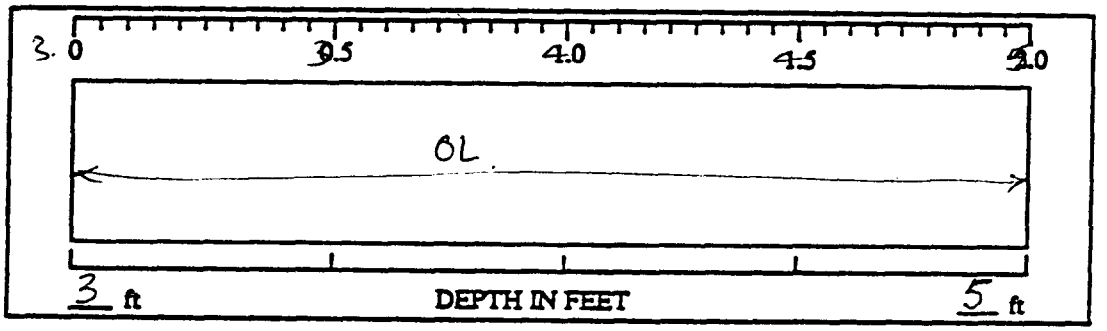
DRILLING METHOD: Vibracore SAMPLER TYPE: Vibracore DATE START: 02-21-92

CORING FOREMAN: S. Gadowski LOG BY: Z-Ahmed DATE COMPLETE: 02-21-92

ASSISTANT: S. Nichols LORAN-C COOR: ____ LAT. DATE CORE COLLECTED: 02-21-9

: ____ LONG. DATE CORE ANALYZED: ____

### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: clay-silt Combination, wooden Chips + Pebbles

5Y 2-5/1 OL.

% CORE RECOVERY: 67%

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATION RATE = 1 INCH/NO. OF VARVE SEQUENCES

BB-02B →

SHEET 1 OF ____

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## SEDIMENT CORE LOG

SITE: CT063 DATE: 8/18/92
BY: Bill Schaefer PROJECT NO.: 20612.020

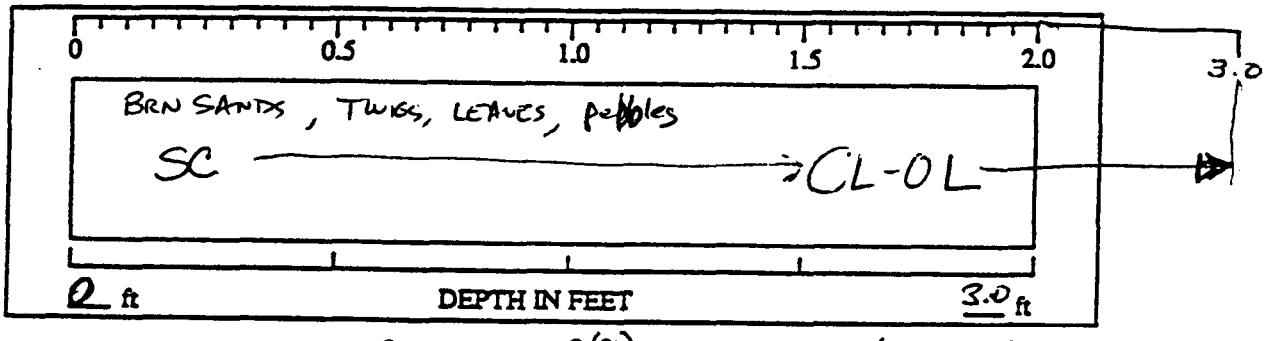
BORING NO. BB-03A

SAMPLE DEPTH 0 TO 3

DRILLING METHOD: VIBRACORE SAMPLER TYPE: VIBRACORE
CORING FOREMAN: STEVE GADOMSKI LOG BY: Schaefer
ASSISTANT: SCOTT NICHOLS LORAN-C COOR.: ____ LAT.
: ____ LONG.

DATE START: 8/18/92
DATE COMPLETE: 8/18/92
DATE CORE COLLECTED: 8/18/92
DATE CORE ANALYZED: ____

### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: Clayey sand (SC) 0-18" 18"-36" CL-OL

Color 5Y 3/1 dark gray trace pebbles 0-6"

2 CORES

% CORE RECOVERY: 2.0/3.0, 2.9/3.0

NUMBER OF VARVE SEQUENCES/INCH 0.0-0.5' ____ 0.5'-1.0' ____ 1.0'-1.5' ____ 1.5-2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0-0.5' ____ 0.5'-1.0' ____ 1.0'-1.5' ____ 1.5-2.0 ____

SEDIMENTATION

BB-03A

SHEET 2 OF ____

**Donohue**

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## SEDIMENT CORE LOG

SITE: CTO 63 DATE: 8/18/92
BY: BILL SCHAEFER PROJECT NO.: 20612.020

BORING NO. BB-03B

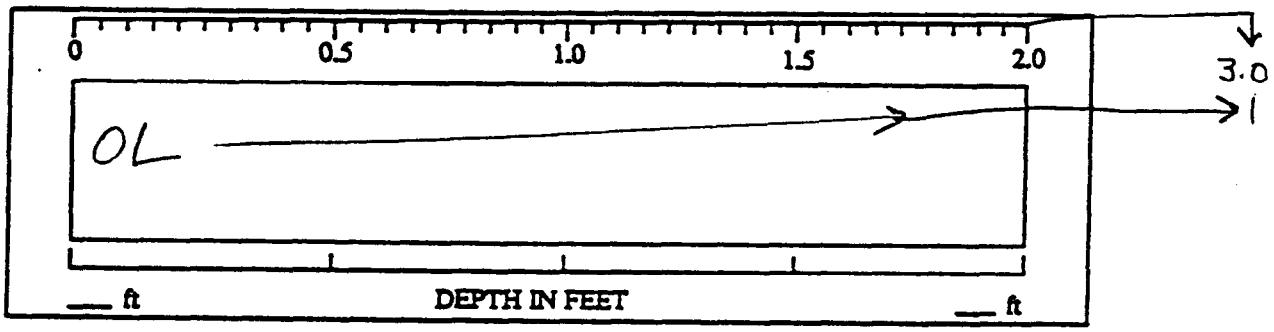
SAMPLE DEPTH 3 TO 6

DRILLING METHOD: VIBRACORER
CORING FOREMAN: S. GADOMSKI
ASSISTANT: S. NICHOLS

SAMPLER TYPE: VIBRACORE
LOG BY: SCHAEFER
LORAN-C COOR.: ____ LAT.
: ____ LONG.

DATE START: 8/18/92
DATE COMPLETE: 8/18/92
DATE CORE COLLECTED: 8/18/92
DATE CORE ANALYZED: ____

### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: dark gray color 5Y/3/1 clay

% CORE RECOVERY: 2.2'/3'

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATIO

BB-03B

SHEET 4 OF ____

**Donohue**

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## SEDIMENT CORE LOG

SITE: CTO 63 DATE: 8/18/92
BY: AHMED PROJECT NO.: 20612.020

BORING NO. BB-04A

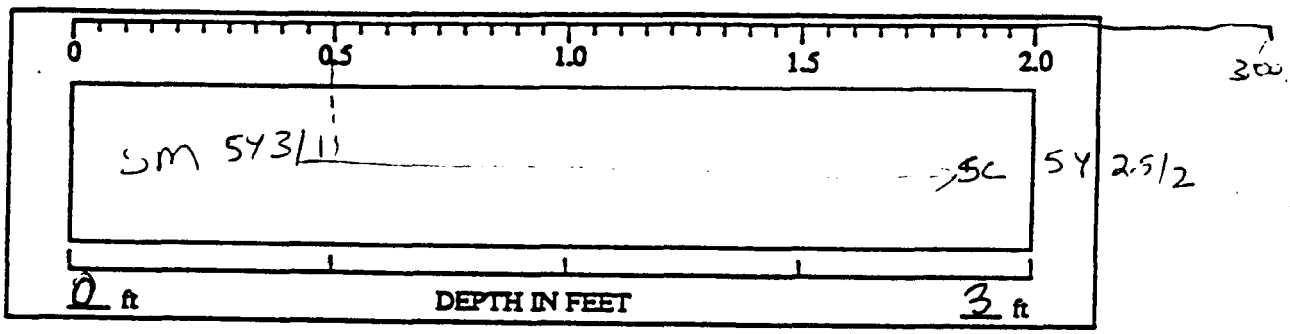
SAMPLE DEPTH ____ TO ____

DRILLING METHOD: VIBRACORE
CORING FOREMAN: SGADOMSKI
ASSISTANT: S. NICHOLS

SAMPLER TYPE: VIBRACORE
LOG BY: Z. AHMED
LORAN-C COOR.: ____ LAT.
: ____ LONG.

DATE START: 8/18/92
DATE COMPLETE: 8/18/92
DATE CORE COLLECTED: 8/18/92
DATE CORE ANALYZED: ____

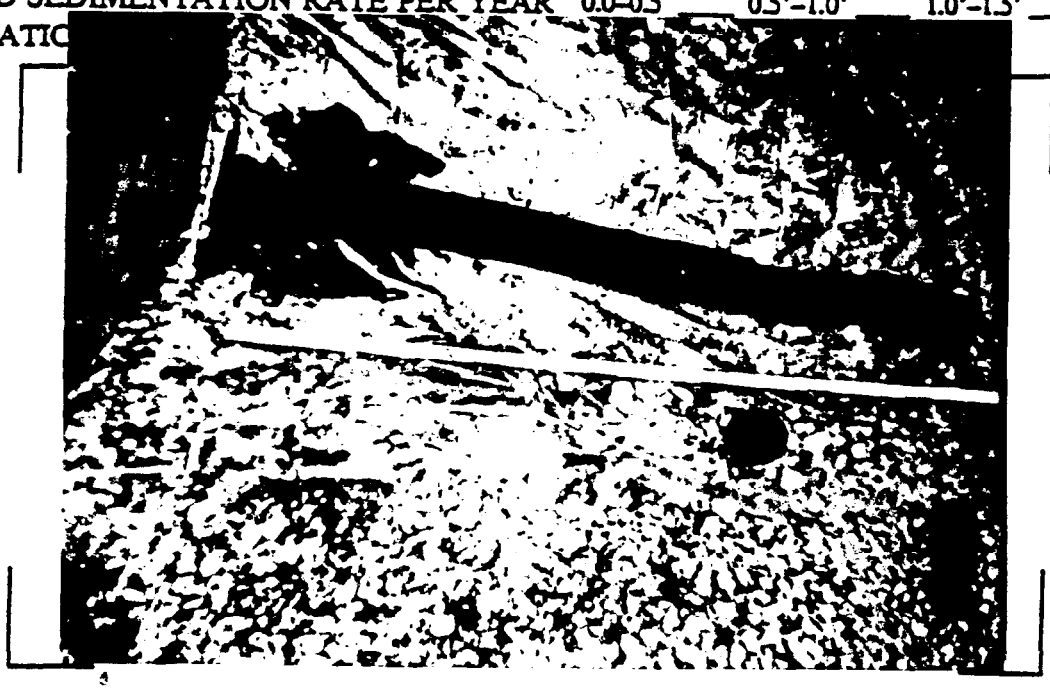
### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: SM 0-0.5' 5Y 3/1
SC 0.5-3.0' 5Y 2.5/2

% CORE RECOVERY: 2.7'/3.0'

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____
ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____
SEDIMENTATIO



SHEET 3 OF ____

**Donohue**

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## SEDIMENT CORE LOG

SITE: CT063 DATE: 8/18/92

BY: SCHAEFER PROJECT NO.: 20612.020

BORING NO. BB-04B

SAMPLE DEPTH 3 TO 6

DRILLING METHOD: VIBRACORE

CORING FOREMAN: S GADOMSKI

ASSISTANT: S NICHOLS

SAMPLER TYPE: VIBRACORE

LOG BY: SCHAEFER

LORAN-C COOR.: ____ LAT.

: ____ LONG.

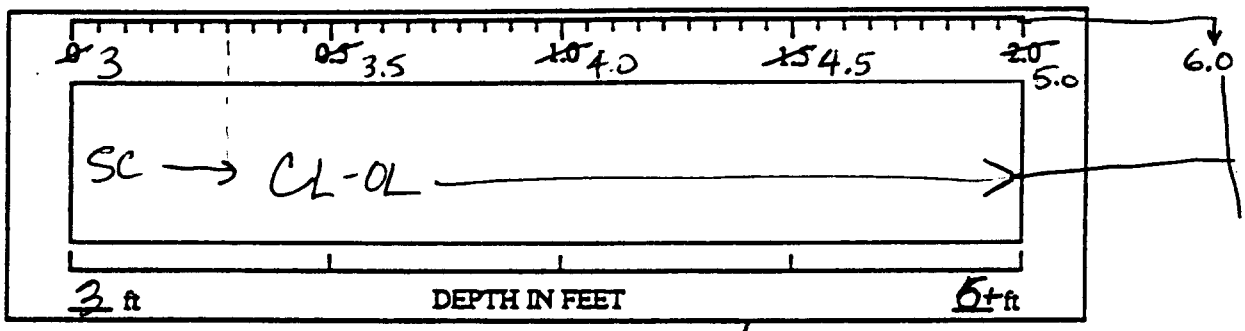
DATE START: 8/18/92

DATE COMPLETE: 8/18/92

DATE CORE COLLECTED: 8/18/92

DATE CORE ANALYZED: ____

### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: Munsell 5Y 3/1

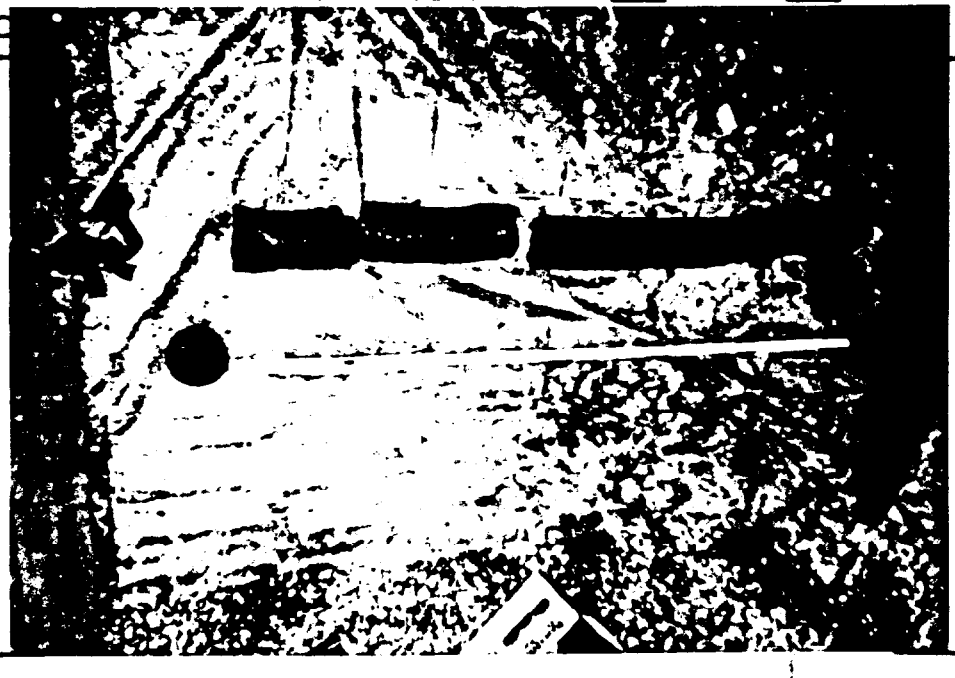
SC 3'-3.3', CL-OL 3.3'-6'

% CORE RECOVERY: 2.4'/~~6~~ BS 3.0'

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATIO



SHEET 6 OF ____

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## SEDIMENT CORE LOG

SITE: CTDG3 DATE: 8/18/92

BY: AHMED PROJECT NO.: 20612.020

BORING NO. IN-05 A

SAMPLE DEPTH 0 TO 3

DRILLING METHOD: VIBRACORE

CORING FOREMAN: S GADOMSKI

ASSISTANT: S NICHOLS

SAMPLER TYPE: VIBRACORE

LOG BY: AHMED

LORAN-C COOR.: ____ LAT.

: ____ LONG.

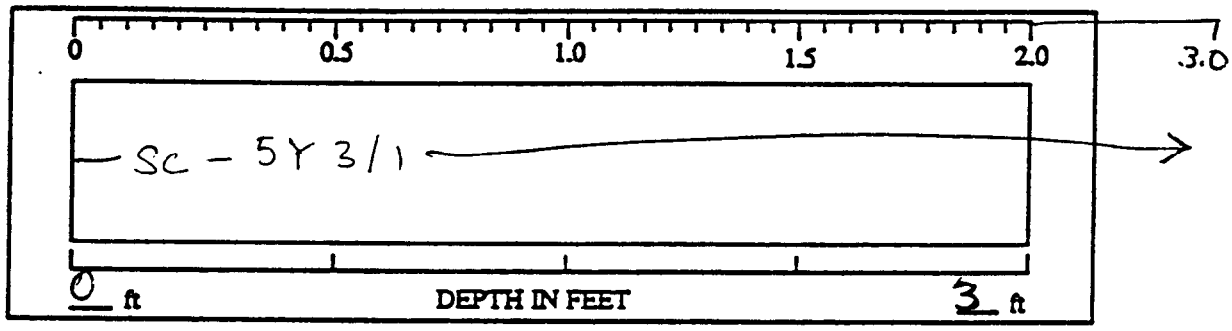
DATE START: 8/18/92

DATE COMPLETE: 8/18/92

DATE CORE COLLECTED: 8/18/92

DATE CORE ANALYZED: ____

### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: SC 5Y 3/1 0'-3'

Oil Sheen visible 0-2.8' petroleum odor

HNu 4.2 ppm max above background

% CORE RECOVERY: 2.7'/3.0'

NUMBER OF VARVE SEQUENCES/INCH 0.0-0.5' ____ 0.5'-1.0' ____ 1.0'-1.5' ____ 1.5-2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0-0.5' ____ 0.5'-1.0' ____ 1.0'-1.5' ____ 1.5-2.0 ____

SEDIMENTATIO

SHEET 5 OF ____

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## SEDIMENT CORE LOG

SITE: CT063 DATE: 8/18/92

BY: AHMED PROJECT NO.: 20612.03C

BORING NO. IN-05B

SAMPLE DEPTH 3 TO 6

DRILLING METHOD: VIBRACORE

CORING FOREMAN: S GADOMSKI

ASSISTANT: S. NICHOLS

SAMPLER TYPE: VIBRACORE

LOG BY: AHMED

LORAN-C COOR.: _____ LAT.

: _____ LONG.

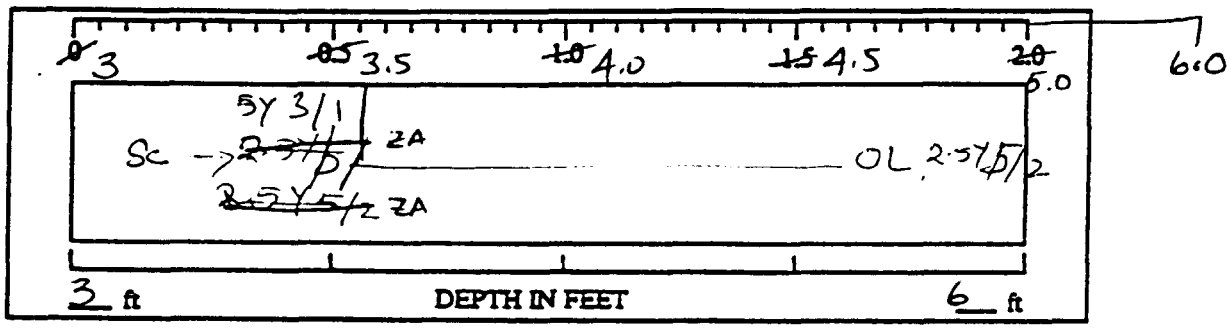
DATE START: 8/18/92

DATE COMPLETE: 8/18/92

DATE CORE COLLECTED: 8/18/92

DATE CORE ANALYZED: _____

## SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: At 3-4 ft. highly plastic At about 6 ft it becomes silty, distinct change in color at 5 1/2 ft. from dark clay to silt SC 5Y 3/1 3-3.5', OL 2.5Y 5/2 3.5-6

% CORE RECOVERY: 2.8'/3.0'

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATIO

SHEET ____ OF ____

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## SEDIMENT CORE LOG

SITE: CTO 63 DATE: 8/20/92
BY: SCHAEFER PROJECT NO.: 20612.020

BORING NO. 011-09A

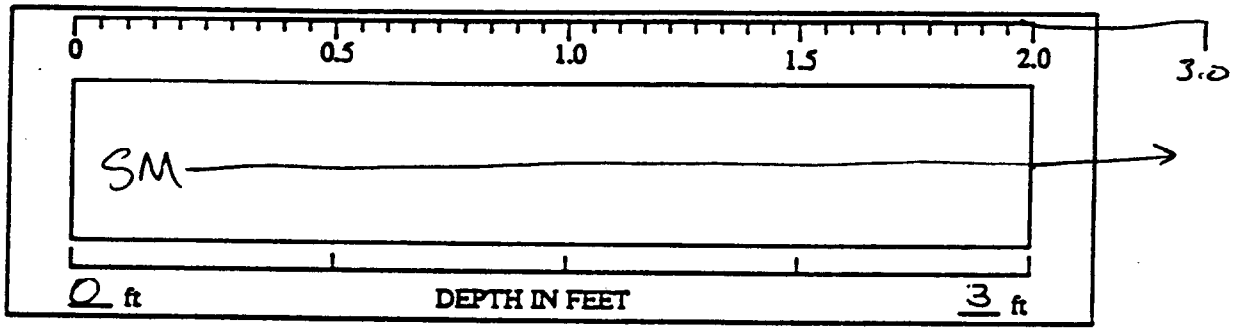
SAMPLE DEPTH 0 TO 3

DRILLING METHOD: VIBRACORE
CORING FOREMAN: S. GADOMSKI
ASSISTANT: S. NICHOLS

SAMPLER TYPE: VIBRACORE
LOG BY: SCHAEFER
LORAN-C COOR.: ____ LAT.
: ____ LONG.

DATE START: 8/20/92
DATE COMPLETE: 8/20/92
DATE CORE COLLECTED: 8/20/92
DATE CORE ANALYZED: ____

### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: sand/silt, mostly sand, no plasticity

5Y 4/1

% CORE RECOVERY: 67%

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____
ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____
SEDIMENTATION RATE = 1 INCH/NO. OF VARVE SEQUENCES

None Taken - Camera in coring vessel

### SEDIMENT CORE PHOTOGRAPH

SHEET ____ OF ____

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# SEDIMENT CORE LOG

SITE: CTO 63 DATE: 8/20/92

BY: Z. AHMED PROJECT NO.: 20612.020

BORING NO. SH10A

SAMPLE DEPTH 0 TO 3

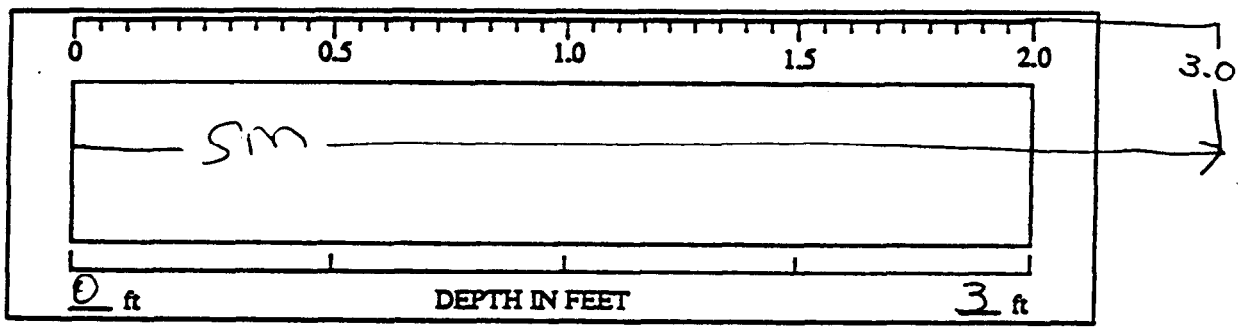
DRILLING METHOD: VIBRACORE SAMPLER TYPE: VIBRACORE DATE START: 8/20/92

CORING FOREMAN: S. GADOMSKI LOG BY: AHMED DATE COMPLETE: 8/20/92

ASSISTANT: S. NICHOLS LORAN-C COOR.: ____ LAT. DATE CORE COLLECTED: 8/20/92

: ____ LONG. DATE CORE ANALYZED: ____

## SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: Sand silt mixture no plasticity, tends to be more sandy towards the end and dry.

P 5Y 5/1 Very low plasticity in the first 1 feet.

% CORE RECOVERY: 100%

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATIO

SHEET ____ OF ____

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## SEDIMENT CORE LOG

BORING NO. CH10B

SITE: CTO 63 DATE: 8/20/92

BY: AHMED PROJECT NO.: 20612-020

SAMPLE DEPTH 3 TO 6'

DRILLING METHOD: VIBRACORE

CORING FOREMAN: GADOMSKI

ASSISTANT: NICHOLS

SAMPLER TYPE: VIBRACORE

LOG BY: AHMED

LORAN-C COOR.: _____ LAT.

: _____ LONG.

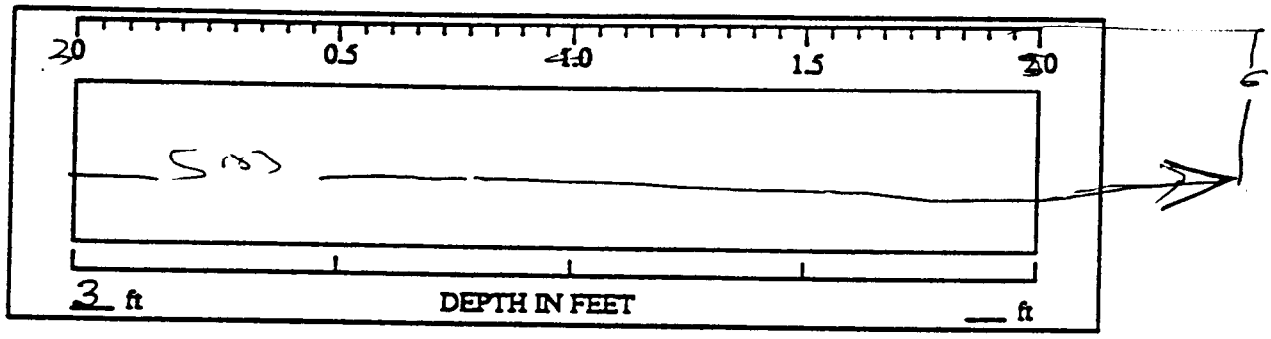
DATE START: 8/20/92

DATE COMPLETE: 8/20/92

DATE CORE COLLECTED: 8/20/92

DATE CORE ANALYZED: _____

### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: Sand silt mostly sand, no plasticity

5Y 5/1

% CORE RECOVERY: 100%

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATI

SHEET ____ OF ____

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## SEDIMENT CORE LOG

SITE: CTO 63 DATE: 8/19/92

BY: ZAFAR AHMED PROJECT NO.: 20612.020

BORING NO. CH-11A

SAMPLE DEPTH 0 TO 3'

DRILLING METHOD: VIBRACORE

CORING FOREMAN: GADOMSKI

ASSISTANT: NICHOLS

SAMPLER TYPE: VIBRACORE

LOG BY: AHMED

LORAN-C COOR.: ____ LAT.

: ____ LONG.

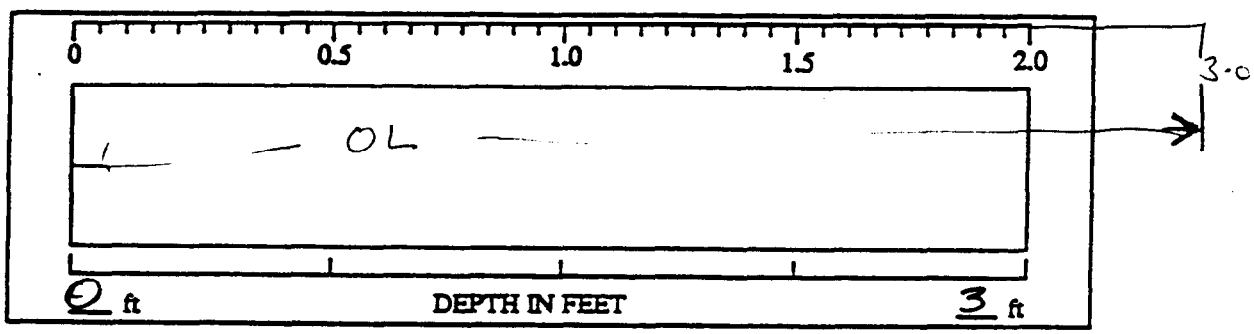
DATE START: 8/19/92

DATE COMPLETE: 8/19/92

DATE CORE COLLECTED: 8/19/92

DATE CORE ANALYZED: ____

### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: Clayey soil with low plasticity 5Y 2.5/1

% CORE RECOVERY: 100%

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATIO

SHEET ____ OF ____

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## SEDIMENT CORE LOG

SITE: CTO 63 DATE: 8/19/92

BY: AHMED PROJECT NO.: 20612-020

BORING NO.: OH-11B

SAMPLE DEPTH 3' TO 6'

DRILLING METHOD: VIBRACORE

CORING FOREMAN: GADOMSKI

ASSISTANT: NICHOLS

SAMPLER TYPE: VIBRACORE

LOG BY: AHMED

LORAN-C COOR.: ____ LAT.

: ____ LONG.

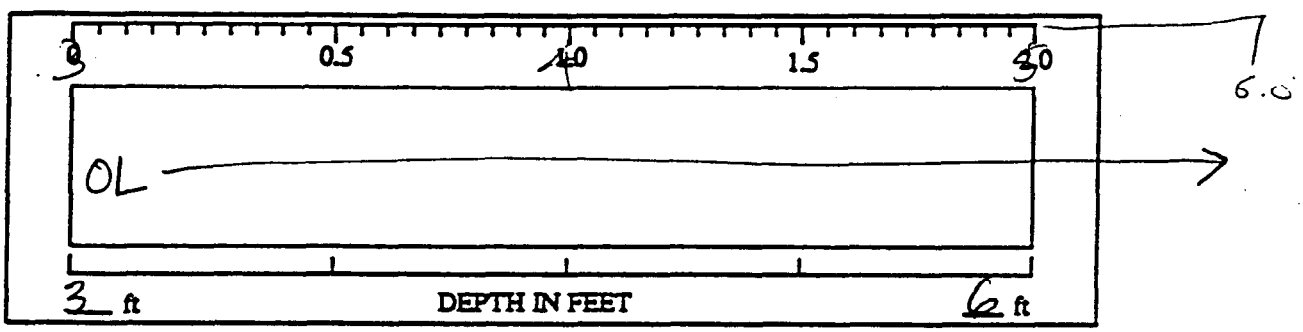
DATE START: 8/19/92

DATE COMPLETE: 8/19/92

DATE CORE COLLECTED: 8/19/92

DATE CORE ANALYZED: ____

### SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: Clayey soil with low plasticity, small pebbles 5Y 2.5/1

% CORE RECOVERY: 100%

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATIO

SHEET ____ OF ____

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Engineers & Architects & Scientists

## SEDIMENT CORE LOG

SITE: CTO 63 DATE: 8/21/92

BY: AHMED PROJECT NO.: 20612.020

BORING NO. OH 12A

SAMPLE DEPTH 0 TO 3'

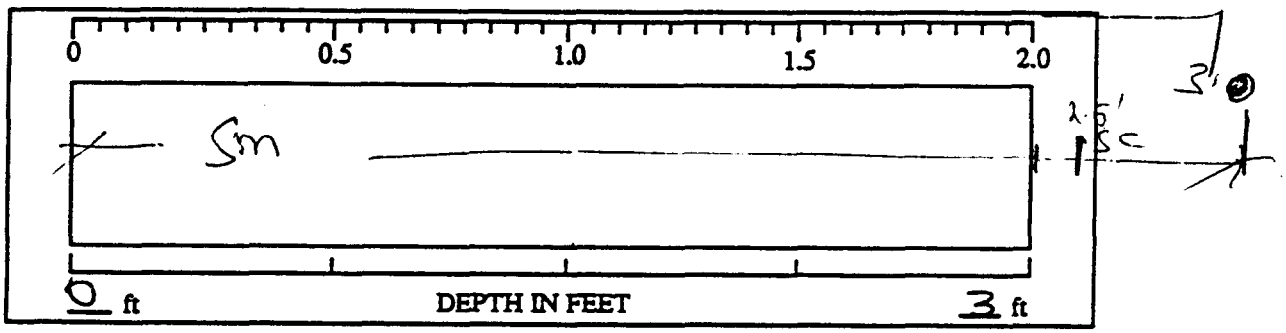
DRILLING METHOD: VIBRACORE SAMPLER TYPE: VIBRACORE DATE START: 8/21/92

CORING FOREMAN: GADOMSKI LOG BY: AHMED DATE COMPLETE: 8/21/92

ASSISTANT: NICHOLS LORAN-C COOR.: ____ LAT. DATE CORE COLLECTED: 8/21/92

: ____ LONG. DATE CORE ANALYZED: ____

## SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: Sand silt combination Organic matter presents. Vegetation at the top layer.

0 - 2.5' 5Y 4/1 5Y 4/1

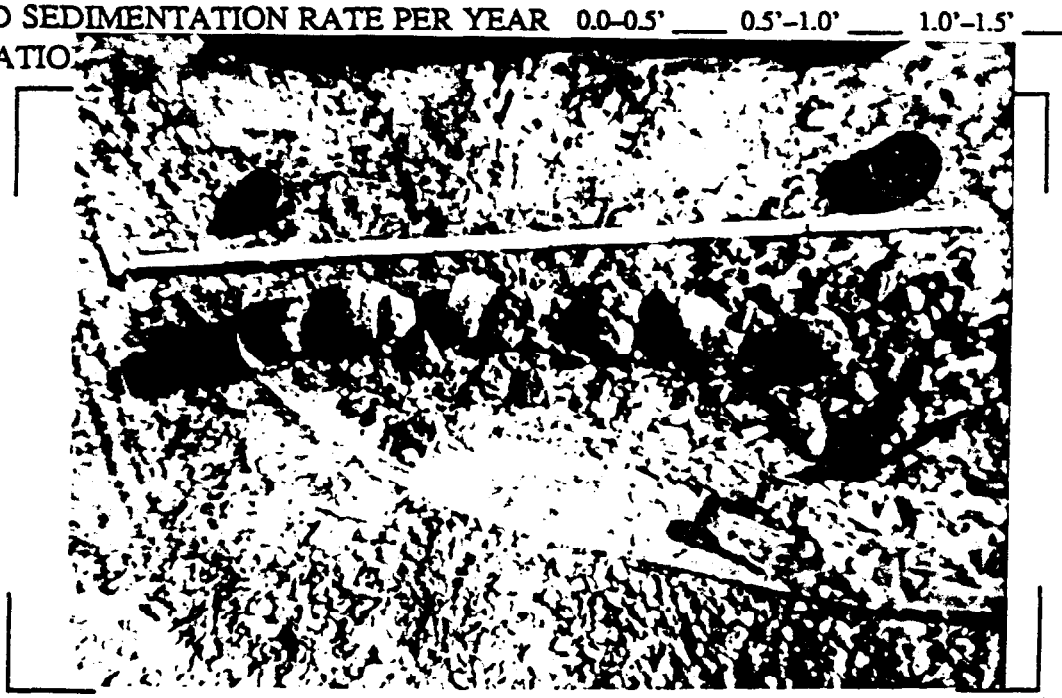
2.5 - 3' 5Y 3/1

% CORE RECOVERY: 90%

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATIO



SHEET ____ OF ____

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Engineers & Architects & Scientists

## SEDIMENT CORE LOG

SITE: CTO 63 DATE: 8/21/92

BY: AHMED PROJECT NO.: 20612-020

BORING NO. OH-12B

SAMPLE DEPTH 3 TO 6

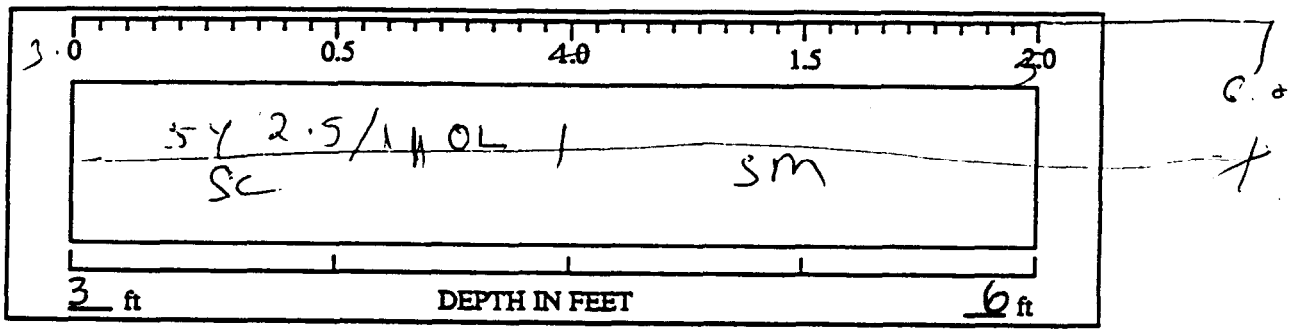
DRILLING METHOD: VIBRACORE SAMPLER TYPE: VIBRACORE DATE START: 8/21/92

CORING FOREMAN: GADOMSKI LOG BY: AHMED DATE COMPLETE: 8/21/92

ASSISTANT: NICHOLS LORAN-C COOR.: _____ LAT. DATE CORE COLLECTED: 8/21/92

: _____ LONG. DATE CORE ANALYZED: _____

## SEDIMENT CORE SKETCH




SEDIMENT CORE DESCRIPTION: 3.0 - 4.0' clay sand mixture 5Y 2.5/1

4' - 6' - sand - silt mixture no plasticity 5Y 5/1

% CORE RECOVERY: 100%

NUMBER OF VARVE SEQUENCES/INCH 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

ESTIMATED SEDIMENTATION RATE PER YEAR 0.0–0.5' ____ 0.5'–1.0' ____ 1.0'–1.5' ____ 1.5–2.0 ____

SEDIMENTATIO

# APPENDIX C

# ANALYTICAL DATA SUMMARY TABLES

CTO 03 - Site Inspection for Tetribone Creek,
Boat Basin and Harbor Areas
Naval Training Center
Sediment
Elutriate

| SAMPLE ID: | | SD01A | SD01B | SD02A | SD02B | SD03A | SD03B |
|---|---|---|---|---|---|---|---|
| DEPTH: | | 0-3 | 3-6 | 0-3 | 3-6 | 0-3 | 3-6 |
| AGENCY SAMPLE ID: | | GL63-SD-BB-01A | GL63-SD-BB-01B | GL63-SD-BB-02A | GL63-SD-BB-02B | GL63-SD-BB-03A | GL63-SD-BB-03B |
| DATE SAMPLED: | | 21-AUG-92 | 21-AUG-92 | 21-AUG-92 | 21-AUG-92 | 18-AUG-92 | 18-AUG-92 |
| COMPOUND | | | | | | | |
| Elutriate | | | | | | | |
| Solids, Suspended at 103C | mg/L | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Solids, Suspended at 103C | mg/L | 10 U | 10 U | 10 U | 10 | 10 U | 10 U |
| Solids, Suspended at 103C SW | mg/L | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Solids, Suspended at 103C | mg/L | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Solids, Total at 103C | mg/L | 380 | 410 | 360 | 370 | 350 | 330 |
| Solids, Total at 103C | mg/L | 400 | 420 | 360 | 360 | 330 | 350 |
| Solids, Total at 103C | mg/L | 370 | 410 | 380 | 370 | 340 | 340 |
| Solids, Total at 103C SW | mg/L | 360 | 420 | 340 | 380 | 230 | 200 |
| Solids, Volatile Total at 550C | mg/L | 110 | 110 | 100 | 110 | 110 | 120 |
| Solids, Volatile Total at 550C | mg/L | 120 | 120 | 110 | 100 | 100 | 110 |
| Solids, Volatile Total at 550C | mg/L | 100 | 110 | 120 | 110 | 110 | 110 |
| Solids, Volatile Total at 550C S | mg/L | 120 | 140 | 120 | 150 | 65 | 67 |
| Carbon, Organic | mg/L | 4 | 7 | 11 | 15 | 11 | 17 |
| Carbon, Organic SW | mg/L | 7 | 3 | 3 | 4 | 3 | 3 |
| Carbon, Organic | mg/L | 5 | 6 | 13 | 17 | 13 | 13 |
| Carbon, Organic | mg/L | 5 | 6 | 8 | 13 | 16 | 20 |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Arsenic SW | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Ammonia (as N) | mg/L | 1.2 | 11 | 24 | 28 | 20 | 26 |
| Ammonia (as N) | mg/L | 5.4 | 13 | 24 | 30 | 33 | 23 |
| Ammonia (as N) | mg/L | 5.2 | 27 | 23 | 30 | 20 | 22 |
| Ammonia (as N) SW | mg/L | 5.9 | 14 | 0.2 | 0.4 | 0.2 | 0.1 |
| Copper | mg/L | 0.01 U | 0.01 U | 0.01 | 0.02 | 0.01 U | 0.01 |
| Copper | mg/L | 0.01 U | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 |
| Copper | mg/L | 0.01 U | 0.01 | 0.01 | 0.02 | 0.01 U | 0.01 |
| Copper SW | mg/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Lead | mg/L | 0.002 U | 0.007 | 0.008 | 0.011 | 0.006 | 0.008 |
| Lead | mg/L | 0.006 | 0.006 | 0.006 | 0.013 | 0.006 | 0.004 |
| Lead | mg/L | 0.004 | 0.007 | 0.010 | 0.012 | 0.008 | 0.014 |
| Lead SW | mg/L | 0.003 | 0.002 | 0.003 | 0.002 U | 0.004 | 0.007 |
| Mercury | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U |
| Mercury | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U |
| Mercury | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U |
| Mercury SW | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U |
| Nickel | mg/L | 0.02 U | 0.03 | 0.02 | 0.03 | 0.02 U | 0.08 |
| Nickel | mg/L | 0.02 U | 0.02 | 0.02 U | 0.04 | 0.02 U | 0.06 |
| Nickel | mg/L | 0.02 U | 0.03 | 0.02 | 0.03 | 0.03 | 0.04 |
| Nickel SW | mg/L | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| Zinc | mg/L | 0.04 | 0.07 | 0.07 | 0.08 | 0.09 | 0.07 |
| Zinc | mg/L | 0.04 | 0.06 | 0.06 | 0.07 | 0.08 | 0.19 |
| Zinc | mg/L | 0.04 | 0.06 | 0.10 | 0.09 | 0.09 | 0.06 |
| Zinc SW | mg/L | 0.06 | 0.05 | 0.03 | 0.02 | 0.04 | 0.06 |

SW - Surface Water
U - Below Detection Limits

[redacted]3 - [redacted]Insp[redacted] for [redacted]ibon[redacted]k,

Boat Basin and Harbor Areas
Naval Training Center
Sediment
Elutriate

| SAMPLE ID: | | SD04A | SD04B | SD05A | SD05B | SD09A | SD10A |
|---|---|---|---|---|---|---|---|
| DEPTH: | | 0-3 | 3-6 | 0-3 | 3-6 | 0-3 | 0-3 |
| AGENCY SAMPLE ID: | | GL63-SD-BB-04A | GL63-SD-BB-04B | GL63-SD-IN-05A | GL63-SD-IN-05B | GL63-SD-OH-09A | GL63-SD-OH-10A |
| DATE SAMPLED: | | 18-AUG-92 | 18-AUG-92 | 18-AUG-92 | 18-AUG-92 | 20-AUG-92 | 19-AUG-92 |
| COMPOUND | | | | | | | |
| Elutriate | | | | | | | |
| Solids, Suspended at 103C | mg/L | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Solids, Suspended at 103C | mg/L | 10 U | 10 U | 10 U | 10 U | | 10 U |
| Solids, Suspended at 103C | mg/L | 10 U | 10 U | 10 U | 10 U | | 10 U |
| Solids, Suspended at 103C SW | mg/L | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Solids, Total at 103C | mg/L | 300 | 310 | 310 | 310 | 220 | 220 |
| Solids, Total at 103C | mg/L | 290 | 290 | 310 | 290 | | 210 |
| Solids, Total at 103C | mg/L | 290 | 260 | 300 | 320 | | 240 |
| Solids, Total at 103C SW | mg/L | 180 | 180 | 180 | 180 | 180 | 180 |
| Solids, Volatile Total at 550C | mg/L | 110 | 110 | 110 | 100 | 59 | 72 |
| Solids, Volatile Total at 550C | mg/L | 100 | 90 | 120 | 100 | | 60 |
| Solids, Volatile Total at 550C | mg/L | 110 | 100 | 81 | 100 | | 81 |
| Solids, Volatile Total at 550C S | mg/L | 70 | 53 | 52 | 67 | 65 | 60 |
| Carbon, Organic | mg/L | 11 | 11 | 11 | 11 | 3 | 5 |
| Carbon, Organic | mg/L | 12 | 11 | 10 | 12 | | 7 |
| Carbon, Organic | mg/L | 13 | 10 | 12 | 13 | | 4 |
| Carbon, Organic SW | mg/L | 3 | 2 | 3 | 2 | 4 | 3 |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | | 0.1 U |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | | 0.1 U |
| Arsenic SW | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Ammonia (as N) | mg/L | 25 | 21 | 23 | 27 | | 5.3 |
| Ammonia (as N) | mg/L | 24 | 20 | 35 | 29 | | 7.0 |
| Ammonia (as N) | mg/L | 12 | 25 | 23 | 23 | 5.1 | 7.0 |
| Ammonia (as N) SW | mg/L | 0.3 | 0.3 | 0.2 | 0.5 | 0.3 | 0.1 U |
| Copper | mg/L | 0.04 | 0.01 U | 0.01 U | 0.01 | | 0.01 U |
| Copper | mg/L | 0.07 | 0.01 U | 0.01 U | 0.01 U | | 0.01 U |
| Copper | mg/L | 0.01 U | 0.01 U | 0.01 U | 0.01 | 0.01 U | 0.01 U |
| Copper SW | mg/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Lead | mg/L | 0.004 | 0.006 | 0.006 | 0.007 | 0.013 | 0.002 |
| Lead | mg/L | 0.021 | 0.002 | 0.011 | 0.004 | | 0.003 |
| Lead | mg/L | 0.028 | 0.008 | 0.007 | 0.016 | | 0.003 |
| Lead SW | mg/L | 0.004 | 0.003 | 0.002 U | 0.002 U | 0.006 | 0.002 U |
| Mercury | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U |
| Mercury | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | | 0.0002 U |
| Mercury | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0006 | | 0.0002 U |
| Mercury SW | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U |
| Nickel | mg/L | 0.03 | 0.03 | 0.02 U | 0.04 | 0.02 U | 0.02 U |
| Nickel | mg/L | 0.03 | 0.02 | 0.02 U | 0.05 | | 0.02 U |
| Nickel | mg/L | 0.04 | 0.02 U | 0.02 | 0.04 | | 0.02 U |
| Nickel SW | mg/L | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| Zinc | mg/L | 0.08 | 0.06 | 0.10 | 0.06 | 0.03 | 0.03 |
| Zinc | mg/L | 0.14 | 0.05 | 0.05 | 0.04 | | 0.03 |
| Zinc | mg/L | 0.12 | 0.08 | 0.07 | 0.18 | | 0.04 |
| Zinc SW | mg/L | 0.03 | 0.26 | 0.03 | 0.04 | 0.10 | 0.05 |

SW - Surface Water
U - Below Detection Limit

[redacted] - [redacted] for [redacted]k,
Boat Basin and Harbor Areas
Naval Training Center
Sediment
Elutriate

| | | | | | | |
|---|---|---|---|---|---|---|
| SAMPLE ID: | | SD10B | SD11A | SD11B | SD12A | SD12B |
| DEPTH: | | 3-6 | 0-3 | 3-6 | 0-3 | 3-6 |
| AGENCY SAMPLE ID: | | GL63-SD-OH-10B | GL63-SD-OH-11A | GL63-SD-OH-11B | GL63-SD-OH-12A | GL63-SD-OH-12B |
| DATE SAMPLED: | | 19-AUG-92 | 19-AUG-92 | 19-AUG-92 | 21-AUG-92 | 21-AUG-92 |
| COMPOUND | | | | | | |
| Elutriate | | | | | | |
| Solids, Suspended at 103C | mg/L | 10 U | 10 U | 10 U | 10 U | 10 U |
| Solids, Suspended at 103C | mg/L | 10 U | 10 U | 10 U | 10 U | 10 U |
| Solids, Suspended at 103C | mg/L | 10 U | 10 U | 10 U | 10 U | 10 U |
| Solids, Suspended at 103C SW | mg/L | 10 U | 10 U | 10 U | 10 U | 10 U |
| Solids, Total at 103C | mg/L | 180 | 220 | 260 | 200 | 190 |
| Solids, Total at 103C | mg/L | 180 | 230 | 250 | 210 | 190 |
| Solids, Total at 103C | mg/L | 200 | 230 | 250 | 200 | 190 |
| Solids, Total at 103C SW | mg/L | 200 | 180 | 200 | 190 | 170 |
| Solids, Volatile Total at 550C | mg/L | 54 | 70 | 73 | 66 | 62 |
| Solids, Volatile Total at 550C | mg/L | 59 | 60 | 83 | 80 | 44 |
| Solids, Volatile Total at 550C | mg/L | 73 | 66 | 84 | 66 | 49 |
| Solids, Volatile Total at 550C S | mg/L | 70 | 59 | 72 | 72 | 59 |
| Carbon, Organic | mg/L | 4 | 18 | 9 | 3 | 5 |
| Carbon, Organic | mg/L | 3 | 9 | 12 | 6 | 6 |
| Carbon, Organic | mg/L | 4 | 10 | 12 | 4 | 5 |
| Carbon, Organic SW | mg/L | 2 | 3 | 3 | 3 | 4 |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Arsenic SW | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Ammonia (as N) | mg/L | 4.5 | 26 | 40 | 3.1 | 4.8 |
| Ammonia (as N) | mg/L | 4.3 | 24 | 40 | 3.2 | 3.9 |
| Ammonia (as N) | mg/L | 3.5 | 24 | 34 | 3.1 | 5.2 |
| Ammonia (as N) SW | mg/L | 0.6 | 0.3 | 11 | 0.1 | 0.2 |
| Copper | mg/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 |
| Copper | mg/L | 0.01 U | 0.01 U | 0.01 | 0.01 U | 0.01 U |
| Copper | mg/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.02 |
| Copper SW | mg/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| Lead | mg/L | 0.002 U | 0.008 | 0.010 | 0.004 | 0.010 |
| Lead | mg/L | 0.005 | 0.004 | 0.008 | 0.004 | 0.008 |
| Lead | mg/L | 0.007 | 0.002 | 0.010 | 0.004 | 0.006 |
| Lead SW | mg/L | 0.003 | 0.002 U | 0.002 U | 0.004 | 0.003 |
| Mercury | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U |
| Mercury | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0009 | 0.0002 U |
| Mercury | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U |
| Mercury SW | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U |
| Nickel | mg/L | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| Nickel | mg/L | 0.02 U | 0.02 | 0.02 U | 0.02 U | 0.02 U |
| Nickel | mg/L | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| Nickel SW | mg/L | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| Zinc | mg/L | 0.04 | 0.05 | 0.07 | 0.05 | 0.05 |
| Zinc | mg/L | 0.02 | 0.04 | 0.04 | 0.03 | 0.04 |
| Zinc | mg/L | 0.04 | 0.04 | 0.03 | 0.04 | 0.04 |
| Zinc SW | mg/L | 0.02 | 0.02 | 0.04 | 0.02 | 0.03 |

SW - Surface Water
U - Below Detection Limit

[redacted]3 - [redacted]nspe[redacted] for [redacted]ibon[redacted]k,

Boat Basin and Harbor Areas
Naval Training Center
Sediment
Supernatant

| | | |
|---|---|---|
| SAMPLE ID: | SD01A | SD01B |
| DEPTH: | 0-3 | 3-6 |
| AGENCY SAMPLE ID: | GL63-SD-BB-01A | GL63-SD-BB-01B |
| DATE SAMPLED: | 21-AUG-92 | 21-AUG-92 |

| COMPOUND | | | |
|---|---|---|---|
| Supernatant | | | |
| Solids, Susp at 103C | mg/L | 69 | 10 U |
| Solids, Total at 103C | mg/L | 490 | 560 |
| Solids, Volatile Total at 550C | mg/L | 120 | 100 |
| Carbon, Organic | mg/L | 4.04 | 4 |
| Arsenic | mg/L | 0.1 U | 0.1 U |
| Copper | mg/L | 0.10 | 0.19 |
| Ammonia (as N) | mg/L | 8.6 | 12 |
| Lead | mg/L | 0.068 | 0.16 |
| Mercury | mg/L | 0.0002 U | 0.0003 |
| Nickel | mg/L | 0.03 | 0.07 |
| Zinc | mg/L | 0.40 | 0.37 |

U - Below Detection Limit

[redacted]3 - [redacted] inspe[redacted] for [redacted]bone [redacted]k,
Boat Basin and Harbor Areas
Naval Training Center
Sediment
Supernatant

| SAMPLE ID: | SD02A | SD02B | SD03A | SD03B | SD04A | SD04B |
|---|---|---|---|---|---|---|
| DEPTH: | 0-3 | 3-6 | 0-3 | 3-6 | 0-3 | 3-6 |
| AGENCY SAMPLE ID: | GL63-SD-BB-02A | GL63-SD-BB-02B | GL63-SD-BB-03A | GL63-SD-BB-03B | GL63-SD-BB-04A | GL63-SD-BB-04B |
| DATE SAMPLED: | 21-AUG-92 | 21-AUG-92 | 18-AUG-92 | 18-AUG-92 | 18-AUG-92 | 18-AUG-92 |

| COMPOUND | | | | | | | |
|---|---|---|---|---|---|---|---|
| Supernatant | | | | | | | |
| Solids, Susp at 103C | mg/L | 180 | 120 | 210 | 110 | 270 | 190 |
| Solids, Total at 103C | mg/L | 600 | 530 | 640 | 530 | 880 | 590 |
| Solids, Volatile Total at 550C | mg/L | 130 | 110 | 140 | 140 | 160 | 140 |
| Carbon, Organic | mg/L | 8 | 10 | 8 | 11 | 10 | 8 |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Copper | mg/L | 0.18 | 0.22 | 0.34 | 0.37 | 2.9 | 0.35 |
| Ammonia (as N) | mg/L | 17 | 28 | 17 | 19 | 23 | 20 |
| Lead | mg/L | 0.26 | 0.19 | 0.39 | 0.35 | 2.0 | 0.38 |
| Mercury | mg/L | 0.0006 | 0.0004 | 0.0011 | 0.0011 | 0.0022 | 0.0008 |
| Nickel | mg/L | 0.04 | 0.09 | 0.09 | 0.12 | 0.22 | 0.09 |
| Zinc | mg/L | 0.52 | 0.36 | 0.67 | 0.59 | 3.1 | 0.66 |

U - Below Detection Limit

[redacted] - [redacted] Inspe[redacted]n for [redacted]ibone [redacted]ek, [redacted]
Boat Basin and Harbor Areas
Naval Training Center
Sediment
Supernatant

| SAMPLE ID: | | SD05A | SD05B | SD09A | SD10A | SD10B | SD11A |
|---|---|---|---|---|---|---|---|
| DEPTH: | | 0-3 | 3-6 | 0-3 | 0-3 | 3-6 | 0-3 |
| AGENCY SAMPLE ID: | | GL63-SD-IN-05A | GL63-SD-IN-05B | GL63-SD-OH-09A | GL63-SD-OH-10A | GL63-SD-OH-10B | GL63-SD-OH-11A |
| DATE SAMPLED: | | 18-AUG-92 | 18-AUG-92 | 20-AUG-92 | 19-AUG-92 | 19-AUG-92 | 19-AUG-92 |
| COMPOUND | | | | | | | |
| Supernatant | | | | | | | |
| Solids, Susp at 103C | mg/L | 230 | 190 | 190 | 560 | 87 | 920 |
| Solids, Total at 103C | mg/L | 620 | 690 | 360 | 800 | 260 | 2100 |
| Solids, Volatile Total at 550C | mg/L | 130 | 140 | 69 | 99 | 17 | 220 |
| Carbon, Organic | mg/L | 7 | 9 | 3 | 3 | 3 | 7 |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Copper | mg/L | 0.22 | 0.39 | 0.11 | 0.36 | 0.02 | 0.84 |
| Ammonia (as N) | mg/L | 20 | 17 | 1.8 | 7.5 | 1.4 | 19 |
| Lead | mg/L | 0.31 | 0.40 | 0.15 | 0.43 | 0.010 | 0.88 |
| Mercury | mg/L | 0.0007 | 0.0017 | 0.0004 | 0.0013 | 0.0002 | 0.0023 |
| Nickel | mg/L | 0.04 | 0.15 | 0.02 U | 0.03 | 0.02 U | 0.13 |
| Zinc | mg/L | 0.53 | 0.66 | 0.23 | 0.57 | 0.04 | 1.4 |

U - Below Detection Limit

3 - Inspe for ibon k,

Boat Basin and Harbor Areas
Naval Training Center
Sediment
Supernatant

| | | | |
|---|---|---|---|
| SAMPLE ID: | SD11B | SD12A | SD12B |
| DEPTH: | 3-6 | 0-3 | 3-6 |
| AGENCY SAMPLE ID: | GL63-SD-OH-11B | GL63-SD-OH-12A | GL63-SD-OH-12B |
| DATE SAMPLED: | 19-AUG-92 | 21-AUG-92 | 21-AUG-92 |

| COMPOUND | | | | |
|---|---|---|---|---|
| Supernatant | | | | |
| Solids, Susp at 103C | mg/L | 390 | 110 | 77 |
| Solids, Total at 103C | mg/L | 4600 | 320 | 300 |
| Solids, Volatile Total at 550C | mg/L | 470 | 69 | 53 |
| Carbon, Organic | mg/L | 10 | 3 | 3 |
| Arsenic | mg/L | 0.3 | 0.1 U | 0.1 U |
| Copper | mg/L | 1.3 | 0.04 | 0.11 |
| Ammonia (as N) | mg/L | 27 | 3.2 | 19 |
| Lead | mg/L | 2.3 | 0.14 | 0.093 |
| Mercury | mg/L | 0.015 | 0.0002 U | 0.0002 U |
| Nickel | mg/L | 0.20 | 0.02 U | 0.02 U |
| Zinc | mg/L | 3.7 | 0.09 | 0.20 |

U - Below Detection Limit

[redacted]3 - [redacted]Inspe[redacted] for [redacted]ibone[redacted]k, [redacted]

Boat Basin and Harbor Areas
Naval Training Center
Sediment
TCLP

| SAMPLE ID: | | SD01A | SD03A | SD05A | SD09A | SD11A | TCLP |
|---|---|---|---|---|---|---|---|
| DEPTH: | | 0-3 | 0-3 | 0-3 | 0-3 | 0-3 | Regulatory |
| AGENCY SAMPLE ID: | | GL63-SD-BB-01A | GL63-SD-BB-03A | GL63-SD-IN-05A | GL63-SD-OH-09A | GL63-SD-OH-11A | Limit |
| DATE SAMPLED: | | 21-AUG-92 | 18-AUG-92 | 18-AUG-92 | 20-AUG-92 | 19-AUG-92 | |
| COMPOUND | | | | | | | |
| TCLP Herbicides | | | | | | | |
| 2,4,5-TP (Silvex) | ug/L | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1,000.0 |
| 2,4-D | ug/L | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 10,000.0 |
| TCLP Pesticides | | | | | | | |
| Toxaphene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 500.0 |
| Methoxychlor | ug/L | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 10,000.0 |
| gamma-Chlordane | ug/L | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 30.0 |
| Endrin | ug/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 20.0 |
| Heptachlor | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 8.0 |
| Gamma-BHC(lindane) | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 400.0 |
| TCLP Semi-Volatiles | | | | | | | |
| Pyridine | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 5.0 |
| 2,4,5-Trichlorophenol | mg/L | 0.5 U | 0.05 U | 0.5 U | 0.62 U | 0.5 U | 400.0 |
| 2,4,6-Trichlorophenol | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 2.0 |
| Hexachlorobutadiene | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 0.5 |
| 2-Methylphenol | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 200.0 |
| Pentachlorophenol | mg/L | 0.5 U | 0.05 U | 0.5 U | 0.62 U | 0.5 U | 100.0 |
| Nitrobenzene | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 2.0 |
| 2,4-Dinitrotoluene | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 0.13 |
| 4-Chloro-3-Methylphenol | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 200.0 |
| 4-Methylphenol | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 200.0 |
| Hexachlorobenzene | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 0.13 |
| Hexachloroethane | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 3.0 |
| 1,4-Dichlorobenzene | mg/L | 0.1 U | 0.01 U | 0.1 U | 0.12 U | 0.1 U | 7.5 |
| TCLP Metals | | | | | | | |
| Arsenic | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 | 5.0 |
| Barium | mg/L | 0.57 | 0.76 | 0.56 | 0.33 | 0.55 | 100.0 |
| Cadmium | mg/L | 0.015 | 0.046 | 0.022 | 0.006 | 0.047 | 1.0 |
| Chromium | mg/L | 0.01 U | 0.01 | 0.02 | 0.01 U | 0.19 | 5.0 |
| Lead | mg/L | 0.24 | 0.16 | 0.32 | 0.15 | 1.1 | 5.0 |
| Mercury | mg/L | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.2 |
| Selenium | mg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 1.0 |
| Silver | mg/L | 0.03 | 0.01 | 0.01 U | 0.01 | 0.01 U | 5.0 |

U - Below Detection Limit

GL63 - Site Inspection for Tesoibone Creek,
Boat Basin and Harbor Areas
Naval Training Center
Sediment
TCLP

| SAMPLE ID: | | SD01A | SD03A | SD05A | SD09A | SD11A | TCLP |
|---|---|---|---|---|---|---|---|
| DEPTH: | | 0-3 | 0-3 | 0-3 | 0-3 | 0-3 | Regulatory |
| AGENCY SAMPLE ID: | | GL63-SD-BB-01A | GL63-SD-BB-03A | GL63-SD-IN-05A | GL63-SD-OH-09A | GL63-SD-OH-11A | Limit |
| DATE SAMPLED: | | 21-AUG-92 | 18-AUG-92 | 18-AUG-92 | 20-AUG-92 | 19-AUG-92 | |
| COMPOUND | | | | | | | |
| TCLP Volatiles | | | | | | | |
| 1,1-dichloroethene | mg/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.7 |
| 1,2-dichloroethane | mg/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.5 |
| 2-butanone [methylethyl keytone] | mg/L | 0.10 U | 0.10 U | 0.10 U | 0.10 U | 0.10 U | 200.0 |
| benzene | mg/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.5 |
| carbon tetrachloride | mg/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.5 |
| chlorobenzene | mg/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 100.0 |
| chloroform | mg/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 6.0 |
| tetrachloroethene | mg/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.7 |
| trichloroethene | mg/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.5 |
| vinyl chloride | mg/L | 0.10 U | 0.10 U | 0.10 U | 0.10 U | 0.10 U | 0.2 |

U - Below Detection Limit
NOTE: All parameters in the TCLP analyses are below RCRA regulatory levels.

# APPENDIX D

# ELUTRIATE LABORATORY REPORTS

**HALLIBURTON NUS**
**Environmental Laboratories**

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

CLIENT ORIGINAL

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

September 29, 1992
Report No.: 00010792
Section A Page 21

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01A ELUTRIATE SW
NUS SAMPLE NO: P0209505
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 5.9 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 7 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.06 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 120 | mg/L |
| 11 | I620 | Solids, Total at 103C | 360 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | 0.003 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

September 29, 1992
Report No.: 00010792
Section A Page 22

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01A ELUTRIATE
NUS SAMPLE NO: P0209506
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 5 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 1.2 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 120 | mg/L |
| 13 | I620 | Solids, Total at 103C | 400 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.006 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

September 29, 1992
Report No.: 00010792
Section A Page 23

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01A ELUTRIATE
NUS SAMPLE NO: P0209507
P.O. NO.: CTO * 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 5 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 5.4 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 370 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.004 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

September 29, 1992
Report No.: 00010792
Section A Page 24

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01A ELUTRIATE
NUS SAMPLE NO: P0209508
P.O. NO.: CTO * 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 4 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 5.2 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 380 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | < 0.002 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

September 29, 1992
Report No.: 00010792
Section A Page 16

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01B ELUTRIATE SW
NUS SAMPLE NO: P0209498
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 14 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.05 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 140 | mg/L |
| 11 | I620 | Solids, Total at 103C | 420 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | 0.002 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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Cleveland, OH 44130
216-891-4700

September 29, 1992
Report No.: 00010792
Section A Page 17

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01B ELUTRIATE
NUS SAMPLE NO: P0209499
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 7 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 27 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 410 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.007 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.07 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010792
Section A Page 18

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01B ELUTRIATE
NUS SAMPLE NO: P0209500
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 6 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 0.8 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 120 | mg/L |
| 13 | I620 | Solids, Total at 103C | 420 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.006 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.06 | mg/L |

COMMENTS:

Re-analyzed.

See Appendix H.

New result 11 mg/L.

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010792
Section A Page 19

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01B ELUTRIATE
NUS SAMPLE NO: P0209501
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 6 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 13 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 410 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.007 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.06 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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216-891-4700

CLIENT ORIGINAL

September 29, 1992
Report No.: 00010792
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02A ELUTRIATE SW
NUS SAMPLE NO: P0209479
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNIT |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.2 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.03 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 120 | mg/L |
| 11 | I620 | Solids, Total at 103C | 340 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | 0.003 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010792
Section A Page 2

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02A ELUTRIATE
NUS SAMPLE NO: P0209480
P.O. NO.: CTO * 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 11 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 23 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 360 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.008 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.07 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010792
Section A Page 3

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02A ELUTRIATE
NUS SAMPLE NO: P0209481
P.O. NO.: CTO * 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 8 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 24 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 360 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.006 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.06 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010792
Section A Page 4

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02A ELUTRIATE
NUS SAMPLE NO: P0209482
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 13 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 24 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 120 | mg/L |
| 13 | I620 | Solids, Total at 103C | 380 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.010 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.10 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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CLIENT ORIGINAL

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September 29, 1992
Report No.: 00010792
Section A Page 11

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02B ELUTRIATE SW
NUS SAMPLE NO: P0209491
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.4 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 4 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.02 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 150 | mg/L |
| 11 | I620 | Solids, Total at 103C | 380 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | < 0.002 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010792
Section A Page 12

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02B ELUTRIATE
NUS SAMPLE NO: P0209492
P.O. NO.: CTO * 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 15 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 30 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 370 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.02 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.011 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.08 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010792
Section A Page 13

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-B8-02B ELUTRIATE
NUS SAMPLE NO: P0209493
P.O. NO.: CTO * 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 13 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 28 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 42 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 360 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.02 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.013 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.04 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.07 | mg/L |

COMMENTS:

Re-analyzed.

See Appendix H.

New result <10 mg/L.

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010792
Section A Page 14

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02B ELUTRIATE
NUS SAMPLE NO: P0209494
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 17 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 30 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 370 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.02 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.012 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.09 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010790
Section A Page 1

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03A ELUTRIATE SW
NUS SAMPLE NO: P0209163
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNIT |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.2 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.04 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 65 | mg/L |
| 11 | I620 | Solids, Total at 103C | 230 | mg/L |
| 12 | AP8A | Lead, Low Level (Pb) | 0.004 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010790
Section A Page 24

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03A ELUTRIATE
NUS SAMPLE NO: P0209217
P.O. NO.: CTO * 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 16 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 20 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 330 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.22 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.08 | mg/L |

COMMENTS:

Re-analyzed.

See Appendix H.

New result 0.006 mg/L.

**HALLIBURTON NUS**
**Environmental Laboratories**

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Cleveland, OH 44130
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CLIENT ORIGINAL

September 29, 1992
Report No.: 00010790
Section A Page 25

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-B8-03A ELUTRIATE
NUS SAMPLE NO: P0209218
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 11 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 20 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 350 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.006 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.09 | mg/L |

COMMENTS:

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**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 2

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03A ELUTRIATE
NUS SAMPLE NO: P0209164
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 13 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 33 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 340 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.008 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.09 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 21

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03B ELUTRIATE SW
NUS SAMPLE NO: P0209194
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.1 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.06 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 67 | mg/L |
| 11 | I620 | Solids, Total at 103C | 200 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | 0.007 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 35

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03B ELUTRIATE
NUS SAMPLE NO: P0209228
P.O. NO.: CTO * 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 13 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 23 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 340 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.014 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.04 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.06 | mg/L |

COMMENTS:

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**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 34

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03B ELUTRIATE
NUS SAMPLE NO: P0209227
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 20 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 26 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 350 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.004 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.06 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.19 | mg/L |

COMMENTS:

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**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 22

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03B ELUTRIATE
NUS SAMPLE NO: P0209195
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 17 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 22 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 120 | mg/L |
| 13 | I620 | Solids, Total at 103C | 330 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.08 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.07 | mg/L |
| 20 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 21 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 22 | APBL | Lead, Leachable (Pb) | 0.008 | mg/L |

COMMENTS:

January 27, 1993
Report No.: UnAvail
Section A Page 1

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

SAMPLE ID: GL63-SD-BB-04A ELUTRIATE — SW
NUS SAMPLE NO: P0209179
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92

| LN | TEST CODE | DETERMINATION | RESULT | UNIT |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.3 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.03 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 70 | mg/L |
| 11 | I620 | Solids, Total at 103C | 180 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | 0.004 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 29

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04A ELUTRIATE
NUS SAMPLE NO: P0209222
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 13 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 25 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 290 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.04 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.021 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.14 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010790
Section A Page 28

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04A ELUTRIATE
NUS SAMPLE NO: P0209221
P.O. NO.: CTO * 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 12 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 24 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 290 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.07 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.028 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.04 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.12 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 14

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04A ELUTRIATE
NUS SAMPLE NO: P0209180
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 11 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 12 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 300 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 2.4 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.08 | mg/L |

COMMENTS:

Re-analyzed.

See Appendix H.

New result 0.004 mg/L.

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 16

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04B ELUTRIATE SW
NUS SAMPLE NO: P0209183
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.3 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 2 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.26 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 53 | mg/L |
| 11 | I620 | Solids, Total at 103C | 180 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | 0.003 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010790
Section A Page 31

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04B ELUTRIATE
NUS SAMPLE NO: P0209224
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 10 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 21 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 90 | mg/L |
| 13 | I620 | Solids, Total at 103C | 290 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.002 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.05 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010790
Section A Page 30

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB 04B ELUTRIATE
NUS SAMPLE NO: P0209223
P.O. NO.: CTO * 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 11 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 25 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 310 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.006 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.06 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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216-891-4700

CLIENT ORIGINAL

September 29, 1992
Report No.: 00010790
Section A Page 17

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04B ELUTRIATE
NUS SAMPLE NO: P0209184
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 11 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 20 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 260 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.008 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.08 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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CLIENT ORIGINAL

September 29, 1992
Report No.: 00010790
Section A Page 7

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05A ELUTRIATE SW
NUS SAMPLE NO: P0209169
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.2 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.03 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 52 | mg/L |
| 11 | I620 | Solids, Total at 103C | 180 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | < 0.002 | mg/L |

COMMENTS:

CLIENT ORIGINAL

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September 29, 1992
Report No.: 00010790
Section A Page 26

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05A ELUTRIATE
NUS SAMPLE NO: P0209219
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 11 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 23 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 310 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.006 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.10 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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CLIENT ORIGINAL

September 29, 1992
Report No.: 00010790
Section A Page 27

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05A ELUTRIATE
NUS SAMPLE NO: P0209220
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 12 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 23 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 120 | mg/L |
| 13 | I620 | Solids, Total at 103C | 310 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.011 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.05 | mg/L |

COMMENTS:

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September 29, 1992
Report No.: 00010790
Section A Page 8

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05A ELUTRIATE
NUS SAMPLE NO: P0209170
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 10 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 35 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 81 | mg/L |
| 13 | I620 | Solids, Total at 103C | 300 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.007 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.07 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 19

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05B ELUTRIATE SW
NUS SAMPLE NO: P0209189
P.O. NO.: CTO * 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.5 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 2 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.04 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 67 | mg/L |
| 11 | I620 | Solids, Total at 103C | 180 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | < 0.002 | mg/L |

COMMENTS:

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September 29, 1992
Report No.: 00010790
Section A Page 32

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05B ELUTRIATE
NUS SAMPLE NO: P0209225
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 13 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 27 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 290 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.004 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.05 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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CLIENT ORIGINAL

September 29, 1992
Report No.: 00010790
Section A Page 33

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05B ELUTRIATE
NUS SAMPLE NO: P0209226
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 12 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 29 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 320 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.016 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | 0.0006 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.04 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.18 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 20

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05B ELUTRIATE
NUS SAMPLE NO: P0209190
P.O. NO.: CTO * 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 11 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 23 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 310 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.007 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.04 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.06 | mg/L |

COMMENTS:

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**HALLIBURTON NUS**
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October 02, 1992
Report No.: 00010899
Section A Page 1

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-09A ELUTRIATE SW
NUS SAMPLE NO: P0209379
P.O. NO.: CTO # 0063

DATE SAMPLED: 20-AUG-92
DATE RECEIVED: 21-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNIT |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.3 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 4 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.10 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 65 | mg/L |
| 11 | I620 | Solids, Total at 103C | 180 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | 0.006 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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CLIENT ORIGINAL

October 02, 1992
Report No.: 00010899
Section A Page 2

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-09A ELUTRIATE
NUS SAMPLE NO: P0209380
P.O. NO.: CTO * 0063

DATE SAMPLED: 20-AUG-92
DATE RECEIVED: 21-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 5.1 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 59 | mg/L |
| 13 | I620 | Solids, Total at 103C | 220 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.013 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.03 | mg/L |

COMMENTS:

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**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010791
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10A ELUTRIATE SW
NUS SAMPLE NO: P0209244
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNIT |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | < 0.1 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.05 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 60 | mg/L |
| 11 | I620 | Solids, Total at 103C | 180 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | < 0.002 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010791
Section A Page 2

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10A ELUTRIATE
NUS SAMPLE NO: P0209245
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 5 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 7.0 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 72 | mg/L |
| 13 | I620 | Solids, Total at 103C | 220 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.002 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.03 | mg/L |

COMMENTS:

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**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010791
Section A Page 3

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10A ELUTRIATE
NUS SAMPLE NO: P0209246
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 4 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 5.3 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 60 | mg/L |
| 13 | I620 | Solids, Total at 103C | 210 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.003 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.03 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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216-891-4700

CLIENT ORIGINAL

September 29, 1992
Report No.: 00010791
Section A Page 4

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10A ELUTRIATE
NUS SAMPLE NO: P0209247
P.O. NO.: CTO * 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 7 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 7.0 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 81 | mg/L |
| 13 | I620 | Solids, Total at 103C | 240 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.003 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

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September 29, 1992
Report No.: 00010791
Section A Page 19

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10B ELUTRIATE SW
NUS SAMPLE NO: P0209284
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.6 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 2 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.02 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 70 | mg/L |
| 11 | I620 | Solids, Total at 103C | 200 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | 0.003 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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CLIENT ORIGINAL

September 29, 1992
Report No.: 00010791
Section A Page 20

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-108 ELUTRIATE
NUS SAMPLE NO: P0209285
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 4 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 3.5 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 54 | mg/L |
| 13 | I620 | Solids, Total at 103C | 180 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | < 0.002 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

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September 29, 1992
Report No.: 00010791
Section A Page 21

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10B ELUTRIATE
NUS SAMPLE NO: P0209286
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 4 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 4.5 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 59 | mg/L |
| 13 | I620 | Solids, Total at 103C | 180 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.005 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.02 | mg/L |

COMMENTS:

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**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010791
Section A Page 22

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10B ELUTRIATE
NUS SAMPLE NO: P0209287
P.O. NO.: CTO * 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 44 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 73 | mg/L |
| 13 | I620 | Solids, Total at 103C | 200 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.007 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

Re-analyzed.

See Appendix H.

New result 4.3 mg/L.

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September 29, 1992
Report No.: 00010791
Section A Page 11

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11A ELUTRIATE SW
NUS SAMPLE NO: P0209267
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.3 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.02 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 59 | mg/L |
| 11 | I620 | Solids, Total at 103C | 180 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | < 0.002 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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CLIENT ORIGINAL

September 29, 1992
Report No.: 00010791
Section A Page 12

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11A ELUTRIATE
NUS SAMPLE NO: P0209268
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 18 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 24 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 70 | mg/L |
| 13 | I620 | Solids, Total at 103C | 220 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.008 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.05 | mg/L |

COMMENTS:

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**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010791
Section A Page 13

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11A ELUTRIATE
NUS SAMPLE NO: P0209269
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 10 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 26 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 60 | mg/L |
| 13 | I620 | Solids, Total at 103C | 230 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.004 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010791
Section A Page 14

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11A ELUTRIATE
NUS SAMPLE NO: P0209270
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 9 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 24 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 66 | mg/L |
| 13 | I620 | Solids, Total at 103C | 230 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.002 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010791
Section A Page 6

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11B ELUTRIATE SW
NUS SAMPLE NO: P0209252
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 11 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.04 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 72 | mg/L |
| 11 | I620 | Solids, Total at 103C | 200 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | < 0.002 | mg/L |

COMMENTS:

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September 29, 1992
Report No.: 00010791
Section A Page 7

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11B ELUTRIATE
NUS SAMPLE NO: P0209253
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 9 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 34 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 73 | mg/L |
| 13 | I620 | Solids, Total at 103C | 260 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.010 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.07 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010791
Section A Page 8

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11B ELUTRIATE
NUS SAMPLE NO: P0209254
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 12 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 40 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 83 | mg/L |
| 13 | I620 | Solids, Total at 103C | 250 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.008 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

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**HALLIBURTON NUS**
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Report No.: 00010791
Section A Page 9

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11B ELUTRIATE
NUS SAMPLE NO: P0209255
P.O. NO.: CTO * 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 12 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 40 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 84 | mg/L |
| 13 | I620 | Solids, Total at 103C | 250 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.010 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.03 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

5350 Campbells Run Road
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6751-L Engle Road
Cleveland, OH 44130
216-891-4700

September 29, 1992
Report No.: 00010792
Section A Page 6

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12A ELUTRIATE SW
NUS SAMPLE NO: P0209485
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.1 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.02 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 72 | mg/L |
| 11 | I620 | Solids, Total at 103C | 190 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | 0.004 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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Cleveland, OH 44130
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CLIENT ORIGINAL

September 29, 1992
Report No.: 00010792
Section A Page 7

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12A ELUTRIATE
NUS SAMPLE NO: P0209486
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 3.1 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 66 | mg/L |
| 13 | I620 | Solids, Total at 103C | 200 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.004 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.05 | mg/L |

COMMENTS:

CLIENT ORIGINAL

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September 29, 1992
Report No.: 00010792
Section A Page 8

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12A ELUTRIATE
NUS SAMPLE NO: P0209487
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 4 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 3.1 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 80 | mg/L |
| 13 | I620 | Solids, Total at 103C | 210 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.004 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | 0.0009 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.03 | mg/L |

COMMENTS:

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Report No.: 00010792
Section A Page 9

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12A ELUTRIATE
NUS SAMPLE NO: P0209488
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 6 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 3.2 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 66 | mg/L |
| 13 | I620 | Solids, Total at 103C | 200 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.004 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS:

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September 29, 1992
Report No.: 00010792
Section A Page 29

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12B ELUTRIATE SW
NUS SAMPLE NO: P0209514
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | I032 | Ammonia (as N), Distillation | 0.2 | mg/L |
| 2 | I106 | Carbon, Organic - Nonpurgeable | 4 | mg/L |
| 3 | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| 4 | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| 6 | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| 7 | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| 8 | AZNW | Zinc, Total (Zn) | 0.03 | mg/L |
| 9 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 10 | I625 | Solids, Volatile Total at 550C | 59 | mg/L |
| 11 | I620 | Solids, Total at 103C | 170 | mg/L |
| 12 | APBA | Lead, Low Level (Pb) | 0.003 | mg/L |

COMMENTS:

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September 29, 1992
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## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12B ELUTRIATE
NUS SAMPLE NO: P0209515
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 5 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 5.2 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 62 | mg/L |
| 13 | I620 | Solids, Total at 103C | 190 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.02 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.010 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.24 | mg/L |

COMMENTS:

Re-analyzed.

See Appendix H.

New result 0.05 mg/L.

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September 29, 1992
Report No.: 00010792
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## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12B ELUTRIATE
NUS SAMPLE NO: P0209516
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 5 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 4.8 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 44 | mg/L |
| 13 | I620 | Solids, Total at 103C | 190 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.008 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS: TVS result is below the method detection limit.

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010792
Section A Page 32

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12B ELUTRIATE
NUS SAMPLE NO: P0209517
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 6 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 3.9 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 49 | mg/L |
| 13 | I620 | Solids, Total at 103C | 190 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.006 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS: TVS result is below the method detection limit.

# APPENDIX E

# SUPERNATANT LABORATORY REPORTS

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010792
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LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01A SUPERNATANT
NUS SAMPLE NO: P0209509
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.10 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.40 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 4.04 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 8.6 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 69 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 120 | mg/L |
| 13 | I620 | Solids, Total at 103C | 490 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.068 | mg/L |

COMMENTS:

CLIENT ORIGINAL

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September 29, 1992
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## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01B SUPERNATANT
NUS SAMPLE NO: P0209502
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.19 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0003 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.07 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.37 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 4 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 12 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 560 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.16 | mg/L |

COMMENTS:

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LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02A SUPERNATANT
NUS SAMPLE NO: P0209483
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.18 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0006 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.04 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.52 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 8 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 17 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 180 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 130 | mg/L |
| 13 | I620 | Solids, Total at 103C | 600 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.26 | mg/L |

COMMENTS:

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## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02B SUPERNATANT
NUS SAMPLE NO: P0209495
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.22 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0004 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.09 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.36 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 10 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 28 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 120 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 530 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.19 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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September 29, 1992
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Section A Page 3

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03A SUPERNATANT
NUS SAMPLE NO: P0209165
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.34 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0011 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.09 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.67 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 8 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 17 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 210 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 140 | mg/L |
| 13 | I620 | Solids, Total at 103C | 640 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.39 | mg/L |

COMMENTS:

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Cleveland, OH 44130
216-891-4700

CLIENT ORIGINAL

September 29, 1992
Report No.: 00010790
Section A Page 23

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03B SUPERNATANT
NUS SAMPLE NO: P0209196
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.37 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0011 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.12 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.59 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 11 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 19 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 110 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 140 | mg/L |
| 13 | I620 | Solids, Total at 103C | 530 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.35 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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CLIENT ORIGINAL

September 29, 1992
Report No.: 00010790
Section A Page 15

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04A SUPERNATANT
NUS SAMPLE NO: P0209181
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 2.9 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0022 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.22 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 3.1 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 10 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 23 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 270 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 160 | mg/L |
| 13 | I620 | Solids, Total at 103C | 880 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 2.0 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010790
Section A Page 18

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04B SUPERNATANT
NUS SAMPLE NO: P0209185
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.35 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0008 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.09 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.66 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 8 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 20 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 190 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 140 | mg/L |
| 13 | I620 | Solids, Total at 103C | 590 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.38 | mg/L |

COMMENTS:

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CLIENT ORIGINAL

September 29, 1992
Report No.: 00010790
Section A Page 9

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05A SUPERNATANT
NUS SAMPLE NO: P0209171
P.O. NO.: CTO * 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.22 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0007 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.04 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.53 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 7 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 20 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 230 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 130 | mg/L |
| 13 | I620 | Solids, Total at 103C | 620 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.31 | mg/L |

COMMENTS:

January 26, 1993
Report No.: UnAvail
Section A Page 1

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

SAMPLE ID: GL63-SD-IN-05B /
NUS SAMPLE NO: P0209191
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92

| LN | TEST CODE | DETERMINATION | RESULT | UNIT |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.39 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0017 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.15 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.66 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 9 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 17 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 190 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 140 | mg/L |
| 13 | I620 | Solids, Total at 103C | 690 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.40 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
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October 02, 1992
Report No.: 00010899
Section A Page 3

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-09A SUPERNATANT
NUS SAMPLE NO: P0209383
P.O. NO.: CTO # 0063

DATE SAMPLED: 20-AUG-92
DATE RECEIVED: 21-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.11 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0004 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.23 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 1.8 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 190 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 69 | mg/L |
| 13 | I620 | Solids, Total at 103C | 360 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.15 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010791
Section A Page 5

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10A SUPERNATANT
NUS SAMPLE NO: P0209248
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.36 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0013 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.57 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 7.5 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 560 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 99 | mg/L |
| 13 | I620 | Solids, Total at 103C | 800 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.43 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010791
Section A Page 23

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10B SUPERNATANT
NUS SAMPLE NO: P0209288
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.02 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0002 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 1.4 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 87 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 17 | mg/L |
| 13 | I620 | Solids, Total at 103C | 260 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.010 | mg/L |

COMMENTS: The result for TVS is less than our detection limit of 50 mg/L.

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**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010791
Section A Page 15

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11A SUPERNATANT
NUS SAMPLE NO: P0209271
P.O. NO.: CTO * 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.84 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.0023 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.13 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 1.4 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 7 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 19 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 920 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 220 | mg/L |
| 13 | I620 | Solids, Total at 103C | 2100 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.88 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010791
Section A Page 10

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11B SUPERNATANT
NUS SAMPLE NO: P0209256
P.O. NO.: CTO * 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | 0.3 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 1.3 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | 0.015 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | 0.20 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 3.7 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 10 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 27 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 390 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 470 | mg/L |
| 13 | I620 | Solids, Total at 103C | 4600 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 2.3 | mg/L |

COMMENTS:

CLIENT ORIGINAL

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010792
Section A Page 10

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12A SUPERNATANT
NUS SAMPLE NO: P0209489
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.04 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.09 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 3.2 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 110 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 69 | mg/L |
| 13 | I620 | Solids, Total at 103C | 320 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.14 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
**Environmental Laboratories**

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CLIENT ORIGINAL

September 29, 1992
Report No.: 00010792
Section A Page 33

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12B SUPERNATANT
NUS SAMPLE NO: P0209518
P.O. NO.: CTO * 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S913 | Supernatant Test | DONE | |
| 3 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 4 | ACUL | Copper, Leachable (Cu) | 0.11 | mg/L |
| 6 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 7 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 8 | AZNL | Zinc, Leachable (Zn) | 0.20 | mg/L |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 19 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | 77 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 53 | mg/L |
| 13 | I620 | Solids, Total at 103C | 300 | mg/L |
| 14 | APBL | Lead, Leachable (Pb) | 0.093 | mg/L |

COMMENTS:

# APPENDIX F

# TCLP LABORATORY REPORTS

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

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September 29, 1992
Report No.: 00010792
Section A Page 28

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01A ZHE
NUS SAMPLE NO: P0209512
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S904 | Zero Headspace Extraction [ZHE] | DONE | |
| 2 | OVZHE | VOLATILES - ZHE/PART 261 | | |
| | | 1,1-dichloroethene [1,1-dichloroethylene] | < 0.05 | mg/L |
| | | 1,2-dichloroethane | < 0.05 | mg/L |
| | | 2-butanone [methylethyl ketone] [MEK] | < 0.10 | mg/L |
| | | benzene | < 0.05 | mg/L |
| | | carbon tetrachloride | < 0.05 | mg/L |
| | | chlorobenzene | < 0.05 | mg/L |
| | | chloroform | < 0.05 | mg/L |
| | | tetrachloroethene [tetrachloroethylene] | < 0.05 | mg/L |
| | | trichloroethene [trichloroethylene] | < 0.05 | mg/L |
| | | vinyl chloride | < 0.10 | mg/L |

COMMENTS:

CLIENT ORIGINAL

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September 29, 1992
Report No.: 00010792
Section A Page 26

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01A TCLP
NUS SAMPLE NO: P0209511
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S903 | Toxic Characteristic Leaching Procedure [TCLP] | DONE | |
| 2 | OTCLP | SEMIVOLATILES - TCLP/PART 261 | | |
| | | 1,4-dichlorobenzene [p-dichlorobenzene] | < 0.1 | mg/L |
| | | 2,4,5-trichlorophenol | < 0.5 | mg/L |
| | | 2,4,6-trichlorophenol | < 0.1 | mg/L |
| | | 2,4-dinitrotoluene | < 0.1 | mg/L |
| | | 2-methylphenol [o-cresol] | < 0.1 | mg/L |
| | | 3-methylphenol [m-cresol] | < 0.1 | mg/L |
| | | 4-methylphenol [p-cresol] | < 0.1 | mg/L |
| | | hexachlorobenzene | < 0.1 | mg/L |
| | | hexachlorobutadiene | < 0.1 | mg/L |
| | | hexachloroethane | < 0.1 | mg/L |
| | | nitrobenzene | < 0.1 | mg/L |
| | | pentachlorophenol | < 0.5 | mg/L |
| | | pyridine | < 0.1 | mg/L |
| 4 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 5 | ABAL | Barium, Leachable (Ba) | 0.57 | mg/L |
| 6 | ACDL | Cadmium, Leachable (Cd) | 0.015 | mg/L |
| 7 | ACRL | Chromium, Leachable (Cr) | < 0.01 | mg/L |
| 8 | APBL | Lead, Leachable (Pb) | 0.24 | mg/L |
| 9 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 10 | ASEL | Selenium, Leachable (Se) | < 0.1 | mg/L |
| 11 | AAGL | Silver, Leachable (Ag) | 0.03 | mg/L |
| 15 | G121L | ORGANOCHLORINE PESTICIDES | | |
| | | chlordane | < 0.5 | ug/L |
| | | endrin | < 0.1 | ug/L |
| | | gamma-BHC [lindane] | < 0.05 | ug/L |
| | | heptachlor | < 0.05 | ug/L |
| | | methoxychlor | < 0.5 | ug/L |
| | | toxaphene | < 1 | ug/L |

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216-891-4700



## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
SAMPLE ID: GL63-SD-BB-01A TCLP
NUS SAMPLE NO: P0209511

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 17 | G13OL | CHLORINATED HERBICIDES | | |
| | | 2,4,5-TP [silvex] | < 0.5 | ug/L |
| | | 2,4-D | < 0.5 | ug/L |

COMMENTS:

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September 29, 1992
Report No.: 00010790
Section A Page 6

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03A / ZHE EXT
NUS SAMPLE NO: P0209168
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S904 | Zero Headspace Extraction [ZHE] | DONE | |
| 2 | OVZHE | VOLATILES - ZHE/PART 261 | | |
| | | 1,1-dichloroethene [1,1-dichloroethylene] | < 0.05 | mg/L |
| | | 1,2-dichloroethane | < 0.05 | mg/L |
| | | 2-butanone [methylethyl ketone] [MEK] | < 0.10 | mg/L |
| | | benzene | < 0.05 | mg/L |
| | | carbon tetrachloride | < 0.05 | mg/L |
| | | chlorobenzene | < 0.05 | mg/L |
| | | chloroform | < 0.05 | mg/L |
| | | tetrachloroethene [tetrachloroethylene] | < 0.05 | mg/L |
| | | trichloroethene [trichloroethylene] | < 0.05 | mg/L |
| | | vinyl chloride | < 0.10 | mg/L |

COMMENTS:

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September 29, 1992
Report No.: 00010790
Section A Page 4

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03A / TCLP LEACH
NUS SAMPLE NO: P0209167
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S903 | Toxic Characteristic Leaching Procedure [TCLP] | DONE | |
| 2 | OTCLP | SEMIVOLATILES - TCLP/PART 261 | | |
| | | 1,4-dichlorobenzene [p-dichlorobenzene] | < 10 | ug/L |
| | | 2,4,5-trichlorophenol | < 50 | ug/L |
| | | 2,4,6-trichlorophenol | < 10 | ug/L |
| | | 2,4-dinitrotoluene | < 10 | ug/L |
| | | 2-methylphenol [o-cresol] | < 10 | ug/L |
| | | 3-methylphenol [m-cresol] | < 10 | ug/L |
| | | 4-methylphenol [p-cresol] | < 10 | ug/L |
| | | hexachlorobenzene | < 10 | ug/L |
| | | hexachlorobutadiene | < 10 | ug/L |
| | | hexachloroethane | < 10 | ug/L |
| | | nitrobenzene | < 10 | ug/L |
| | | pentachlorophenol | < 50 | ug/L |
| | | pyridine | < 10 | ug/L |
| 4 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 5 | ABAL | Barium, Leachable (Ba) | 0.76 | mg/L |
| 6 | ACDL | Cadmium, Leachable (Cd) | 0.046 | mg/L |
| 7 | ACRL | Chromium, Leachable (Cr) | 0.01 | mg/L |
| 8 | APBL | Lead, Leachable (Pb) | 0.16 | mg/L |
| 9 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 10 | ASEL | Selenium, Leachable (Se) | < 0.1 | mg/L |
| 11 | AAGL | Silver, Leachable (Ag) | 0.01 | mg/L |
| 15 | G121L | ORGANOCHLORINE PESTICIDES | | |
| | | chlordane | < 0.5 | ug/L |
| | | endrin | < 0.1 | ug/L |
| | | gamma-BHC [lindane] | < 0.05 | ug/L |
| | | heptachlor | < 0.05 | ug/L |
| | | methoxychlor | < 0.5 | ug/L |
| | | toxaphene | < 1 | ug/L |

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September 29, 1992
Report No.: 00010790
Section A Page 5

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
SAMPLE ID: GL63-SD-BB-03A / TCLP LEACH
NUS SAMPLE NO: P0209167

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 17 | G130L | CHLORINATED HERBICIDES | | |
| | | 2,4,5-TP [silvex] | < 0.5 | ug/L |
| | | 2,4-D | < 0.5 | ug/L |

COMMENTS:

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September 29, 1992
Report No.: 00010790
Section A Page 12

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05A / ZHE EXT
NUS SAMPLE NO: P0209174
P.O. NO.: CTO * 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S904 | Zero Headspace Extraction [ZHE] | DONE | |
| 2 | OVZHE | VOLATILES - ZHE/PART 261 | | |
| | | 1,1-dichloroethene [1,1-dichloroethylene] | < 0.05 | mg/L |
| | | 1,2-dichloroethane | < 0.05 | mg/L |
| | | 2-butanone [methylethyl ketone] [MEK] | < 0.10 | mg/L |
| | | benzene | < 0.05 | mg/L |
| | | carbon tetrachloride | < 0.05 | mg/L |
| | | chlorobenzene | < 0.05 | mg/L |
| | | chloroform | < 0.05 | mg/L |
| | | tetrachloroethene [tetrachloroethylene] | < 0.05 | mg/L |
| | | trichloroethene [trichloroethylene] | < 0.05 | mg/L |
| | | vinyl chloride | < 0.10 | mg/L |

COMMENTS:

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September 29, 1992
Report No.: 00010790
Section A Page 10

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-1N-05A / TCLP LEACH
NUS SAMPLE NO: P0209173
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S903 | Toxic Characteristic Leaching Procedure [TCLP] | DONE | |
| 2 | OTCLP | SEMIVOLATILES - TCLP/PART 261 | | |
| | | 1,4-dichlorobenzene [p-dichlorobenzene] | < 0.1 | mg/L |
| | | 2,4,5-trichlorophenol | < 0.5 | mg/L |
| | | 2,4,6-trichlorophenol | < 0.1 | mg/L |
| | | 2,4-dinitrotoluene | < 0.1 | mg/L |
| | | 2-methylphenol [o-cresol] | < 0.1 | mg/L |
| | | 3-methylphenol [m-cresol] | < 0.1 | mg/L |
| | | 4-methylphenol [p-cresol] | < 0.1 | mg/L |
| | | hexachlorobenzene | < 0.1 | mg/L |
| | | hexachlorobutadiene | < 0.1 | mg/L |
| | | hexachloroethane | < 0.1 | mg/L |
| | | nitrobenzene | < 0.1 | mg/L |
| | | pentachlorophenol | < 0.5 | mg/L |
| | | pyridine | < 0.1 | mg/L |
| 4 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 5 | ABAL | Barium, Leachable (Ba) | 0.56 | mg/L |
| 6 | ACDL | Cadmium, Leachable (Cd) | 0.022 | mg/L |
| 7 | ACRL | Chromium, Leachable (Cr) | 0.02 | mg/L |
| 8 | APBL | Lead, Leachable (Pb) | 0.32 | mg/L |
| 9 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 10 | ASEL | Selenium, Leachable (Se) | < 0.1 | mg/L |
| 11 | AAGL | Silver, Leachable (Ag) | < 0.01 | mg/L |
| 15 | G121L | ORGANOCHLORINE PESTICIDES | | |
| | | chlordane | < 0.5 | ug/L |
| | | endrin | < 0.1 | ug/L |
| | | gamma-BHC [lindane] | < 0.05 | ug/L |
| | | heptachlor | < 0.05 | ug/L |
| | | methoxychlor | < 0.5 | ug/L |
| | | toxaphene | < 1 | ug/L |

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September 29, 1992
Report No.: 00010790
Section A Page 11

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
SAMPLE ID: GL63-SD-1N-05A / TCLP LEACH
NUS SAMPLE NO: P0209173

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 17 | G130L | CHLORINATED HERBICIDES | | |
| | | 2,4,5-TP [silvex] | < 0.5 | ug/L |
| | | 2,4-D | < 0.5 | ug/L |

COMMENTS:

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October 02, 1992
Report No.: 00010899
Section A Page 6

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-09A / ZHE EXT
NUS SAMPLE NO: P0209386
P.O. NO.: CTO # 0063

DATE SAMPLED: 20-AUG-92
DATE RECEIVED: 21-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S904 | Zero Headspace Extraction [ZHE] | DONE | |
| 2 | OVZHE | VOLATILES - ZHE/PART 261 | | |
| | | 1,1-dichloroethene [1,1-dichloroethylene] | < 0.05 | mg/L |
| | | 1,2-dichloroethane | < 0.05 | mg/L |
| | | 2-butanone [methylethyl ketone] [MEK] | < 0.10 | mg/L |
| | | benzene | < 0.05 | mg/L |
| | | carbon tetrachloride | < 0.05 | mg/L |
| | | chlorobenzene | < 0.05 | mg/L |
| | | chloroform | < 0.05 | mg/L |
| | | tetrachloroethene [tetrachloroethylene] | < 0.05 | mg/L |
| | | trichloroethene [trichloroethylene] | < 0.05 | mg/L |
| | | vinyl chloride | < 0.10 | mg/L |

COMMENTS:

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CLIENT ORIGINAL

October 02, 1992
Report No.: 00010899
Section A Page 4

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-09A / TCLP LEACH
NUS SAMPLE NO: P0209385
P.O. NO.: CTO # 0063

DATE SAMPLED: 20-AUG-92
DATE RECEIVED: 21-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S903 | Toxic Characteristic Leaching Procedure [TCLP] | DONE | |
| 2 | OTCLP | SEMIVOLATILES - TCLP/PART 261 | | |
| | | 1,4-dichlorobenzene [p-dichlorobenzene] | < 0.12 | mg/L |
| | | 2,4,5-trichlorophenol | < 0.62 | mg/L |
| | | 2,4,6-trichlorophenol | < 0.12 | mg/L |
| | | 2,4-dinitrotoluene | < 0.12 | mg/L |
| | | 2-methylphenol [o-cresol] | < 0.12 | mg/L |
| | | 3-methylphenol [m-cresol] | < 0.12 | mg/L |
| | | 4-methylphenol [p-cresol] | < 0.12 | mg/L |
| | | hexachlorobenzene | < 0.12 | mg/L |
| | | hexachlorobutadiene | < 0.12 | mg/L |
| | | hexachloroethane | < 0.12 | mg/L |
| | | nitrobenzene | < 0.12 | mg/L |
| | | pentachlorophenol | < 0.62 | mg/L |
| | | pyridine | < 0.12 | mg/L |
| 4 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 5 | ABAL | Barium, Leachable (Ba) | 0.33 | mg/L |
| 6 | ACDL | Cadmium, Leachable (Cd) | 0.006 | mg/L |
| 7 | ACRL | Chromium, Leachable (Cr) | < 0.01 | mg/L |
| 8 | APBL | Lead, Leachable (Pb) | 0.15 | mg/L |
| 9 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 10 | ASEL | Selenium, Leachable (Se) | < 0.1 | mg/L |
| 11 | AAGL | Silver, Leachable (Ag) | 0.01 | mg/L |
| 15 | G121L | ORGANOCHLORINE PESTICIDES | | |
| | | chlordane | < 0.5 | ug/L |
| | | endrin | < 0.1 | ug/L |
| | | gamma-BHC [lindane] | < 0.05 | ug/L |
| | | heptachlor | < 0.05 | ug/L |
| | | methoxychlor | < 0.5 | ug/L |
| | | toxaphene | < 1 | ug/L |

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October 02, 1992
Report No.: 00010899
Section A Page 5

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
SAMPLE ID: GL63-SD-OH-09A / TCLP LEACH
NUS SAMPLE NO: P0209385

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 17 | G130L | CHLORINATED HERBICIDES | | |
| | | 2,4,5-TP [silvex] | < 0.5 | ug/L |
| | | 2,4-D | < 0.5 | ug/L |

COMMENTS: The original semivolatile organic GC/MS analysis of this TCLP extract (prepared on 09/02/92) showed no recoveries of any of the acid surrogate compounds. Reextraction (prepared on 09/21/92) and reanalysis of this TCLP extract showed acceptable recoveries of all surrogate compounds. The problem with the acid surrogates during the original extract analysis has not been determined. The results reported here represent the results obtained during the reanalysis of the reextracted TCLP extract.

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## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11A / ZHE EXT
NUS SAMPLE NO: P0209274
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S904 | Zero Headspace Extraction [ZHE] | DONE | |
| 2 | OVZHE | VOLATILES - ZHE/PART 261 | | |
| | | 1,1-dichloroethene [1,1-dichloroethylene] | < 0.05 | mg/L |
| | | 1,2-dichloroethane | < 0.05 | mg/L |
| | | 2-butanone [methylethyl ketone] [MEK] | < 0.10 | mg/L |
| | | benzene | < 0.05 | mg/L |
| | | carbon tetrachloride | < 0.05 | mg/L |
| | | chlorobenzene | < 0.05 | mg/L |
| | | chloroform | < 0.05 | mg/L |
| | | tetrachloroethene [tetrachloroethylene] | < 0.05 | mg/L |
| | | trichloroethene [trichloroethylene] | < 0.05 | mg/L |
| | | vinyl chloride | < 0.10 | mg/L |

COMMENTS:

**HALLIBURTON NUS**
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September 29, 1992
Report No.: 00010791
Section A Page 16

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11A / TCLP LEACH
NUS SAMPLE NO: P0209273
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S903 | Toxic Characteristic Leaching Procedure [TCLP] | DONE | |
| 2 | OTCLP | SEMIVOLATILES - TCLP/PART 261 | | |
| | | 1,4-dichlorobenzene [p-dichlorobenzene] | < 0.1 | mg/L |
| | | 2,4,5-trichlorophenol | < 0.5 | mg/L |
| | | 2,4,6-trichlorophenol | < 0.1 | mg/L |
| | | 2,4-dinitrotoluene | < 0.1 | mg/L |
| | | 2-methylphenol [o-cresol] | < 0.1 | mg/L |
| | | 3-methylphenol [m-cresol] | < 0.1 | mg/L |
| | | 4-methylphenol [p-cresol] | < 0.1 | mg/L |
| | | hexachlorobenzene | < 0.1 | mg/L |
| | | hexachlorobutadiene | < 0.1 | mg/L |
| | | hexachloroethane | < 0.1 | mg/L |
| | | nitrobenzene | < 0.1 | mg/L |
| | | pentachlorophenol | < 0.5 | mg/L |
| | | pyridine | < 0.1 | mg/L |
| 4 | AASL | Arsenic, Leachable (As) | 0.1 | mg/L |
| 5 | ABAL | Barium, Leachable (Ba) | 0.55 | mg/L |
| 6 | ACDL | Cadmium, Leachable (Cd) | 0.047 | mg/L |
| 7 | ACRL | Chromium, Leachable (Cr) | 0.19 | mg/L |
| 8 | APBL | Lead, Leachable (Pb) | 1.1 | mg/L |
| 9 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 10 | ASEL | Selenium, Leachable (Se) | < 0.1 | mg/L |
| 11 | AAGL | Silver, Leachable (Ag) | < 0.01 | mg/L |
| 15 | GI21L | ORGANOCHLORINE PESTICIDES | | |
| | | chlordane | < 0.5 | ug/L |
| | | endrin | < 0.1 | ug/L |
| | | gamma-BHC [lindane] | < 0.05 | ug/L |
| | | heptachlor | < 0.05 | ug/L |
| | | methoxychlor | < 0.5 | ug/L |
| | | toxaphene | < 1 | ug/L |

CLIENT ORIGINAL

**HALLIBURTON NUS**
**Environmental Laboratories**

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

September 29, 1992
Report No.: 00010791
Section A Page 17

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
SAMPLE ID: GL63-SD-OH-11A / TCLP LEACH
NUS SAMPLE NO: P0209273

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 17 | G130L | CHLORINATED HERBICIDES | | |
| | | 2,4,5-TP [silvex] | < 0.5 | ug/L |
| | | 2,4-D | < 0.5 | ug/L |

COMMENTS:

# APPENDIX G

# PARTICLE SIZE LABORATORY REPORTS

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011403
Section A Page 8

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01A AS REC'D
NUS SAMPLE NO: P0209510
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 0.63 u | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.5 | |
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | d. 3/4 inch | 100.0 | % Passed |
| | | e. 1/2 inch | 96.6 | % Passed |
| | | f. 3/8 inch | 94.0 | % Passed |
| | | g. Sieve No. 4 | 85.1 | % Passed |
| | | h. Sieve No. 10 | 71.8 | % Passed |
| | | i. Sieve No. 20 | 55.0 | % Passed |
| | | j. Sieve No. 40 | 38.8 | % Passed |
| | | k. Sieve No. 60 | 19.2 | % Passed |
| | | l. Sieve No. 140 | 6.7 | % Passed |
| | | m. Sieve No. 200 | 5.7 | % Passed |
| | | n. Particle Size .024mm | 5.0 | % Passed |
| | | o. Particle Size .007mm | 4.3 | % Passed |
| | | p. Particle Size .001mm | 2.9 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 2800 | mg/kg |
| 11 | I750 | Sulfide, Reactive (as H2S) | < 10 | mg/kg |
| 12 | I620S | Percent Solids at 103C | 79.3 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011403
Section A Page 6

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01B AS REC'D
NUS SAMPLE NO: P0209503
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 0.64 u | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.5 | |
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | d. 3/4 inch | 100.0 | % Passed |
| | | e. 1/2 inch | 99.1 | % Passed |
| | | f. 3/8 inch | 97.3 | % Passed |
| | | g. Sieve No. 4 | 94.2 | % Passed |
| | | h. Sieve No. 10 | 88.6 | % Passed |
| | | i. Sieve No. 20 | 83.5 | % Passed |
| | | j. Sieve No. 40 | 75.1 | % Passed |
| | | k. Sieve No. 60 | 50.3 | % Passed |
| | | l. Sieve No. 140 | 20.2 | % Passed |
| | | m. Sieve No. 200 | 17.5 | % Passed |
| | | n. Particle Size .023mm | 14.4 | % Passed |
| | | o. Particle Size .007mm | 10.8 | % Passed |
| | | p. Particle Size .001mm | 7.3 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 5400 | mg/kg |
| 12 | I620S | Percent Solids at 103C | 74.9 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011403
Section A Page 1

# LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02A AS REC'D
NUS SAMPLE NO: P0209484
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNIT |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 1.4 | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.2 | |
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | c. 1.0 inch | 100.0 | % Passed |
| | | d. 3/4 inch | 99.5 | % Passed |
| | | e. 1/2 inch | 99.5 | % Passed |
| | | f. 3/8 inch | 98.6 | % Passed |
| | | g. Sieve No. 4 | 95.7 | % Passed |
| | | h. Sieve No. 10 | 90.5 | % Passed |
| | | i. Sieve No. 20 | 84.3 | % Passed |
| | | j. Sieve No. 40 | 81.1 | % Passed |
| | | k. Sieve No. 60 | 77.8 | % Passed |
| | | l. Sieve No. 140 | 66.1 | % Passed |
| | | m. Sieve No. 200 | 60.5 | % Passed |
| | | n. Particle Size .022mm | 33.0 | % Passed |
| | | o. Particle Size .007mm | 19.1 | % Passed |
| | | p. Particle Size .001mm | 10.4 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 12000 | mg/kg |
| 12 | I620S | Percent Solids at 103C | 71.0 | % |

HALLIBURTON NUS
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Houston, TX 77058

October 28, 1992
Report No.: 00011403
Section A Page 4

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02B AS REC'D
NUS SAMPLE NO: P0209496
P.O. NO.: CTO * 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 8.2 | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.3 | |
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | e. 1/2 inch | 100.0 | % Passed |
| | | f. 3/8 inch | 99.7 | % Passed |
| | | g. Sieve No. 4 | 99.3 | % Passed |
| | | h. Sieve No. 10 | 98.7 | % Passed |
| | | i. Sieve No. 20 | 97.7 | % Passed |
| | | j. Sieve No. 40 | 96.7 | % Passed |
| | | k. Sieve No. 60 | 95.3 | % Passed |
| | | l. Sieve No. 140 | 87.6 | % Passed |
| | | m. Sieve No. 200 | 82.5 | % Passed |
| | | n. Particle Size .020mm | 52.2 | % Passed |
| | | o. Particle Size .006mm | 29.0 | % Passed |
| | | p. Particle Size .001mm | 15.5 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 20000 | mg/kg |
| 12 | I620S | Percent Solids at 103C | 68.2 | % |

COMMENTS:

**HALLIBURTON NUS**
*Environmental Corporation*
*Environmental Laboratories*

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011400
Section A Page 9

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03A / AS REC'D
NUS SAMPLE NO: P0209166
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 4.8 | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLFS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.2 | |
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | d. 3/4 inch | 100.0 | % Passed |
| | | e. 1/2 inch | 99.6 | % Passed |
| | | f. 3/8 inch | 98.6 | % Passed |
| | | g. Sieve No. 4 | 97.6 | % Passed |
| | | h. Sieve No. 10 | 96.2 | % Passed |
| | | i. Sieve No. 20 | 94.9 | % Passed |
| | | j. Sieve No. 40 | 92.5 | % Passed |
| | | k. Sieve No. 60 | 88.7 | % Passed |
| | | l. Sieve No. 140 | 71.4 | % Passed |
| | | m. Sieve No. 200 | 66.2 | % Passed |
| | | n. Particle Size .021mm | 40.1 | % Passed |
| | | o. Particle Size .007mm | 21.5 | % Passed |
| | | p. Particle Size .001mm | 12.1 | % Passed |
| 10 | I750 | Sulfide, Reactive (as H2S) | < 10 | mg/kg |
| 11 | I620S | Percent Solids at 103C | 62.5 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011400
Section A Page 22

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-B8-03B / AS REC'D
NUS SAMPLE NO: P0209197
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 13 | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.2 | |
| 9 | I107S | Carbon, Total Organic (as C) | 16000 | mg/kg |
| 10 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | g. Sieve No. 4 | 100.0 | % Passed |
| | | h. Sieve No. 10 | 99.8 | % Passed |
| | | i. Sieve No. 20 | 99.4 | % Passed |
| | | j. Sieve No. 40 | 98.8 | % Passed |
| | | k. Sieve No. 60 | 98.0 | % Passed |
| | | l. Sieve No. 140 | 94.2 | % Passed |
| | | m. Sieve No. 200 | 90.6 | % Passed |
| | | n. Particle Size .020mm | 62.3 | % Passed |
| | | o. Particle Size .006mm | 34.6 | % Passed |
| | | p. Particle Size .001mm | 17.8 | % Passed |
| 11 | I620S | Percent Solids at 103C | 66.3 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

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Houston, TX 77058

October 28, 1992
Report No.: 00011400
Section A Page 15

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04A / AS REC'D
NUS SAMPLE NO: P0209182
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 14 | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.3 | |
| 9 | I107S | Carbon, Total Organic (as C) | 14000 | mg/kg |
| 10 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | d. 3/4 inch | 100.0 | % Passed |
| | | e. 1/2 inch | 99.6 | % Passed |
| | | f. 3/8 inch | 99.6 | % Passed |
| | | g. Sieve No. 4 | 99.2 | % Passed |
| | | h. Sieve No. 10 | 98.7 | % Passed |
| | | i. Sieve No. 20 | 98.1 | % Passed |
| | | j. Sieve No. 40 | 97.7 | % Passed |
| | | k. Sieve No. 60 | 96.1 | % Passed |
| | | l. Sieve No. 140 | 85.7 | % Passed |
| | | m. Sieve No. 200 | 83.3 | % Passed |
| | | n. Particle Size .020mm | 56.9 | % Passed |
| | | o. Particle Size .006mm | 30.9 | % Passed |
| | | p. Particle Size .001mm | 16.0 | % Passed |
| 11 | I620S | Percent Solids at 103C | 63.9 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011400
Section A Page 16

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04B / AS REC'D
NUS SAMPLE NO: P0209186
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 4.1 | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.2 | |
| 9 | I107S | Carbon, Total Organic (as C) | 14000 | mg/kg |
| 10 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | f. 3/8 inch | 100.0 | % Passed |
| | | g. Sieve No. 4 | 99.8 | % Passed |
| | | h. Sieve No. 10 | 99.5 | % Passed |
| | | i. Sieve No. 20 | 98.9 | % Passed |
| | | j. Sieve No. 40 | 97.9 | % Passed |
| | | k. Sieve No. 60 | 96.3 | % Passed |
| | | l. Sieve No. 140 | 86.2 | % Passed |
| | | m. Sieve No. 200 | 81.2 | % Passed |
| | | n. Particle Size .020mm | 50.6 | % Passed |
| | | o. Particle Size .006mm | 23.9 | % Passed |
| | | p. Particle Size .001mm | 13.3 | % Passed |
| 11 | I620S | Percent Solids at 103C | 69.0 | % |

COMMENTS:

CLIENT DUPLICATE

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011400
Section A Page 10

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-IN-05A / AS REC'D
NUS SAMPLE NO: P0209172
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I285SC | CLP - Cyanide (CN) | 2.0 | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.1 | |
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | f. 3/8 inch | 100.0 | % Passed |
| | | g. Sieve No. 4 | 99.9 | % Passed |
| | | h. Sieve No. 10 | 99.6 | % Passed |
| | | i. Sieve No. 20 | 99.2 | % Passed |
| | | j. Sieve No. 40 | 98.6 | % Passed |
| | | k. Sieve No. 60 | 97.8 | % Passed |
| | | l. Sieve No. 140 | 94.4 | % Passed |
| | | m. Sieve No. 200 | 91.4 | % Passed |
| | | n. Particle Size .020mm | 54.5 | % Passed |
| | | o. Particle Size .006mm | 27.7 | % Passed |
| | | p. Particle Size .001mm | 15.3 | % Passed |
| 10 | I750 | Sulfide, Reactive (as H2S) | 81 | mg/kg |
| 11 | I620S | Percent Solids at 103C | 59.1 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011400
Section A Page 20

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-IN-05B / AS REC'D
NUS SAMPLE NO: P0209192
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 10 | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.3 | |
| 9 | I107S | Carbon, Total Organic (as C) | 15000 | mg/kg |
| 10 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | h. Sieve No. 10 | 100.0 | % Passed |
| | | i. Sieve No. 20 | 99.4 | % Passed |
| | | j. Sieve No. 40 | 99.2 | % Passed |
| | | k. Sieve No. 60 | 98.8 | % Passed |
| | | l. Sieve No. 140 | 96.4 | % Passed |
| | | m. Sieve No. 200 | 94.8 | % Passed |
| | | n. Particle Size .019mm | 73.7 | % Passed |
| | | o. Particle Size .006mm | 39.4 | % Passed |
| | | p. Particle Size .001mm | 18.2 | % Passed |
| 11 | I620S | Percent Solids at 103C | 59.6 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011402
Section A Page 30

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-09A / AS REC'D
NUS SAMPLE NO: P0209384
P.O. NO.: CTO # 0063

DATE SAMPLED: 20-AUG-92
DATE RECEIVED: 21-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | f. 3/8 inch | 100.0 | % Passed |
| | | g. Sieve No. 4 | 99.8 | % Passed |
| | | h. Sieve No. 10 | 99.5 | % Passed |
| | | i. Sieve No. 20 | 99.0 | % Passed |
| | | j. Sieve No. 40 | 98.1 | % Passed |
| | | k. Sieve No. 60 | 92.7 | % Passed |
| | | l. Sieve No. 140 | 15.7 | % Passed |
| | | m. Sieve No. 200 | 8.7 | % Passed |
| | | n. Particle Size .024mm | 4.0 | % Passed |
| | | o. Particle Size .007mm | 3.0 | % Passed |
| | | p. Particle Size .001mm | 3.0 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 2700 | mg/kg |
| 11 | I750 | Sulfide, Reactive (as H2S) | < 10 | mg/kg |
| 12 | I620S | Percent Solids at 103C | 74.8 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011401
Section A Page 6

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10A / AS REC'D
NUS SAMPLE NO: P0209249
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | g. Sieve No. 4 | 100.0 | % Passed |
| | | h. Sieve No. 10 | 99.9 | % Passed |
| | | i. Sieve No. 20 | 99.7 | % Passed |
| | | j. Sieve No. 40 | 99.5 | % Passed |
| | | k. Sieve No. 60 | 98.9 | % Passed |
| | | l. Sieve No. 140 | 74.1 | % Passed |
| | | m. Sieve No. 200 | 61.5 | % Passed |
| | | n. Particle Size .022mm | 25.0 | % Passed |
| | | o. Particle Size .007mm | 11.0 | % Passed |
| | | p. Particle Size .001mm | 5.0 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 4200 | mg/kg |
| 11 | I620S | Percent Solids at 103C | 72.9 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

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Pittsburgh, PA 15205

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Houston, TX 77058

October 28, 1992
Report No.: 00011401
Section A Page 29

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10B / AS REC'D
NUS SAMPLE NO: P0209289
P.O. NO.: CTO * 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | f. 3/8 inch | 100.0 | % Passed |
| | | g. Sieve No. 4 | 99.8 | % Passed |
| | | h. Sieve No. 10 | 99.4 | % Passed |
| | | i. Sieve No. 20 | 99.3 | % Passed |
| | | j. Sieve No. 40 | 99.2 | % Passed |
| | | k. Sieve No. 60 | 99.0 | % Passed |
| | | l. Sieve No. 140 | 19.8 | % Passed |
| | | m. Sieve No. 200 | 4.7 | % Passed |
| | | n. Particle Size .024mm | 1.0 | % Passed |
| | | o. Particle Size .007mm | 1.0 | % Passed |
| | | p. Particle Size .001mm | 1.0 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 650 | mg/kg |
| 11 | I620S | Percent Solids at 103C | 83.0 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
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Pittsburgh, PA 15205

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October 28, 1992
Report No.: 00011401
Section A Page 19

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11A / AS REC'D
NUS SAMPLE NO: P0209272
P.O. NO.: CTO * 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 0.84 u | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.2 | |
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | f. 3/8 inch | 100.0 | % Passed |
| | | g. Sieve No. 4 | 99.9 | % Passed |
| | | h. Sieve No. 10 | 99.9 | % Passed |
| | | i. Sieve No. 20 | 99.9 | % Passed |
| | | j. Sieve No. 40 | 99.9 | % Passed |
| | | k. Sieve No. 60 | 99.9 | % Passed |
| | | l. Sieve No. 140 | 98.5 | % Passed |
| | | m. Sieve No. 200 | 96.7 | % Passed |
| | | n. Particle Size .020mm | 65.0 | % Passed |
| | | o. Particle Size .006mm | 33.6 | % Passed |
| | | p. Particle Size .001mm | 14.7 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 9300 | mg/kg |
| 11 | I750 | Sulfide, Reactive (as H2S) | < 10 | mg/kg |
| 12 | I820S | Percent Solids at 103C | 61.0 | % |

COMMENTS:

HALLIBURTON NUS
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Pittsburgh, PA 15205

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October 28, 1992
Report No.: 00011401
Section A Page 9

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-11B / AS REC'D
NUS SAMPLE NO: P0209257
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | G120SC | PESTICIDES/PCBS + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - Pesticides/PCBs | DONE | |
| 2 | I265SC | CLP - Cyanide (CN) | 1.7 | mg/kg |
| 3 | OVTSC | TCL - VOA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - VOA | DONE | |
| 4 | OSTSC | TCL - BNA + CLP DATA PACKAGE - SOIL | | |
| | | Data Package - BNA | DONE | |
| 5 | ACLPS | TAL METALS & CLP DATA PACKAGE | DONE | |
| 6 | DPACK | CLP Data Package Deliverable | DONE | |
| 8 | I801 | CLP pH for Organics Extraction | 7.2 | |
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | h. Sieve No. 10 | 100.0 | % Passed |
| | | i. Sieve No. 20 | 99.8 | % Passed |
| | | j. Sieve No. 40 | 99.6 | % Passed |
| | | k. Sieve No. 60 | 99.6 | % Passed |
| | | l. Sieve No. 140 | 98.4 | % Passed |
| | | m. Sieve No. 200 | 97.2 | % Passed |
| | | n. Particle Size .019mm | 75.6 | % Passed |
| | | o. Particle Size .006mm | 39.9 | % Passed |
| | | p. Particle Size .001mm | 16.8 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 8600 | mg/kg |
| 11 | I620S | Percent Solids at 103C | 61.2 | % |

COMMENTS:

HALLIBURTON NUS
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October 28, 1992
Report No.: 00011403
Section A Page 3

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12A AS REC'D
NUS SAMPLE NO: P0209490
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | g. Sieve No. 4 | 100.0 | % Passed |
| | | h. Sieve No. 10 | 99.9 | % Passed |
| | | i. Sieve No. 20 | 99.8 | % Passed |
| | | j. Sieve No. 40 | 99.5 | % Passed |
| | | k. Sieve No. 60 | 97.9 | % Passed |
| | | l. Sieve No. 140 | 15.8 | % Passed |
| | | m. Sieve No. 200 | 6.6 | % Passed |
| | | n. Particle Size .024mm | 3.0 | % Passed |
| | | o. Particle Size .007mm | 2.5 | % Passed |
| | | p. Particle Size .001mm | 2.0 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 7300 | mg/kg |
| 12 | I620S | Percent Solids at 103C | 82.2 | % |

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

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Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 28, 1992
Report No.: 00011403
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## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0005
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12B AS REC'D
NUS SAMPLE NO: P0209519
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 9 | T45 | Grain Size - Sieve & Hydrometer | | |
| | | g. Sieve No. 4 | 100.0 | % Passed |
| | | h. Sieve No. 10 | 99.8 | % Passed |
| | | i. Sieve No. 20 | 99.4 | % Passed |
| | | j. Sieve No. 40 | 98.9 | % Passed |
| | | k. Sieve No. 60 | 97.8 | % Passed |
| | | l. Sieve No. 140 | 35.4 | % Passed |
| | | m. Sieve No. 200 | 22.4 | % Passed |
| | | n. Particle Size .022mm | 7.9 | % Passed |
| | | o. Particle Size .007mm | 4.0 | % Passed |
| | | p. Particle Size .001mm | 3.0 | % Passed |
| 10 | I107S | Carbon, Total Organic (as C) | 2400 | mg/kg |
| 12 | I620S | Percent Solids at 103C | 79.8 | % |

COMMENTS:

# APPENDIX H

# ELUTRIATE RE-ANALYSIS LABORATORY REPORTS

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

November 05, 1992
Report No.: 00011616
Section A Page 5

# LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-01B ELUTRIATE
NUS SAMPLE NO: P0208500
P.O. NO.: CTO # 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 6 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 11* | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 120 | mg/L |
| 13 | I620 | Solids, Total at 103C | 420 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.006 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.06 | mg/L |

COMMENTS: * Re-analysis result for Ammonia.

CLIENT ORIGINAL

HALLIBURTON NUS
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5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

November 05, 1992
Report No.: 00011616
Section A Page 4

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-02B ELUTRIATE
NUS SAMPLE NO: P0209493
P.O. NO.: CTO * 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 13 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 28 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 * | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 360 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.02 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.013 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.04 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.07 | mg/L |

COMMENTS: * Re-analysis result for TSS.

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November 05, 1992
Report No.: 00011616
Section A Page 2

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-03A ELUTRIATE
NUS SAMPLE NO: P0209217
P.O. NO.: CTO # 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 16 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 20 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 100 | mg/L |
| 13 | I620 | Solids, Total at 103C | 330 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.08 | mg/L |
| 20 | APBL | Lead, Leachable (Pb) | 0.006 * | mg/L |

COMMENTS: * Reanalysis result for lead.

CLIENT ORIGINAL

HALLIBURTON NUS
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Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
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November 05, 1992
Report No.: 00011616
Section A Page 1

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-BB-04A ELUTRIATE
NUS SAMPLE NO: P0209180
P.O. NO.: CTO * 0063

DATE SAMPLED: 18-AUG-92
DATE RECEIVED: 19-AUG-92
APPROVED BY: R Volk

| LN | TEST CODE | DETERMINATION | RESULT | UNIT |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 11 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 12 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 110 | mg/L |
| 13 | I620 | Solids, Total at 103C | 300 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | 0.03 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.08 | mg/L |
| 20 | APBL | Lead, Leachable (Pb) | 0.004 * | mg/L |

COMMENTS: * Reanalysis result for lead.

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November 05, 1992
Report No.: 00011616
Section A Page 3

## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-10B ELUTRIATE
NUS SAMPLE NO: P0209287
P.O. NO.: CTO # 0063

DATE SAMPLED: 19-AUG-92
DATE RECEIVED: 20-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 3 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 4.3 * | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 73 | mg/L |
| 13 | I620 | Solids, Total at 103C | 200 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.007 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 19 | AZNL | Zinc, Leachable (Zn) | 0.04 | mg/L |

COMMENTS: * Re-analysis result for Ammonia.

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Houston, TX 77058

November 05, 1992
Report No.: 00011616
Section A Page 6

LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-12B ELUTRIATE
NUS SAMPLE NO: P0209515
P.O. NO.: CTO * 0063

DATE SAMPLED: 21-AUG-92
DATE RECEIVED: 22-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S912 | Elutriate Test | DONE | |
| 9 | I106 | Carbon, Organic - Nonpurgeable | 5 | mg/L |
| 10 | I032 | Ammonia (as N), Distillation | 5.2 | mg/L |
| 11 | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| 12 | I625 | Solids, Volatile Total at 550C | 62 | mg/L |
| 13 | I620 | Solids, Total at 103C | 190 | mg/L |
| 14 | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| 15 | ACUL | Copper, Leachable (Cu) | 0.02 | mg/L |
| 16 | APBL | Lead, Leachable (Pb) | 0.010 | mg/L |
| 17 | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| 18 | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| 20 | AZNL | Zinc, Leachable (Zn) | 0.05 * | mg/L |

COMMENTS: * Reanalysis result for zinc.

# APPENDIX I

# LABORATORY QUALITY CONTROL REPORTS

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6751-L Engle Road
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October 06, 1992
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## QUALITY CONTROL REPORT
## LABORATORY CONTROL SAMPLE RECOVERY

| TEST CODE | DETERMINATION | PERCENT RECOVERY | ACCEPTANCE LIMITS |
|---|---|---|---|
| BATCH: 12284 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0209724 |
| I610 | Solids, Suspended at 103C | 96.3 | - |
| BATCH: 12380 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0209827 |
| AASW | Arsenic, Total (As) | 97.6 | - |
| ACUW | Copper, Total (Cu) | 101 | - |
| ANIW | Nickel, Total (Ni) | 100 | - |
| AZNW | Zinc, Total (Zn) | 101 | - |
| BATCH: 12361 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0209829 |
| APBA | Lead, Low Level (Pb) | 113 | - |
| APBL | Lead, Leachable (Pb) | 113 | - |
| BATCH: 12379 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210343 |
| I610 | Solids, Suspended at 103C | 99.7 | - |
| BATCH: 12385 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210350 |
| I610 | Solids, Suspended at 103C | 98.2 | - |
| BATCH: 12397 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210366 |
| AHGL | Mercury, Leachable (Hg) | 99.4 | - |
| AHGW | Mercury, Total (Hg) | 99.4 | - |
| BATCH: 12398 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210368 |
| AHGL | Mercury, Leachable (Hg) | 93.7 | - |
| BATCH: 12417 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210389 |
| I106 | Carbon, Organic - Nonpurgeable | 104 | - |
| BATCH: 12491 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210466 |
| APBL | Lead, Leachable (Pb) | 95.5 | - |

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QUALITY CONTROL REPORT
LABORATORY CONTROL SAMPLE RECOVERY

| TEST CODE | DETERMINATION | PERCENT RECOVERY | ACCEPTANCE LIMITS |
|---|---|---|---|
| BATCH: 12492 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210468 |
| APBL | Lead, Leachable (Pb) | 108 | - |
| BATCH: 12494 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210472 |
| AASL | Arsenic, Leachable (As) | 95.8 | - |
| ACUL | Copper, Leachable (Cu) | 100 | - |
| ANIL | Nickel, Leachable (Ni) | 98.0 | - |
| AZNL | Zinc, Leachable (Zn) | 98.8 | - |
| BATCH: 12517 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210507 |
| AHGL | Mercury, Leachable (Hg) | 93.7 | - |
| BATCH: 12559 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210545 |
| AHGL | Mercury, Leachable (Hg) | 102 | - |
| BATCH: 12560 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0210547 |
| AHGL | Mercury, Leachable (Hg) | 102 | - |
| BATCH: 12579 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211071 |
| I032 | Ammonia (as N), Distillation | 105 | - |
| BATCH: 12584 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211080 |
| I106 | Carbon, Organic - Nonpurgeable | 96.5 | - |
| BATCH: 12589 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211086 |
| AASL | Arsenic, Leachable (As) | 97.6 | - |
| ACUL | Copper, Leachable (Cu) | 97.6 | - |
| ANIL | Nickel, Leachable (Ni) | 96.6 | - |
| AZNL | Zinc, Leachable (Zn) | 95.6 | - |

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## QUALITY CONTROL REPORT
## LABORATORY CONTROL SAMPLE RECOVERY

| TEST CODE | DETERMINATION | PERCENT RECOVERY | ACCEPTANCE LIMITS |
|---|---|---|---|
| BATCH: 12590 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211088 |
| AASL | Arsenic, Leachable (As) | 97.0 | - |
| ACUL | Copper, Leachable (Cu) | 96.8 | - |
| ANIL | Nickel, Leachable (Ni) | 98.2 | - |
| AZNL | Zinc, Leachable (Zn) | 95.8 | - |
| BATCH: 12602 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211102 |
| I032 | Ammonia (as N), Distillation | 104 | - |
| BATCH: 12609 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211108 |
| I032 | Ammonia (as N), Distillation | 110 | - |
| BATCH: 12673 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211188 |
| APBA | Lead, Low Level (Pb) | 94.5 | - |
| APBA | Lead, Low Level (Pb) | 94.5 | - |
| BATCH: 12674 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211190 |
| APBL | Lead, Leachable (Pb) | 116 | - |
| BATCH: 12678 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211198 |
| AASL | Arsenic, Leachable (As) | 94.8 | - |
| ACUL | Copper, Leachable (Cu) | 98.4 | - |
| ANIL | Nickel, Leachable (Ni) | 98.4 | - |
| AZNL | Zinc, Leachable (Zn) | 98.2 | - |
| BATCH: 12679 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211200 |
| AASL | Arsenic, Leachable (As) | 95.2 | - |
| ACUL | Copper, Leachable (Cu) | 98.8 | - |
| ANIL | Nickel, Leachable (Ni) | 100 | - |
| AZNL | Zinc, Leachable (Zn) | 98.4 | - |

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## QUALITY CONTROL REPORT
## LABORATORY CONTROL SAMPLE RECOVERY

| TEST CODE | DETERMINATION | PERCENT RECOVERY | ACCEPTANCE LIMITS |
|---|---|---|---|
| BATCH: 12710 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211241 |
| APBA | Lead, Low Level (Pb) | 85.5 | - |
| APBA | Lead, Low Level (Pb) | 85.5 | - |
| APBL | Lead, Leachable (Pb) | 85.5 | - |
| BATCH: 12746 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211293 |
| I106 | Carbon, Organic - Nonpurgeable | 87.8 | - |
| BATCH: 12757 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211311 |
| AASW | Arsenic, Total (As) | 97.6 | - |
| ACUW | Copper, Total (Cu) | 98.4 | - |
| ANIW | Nickel, Total (Ni) | 101 | - |
| AZNW | Zinc, Total (Zn) | 98.6 | - |
| BATCH: 12790 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211847 |
| AHGW | Mercury, Total (Hg) | 91.8 | - |
| BATCH: 12846 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211909 |
| I032 | Ammonia (as N), Distillation | 95 | - |
| BATCH: 12859 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211927 |
| APBA | Lead, Low Level (Pb) | 108 | - |
| APBL | Lead, Leachable (Pb) | 108 | - |
| BATCH: 12899 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0211986 |
| I610 | Solids, Suspended at 103C | 76.5 | - |
| BATCH: 12963 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0212571 |
| AHGL | Mercury, Leachable (Hg) | 112 | - |

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## QUALITY CONTROL REPORT
## LABORATORY CONTROL SAMPLE RECOVERY

| TEST CODE | DETERMINATION | PERCENT RECOVERY | ACCEPTANCE LIMITS |
|---|---|---|---|
| BATCH: 13031 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0212654 |
| AZNL | Zinc, Leachable (Zn) | 96.4 | - |
| BATCH: 13049 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0212679 |
| AHGL | Mercury, Leachable (Hg) | 106 | - |
| BATCH: 13293 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0213494 |
| APBA | Lead, Low Level (Pb) | 106 | - |
| BATCH: 13429 | SAMPLE ID: Lab Control Sample | | NUS SAMPLE NO: P0213675 |

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AZNL Zinc, Leachable (Zn)

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QUALITY CONTROL REPORT
METHOD BLANK DATA

| | TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|---|
| BATCH: 12284 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0209725 |
| | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| BATCH: 12300 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0209740 |
| | I620 | Solids, Total at 103C | < 10 | mg/L |
| BATCH: 12354 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0209820 |
| | I625 | Solids, Volatile Total at 550C | < 10 | mg/L |
| BATCH: 12360 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0209828 |
| | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| | ANIW | Nickel, Total (Ni) | < 0.01 | mg/L |
| | AZNW | Zinc, Total (Zn) | < 0.01 | mg/L |
| BATCH: 12361 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0209830 |
| | APBA | Lead, Low Level (Pb) | 0.0021 | mg/L |
| | APBL | Lead, Leachable (Pb) | 0.0021 | mg/L |
| BATCH: 12379 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210344 |
| | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| BATCH: 12380 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210345 |
| | I620 | Solids, Total at 103C | < 10 | mg/L |
| BATCH: 12381 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210346 |
| | I625 | Solids, Volatile Total at 550C | < 10 | mg/L |
| BATCH: 12383 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210348 |
| | I620 | Solids, Total at 103C | < 10 | mg/L |

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## QUALITY CONTROL REPORT
### METHOD BLANK DATA

| | TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|---|
| BATCH: 12385 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210351 |
| | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| BATCH: 12397 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210367 |
| | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| BATCH: 12398 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210369 |
| | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| BATCH: 12417 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210390 |
| | I106 | Carbon, Organic - Nonpurgeable | < 1 | mg/L |
| BATCH: 12486 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210460 |
| | I625 | Solids, Volatile Total at 550C | < 50 | mg/L |
| BATCH: 12488 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210463 |
| | I620 | Solids, Total at 103C | < 10 | mg/L |
| BATCH: 12490 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210465 |
| | I625 | Solids, Volatile Total at 550C | < 50 | mg/L |
| BATCH: 12491 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210467 |
| | APBL | Lead, Leachable (Pb) | < 0.002 | mg/L |
| BATCH: 12492 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210469 |
| | APBL | Lead, Leachable (Pb) | < 0.002 | mg/L |
| BATCH: 12494 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210473 |
| | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| | AZNL | Zinc, Leachable (Zn) | < 0.01 | mg/L |

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Section E Page 3

## QUALITY CONTROL REPORT
### METHOD BLANK DATA

| | TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|---|
| BATCH: 12517 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210508 |
| | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| BATCH: 12557 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210543 |
| | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| BATCH: 12559 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210546 |
| | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| BATCH: 12560 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0210548 |
| | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| BATCH: 12579 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0211072 |
| | I032 | Ammonia (as N), Distillation | < 0.1 | mg/L |
| BATCH: 12584 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0211081 |
| | I106 | Carbon, Organic - Nonpurgeable | < 1 | mg/L |
| BATCH: 12589 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0211087 |
| | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| | AZNL | Zinc, Leachable (Zn) | 0.014 | mg/L |
| BATCH: 12590 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0211089 |
| | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| | AZNL | Zinc, Leachable (Zn) | < 0.01 | mg/L |
| BATCH: 12602 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0211103 |
| | I032 | Ammonia (as N), Distillation | < 0.1 | mg/L |

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## QUALITY CONTROL REPORT
### METHOD BLANK DATA

| | TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|---|
| BATCH: 12609 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211109 | |
| | I032 | Ammonia (as N), Distillation | < 0.1 | mg/L |
| BATCH: 12616 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211118 | |
| | I620 | Solids, Total at 103C | < 10 | mg/L |
| BATCH: 12618 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211120 | |
| | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| LCSR = 85.6% | | | | |
| BATCH: 12620 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211122 | |
| | I625 | Solids, Volatile Total at 550C | < 50 | mg/L |
| BATCH: 12673 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211189 | |
| | APBA | Lead, Low Level (Pb) | 0.0020 | mg/L |
| | APBA | Lead, Low Level (Pb) | 0.0020 | mg/L |
| BATCH: 12674 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211191 | |
| | APBL | Lead, Leachable (Pb) | < 0.002 | mg/L |
| BATCH: 12678 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211199 | |
| | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| | AZNL | Zinc, Leachable (Zn) | < 0.01 | mg/L |
| BATCH: 12679 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211201 | |
| | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| | ACUL | Copper, Leachable (Cu) | < 0.01 | mg/L |
| | ANIL | Nickel, Leachable (Ni) | < 0.02 | mg/L |
| | AZNL | Zinc, Leachable (Zn) | < 0.01 | mg/L |

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## QUALITY CONTROL REPORT
### METHOD BLANK DATA

| | TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|---|
| BATCH: 12710 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211242 | |
| | APBA | Lead, Low Level (Pb) | < 0.002 | mg/L |
| | APBA | Lead, Low Level (Pb) | < 0.002 | mg/L |
| | APBL | Lead, Leachable (Pb) | < 0.002 | mg/L |
| BATCH: 12744 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211291 | |
| | I610 | Solids, Suspended at 103C | < 10 | mg/L |
| BATCH: 12746 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211294 | |
| | I106 | Carbon, Organic - Nonpurgeable | < 1 | mg/L |
| BATCH: 12757 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211312 | |
| | AASW | Arsenic, Total (As) | < 0.1 | mg/L |
| | ACUW | Copper, Total (Cu) | < 0.01 | mg/L |
| | ANIW | Nickel, Total (Ni) | < 0.02 | mg/L |
| | AZNW | Zinc, Total (Zn) | < 0.01 | mg/L |
| BATCH: 12790 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211848 | |
| | AHGW | Mercury, Total (Hg) | < 0.0002 | mg/L |
| BATCH: 12846 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211910 | |
| | I032 | Ammonia (as N), Distillation | < 0.1 | mg/L |
| BATCH: 12859 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211928 | |
| | APBA | Lead, Low Level (Pb) | < 0.002 | mg/L |
| | APBL | Lead, Leachable (Pb) | < 0.002 | mg/L |
| BATCH: 12944 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0212544 | |
| | I625 | Solids, Volatile Total at 550C | < 50 | mg/L |
| BATCH: 12945 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0212545 | |
| | I620 | Solids, Total at 103C | < 10 | mg/L |

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## QUALITY CONTROL REPORT
### METHOD BLANK DATA

| | TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|---|
| BATCH: 12963 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0212572 |
| | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| BATCH: 13031 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0212655 |
| | AZNL | Zinc, Leachable (Zn) | < 0.01 | mg/L |
| BATCH: 13049 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0212680 |
| | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |
| BATCH: 13293 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0213495 |
| | APBA | Lead, Low Level (Pb) | < 0.002 | mg/L |
| BATCH: 13429 | SAMPLE ID: | Method Blank | NUS SAMPLE NO: | P0213676 |

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AZNL Zinc, Leachable (Zn)

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QUALITY CONTROL REPORT
DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 12300 NUS SAMPLE NO: P0209163

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I620 | Solids, Total at 103C | 230 | 232 | mg/L | 1.30 | mg/L | | |

PREP BATCH: 12354 NUS SAMPLE NO: P0209163

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I625 | Solids, Volatile Total at 550C | 65 | 64 | mg/L | 1.55 | mg/L | | |

PREP BATCH: 12397 NUS SAMPLE NO: P0209163

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| AHGW | Mercury, Total (Hg) | < 0.0002 | < 0.0002 | mg/L | NC | mg/L | 0.000991 | 99.1 |

PREP BATCH: 12579 NUS SAMPLE NO: P0209189

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I032 | Ammonia (as N), Distillation | 0.5 | 0.52 | mg/L | 0 | mg/L | 4.4 | 97 |

PREP BATCH: 12417 NUS SAMPLE NO: P0209190

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I106 | Carbon, Organic - Nonpurgeable | 11 | 10.7 | mg/L | 0.930 | mg/L | | |

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## QUALITY CONTROL REPORT
## DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 12417 — NUS SAMPLE NO: P0209224

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I106 | Carbon, Organic - Nonpurgeable | 10 | 9.58 | mg/L | 0.314 | mg/L | | |

PREP BATCH: 12417 — NUS SAMPLE NO: P0209253

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I106 | Carbon, Organic - Nonpurgeable | 9 | 9.32 | mg/L | 0.322 | mg/L | | |

PREP BATCH: 12609 — NUS SAMPLE NO: P0209267

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I032 | Ammonia (as N), Distillation | 0.3 | 0.26 | mg/L | .04 | mg/L | 4.4 | 102 |

PREP BATCH: 12379 — NUS SAMPLE NO: P0209284

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I610 | Solids, Suspended at 103C | < 10 | < 20 | mg/L | | mg/L | | |

PREP BATCH: 12710 — NUS SAMPLE NO: P0209284

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| APBA | Lead, Low Level (Pb) | 0.003 | < 0.002 | mg/L | NC | mg/L | 0.0388 | 89.5 |

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## QUALITY CONTROL REPORT
## DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 12417 — NUS SAMPLE NO: P0209287

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 106 | Carbon, Organic - Nonpurgeable | 3 | 3.33 | mg/L | 2.43 | mg/L | | |

PREP BATCH: 12584 — NUS SAMPLE NO: P0209288

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 106 | Carbon, Organic - Nonpurgeable | 3 | 2.70 | mg/L | 1.11 | mg/L | | |

PREP BATCH: 12380 — NUS SAMPLE NO: P0209379

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 620 | Solids, Total at 103C | 180 | 198 | mg/L | 10.6 | mg/L | | |

PREP BATCH: 12381 — NUS SAMPLE NO: P0209379

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 625 | Solids, Volatile Total at 550C | 65 | 68 | mg/L | 4.51 | mg/L | | |

PREP BATCH: 12417 — NUS SAMPLE NO: P0209379

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 106 | Carbon, Organic - Nonpurgeable | 4 | 3.90 | mg/L | .454 | mg/L | | |

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## QUALITY CONTROL REPORT
## DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 12609 — NUS SAMPLE NO: P0209379

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I032 | Ammonia (as N), Distillation | 0.3 | 0.30 | mg/L | .04 | mg/L | 4.60 | 106 |

PREP BATCH: 13293 — NUS SAMPLE NO: P0209379

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| PBA | Lead, Low Level (Pb) | 0.006 | 0.0024 | mg/L | .0038 | mg/L | 0.0223 | 80.5 |

PREP BATCH: 12488 — NUS SAMPLE NO: P0209481

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 1620 | Solids, Total at 103C | 360 | 386 | mg/L | 6.67 | mg/L | | |

PREP BATCH: 12490 — NUS SAMPLE NO: P0209481

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 1625 | Solids, Volatile Total at 550C | 110 | 134 | mg/L | 24 | mg/L | | |

PREP BATCH: 12557 — NUS SAMPLE NO: P0209482

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 1610 | Solids, Suspended at 103C | < 10 | < 20 | mg/L | | mg/L | | |

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## QUALITY CONTROL REPORT
DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 12417 NUS SAMPLE NO: P0209488

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I106 | Carbon, Organic - Nonpurgeable | 6 | 5.62 | mg/L | 4.01 | mg/L | | |

PREP BATCH: 12616 NUS SAMPLE NO: P0209498

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I620 | Solids, Total at 103C | 420 | 396 | mg/L | 5.40 | mg/L | | |

PREP BATCH: 12618 NUS SAMPLE NO: P0209498

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I610 | Solids, Suspended at 103C | < 10 | < 20 | mg/L | | mg/L | | |

PREP BATCH: 12620 NUS SAMPLE NO: P0209498

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I625 | Solids, Volatile Total at 550C | 140 | 112 | mg/L | 33 | mg/L | | |

PREP BATCH: 12859 NUS SAMPLE NO: P0209498

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| APBA | Lead, Low Level (Pb) | 0.002 | < 0.002 | mg/L | NC | mg/L | 0.0172 | 76.0 |

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## QUALITY CONTROL REPORT
## DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 12944 — NUS SAMPLE NO: P0209502

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I625 | Solids, Volatile Total at 550C | 100 | 110 | mg/L | 8.53 | mg/L | | |

PREP BATCH: 12945 — NUS SAMPLE NO: P0209502

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I620 | Solids, Total at 103C | 560 | 558 | mg/L | 0.890 | mg/L | | |

PREP BATCH: 12488 — NUS SAMPLE NO: P0209506

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I620 | Solids, Total at 103C | 400 | 362 | mg/L | 9.72 | mg/L | | |

PREP BATCH: 12490 — NUS SAMPLE NO: P0209506

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I625 | Solids, Volatile Total at 550C | 120 | 106 | mg/L | 16 | mg/L | | |

PREP BATCH: 12557 — NUS SAMPLE NO: P0209507

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I610 | Solids, Suspended at 103C | < 10 | < 20 | mg/L | | mg/L | | |

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## QUALITY CONTROL REPORT
## DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 12744 NUS SAMPLE NO: P0209509

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I610 | Solids, Suspended at 103C | 69 | 54 | mg/L | 15 | mg/L | | |

PREP BATCH: 12746 NUS SAMPLE NO: P0209509

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I106 | Carbon, Organic - Nonpurgeable | 4.04 | 4 | mg/L | 0.985 | mg/L | 23.7 | 98.3 |

PREP BATCH: 12584 NUS SAMPLE NO: P0209514

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I106 | Carbon, Organic - Nonpurgeable | 4 | 3.67 | mg/L | 1.35 | mg/L | | |

PREP BATCH: 12616 NUS SAMPLE NO: P0209514

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I620 | Solids, Total at 103C | 170 | 180 | mg/L | 4.00 | mg/L | | |

PREP BATCH: 12618 NUS SAMPLE NO: P0209514

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I610 | Solids, Suspended at 103C | < 10 | < 20 | mg/L | | mg/L | | |

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## QUALITY CONTROL REPORT
## DUPLICATE AND MATRIX SPIKE DATA

REP BATCH: 12620 NUS SAMPLE NO: P0209514

| EST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 625 | Solids, Volatile Total at 550C | 59 | 60 | mg/L | 1.68 | mg/L | | |

REP BATCH: 12488 NUS SAMPLE NO: P0209517

| EST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 620 | Solids, Total at 103C | 190 | 170 | mg/L | 10.1 | mg/L | | |

REP BATCH: 12490 NUS SAMPLE NO: P0209517

| EST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 625 | Solids, Volatile Total at 550C | 49 | < 100 | mg/L | | mg/L | | |

REP BATCH: 12944 NUS SAMPLE NO: P0209518

| EST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 625 | Solids, Volatile Total at 550C | 53 | < 100 | mg/L | | mg/L | | |

REP BATCH: 12945 NUS SAMPLE NO: P0209518

| EST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| 620 | Solids, Total at 103C | 300 | 292 | mg/L | 3.70 | mg/L | | |

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## QUALITY CONTROL REPORT
## DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 12284 — NUS SAMPLE NO: P0209231

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I610 | Solids, Suspended at 103C | < 10 | < 20 | mg/L | NC | mg/L | | |

PREP BATCH: 12360 — NUS SAMPLE NO: P0209555

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| AASW | Arsenic, Total (As) | < 0.1 | < 0.1 | mg/L | NC | mg/L | 4.86 | 97.2 |
| ACUW | Copper, Total (Cu) | 0.06 | 0.052 | mg/L | 5.61 | mg/L | 0.303 | 99.2 |
| ANIW | Nickel, Total (Ni) | 0.07 | 0.081 | mg/L | .007 | mg/L | 0.567 | 98.6 |
| AZNW | Zinc, Total (Zn) | 0.06 | 0.062 | mg/L | 4.72 | mg/L | 0.561 | 99.2 |

PREP BATCH: 12361 — NUS SAMPLE NO: P0209438

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| APBA | Lead, Low Level (Pb) | < 0.002 | < 0.002 | mg/L | NC | mg/L | 0.0121 | 60.5 |

PREP BATCH: 12385 — NUS SAMPLE NO: P0209545

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I610 | Solids, Suspended at 103C | < 10 | < 20 | mg/L | | mg/L | | |

PREP BATCH: 12602 — NUS SAMPLE NO: P0209438

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I032 | Ammonia (as N), Distillation | < 0.1 | < 0.2 | mg/L | | mg/L | 4.2 | 105 |

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## QUALITY CONTROL REPORT
## DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 12673 — NUS SAMPLE NO: P0210334

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| APBA | Lead, Low Level (Pb) | 0.003 | < 0.002 | mg/L | NC | mg/L | 0.0191 | 82.5 |

PREP BATCH: 12757 — NUS SAMPLE NO: P0210797

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| AASW | Arsenic, Total (As) | < 0.1 | < 0.1 | mg/L | NC | mg/L | 4.66 | 93.2 |
| ACUW | Copper, Total (Cu) | 0.07 | 0.071 | mg/L | 2.86 | mg/L | 0.319 | 100 |
| ANIW | Nickel, Total (Ni) | < 0.02 | < 0.02 | mg/L | NC | mg/L | 0.469 | 93.8 |
| AZNW | Zinc, Total (Zn) | 0.29 | 0.299 | mg/L | 3.40 | mg/L | 0.761 | 94.4 |

PREP BATCH: 12790 — NUS SAMPLE NO: P0210992

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| AHGW | Mercury, Total (Hg) | < 0.0002 | < 0.0002 | mg/L | NC | mg/L | 0.00108 | 108 |

PREP BATCH: 12846 — NUS SAMPLE NO: P0210336

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I032 | Ammonia (as N), Distillation | < 0.1 | < 0.2 | mg/L | | mg/L | 3.8 | 95 |

PREP BATCH: 12899 — NUS SAMPLE NO: P0209644

| TEST | DETERMINATION | ORIGINAL RESULT | DUPLICATE RESULT | UNITS | RANGE / RPD | UNITS | MS RESULT | MS % RCVRY |
|---|---|---|---|---|---|---|---|---|
| I610 | Solids, Suspended at 103C | 26 | 28 | mg/L | 2 | mg/L | | |

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## QUALITY CONTROL REPORT
### MATRIX SPIKE AND MATRIX SPIKE DUPLICATE DATA

PREP BATCH: 12543 NUS SAMPLE NO: P0209385

| TEST | DETERMINATION | MS RESULT | MSD RESULT | UNITS | RPD | MS PCT RECOVERY | MSD PCT RECOVERY |
|---|---|---|---|---|---|---|---|
| G121L | DDT | 0.503 | 0.481 | ug/L | 4.5 | 101 | 96 |
| G121L | aldrin | 0.169 | 0.149 | ug/L | 12 | 84 | 74 |
| G121L | dieldrin | 0.447 | 0.414 | ug/L | 7.7 | 89 | 83 |
| G121L | endrin | 0.499 | 0.466 | ug/L | 6.8 | 100 | 93 |
| G121L | gamma-BHC [lindane] | 0.190 | 0.172 | ug/L | 15 | 95 | 86 |
| G121L | heptachlor | 0.209 | 0.174 | ug/L | 18 | 104 | 87 |

PREP BATCH: 12542 NUS SAMPLE NO: P0209385

| TEST | DETERMINATION | MS RESULT | MSD RESULT | UNITS | RPD | MS PCT RECOVERY | MSD PCT RECOVERY |
|---|---|---|---|---|---|---|---|
| G130L | 2,4,5-TP [silvex] | 1.34 | 1.66 | ug/L | 21 | 53 | 124 |
| G130L | 2,4-D | 21.27 | 25.30 | ug/L | 17 | 84 | 100 |

ANLS BATCH: 11500 NUS SAMPLE NO: P0205561

| TEST | DETERMINATION | MS RESULT | MSD RESULT | UNITS | RPD | MS PCT RECOVERY | MSD PCT RECOVERY |
|---|---|---|---|---|---|---|---|
| G130L | 2,4,5-TP [silvex] | 1.55 | 1.98 | ug/L | 1 | 62 | 96 |
| G130L | 2,4-D | 24.5 | 24.2 | ug/L | 24 | 97 | 79 |

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## QUALITY CONTROL REPORT
### METHOD BLANK DATA

| TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|
| | chloroform | < 0.005 | mg/L |
| | tetrachloroethene [tetrachloroethylene] | < 0.005 | mg/L |
| | trichloroethene [trichloroethylene] | < 0.005 | mg/L |
| | vinyl chloride | < 0.010 | mg/L |

BATCH: 13233 SAMPLE ID: Method Blank NUS SAMPLE NO: P0213422

| TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|
| OTCLP | SEMIVOLATILES - TCLP/PART 261 | | |
| | 1,4-dichlorobenzene [p-dichlorobenzene] | < 0.01 | mg/L |
| | 2,4,5-trichlorophenol | < 0.05 | mg/L |
| | 2,4,6-trichlorophenol | < 0.01 | mg/L |
| | 2,4-dinitrotoluene | < 0.01 | mg/L |
| | 2-methylphenol [o-cresol] | < 0.01 | mg/L |
| | 3-methylphenol [m-cresol] | < 0.01 | mg/L |
| | 4-methylphenol [p-cresol] | < 0.01 | mg/L |
| | hexachlorobenzene | < 0.01 | mg/L |
| | hexachlorobutadiene | < 0.01 | mg/L |
| | hexachloroethane | < 0.01 | mg/L |
| | nitrobenzene | < 0.01 | mg/L |
| | pentachlorophenol | < 0.05 | mg/L |
| | pyridine | < 0.01 | mg/L |

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## QUALITY CONTROL REPORT
### METHOD BLANK DATA

| | TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|---|
| BATCH: 12589 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211087 | |
| | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| | ABAL | Barium, Leachable (Ba) | < 0.005 | mg/L |
| | ACDL | Cadmium, Leachable (Cd) | < 0.005 | mg/L |
| | ACRL | Chromium, Leachable (Cr) | < 0.01 | mg/L |
| | ASEL | Selenium, Leachable (Se) | < 0.1 | mg/L |
| BATCH: 12590 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211089 | |
| | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| | ABAL | Barium, Leachable (Ba) | < 0.005 | mg/L |
| | ACDL | Cadmium, Leachable (Cd) | < 0.005 | mg/L |
| | ACRL | Chromium, Leachable (Cr) | < 0.01 | mg/L |
| | ASEL | Selenium, Leachable (Se) | < 0.1 | mg/L |
| BATCH: 12673 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211189 | |
| | AAGL | Silver, Leachable (Ag) | < 0.01 | mg/L |
| BATCH: 12674 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211191 | |
| | AAGL | Silver, Leachable (Ag) | < 0.01 | mg/L |
| BATCH: 12679 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211201 | |
| | AASL | Arsenic, Leachable (As) | < 0.1 | mg/L |
| | ABAL | Barium, Leachable (Ba) | < 0.005 | mg/L |
| | ACDL | Cadmium, Leachable (Cd) | < 0.005 | mg/L |
| | ACRL | Chromium, Leachable (Cr) | < 0.01 | mg/L |
| | APBL | Lead, Leachable (Pb) | < 0.05 | mg/L |
| | ASEL | Selenium, Leachable (Se) | < 0.1 | mg/L |
| BATCH: 12809 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: P0211868 | |
| | OVZHE | VOLATILES - ZHE/PART 261 | | |
| | | 1,1-dichloroethene [1,1-dichloroethylene] | < 0.005 | mg/L |
| | | 1,2-dichloroethane | < 0.005 | mg/L |
| | | 2-butanone [methylethyl ketone] [MEK] | < 0.010 | mg/L |
| | | benzene | < 0.005 | mg/L |
| | | carbon tetrachloride | < 0.005 | mg/L |
| | | chlorobenzene | < 0.005 | mg/L |

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## QUALITY CONTROL REPORT
### METHOD BLANK DATA

| | TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|---|
| | | chloroform | < 0.005 | mg/L |
| | | tetrachloroethene [tetrachloroethylene] | < 0.005 | mg/L |
| | | trichloroethene [trichloroethylene] | < 0.005 | mg/L |
| | | vinyl chloride | < 0.010 | mg/L |
| BATCH: 12542 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: | P0210529 |
| | G130L | CHLORINATED HERBICIDES | | |
| | | 2,4,5-TP [silvex] | < 0.5 | ug/L |
| | | 2,4-D | < 0.5 | ug/L |
| BATCH: 12543 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: | P0210530 |
| | G121L | ORGANOCHLORINE PESTICIDES | | |
| | | chlordane | < 0.5 | ug/L |
| | | endrin | < 0.1 | ug/L |
| | | gamma-BHC [lindane] | < 0.05 | ug/L |
| | | heptachlor | < 0.05 | ug/L |
| | | methoxychlor | < 0.5 | ug/L |
| | | toxaphene | < 1 | ug/L |
| BATCH: 12544 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: | P0210531 |
| | OTCLP | SEMIVOLATILES - TCLP/PART 261 | | |
| | | 1,4-dichlorobenzene [p-dichlorobenzene] | < 0.01 | mg/L |
| | | 2,4,5-trichlorophenol | < 0.05 | mg/L |
| | | 2,4,6-trichlorophenol | < 0.01 | mg/L |
| | | 2,4-dinitrotoluene | < 0.01 | mg/L |
| | | 2-methylphenol [o-cresol] | < 0.01 | mg/L |
| | | 3-methylphenol [m-cresol] | < 0.01 | mg/L |
| | | 4-methylphenol [p-cresol] | < 0.01 | mg/L |
| | | hexachlorobenzene | < 0.01 | mg/L |
| | | hexachlorobutadiene | < 0.01 | mg/L |
| | | hexachloroethane | < 0.01 | mg/L |
| | | nitrobenzene | < 0.01 | mg/L |
| | | pentachlorophenol | < 0.05 | mg/L |
| | | pyridine | < 0.01 | mg/L |
| BATCH: 12559 | SAMPLE ID: Method Blank | | NUS SAMPLE NO: | P0210546 |
| | AHGL | Mercury, Leachable (Hg) | < 0.0002 | mg/L |

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## QUALITY CONTROL REPORT
### METHOD BLANK DATA

| TEST CODE | Determination | RESULT | UNITS |
|---|---|---|---|
| BATCH: 12458 | SAMPLE ID: Method Blank | NUS SAMPLE NO: | P0210434 |
| G130L | CHLORINATED HERBICIDES | | |
| | 2,4,5-TP [silvex] | < 0.5 | ug/L |
| | 2,4-D | < 0.5 | ug/L |
| BATCH: 12459 | SAMPLE ID: Method Blank | NUS SAMPLE NO: | P0210435 |
| G121L | ORGANOCHLORINE PESTICIDES | | |
| | chlordane | < 0.5 | ug/L |
| | endrin | < 0.1 | ug/L |
| | gamma-BHC [lindane] | < 0.05 | ug/L |
| | heptachlor | < 0.05 | ug/L |
| | methoxychlor | < 0.5 | ug/L |
| | toxaphene | < 1 | ug/L |
| BATCH: 12470 | SAMPLE ID: Method Blank | NUS SAMPLE NO: | P0211954 |
| OTCLP | SEMIVOLATILES - TCLP/PART 261 | | |
| | 1,4-dichlorobenzene [p-dichlorobenzene] | < 10 | ug/L |
| | 2,4,5-trichlorophenol | < 50 | ug/L |
| | 2,4,6-trichlorophenol | < 10 | ug/L |
| | 2,4-dinitrotoluene | < 10 | ug/L |
| | 2-methylphenol [o-cresol] | < 10 | ug/L |
| | 3-methylphenol [m-cresol] | < 10 | ug/L |
| | 4-methylphenol [p-cresol] | < 10 | ug/L |
| | hexachlorobenzene | < 10 | ug/L |
| | hexachlorobutadiene | < 10 | ug/L |
| | hexachloroethane | < 10 | ug/L |
| | nitrobenzene | < 10 | ug/L |
| | pentachlorophenol | < 50 | ug/L |
| | pyridine | < 10 | ug/L |
| BATCH: 12500 | SAMPLE ID: Method Blank | NUS SAMPLE NO: | P0210480 |
| OVZHE | VOLATILES - ZHE/PART 261 | | |
| | 1,1-dichloroethene [1,1-dichloroethylene] | < 0.005 | mg/L |
| | 1,2-dichloroethane | < 0.005 | mg/L |
| | 2-butanone [methylethyl ketone] [MEK] | < 0.010 | mg/L |
| | benzene | < 0.005 | mg/L |
| | carbon tetrachloride | < 0.005 | mg/L |
| | chlorobenzene | < 0.005 | mg/L |

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## QUALITY CONTROL REPORT
### LABORATORY CONTROL SAMPLE RECOVERY

| TEST CODE | DETERMINATION | PERCENT RECOVERY | DUPLICATE RECOVERY | RPD | ACCEPTANCE LIMITS |
|---|---|---|---|---|---|
| BATCH: 12559 | SAMPLE ID: Lab Control Sample | | | NUS SAMPLE NO: | P0210545 |
| AHGL | Mercury, Leachable (Hg) | 102 | | NA | - |
| BATCH: 12589 | SAMPLE ID: Lab Control Sample | | | NUS SAMPLE NO: | P0211086 |
| AASL | Arsenic, Leachable (As) | 97.6 | | NA | - |
| ABAL | Barium, Leachable (Ba) | 98.5 | | NA | - |
| ACDL | Cadmium, Leachable (Cd) | 100 | | NA | - |
| ACRL | Chromium, Leachable (Cr) | 102 | | NA | - |
| ASEL | Selenium, Leachable (Se) | 86.0 | | NA | - |
| BATCH: 12590 | SAMPLE ID: Lab Control Sample | | | NUS SAMPLE NO: | P0211088 |
| AASL | Arsenic, Leachable (As) | 97.0 | | NA | - |
| ABAL | Barium, Leachable (Ba) | 98.0 | | NA | - |
| ACDL | Cadmium, Leachable (Cd) | 88.0 | | NA | - |
| ACRL | Chromium, Leachable (Cr) | 102 | | NA | - |
| ASEL | Selenium, Leachable (Se) | 85.8 | | NA | - |
| BATCH: 12673 | SAMPLE ID: Lab Control Sample | | | NUS SAMPLE NO: | P0211188 |
| AAGL | Silver, Leachable (Ag) | 110 | | NA | - |
| BATCH: 12674 | SAMPLE ID: Lab Control Sample | | | NUS SAMPLE NO: | P0211190 |
| AAGL | Silver, Leachable (Ag) | 102 | | NA | - |
| BATCH: 12679 | SAMPLE ID: Lab Control Sample | | | NUS SAMPLE NO: | P0211200 |
| AASL | Arsenic, Leachable (As) | 95.2 | | NA | - |
| ABAL | Barium, Leachable (Ba) | 98.5 | | NA | - |
| ACDL | Cadmium, Leachable (Cd) | 94.0 | | NA | - |
| ACRL | Chromium, Leachable (Cr) | 103 | | NA | - |
| APBL | Lead, Leachable (Pb) | 97.2 | | NA | - |
| ASEL | Selenium, Leachable (Se) | 96.0 | | NA | - |

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## QUALITY CONTROL REPORT
### SURROGATE STANDARD RECOVERY

| LN | TEST CODE | SURROGATE COMPOUND | PERCENT RECOVERY | ACCEPTANCE LIMITS | REF LN |
|---|---|---|---|---|---|
| | | toluene-d8 | 107 | - | |

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## QUALITY CONTROL REPORT
### SURROGATE STANDARD RECOVERY

| LN | TEST CODE | SURROGATE COMPOUND | PERCENT RECOVERY | ACCEPTANCE LIMITS | REF LN |
|---|---|---|---|---|---|
| SAMPLE ID: | GL63-SD-BB-01A TCLP | | NUS SAMPLE NO: | P0209511 | |
| 3 | $BNAW | GC/MS BNA SURROGATES | | | 2 |
| | | 2,4,6-tribromophenol | 61 | - | |
| | | 2-fluorobiphenyl | 70 | - | |
| | | 2-fluorophenol | 88 | - | |
| | | nitrobenzene-d5 | 84 | - | |
| | | p-terphenyl-d14 | 115 | - | |
| | | phenol-d5 | 46 | - | |
| 16 | $PSTW | PESTICIDES SURROGATE | | | 15 |
| | | dibutylchlorendate | 84 | - | |
| 18 | $HRBW | HERBICIDES SURROGATE | | | 17 |
| | | 2,4,5-T | 91 | - | |
| SAMPLE ID: | GL63-SD-BB-01A ZHE | | NUS SAMPLE NO: | P0209512 | |
| 3 | $VOAW | GC/MS VOLATILES SURROGATES | | | 2 |
| | | 1,2-dichloroethane-d4 | 99 | - | |
| | | 4-bromofluorobenzene | 109 | - | |
| | | toluene-d8 | 108 | - | |
| SAMPLE ID: | GL63-SD-OH-09A TCLP MS | | NUS SAMPLE NO: | P0209961 | |
| 3 | $BNAW | GC/MS BNA SURROGATES | | | 2 |
| | | 2,4,6-tribromophenol | 49 | - | |
| | | 2-fluorobiphenyl | 110 | - | |
| | | 2-fluorophenol | 90 | - | |
| | | nitrobenzene-d5 | 165 | - | |
| | | p-terphenyl-d14 | 117 | - | |
| | | phenol-d5 | 63 | - | |
| 16 | $PSTW | PESTICIDES SURROGATE | | | 15 |
| | | dibutylchlorendate | DO | - | |
| DO indicates the extract was analyzed at a dilution of greater than or equal to 20x due to matrix interferences. Such a dilution diminishes the response of the surrogate compound to the extent that its concentration (and hence its recovery) can not be calculated. | | | | | |
| 18 | $HRBW | HERBICIDES SURROGATE | | | 17 |
| | | 2,4,5-T | 81 | - | |
| SAMPLE ID: | GL63-SD-OH-09A ZHE MS | | NUS SAMPLE NO: | P0209962 | |
| 3 | $VOAW | GC/MS VOLATILES SURROGATES | | | 2 |
| | | 1,2-dichloroethane-d4 | 102 | - | |
| | | 4-bromofluorobenzene | 108 | - | |

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## QUALITY CONTROL REPORT
SURROGATE STANDARD RECOVERY

| LN | TEST CODE | SURROGATE COMPOUND | PERCENT RECOVERY | ACCEPTANCE LIMITS | REF LN |
|---|---|---|---|---|---|
| 3 | $BNAW | GC/MS BNA SURROGATES | | | 2 |
| | | 2,4,6-tribromophenol | * | - | |
| | | 2-fluorobiphenyl | 79 | - | |
| | | 2-fluorophenol | * | - | |
| | | nitrobenzene-d5 | 74 | - | |
| | | p-terphenyl-d14 | 115 | - | |
| | | phenol-d5 | * | - | |

* The acid surrogates were not detected during the original GC/MS analysis of this TCLP extract. Reextraction and reanalysis confirmed that the acid surrogates were not detectable, apparently due to matrix interference.

| | | | | | |
|---|---|---|---|---|---|
| 16 | $PSTW | PESTICIDES SURROGATE | | | 15 |
| | | dibutylchlorendate | 86 | - | |
| 18 | $HRBW | HERBICIDES SURROGATE | | | 17 |
| | | 2,4,5-T | 87 | - | |

SAMPLE ID: GL63-SD-OH-11A / ZHE EXT NUS SAMPLE NO: P0209274

| | | | | | |
|---|---|---|---|---|---|
| 3 | $VOAW | GC/MS VOLATILES SURROGATES | | | 2 |
| | | 1,2-dichloroethane-d4 | 84 | - | |
| | | 4-bromofluorobenzene | 104 | - | |
| | | toluene-d8 | 105 | - | |

SAMPLE ID: GL63-SD-OH-09A / TCLP LEACH NUS SAMPLE NO: P0209385

| | | | | | |
|---|---|---|---|---|---|
| 3 | $BNAW | GC/MS BNA SURROGATES | | | 2 |
| | | 2,4,6-tribromophenol | 47 | - | |
| | | 2-fluorobiphenyl | 61 | - | |
| | | 2-fluorophenol | 86 | - | |
| | | nitrobenzene-d5 | 64 | - | |
| | | p-terphenyl-d14 | 106 | - | |
| | | phenol-d5 | 47 | - | |
| 16 | $PSTW | PESTICIDES SURROGATE | | | 15 |
| | | dibutylchlorendate | 83 | - | |
| 18 | $HRBW | HERBICIDES SURROGATE | | | 17 |
| | | 2,4,5-T | 85 | - | |

SAMPLE ID: GL63-SD-OH-09A / ZHE EXT NUS SAMPLE NO: P0209386

| | | | | | |
|---|---|---|---|---|---|
| 3 | $VOAW | GC/MS VOLATILES SURROGATES | | | 2 |
| | | 1,2-dichloroethane-d4 | 85 | - | |
| | | 4-bromofluorobenzene | 102 | - | |
| | | toluene-d8 | 103 | - | |

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## QUALITY CONTROL REPORT
SURROGATE STANDARD RECOVERY

| LN | TEST CODE | SURROGATE COMPOUND | PERCENT RECOVERY | ACCEPTANCE LIMITS | REF LN |
|---|---|---|---|---|---|
| SAMPLE ID: | GL63-SD-BB-03A / TCLP LEACH | | NUS SAMPLE NO: | P0209167 | |
| 3 | $BNAW | GC/MS BNA SURROGATES | | | 2 |
| | | 2,4,6-tribromophenol | 39 | - | |
| | | 2-fluorobiphenyl | 62 | - | |
| | | 2-fluorophenol | 46 | - | |
| | | nitrobenzene-d5 | 73 | - | |
| | | p-terphenyl-d14 | 64 | - | |
| | | phenol-d5 | 29 | - | |
| 16 | $PSTW | PESTICIDES SURROGATE | | | 15 |
| | | dibutylchlorendate | 94 | - | |
| 18 | $HRBW | HERBICIDES SURROGATE | | | 17 |
| | | 2,4,5-T | 63 | - | |
| SAMPLE ID: | GL63-SD-BB-03A / ZHE EXT | | NUS SAMPLE NO: | P0209168 | |
| 3 | $VOAW | GC/MS VOLATILES SURROGATES | | | 2 |
| | | 1,2-dichloroethane-d4 | 88 | - | |
| | | 4-bromofluorobenzene | 105 | - | |
| | | toluene-d8 | 103 | - | |
| SAMPLE ID: | GL63-SD-1N-05A / TCLP LEACH | | NUS SAMPLE NO: | P0209173 | |
| 3 | $BNAW | GC/MS BNA SURROGATES | | | 2 |
| | | 2,4,6-tribromophenol | 61 | - | |
| | | 2-fluorobiphenyl | 93 | - | |
| | | 2-fluorophenol | 70 | - | |
| | | nitrobenzene-d5 | 78 | - | |
| | | p-terphenyl-d14 | 115 | - | |
| | | phenol-d5 | 41 | - | |
| 16 | $PSTW | PESTICIDES SURROGATE | | | 15 |
| | | dibutylchlorendate | 84 | - | |
| 18 | $HRBW | HERBICIDES SURROGATE | | | 17 |
| | | 2,4,5-T | 73 | - | |
| SAMPLE ID: | GL63-SD-1N-05A / ZHE EXT | | NUS SAMPLE NO: | P0209174 | |
| 3 | $VOAW | GC/MS VOLATILES SURROGATES | | | 2 |
| | | 1,2-dichloroethane-d4 | 85 | - | |
| | | 4-bromofluorobenzene | 106 | - | |
| | | toluene-d8 | 103 | - | |
| SAMPLE ID: | GL63-SD-OH-11A / TCLP LEACH | | NUS SAMPLE NO: | P0209273 | |

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## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-09A TCLP MS
NUS SAMPLE NO: P0209961
P.O. NO.: CTO # 0063

DATE SAMPLED: 20-AUG-92
DATE RECEIVED: 27-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNIT |
|---|---|---|---|---|
| 1 | S903 | Toxic Characteristic Leaching Procedure [TCLP] | DONE | |
| 2 | OTCLP | SEMIVOLATILES - TCLP/PART 261 | | |
| | | 1,4-dichlorobenzene [p-dichlorobenzene] | 79.8 | % |
| | | 2,4,5-trichlorophenol | 125 | % |
| | | 2,4,6-trichlorophenol | 124 | % |
| | | 2,4-dinitrotoluene | 134 | % |
| | | 2-methylphenol [o-cresol] | 149 | % |
| | | 3-/4-methylphenol [m-/p-cresol] | 134 | % |
| | | hexachlorobenzene | 20.1 | % |
| | | hexachlorobutadiene | 27.6 | % |
| | | hexachloroethane | 52.3 | % |
| | | nitrobenzene | 191 | % |
| | | pentachlorophenol | 75.0 | % |
| | | pyridine | 175 | % |
| 4 | AASL | Arsenic, Leachable (As) | 109 | % |
| 5 | ABAL | Barium, Leachable (Ba) | 91.4 | % |
| 6 | ACDL | Cadmium, Leachable (Cd) | 85.8 | % |
| 7 | ACRL | Chromium, Leachable (Cr) | 94.0 | % |
| 8 | APBL | Lead, Leachable (Pb) | 90.4 | % |
| 9 | AHGL | Mercury, Leachable (Hg) | 120 | % |
| 10 | ASEL | Selenium, Leachable (Se) | 93.5 | % |
| 11 | AAGL | Silver, Leachable (Ag) | 57.2 | % |
| 15 | G121L | ORGANOCHLORINE PESTICIDES | | |
| | | chlordane | 53 | % |
| | | endrin | 96 | % |
| | | gamma-BHC [lindane] | 135 | % |
| | | heptachlor | 67 | % |
| | | methoxychlor | 92 | % |

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## LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
ADDRESS: 111 NORTH CANAL STREET
CHICAGO, IL 60606-
ATTENTION: MR. MANSOUR GHIASI, P.E.

NUS CLIENT NO: 1495 0006
WORK ORDER NO: 5298-
VENDOR NO:

Carbon Copy:

SAMPLE ID: GL63-SD-OH-09A ZHE MS
NUS SAMPLE NO: P0209962
P.O. NO.: CTO # 0063

DATE SAMPLED: 20-AUG-92
DATE RECEIVED: 27-AUG-92
APPROVED BY: J Simanic

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| 1 | S904 | Zero Headspace Extraction [ZHE] | DONE | |
| 2 | OVZHE | VOLATILES - ZHE/PART 261 | | |
| | | 1,1-dichloroethene [1,1-dichloroethylene] | 76.0 | % |
| | | 1,2-dichloroethane | 73.0 | % |
| | | 2-butanone [methylethyl ketone] [MEK] | 88.0 | % |
| | | benzene | 71.5 | % |
| | | carbon tetrachloride | 74.5 | % |
| | | chlorobenzene | 76.5 | % |
| | | chloroform | 74.0 | % |
| | | tetrachloroethene [tetrachloroethylene] | 76.5 | % |
| | | trichloroethene [trichloroethylene] | 73.5 | % |
| | | vinyl chloride | 61.0 | % |

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LABORATORY ANALYSIS REPORT

CLIENT NAME: SEC DONOHUE INC.
SAMPLE ID: GL63-SD-OH-09A TCLP MS
NUS SAMPLE NO: P0209961

| LN | TEST CODE | DETERMINATION | RESULT | UNITS |
|---|---|---|---|---|
| | | toxaphene | 113 | % |
| 17 | G130L | CHLORINATED HERBICIDES | | |
| | | 2,4,5-TP [silvex] | 113 | % |
| | | 2,4-D | 109 | % |

COMMENTS: