ENVIRONMENTAL CONSULTING SERVICES, INC.

ASBESTOS & LEAD-BASED PAINT SURVEY REPORTS

CITY OF HOUSTON
BUCKINGHAM LIFT STATION
314 ½ FRIAR TUCK LANE
HOUSTON, TEXAS

Project Number: 50222028

5718 WESTHEIMER, SUITE 1575, HOUSTON, TEXAS 77057
PHONE: (713) 622-4800 FAX: (713) 622-4828
E-MAIL: INFO@ECSUS.COM

CITY OF HOUSTON

Public Works and Engineering Department

Interoffice

Correspondence

To:	Harish Jajoo, P.E. Senior Assistant Director Engineering Branch Engineering and Construction Division	**From:**	Assistant Director Geo-Environmental Services Branch Engineering and Construction Division
		Date:	April 8, 2005
Attn:	Gauher Khan, P.E.	**Subject:**	**BUCKINGHAM LIFT STATION** **314 ½ FRIAR TUCK LANE.** **GFS No. S-0267-23-2**

Attached are two copies of the asbestos and lead survey report for the subject property, prepared by Environmental Consulting Services, Inc. (ECS) for the subject project. The consultant's findings and recommendations are summarized below:

ASBESTOS

Findings

The Buckingham Lift station consists primarily of a pump room, and associated piping. Based on visual inspection, no suspect materials were present at the facility; therefore, no samples were collected at the facility (See Section 2.4, Page 8 of the asbestos survey report).

Recommendations:

No ACM was identified. No abatement deemed necessary.

Any building materials that were not sampled for asbestos must be sampled and analyzed for asbestos content before disposal during demolition and/or renovation activities. If testing is not performed, it can be presumed that all of the materials are ACM and should be disposed off accordingly.

LEAD

Findings

A total of five (5) paint chip samples were collected and analyzed for lead content, (See Section 4.3.1, and Table 2, Page 12 of the lead survey report). These samples were analyzed by using Flame AA Method.

- Analytical results for the:
  - gray, blue, and green paint samples indicated that lead content levels were below 600 PPM or 0.06% by weight (See Appendix B, of the lead survey report). These levels fall under the City of Houston's Hazard Category A (Allowable Lead Level).
  - black paint located on the pump motor and associated piping indicated lead concentration of 0.29% by weight and red paint located on the piping indicated lead concentrations of 0.34% by weight. These levels fall under the City of Houston's Hazard Category C-2 (Lead present).

Recommendations:

Estimated one hundred fifty (150) square feet of the red paint and black paint located on the pump motor and associated piping were found to contain lead above allowable lead level (See Appendix A Figures and Photographs of the lead report). Abatement should be addressed prior to any renovation/demolition activities.

OSHA regulations apply to workers during Demolition and/or Renovation. For further details (See Section 4.3 of the lead report) for detailed findings and recommendations.

If you have any questions, please feel free to call Maher Tanbouz, P.E. at 713-837-7060.

Michael K. Ho, P.E.

MKH:MT:bd
J:\A-ENV-SB\Environmental_Items\Abestos_&_Lead\Assessments\2005\Buckingham Lift Station.doc

Attachment: Asbestos/Lead Survey Reports

c: Daniel W. Krueger, P.E. (without attachment)
Ebi Nassiri, P.E.

ASBESTOS AND LEAD SURVEY REPORT

BUCKINGHAM LIFT STATION
314 ½ Friar Tuck Lane
Houston, Texas

City of Houston Contract Number: 53564

ECS Project Number: 50222028

Prepared For:

City of Houston
611 Walker – 14th Floor
Houston, Texas 77002

March 19, 2005

ECS

5718 Westheimer, Suite # 1575
Houston, Texas 77057
Tel: (713) 622-4800
Fax: (713) 622-4828
E-Mail: info@ecsus.com

ENVIRONMENTAL CONSULTING SERVICES, INC.

March 19, 2005

Mr. Maher Tanbouz
Attention: Mr. Willie Hunter
City of Houston
611 Walker Street
14th Floor
Houston, Texas 77002

Re: Comprehensive Asbestos and Lead-Based Paint Survey
Buckingham Lift Station
314 ½ Friar Tuck Lane
Houston, Texas
ECS Project Number: 50222028
City of Houston Contact Number: 53564

Dear Mr. Tanbouz:

Environmental Consulting Services, Inc. (ECS) is pleased to present the results of the comprehensive asbestos and lead-based paint survey conducted at the above referenced facility.

This report includes the results of our findings from visual reconnaissance, sampling and laboratory analysis. An assessment of the information was made to arrive at the conclusions stated and the recommendations presented.

We appreciate the opportunity to be of service to you and look forward to working on future assignments. Should you have any questions concerning this report or if we can assist you with any other matter, please feel free to contact us. ECS staffs are available for your assistance around the clock.

Sincerely,
Environmental Consulting Services, Inc. (ECS)

Abu Chowdhury
Asbestos Inspector License # 60-2497
Expiration Date: 11-03-2005

Sam H. Barbar
Individual Asbestos Consultant # 10-5452
Expiration Date: 04-21-2005

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

On February 23, 2005, Environmental Consulting Services, Inc. (ECS) conducted an asbestos and lead based paint survey at the Buckingham Lift Station located at 314 ½ Friar Tuck Lane in Houston, Texas, under professional services Contract No.: 53564. The scope of services was to inspect the facility for the presence of asbestos and lead-based-paint materials in accordance with the AHERA and HUD guidelines sampling protocols respectively.

1.1. Asbestos:

No suspect asbestos containing materials were identified at the time of our observation and sampling activities (City of Houston Hazard Category A).

Recommendations

No suspect asbestos containing materials were noted during our site visit. No Abatement deemed necessary (City of Houston Hazard Category A).

If during demolition and/or renovation activities, and prior to disposal, any unforeseen building materials that were not sampled for asbestos are discovered:

1. The suspect material should be analyzed for asbestos content and disposed of properly based on the analytical test results; or,

2. The construction material may be presumed asbestos-containing material, and disposed of following all applicable regulations.

1.2. Lead

Five (5) homogenous areas were identified. A total of five (5) samples of suspect Lead-Based-Paint (LBP) materials were collected and analyzed. Sample analysis results indicated the following:

1. Analytical results of the gray paint located on the control box and associated piping indicated lead concentrations of 0.06% by weight. These materials appeared to be in good condition at the time of our facility visit. Approximately three hundred (300) square feet of this paint exist. No abatement deemed necessary (City of Houston Hazard Category A).

2. Analytical results of the black paint located on the pump motors and associated piping indicated lead concentrations of 0.29% by weight. These materials appeared to be in a damaged condition at the time of our facility visit. Approximately one hundred (100) square feet of this paint exist. Abatement of this material should be addressed prior to any renovation/demolition activities. OSHA regulations apply to workers or the public (City of Houston Hazard Category C-2).

3. Analytical results of the blue paint located on the piping indicated lead concentrations of <0.016% by weight. These materials appeared to be in good condition at the time of our facility visit. Approximately fifty (50) square feet of this paint exist. No Abatement deemed necessary (City of Houston Hazard Category A).

4. Analytical results of the red paint located on the piping indicated lead concentrations of 0.34% by weight. These materials appeared to be in good condition at the time of our facility visit. Approximately fifty (50) square feet of this paint exist. Abatement of this material should be addressed prior to any renovation/demolition activities. OSHA regulations apply to workers or the public (City of Houston Hazard Category C-2).

5. Analytical results of the green paint located on the Lift Station Cover doors indicated lead concentrations of <0.010% by weight. These materials appeared to be in good condition at the

time of our facility visit. Approximately one hundred (100) square feet of this paint exist. No Abatement deemed necessary (City of Houston Hazard Category A).

Recommendations

1. Prior to disturbance, all paints indicating lead concentrations below 0.06% by weight should be addressed for workers protection following the applicable OSHA regulations (i.e. 29 CFR 1926.62).

2. All paints indicated as lead containing should be considered a health hazard and should be addressed accordingly under applicable state and federal laws.

3. Any painted areas that are homogenous with the above sampled areas identified as lead containing, shall also be considered as lead-containing and should be maintained or removed by qualified personnel.

4. Paint materials indicating lead concentrations of greater than 0.5% by weight pose a health hazard, as defined by applicable federal, state and city regulations. Abatement should be a top priority (City of Houston Hazard Category C-1).

2. COMPREHENSIVE ASBESTOS SURVEY

Environmental Consulting Services, Inc. (ECS) has completed a comprehensive asbestos survey at the Buckingham Lift Station located at 314 ½ Friar Tuck Lane in Houston, Texas, and referred to as the "facility".

2.1. Scope of Services

This survey was performed to determine the presence, location, and condition of Asbestos-Containing Materials (ACM) at the referenced facilities. Mr. Abu Chowdhury an EPA-accredited/TDH-Licensed Asbestos Inspector with ECS performed the facility inspection on February 23, 2005.

The inspection consisted of the following:

- Sampling of suspect Asbestos-Containing Materials (ACMs).
- Quantifying and qualifying ACM.
- Locating ACM samples on computer generated maps.
- Preparing an inspection report.

2.2. Facility Description

The Buckingham Lift Station Facility consists primarily of a Pump Room, and associated piping. Based on visual surveillance, no suspect materials were present at the facility at the time of our site visit.

2.3. Sampling Techniques and Laboratory Methods

This section details the sampling and laboratory methods used in the comprehensive asbestos survey to quantify and assess the condition of the confirmed ACM.

2.3.1 Survey Methods

This section addresses the criteria necessary for identifying, evaluating and assessing suspect Asbestos-Containing Materials (ACMs).

a. Homogeneous Areas

Prior to collecting bulk samples of suspect ACM, distinct homogeneous sampling areas and specific sampling sites were defined based on building construction dates. A homogeneous sample area can be defined as a material that is similar in appearance, color, and generally having the same episode of installation as surrounding "like" material. Attempts were made in all cases to obtain representative samples of like materials, as this is the most cost-effective method for determination of ACM. It should be assumed by the building owner, contractor, and the abatement contractors that the composition of like materials in a single homogeneous area is the same. Homogeneous areas sampled as part of this survey include materials which have been identified by ECS as ACM and have been classified as friable (material containing more than one-percent asbestos that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure) or non-friable (material containing more than one-percent asbestos that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure). Friable materials are more likely to become airborne, thereby increasing the potential for health hazards.

b. Hazard Assessment

According to AHERA (December 30, 1986), verified friable or assumed ACM uncovered in an inspection or reinspection of a facility shall be accessed in view of past, present, or future likelihood of disturbance and may include the following:

1. Location of material present.
2. Condition of material: type of damage, severity of damage, and the extent or spread of damage.
3. Accessibility of the materials.

4. Potential for disturbance of the material.
5. Known or suspected causes of damage (i.e., air erosion, vandalism, service or repair, vibration, and water).
6. Preventive measures which might eliminate the likelihood of undamaged ACM from becoming significantly damaged.
7. Actions to be taken to protect human health.

The above hazard assessment factors will be discussed according to classifications of verified ACM. The ACM is usually examined and prioritized according to hazard categories based on condition, location, potential for damage and potential for fiber release. The asbestos hazard categories as defined by the City of Houston are presented in Table 1 as follows:

Table 1: HAZARD CATEGORY AND REPONSE ACTION

Hazard Category	Response Action
C-1: Asbestos Present	Serious health hazard, as defined by EPA, abatement should be a top priority
C-2: Asbestos Present	Health hazard, as defined by EPA, abatement should be planned
C-3: Asbestos Present	No action necessary unless renovation, remodeling, or demolition is planned
B-1: Asbestos Present	Contains 1% asbestos, or less, not regulated by TDH
B-2: Asbestos Present	Adequately enclosed
B-3: Asbestos Present	Adequately encapsulated
A: No asbestos found	N/A
A-1: Asbestos Abated	Once identified asbestos containing materials have been abated

c. Field Methods

All accessible areas of the facility were inspected for the presence of suspect ACM. Based on visual surveillance, no suspect materials were present at the facility at the time of our site visit.

2.3.2. Laboratory Methods

No suspect asbestos containing materials were identified at the time of our observation and sampling activities. All material samples were analyzed using the Polarized Light Microscopy (PLM) methods with dispersion-staining techniques according to US EPA Interim Method EPA 600/M4-82-020. This type of analysis requires the microscopist to take a portion of the bulk sample and treat it with a special light-refractive oil emulsion stain. The prepared slide is then subjected to a variety of tests while being viewed under varying polarization of light.

Each type of asbestos displays unique characteristics when subjected to these tests. Percentages of the identified types of asbestos are determined by visual estimation. Even though this is an estimation, any material that contains over one percent (> 1%) of any type of asbestos using the PLM Method is considered an ACM and must be handled according to OSHA, EPA, and State regulations if disturbed.

CA Labs participates in the EPA Quality Assurance Program for Polarized Light Microscopy and are accredited by the EPA/NIST. This program helps ensure accurate repeatable results on the part of the analyst.

2.3.3. Asbestos-Containing Material (ACM) Verification and Assessment

No suspect asbestos containing materials were identified at the time of our observation and sampling activities.

2.3.4. Hazard Assessment Results

The exact hazard ratings as defined by the City of Houston Hazard Category and Response Action (Table 1) are referenced in Table 2.

TABLE 2: SUSPECT ACM ANALYTICAL RESULTS						
Homogenous Area No.	**Material**	**Location**	**Type***	**Damaged***	**Hazard Risk***	**Asbestos Content (ND = None Detected)**
No Suspect Materials Identified						

2.4. Findings and Recommendations

2.4.1. Findings

ECS has completed an asbestos survey at the Buckingham Lift Station located at 314 ½ Friar Tuck Lane in Houston, Texas. The scope of services was to inspect the facility for the presence of asbestos-containing materials.

No suspect materials were noted at the time of our observation and sampling activities.

2.4.2. Recommendations

No suspect asbestos containing materials were identified at the Buckingham Lift Station facility. No Abatement deemed necessary (City of Houston Hazard Category A).

If during demolition and/or renovation activities, and prior to disposal, any unforeseen building materials that were not sampled for asbestos are discovered:

1. The suspect material should be analyzed for asbestos content and disposed of properly based on the analytical test results; or,

2. The construction material may be presumed asbestos-containing material, and disposed of following all applicable regulations.

APPENDIX A
FIGURES AND PHOTOGRAPHS

NO SUSPECT ASBESTOS CONTAINING MATERIALS IDENTIFIED

APPENDIX B
ANALYTICAL RESULTS
AND
CHAIN-OF-CUSTODY

NO SUSPECT ASBESTOS CONTAINING MATERIALS IDENTIFIED

APPENDIX C
LICENSES AND CERTIFICATIONS

TEXAS
Department of
State Health Services

Control No: 82374

Department of State Health Services certifies that:

ABU CHOWDHURY

is Licensed as an:

Asbestos Inspector

License Number: 602497
From: 11/04/2004
To: 11/03/2005

NATEC
OF TEXAS, INC.
www.natectx.com

Abu Chowdhury
Name

602-04-2023
SS# / DL#

NIR092704-2023
Certification #

Asbestos Inspector Refresher
Approved Course

September 27, 2004
Course Date

September 27, 2005
Expires

Authorized NATEC Signature

Natec Courses:
Asbestos, Lead, Mold
Air Monitoring, Texas and Louisiana Regulations
RFCI, Forklift, Defensive Driving, Anthrax, HAZWOPER, OSHA 582

National Abatement Technology Center
9802 Lawndale * Houston, Texas 77017
(713) 472-4022 * (800) 446-2832 * FAX: (713) 472-4064
www.natectx.com

CERTIFICATE

THIS CERTIFIES THAT

ABU CHOWDHURY

DL# 12164593

Has completed the NATEC

AHERA/EPA Accredited Course for Asbestos Abatement ***Inspector Refresher***

and has passed the Required Exam in that Discipline.

This course is EPA Approved Under the Toxic Substance Control Act (TSCA) Title II.

September 27, 2004 **Course Date**	**Authorized Signature**	**September 27, 2005** **Expiration Date**
September 27, 2004 **Exam Date**	**Instructors Signature**	**NIR092704-2023** **Certification #**

MAILING ADDRESS: 9802 Lawndale Avenue, Houston, Texas 77017, (713) 472-4022 Visit us @ natectx.com

APPENDIX D
SURVEY CHECKLISTS

CHECK LIST FOR ASBESTOS SURVEYS

NAME OF THE FACILITY: **Buckingham Lift Station**

FACILITY ADDRESS: **314 ½ Friar Tuck Lane, Houston, Texas**

DATE OF THE SURVEY: **02/23/2005** CONSULTANT: **ECS**

INSPECTOR (S) NAME: **Abu Chowdhury**

Note: Items/information listed below must be included in the report. Use this checklist to ensure completeness of your report. Mark "X" or "check" in front of the information included in the report. Submit completed check list with the report. If a facility is surveyed for asbestos and lead, the survey reports shall be segregated in one binder or preferably two separate reports.

1. X Date and Contract number of the survey.
2. X Scope of work.
3. X Copy of the inspectors TDH license.
4. X Name and Address of the building.
5. N/A Statement...if building records were used in the inspection and if not, why?
6. N/A Date of construction and last renovation (if any) of the building.
7. X Cover letter (in report) contain executive summary or executive summary begin the report format.
8. X List of areas that were not inspected. Explain.
9. X Procedures and protocols used to collect bulk samples.
10. N/A List of measures taken to prevent potential fiber release form locations where samples were extracted
11. N/A Drawings and photographs with sample locations marked to facilitate future location of materials sampled.
12. N/A Statement...if an accredited (NVLAP) laboratory was used for Sample Analysis.
13. N/A Copy of the laboratory accreditation certificate.

14. N/A Copy of the laboratory analysis results of the bulk samples.

15. N/A Statement (by the laboratory) regarding Quality Assurance and Quality Control performed.

16. N/A Copy of the chain of custody form for the bulk samples.

17. N/A List of materials assumed to be containing asbestos.

18. X City of Houston Asbestos Hazard Categorization (AHC) list and categorization of all the samples according to the AHC list included in the report.

19. N/A Condition of the building structure such as deterioration, structural problems, or other damages.

If Asbestos Present:

20. N/A Statement...if repeat analysis using point counting PLM was done as required by the city for the samples that show less than 5% asbestos.

21. N/A Photographs of all Materials proven to be ACM are included.

22. N/A All asbestos containing materials are classified as Friable or Non-Friable.

23. N/A Recommendations are made for all Asbestos Containing Materials.

24. N/A Reasonably accurate quantities of ACM's are estimated and given in the report.

25. N/A Cost estimations are given for abatement.

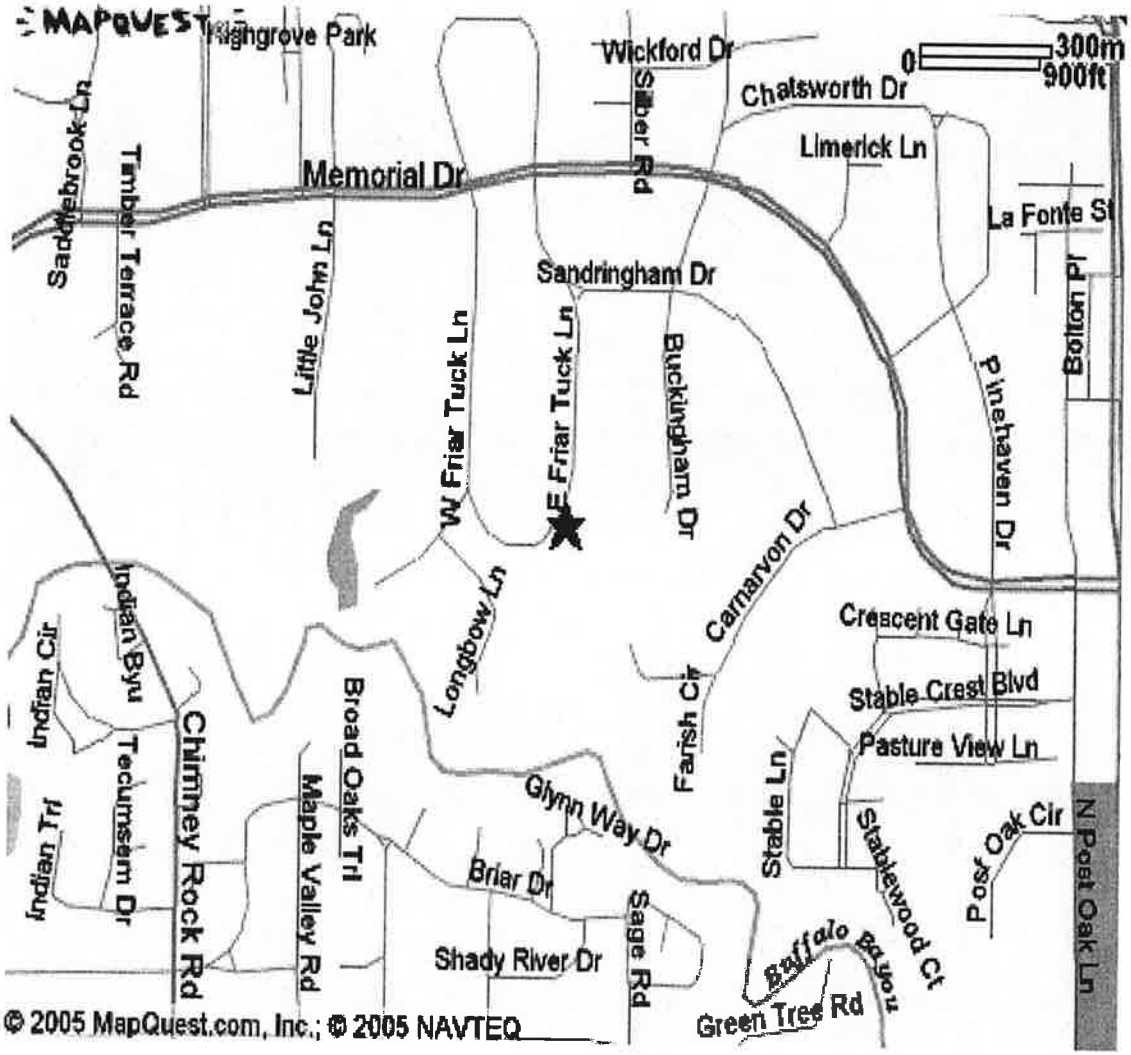
26. N/A Operation and Maintenance Plans are recommended.

Signed: Shasi Baker

for **Name: Abu Chowdhury**

Title: Asbestos Inspector

APPENDIX E
FACILITY LOCATION MAP


MAPQUEST
Highgrove Park
Wickford Dr
Silber Rd
Chatsworth Dr
Limerick Ln
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300m
900ft
Memorial Dr
Saddlebrook Ln
Timber Terrace Rd
Little John Ln
Sandringham Dr
La Fonte St
Bolton Pl
W Friar Tuck Ln
E Friar Tuck Ln
Buckingham Dr
Pinehaven Dr
Carnarvon Dr
Crescent Gate Ln
Stable Crest Blvd
Pasture View Ln
Longbow Ln
Farish Cir
Indian Cir
Indian Byu
Indian Trl
Tecumseh Dr
Chimney Rock Rd
Broad Oaks Trl
Maple Valley Rd
Glynn Way Dr
Briar Dr
Shady River Dr
Sage Rd
Stable Ln
Stablewood Ct
Buffalo Bayou
Green Tree Rd
Post Oak Cir
N Post Oak Ln
© 2005 MapQuest.com, Inc.; © 2005 NAVTEQ

APPENDIX F

LABORATORY STATEMENT REGARDING QUALITY ASSURANCE AND QUALITY CONTROL PERFORMED

4. LEAD-BASED PAINT SURVEY

Environmental Consulting Services, Inc. (ECS) performed a comprehensive Lead-Based Paint Survey at the Buckingham Lift Station located at 314 ½ Friar Tuck Lane, in Houston, Texas, under professional services City of Houston Contract No.: 53564. Ms. Lina Jazi, an EPA/TDH-certified Lead Risk Assessor with ECS, performed the facility inspection on February 23, 2005. The purpose of this assessment was to determine if Lead-Based Paint (LBP) was present at the facility.

4.1. Scope of Services

ECS was contracted by the City of Houston to perform the following scope of services:

1. Collect paint samples at the facility;
2. Submit the paint samples to a laboratory for the analysis of lead content; and,
3. Prepare a report presenting the analytical results, including recommendations for abatement of any lead-based painted materials discovered.

4.2. Sampling and Analysis

4.2.1. Paint Samples Collection

Five (5) homogenous areas were identified. A total of five (5) material samples of suspect Lead-Based-Paint (LBP) materials were collected and analyzed. The paint chips were placed in small plastic bags, labeled and shipped to Crisp Analytical Laboratories, LLC (CA Labs) for analysis. Description and location of the samples are included in Table 2. HUD sampling procedures and guidelines for evaluation and control of lead-based paint in housing were followed for this survey.

Lead containing paint hazard categories as defined by the City of Houston are presented in Table 1 as follows:

Table 1: HAZARD CATEGORY AND RESPONSE ACTION	
Hazard Category	**Response Action**
C-1: Lead Present	Health Hazard, as defined by applicable federal, state and city regulations. Abatement should be a top priority. (> 5,000 ppm or 0.5% by weight)
C-2: Lead Present	No action necessary when the material is adequately enclosed, must be addressed prior to demolition or renovation. OSHA regulations apply to workers or the public. (> 600 ppm or 0.06% but < 5,000 ppm or 0.5% by weight)
A: Allowable Lead Level	< 600 ppm or 0.06% by weight
A-1: Lead Abated	Once identified; lead containing materials (LCM) have been abated

4.2.2. Laboratory Analytical Results

CA Labs is accredited by the American Industrial Hygiene Association for environmental lead analysis, and is recognized by the Environmental Protection Agency (EPA) under the National Lead Laboratory Accreditation Program. Flame AA method (SW-846, 3050A/7420) was utilized to detect the lead content in the paint materials sampled. Lead-based paint is defined as a paint chip with a lead content of 0.5% by weight or greater in a dry film of paint applied.

A total of five (5) material samples were collected and submitted to the lab for analysis. Analytical results indicated the following:

1. Analytical results of the gray paint located on the control box and associated piping indicated lead concentrations of 0.06% by weight. These materials appeared to be in good condition at the time of our facility visit. Approximately three hundred (300) square feet of this paint exist. No abatement deemed necessary (City of Houston Hazard Category A).

2. Analytical results of the black paint located on the pump motors and associated piping indicated lead concentrations of 0.29% by weight. These materials appeared to be in a damaged condition at the time of our facility visit. Approximately one hundred (100) square feet of this paint exist. Abatement of this material should be addressed prior to any renovation/demolition activities. OSHA regulations apply to workers or the public (City of Houston Hazard Category C-2).

3. Analytical results of the blue paint located on the piping indicated lead concentrations of <0.016% by weight. These materials appeared to be in good condition at the time of our facility visit. Approximately fifty (50) square feet of this paint exist. No Abatement deemed necessary (City of Houston Hazard Category A).

4. Analytical results of the red paint located on the piping indicated lead concentrations of 0.34% by weight. These materials appeared to be in good condition at the time of our facility visit. Approximately fifty (50) square feet of this paint exist. Abatement of this material should be addressed prior to any renovation/demolition activities. OSHA regulations apply to workers or the public (City of Houston Hazard Category C-2).

5. Analytical results of the green paint located on the Lift Station Cover doors indicated lead concentrations of <0.010% by weight. These materials appeared to be in good condition at the time of our facility visit. Approximately one hundred (100) square feet of this paint exist. No Abatement deemed necessary (City of Houston Hazard Category A).

A numbered label identified all samples. The numbers directly correspond with the numbers listed in the Chain-of-Custody and the Laboratory Test Results in Appendix B. Sample locations for all areas tested and analytically reviewed are presented in Appendix A. Photographs are presented in Appendix A. Analytical results are presented in Table 2 and Appendix B.

TABLE 2: SUSPECT LBP ANALYTICAL RESULTS			
Sample No.	**Location**	**Color / Hazard**	**Lead Concentration (%) by Weight (BDL=Below Detectable Limits)**
L028001	Control Box and Associated Piping	Gray/A	0.06
L028002	Pump Motors and Piping	Black/C-2	0.29
L028003	Piping	Blue/A	<0.016
L028004	Piping	Red/C-2	0.34
L028005	Lift Station Door Cover	Green/A	<0.010

4.3. Findings and Recommendations

ECS has completed a Lead-Based Paint Survey at the Buckingham Lift Station, located at 314 ½ Friar Tuck Lane, in Houston, Texas. This assessment was performed to determine the presence and location of lead-based paint

4.3.1. Findings

Five (5) homogenous areas were identified. A total of five (5) material samples of suspect Lead-Based-Paint (LBP) materials were collected and analyzed. Analytical results indicated the following:

1. Analytical results of the gray paint located on the control box and associated piping indicated lead concentrations of 0.06% by weight. These materials appeared to be in good condition at the time of our facility visit. Approximately three hundred (300) square feet of this paint exist. No abatement deemed necessary (City of Houston Hazard Category A).

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5. Analytical results of the green paint located on the Lift Station Cover doors indicated lead concentrations of <0.010% by weight. These materials appeared to be in good condition at the time of our facility visit. Approximately one hundred (100) square feet of this paint exist. No Abatement deemed necessary (City of Houston Hazard Category A).

4.3.2. Recommendations

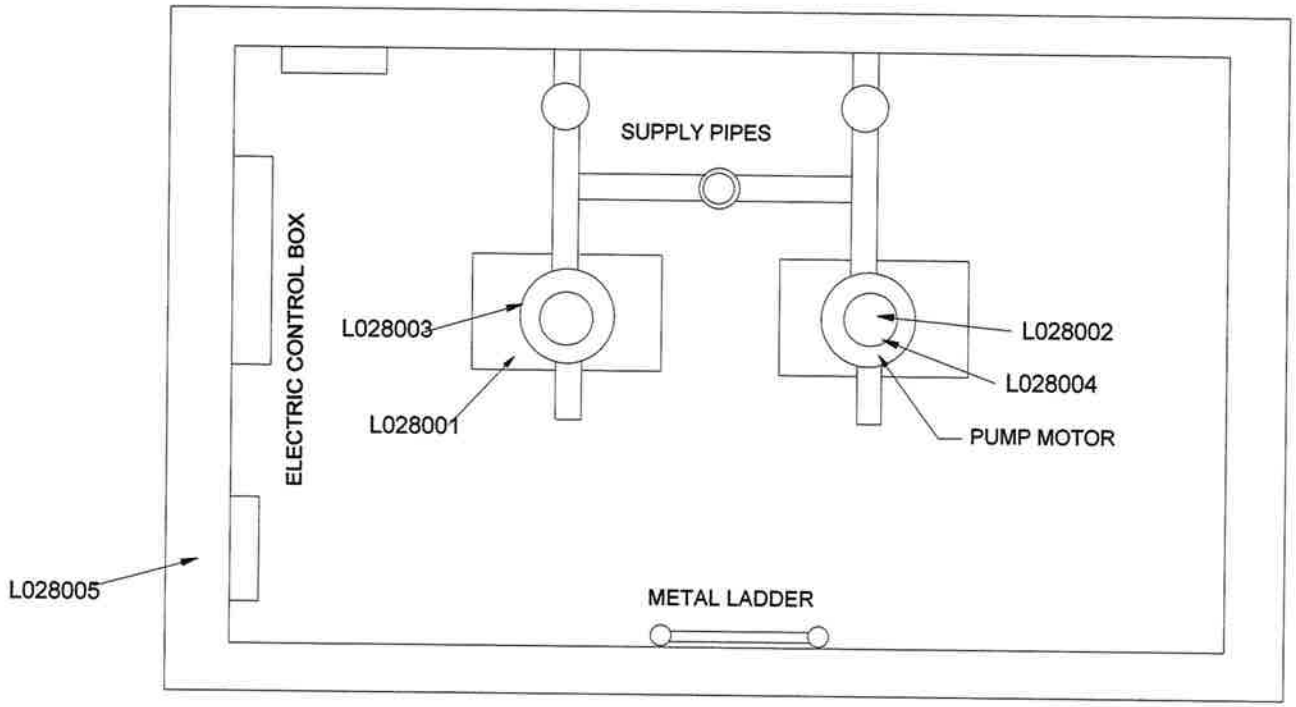
1. Prior to disturbance, all paints indicating lead concentrations below 0.06% by weight should be addressed for workers protection following the applicable OSHA regulations (i.e. 29 CFR 1926.62).

2. Any painted areas that are homogenous with the above sampled areas identified as being lead containing, should also be considered as lead containing, and should be maintained or removed by qualified personnel.

3. Paint materials indicating lead concentrations of greater than 0.5% by weight pose a health hazard, as defined by applicable federal, state and city regulations. Abatement should be a top priority. (City of Houston Hazard Category C-1).

4. Paint materials indicating lead concentration of greater than 0.06% but less than 0.5% by weight can be managed in-place. No action necessary when the material is adequately enclosed, must be addressed prior to demolition or renovation. OSHA regulations apply to workers or the public. (City of Houston Hazard Category C-2).

APPENDIX A
FIGURES AND PHOTOGRAPHS



PROJECT NAME: BUCKINGHAM LIFT STATION
PROJECT ADDRESS: 314 1/2 FRIAR TUCK LANE
HOUSTON, TEXAS
NOT TO SCALE

ENVIRONMENTAL CONSULTING SURVICES, INC.
5718 WESTHEIMER ROAD
SUITE # 1575
HOUSTON, TEXAS 77057

DATE : FEBRUARY 23, 2005
PROJECT NO.: 50222028

Photo No. 1: Buckingham Lift Station at 314 1/2 Fair Tuck Lane, Houston, Texas

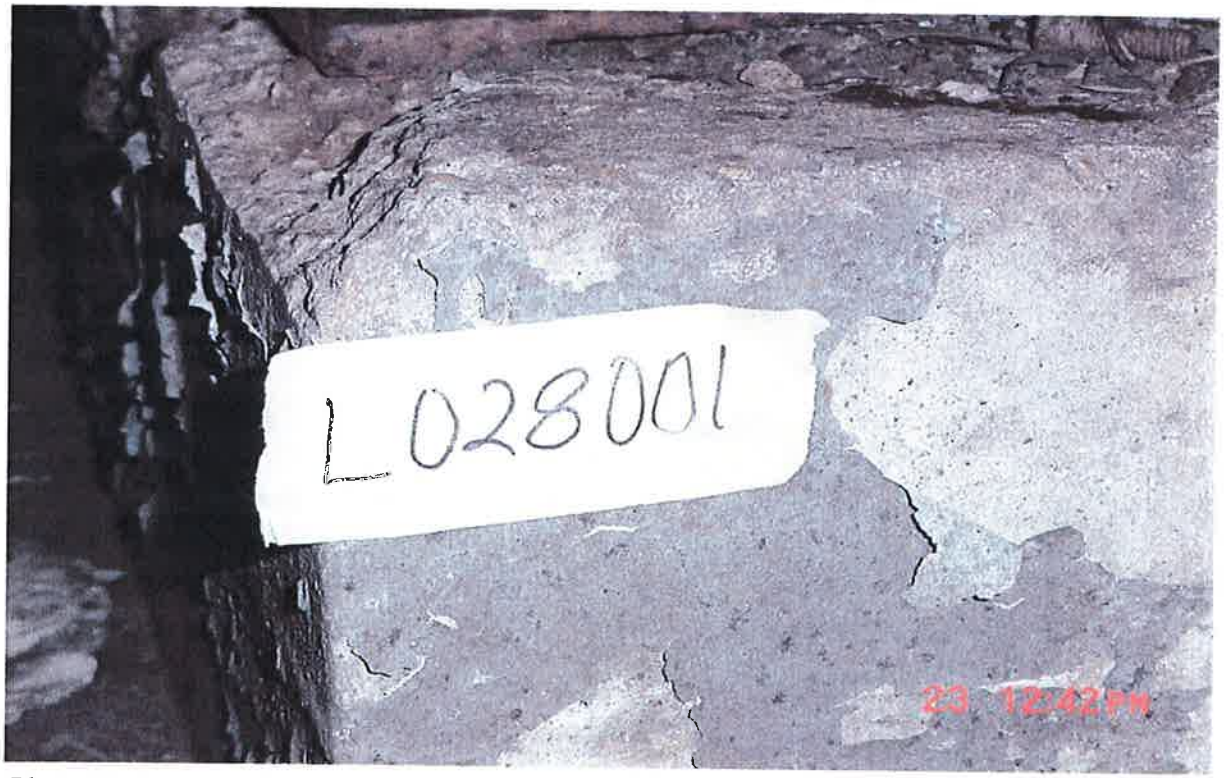


Photo No. 2: L028001 - Gray paint on pumps base floor

Photo No. 3: L028002 - Black paint on pumps

Photo No. 4: L028004 - Red paint on pipes

APPENDIX B
ANALYTICAL RESULTS
AND
CHAIN-OF-CUSTODY

Crisp Analytical Laboratories, L.L.C.
2081 Hutton Dr., Suite 301
Carrollton, TX 75006
PH: (972) 488-1414
Fax: (972) 488-8006

CA Labs, L.L.C.
12232 Industriplex, Suite 32
Baton Rouge, LA 70809
PH: (225) 751-5632
Fax: (225) 751-5634

Crisp Analytical Laboratories, L.L.C. at Houston
5829 West Sam Houston Parkway North, Suite 803
Houston, TX 77041
PH: (713) 983-6336
Fax: (713) 983-6776

Atomic Absorption Lead Report

Analysis Method: Lead in Paint analyzed by Atomic Absorption (AA)/SW-846-7420;
This analysis is not covered by the scope of accreditation by NVLAP.

Sample Prep Method: Samples are dissolved in nitric acid, extracted, and analyzed on a properly calibrated AA; Absorbency curve was calculated, bandwidth corrected, and wavelength at the time of the analysis was measured and recorded.

Client Information:
Environmental Consulting Services
5718 Westheimer, Suite 1575
Houston, Texas 77057
Phone: 713-622-4800

Fax: 713-622-4828

Client Project:
Buckingham Lift Station

Turnaround Time: 2 days

Attn: Serrie

CA Labs Project #:
CAH0502506
Date: 3/7/2005

Samples Received: 02-23-05

Purchase Order #:

Sample#	Description:	Sample Concentration: parts per million (ppm)	Weight Percent:
L028001	Gray paint on metal	595.02	0.06%
L028002	Black paint on metal	2874.31	0.29%
L028003	Blue paint on metal	<156.49	<0.016%
L028004	Red paint on metal	3397.37	0.34%
L028005	Green paint on metal	<99.26	<0.010%

NVLAP # 200452-0

TDH # 30-0256

Page 1 of 1

Approved Signatories:

Cody Newton
Analyst

Arthur Hernandez
Laboratory Director

Notes
The current guidelines for lead in paint from the Consumer Products Safety Council (CPSC) is 0.06% by weight; the Housing and Urban Development (HUD) guideline is 0.5% by weight.

CA Labs is participating in ELPAT rounds sponsored by American Industrial Hygiene Association (AIHA) and National Lead Laboratory Program (NVLAP). This test report relates only to the items tested. CA labs participates in the AIHA EMPAT proficiency program. This test reports relates only to the items tested. Neither AIHA, NVLAP nor EPA accreditation implies endorsement by any US Government agency. This report may not be reproduced except in full without written permission from CA Labs.

These results are submitted pursuant to CA Labs' current terms and condition of sale, including the company's standard warranty and limitation of liability provisions and no responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, CA Labs will store the samples for a period of ninety (90) days before discarding. A shipping and handling fee may be assessed for the return of any samples.

Form Name: Bulk Sample Analysis Summary Sheet

506
CAT05D2电 Form Number: ECS 02

ENVIRONMENTAL CONSULTING SERVICES, INC. (ECS)
5718 Westheimer Road, Suite # 1575, Houston, Texas 77057
Tel: 713-622-4800 / Fax: 713-622-4828

5 *2 day TAT *

BULK SAMPLE ANALYSIS SUMMARY SHEET

Page 1 Of 1

Survey Type (Check One): ☐ ACM ☒ LBP

Project Name:	Buckingham Lift Station	**Address:**	314 1/2 Frair Tuck lane, Houston, Tx
Project Number:	50222028	**Date:**	02-23-05
Inspected By:			

Sample Number	Description	Sample Location	F or NF	Damage	Damage Localized /Overall	%	HA No.	Quantity Approx.	Photo Log
L028001	Gray paint on metal	pipes, control box etc		N D SD	L O			300 sf / lf / ea	
L028002	Black paint on metal	pump motors, pipes etc.		N D SD	L O			100 sf / lf / ea	
L028003	Blue paint on metal	pipes		N D SD	L O			50 sf / lf / ea	
L028004	Red paint on metal	pipes		N D SD	L O			50 sf / lf / ea	
L028005	Green paint on metal	Lift station cover door (surface)		N D SD	L O			100 sf / lf / ea	
				N D SD	L O			sf / lf / ea	
				N D SD	L O			sf / lf / ea	
				N D SD	L O			sf / lf / ea	
				N D SD	L O			sf / lf / ea	
				N D SD	L O			sf / lf / ea	

Notes: No paint on walls (concrete)

Mch 2/23@1345

ACM: Asbestos-Containing Material Sample (Considered ACM if material contains more than 1% asbestos)

LBP- Lead-Based Paint Sample (Considered LBP if paint contains Lead in more than 0.5% by weigh

APPENDIX C
LICENSES AND CERTIFICATIONS

TEXAS DEPARTMENT OF HEALTH

BE IT KNOWN THAT

Lina A. Jazi

is hereby granted Certification as a

Lead Risk Assessor

in the State of Texas within the purview of Vernon's Texas Civil Statutes, Article 9029, as amended, so long as not suspended or revoked, and as long as renewed according to the rules adopted by the Texas Board of Health.

ENVIRONMENTAL LEAD BRANCH
TEXAS DEPARTMENT OF HEALTH

2070318
Certification Number

09/26/2004
Issue Date

09/26/2007
Expiration Date

Keith Alexander, Chief
Environmental Lead Branch
Toxic Substances Control Division

Eduardo J. Sanchez, M.D., M.P.H
Commissioner of Health

VOID IF ALTERED **NON-TRANSFERABLE**

4537

E Hernandez
Authorized NATEC Signature

Natec Courses:
Asbestos, Lead, Mold
Air Monitoring, Texas and Louisiana Regulations
RFCI, Forklift, Defensive Driving, Anthrax, HAZWOPER, NIOSH 582

National Abatement Technology Center
9802 Lawndale * Houston, Texas 77017
(713) 472-4022 * (800) 446-2832 * FAX: (713) 472-4064
www.natectx.com

NATEC OF TEXAS, INC.
www.natectx.com

Lina Jazi
Name

642-07-9373
SS# / DL#

NLR082404-9373
Certification #

Lead Risk Assessor Refresher
Approved Course

August 24, 2004
Course Date

August 24, 2007
Expires

E Hernandez
Authorized NATEC Signature

Natec Courses:
Asbestos, Lead, Mold
Air Monitoring, Texas and Louisiana Regulations
RFCI, Forklift, Defensive Driving, Anthrax, HAZWOPER, NIOSH 582

National Abatement Technology Center
9802 Lawndale * Houston, Texas 77017
(713) 472-4022 * (800) 446-2832 * FAX: (713) 472-4064
www.natectx.com

NATEC OF TEXAS, INC.
www.natectx.com

Lina Jazi
Name

642-07-9373
SS# / DL#

NLR082304-9373
Certification #

Lead Inspector Refresher
Approved Course

August 23, 2004
Course Date

August 23, 2007
Expires

CERTIFICATE

THIS CERTIFIES THAT

LINA JAZI

SS# 642-07-9373

Has completed the NATEC

TDH Accredited Course for Lead *Risk Assessor Refresher*

and has passed the Required Exam in that Discipline.

This course is Approved Under §295.204 of the

Texas Environmental Lead Reduction Rules

August 24, 2004	David A. Roberts	**NLR082404-9373**
Course Date	Authorized Signature	Certification #
August 24, 2004	David A. Roberts	
Exam Date	Instructors Signature	

9802 Lawndale Avenue, Houston, Texas 77017, (713) 472-4022, *www.natectx.com*

CERTIFICATE

THIS CERTIFIES THAT

LINA JAZI

SS# 642-07-9373

Has completed the NATEC

TDH Accredited Course for Lead *Inspector Refresher*

and has passed the Required Exam in that Discipline.

This course is Approved Under §295.204 of the

Texas Environmental Lead Reduction Rules

August 23, 2004	David A. Roberts	**NLR082304-9373**
Course Date	Authorized Signature	Certification #
August 23, 2004	David A. Roberts	
Exam Date	Instructors Signature	

9802 Lawndale Avenue, Houston, Texas 77017, (713) 472-4022, *www.natectx.com*

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Is hereby granting a Louisiana Environmental Laboratory Accreditation to:

CA Labs LLC
11800 Industriplex, Suite #5
Baton Rouge, LA 70809

Agency Interest No. 83659

According to the Louisiana Administrative Code, Title 33, Part I, Subpart 3, LABORATORY ACCREDITATION, the State of Louisiana formally recognizes that this laboratory is technically competent to perform the environmental analyses listed on the scope of accreditation detailed in the attachment.

The laboratory agrees to perform all analyses listed on this scope of accreditation according to the Part I, Subpart 3 requirements and acknowledges that continued accreditation is dependent on successful ongoing compliance with the applicable requirements of Part I. Please contact the Department of Environmental Quality, Louisiana Environmental Laboratory Accreditation Program (LELAP) to verify the laboratory's scope of accreditation and accreditation status. Accreditation by the State of Louisiana is not an endorsement or a guarantee of validity of the data generated by the laboratory.

To be accredited initially and maintain accreditation, the laboratory agrees to participate in two single-blind, single-concentration PT studies, where available, per year for each field of testing for which it seeks accreditation or maintains accreditation as required in LAC 33:I.4711 and NELAP Standard 2.4.1.

Louis R.C. Johnson, Accreditation Officer
Louisiana Environmental Laboratory Accreditation Program

Certificate Number: 03069
Expiration Date: June 30, 2004
Issued On: July 3, 2003

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY
Awards the Certificate of Approval

CERTIFICATE NO.: 03069
August 5, 2002

CA Labs LLC
11800 Industriplex, Suite #5
Baton Rouge, LA 70809

According to the Louisiana Administrative Code, Title 33, Part I, Subpart 3, Laboratory Accreditation, the State of Louisiana formally recognizes that this laboratory is technically competent to perform the environmental analyses listed on the scope of the accreditation detailed below.

The laboratory agrees to perform all analyses listed on this scope of accreditation according to the Part I, Subpart 3 requirements and acknowledges that continued accreditation is dependent on successful ongoing compliance with the applicable requirements of Part I, Subpart 3. Please contact the Department of Environmental Quality, Louisiana Environmental Laboratory Accreditation Program (LELAP) to verify the laboratory's scope of accreditation and accreditation status. Accreditation by the State of Louisiana is not an endorsement or a guarantee of validity of the data generated by the laboratory.

PARAMETER	ANALYSIS METHOD	TYPE	ACCREDITATION STATUS
SOLID and HAZARDOUS WASTE METHODS			
Lead Flame Atomic Absorption in Paint	NIOSH 7082	STATE	CERTIFIED
Lead Flame Atomic Absorption in Soil	NIOSH 7082	STATE	CERTIFIED
Lead Flame Atomic Absorption in Wipes	NIOSH 7082	STATE	CERTIFIED
Phase Contrast Microscopy	NIOSH 7400	STATE	CERTIFIED
Transmission Electron Microscopy	Ahera Method	STATE	CERTIFIED
Polarized Light Microscopy	Interim Method for the Department of Asbestos in Bulk Samples, 40CFR Part 763, Appendix E to Subpart E and Asbestos, Hazardous Emergency Response Act, EPA-600/R-93/116	STATE	CERTIFIED

The American Industrial Hygiene Association

acknowledges that

Crisp Analytical Laboratories

OVER TWENTY FIVE YEARS 25 OF ACCREDITING LABS AIHA

Laboratory ID: 102929

has fulfilled the requirements of the AIHA Laboratory Quality Assurance Programs (LQAP), thereby, conforming to the ISO/IEC 17025 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories*. The above named laboratory has been accredited by AIHA in the following:

ACCREDITATION PROGRAMS

☐	INDUSTRIAL HYGIENE	Accreditation Expires:
☐	ENVIRONMENTAL LEAD	Accreditation Expires:
☑	ENVIRONMENTAL MICROBIOLOGY	Accreditation Expires: 03/01/2007
☐	FOOD	Accreditation Expires:
☐	UNIQUE SCOPE	Accreditation Expires:

Specific categories of testing, within each Accreditation Program, for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation**. Continued accreditation is contingent upon successful on-going compliance with LQAP requirements. This certificate is not valid without the attached **Scope of Accreditation.**

Kimberly Ruthe

Kimberly A. Ruthe, CIH
Chairperson, Analytical Accreditation Board

Thomas L. Grumbles

Thomas G. Grumbles, CIH
President, AIHA

Date Issued: 03/01/2004

APPENDIX D
SURVEY CHECKLISTS

CHECK LIST FOR LEAD SURVEYS

NAME OF THE FACILITY: **Buckingham Lift Station Facility**

FACILITY ADDRESS: **314 ½ Friar Tuck Lane, Houston, Texas**

DATE OF THE SURVEY: **02/23/05** CONSULTANT: **ECS**

INSPECTOR(S) NAME: **Lina Jazi**

Note: Items/information listed below must be included in the report. Use this check list to ensure completeness of your report. Mark "X" or "check" in front of the information included in the report. Submit completed check list with the report. If a facility is surveyed for lead and asbestos, the survey reports shall be segregated in one binder or preferably two separate reports.

1. X Statement...if "HUD Guidelines for Evaluation and Control of Lead Based Paint in Housing" or any other criteria were followed for the survey.
2. X Date and Contract number of the survey.
3. X Scope of the work.
4. X Copy of the inspector (s) TDH Certificate.
5. X Name and Address of the building
6. N/A Statement...if building records were used in the inspection, and if not, Why?
7. X Cover letter (in report) containing executive summary or executive summary at the beginning of the report format.
8. N/A Date of construction and last renovation (if any) of the building.
9. X List of areas that were not inspected. Explain.
10. X Condition of the building structure such as deterioration, structural problems or other damages.
11. X List of components assumed to have lead based paint or coating, if any.

12. X City of Houston Lead Hazard Categorization (LHC) list and categorization of all the samples according to the LHC list included in the report.

If XRF Analyzer Used:

13. N/A Performance Characteristics Sheet (PCS) for the XRF equipment/s used.

14. N/A Calibration Check Test Results (Form 7.2, HUD Guidelines, or equivalent).

15. N/A Statement...if HUD Guidelines were followed for Calibration Check Test of the XRF equipment and replacement XRF equipment, if used.

16. N/A Installation date and type of source for XRF equipment and replacement equipment, if used.

17. N/A Drawings and photographs with XRF reading locations marked to facilitate future location of XRF readings.

If Samples Taken For Laboratory Analysis:

18. X Procedures and protocols used to collect paint chip samples.

19. X Copy of the chain of custody form for samples.

20. X Statement...if an accredited (NLLAP/ELLAP) laboratory was used for Sample Analysis.

21. X Copy of the laboratory accreditation certificate.

22. X Copy of the laboratory analysis results of the paint chip samples and other PbCMs.

23. X Statement (by the laboratory) regarding Quality Assurance and Quality Control performed.

24. X Drawings and photographs with sample locations marked to facilitate future location of coating materials sampled.

IF LEAD FOUND:

25. X Photographs of all component areas proven to have lead.

26. X Recommendations for all components proven to have lead based paint or coatings.

27. N/A Recommendations for Operation and Maintenance Materials.

28. X Estimated quantities of Lead Containing Materials.

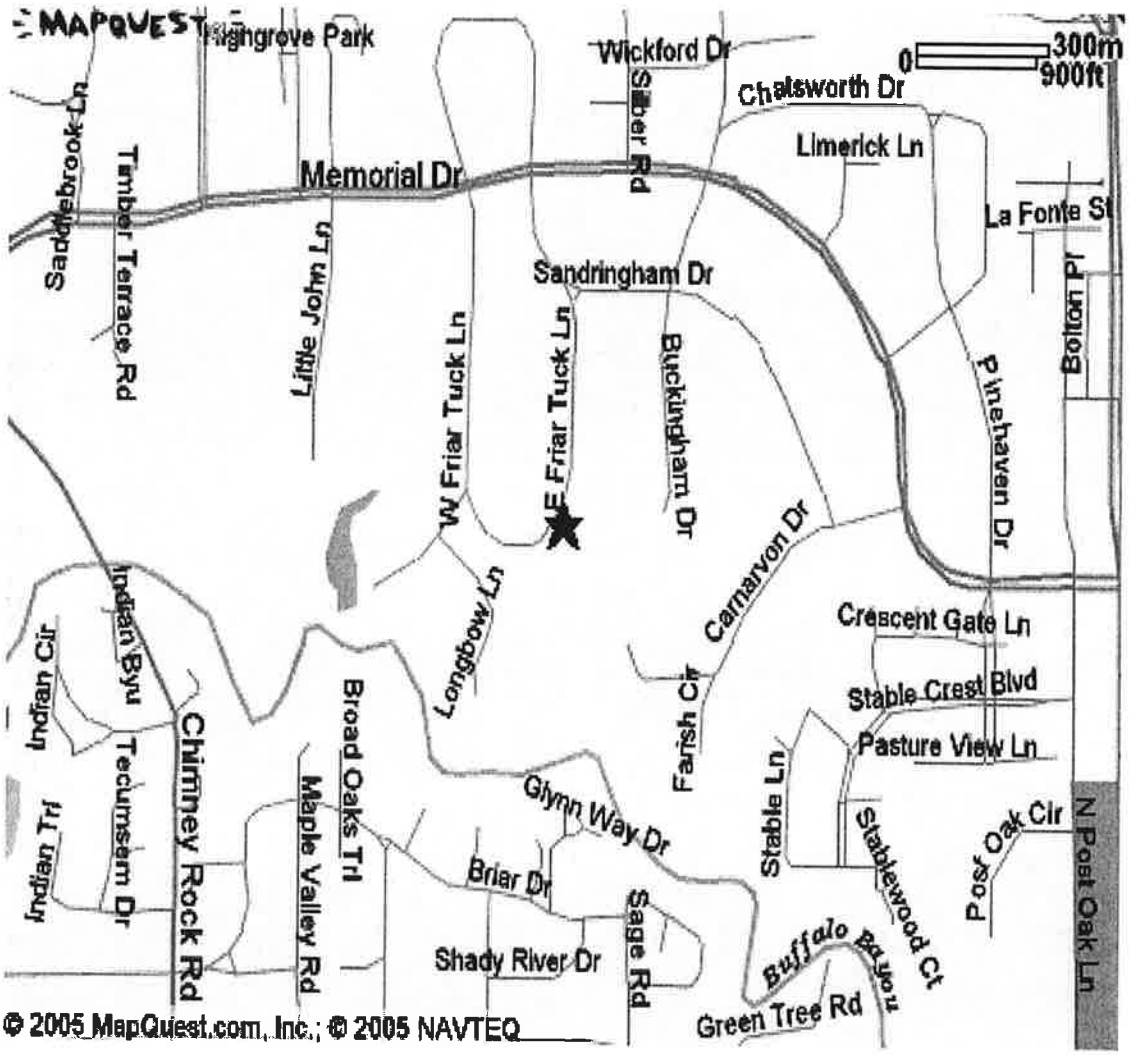
29. N/A Cost estimations for abatement.

Signed: _____

Name: **Lina Jazi**

Title: **Certified Lead Risk Assessor**

APPENDIX E
FACILITY LOCATION MAP


MAPQUEST
Highgrove Park
Wickford Dr
Silber Rd
Chatsworth Dr
Limerick Ln
La Fonte St
Bolton Pl
Memorial Dr
Saddlebrook Ln
Timber Terrace Rd
Little John Ln
Sandringham Dr
W Friar Tuck Ln
E Friar Tuck Ln
Buckingham Dr
Pinehaven Dr
Carnarvon Dr
Crescent Gate Ln
Stable Crest Blvd
Pasture View Ln
Longbow Ln
Farish Cir
Stable Ln
Stablewood Ct
Posf Oak Cir
N Post Oak Ln
Indian Cir
Indian Byu
Indian Trl
Tecumseh Dr
Chimney Rock Rd
Broad Oaks Trl
Maple Valley Rd
Glynn Way Dr
Briar Dr
Shady River Dr
Sage Rd
Buffalo Bayou
Green Tree Rd
0
300m
900ft
© 2005 MapQuest.com, Inc.; © 2005 NAVTEQ

APPENDIX F
LABORATORY STATEMENT REGARDING QUALITY ASSURANCE
AND
QUALITY CONTROL PERFORMED

Crisp Analytical Laboratories, L.L.C.
C.A. Laboratories, L.L.C.
Crisp Analytical Laboratories at Houston, L.L.C.

Quality Assurance Manual

Revision 4
4 August 2003

Latest Update
July 20, 2004

Authorized Signatories:

Arthur Hernandez. Lab Director-Owner

Issued to:

ECS- Sherri

Sample Log-in, Handling, and Reporting

Scope

All samples must be logged in when received, and trackable at all times. The log-in process involves keeping records on computer and paper of every project received by CA Labs, and when it was received.

Sample Receiving

Samples may be hand-delivered, mailed, or shipped (Fed-Ex, Lone Star, etc.). Sometimes, samples will come after-hour and on weekends. Any time samples are received, they must be logged in.

Condition of Acceptable Samples

When samples are received at CA Labs, they must be acceptable by the following rules:

- Bulk samples must be in individual, air-tight containers. The containers should also be sealed with a ziploc style bag large enough for all samples in project. If this is not provided by the client, CA Labs will have large ziploc bags on-hand.
- A sufficient amount of sample must be included in each container. Only a small amount (about a square centimeter) is required for PLM analysis.
- The sample identification on the samples must match the information on the clients' paperwork. If there is a discrepancy, such as samples missing, it must be marked not received by each missing sample on the chain of custody. When possible, the client will be notified of the discrepancy over the phone.
- Bulk samples must not be packaged with air samples. The reasoning is that the bulk samples may contaminate the air samples, but due to the small fiber size, the air samples would not give the bulk samples any recognizable contamination.

Bulk Sample Preparation: Overview

Before the samples are due, the analyst must begin the sample analysis. The first part of this includes prepping the samples. This consists of taking a small amount of each layer of the sample, and immersing it in calibrated refractive index liquid on a slide for microscope analysis. Carefully label all slides with sample numbers. Between all sample preps, the tools and work area must be wet-wiped with a clean wiper. Care must be taken in order to prevent contamination. Samples must only be opened one at a time, in the HEPA hood.
During the sample prep, the first part of the analysis is done. This is the stereo-microscope analysis, which includes inspection of the sample for determination of how many layers there are, each to get its own subsample (prep) unless inseparable. The stereo-microscope analysis also includes a physical description of the each subsample, including color, texture, fibrosity, and determination of whether the subsample is homogenous or not.

Bulk Sample Analysis: Overview

After the prep is complete, each subsample should be prepped and labeled so as not to mix any samples up. The analyst takes one subsample prep and places it on the stage of the polarized light microscope. When the sample is analyzed, the following data is recorded: asbestos type(s) and visual percent, non-asbestos fiber type(s) and percent, non-fibrous matrix identification and percent. Also included by the analyst, but not recorded on any reports are identification properties of asbestos and non-asbestos fibers (parallel and perpendicular refractive indices, morphology, color / pleochroism, sign of elongation, birefringence, and extinction angle.

Data Reporting

Before entering data on report, the receptionist must check over analysts' filled out worksheets for completeness and any mistakes if present. The data on the worksheet should include: sample number, layer (subsample) number, whether fibers are present by stereoscope or not, analysts' physical description of subsample, whether it is homogenous or not, asbestos, non-asbestos, non fibrous qualification and quantification, and properties, following guidelines set forth for PLM analysis.

Final Report Delivery

When the data entry is complete, the report is ready to be checked over and printed. The reports are to be checked over and signed by the analyst and a supervisor.

Sample Storage and Disposal: Overview

After sample analysis, positive and negative samples are separated into seperate bins in the PLM and grouped together by job number. These samples are to be archive. These archived boxes are held for at least ninety days, in case the client calls back for reanalysis for point counting or QC purposes. After this period, the samples may be disposed of. **All positive samples must be disposed of in a hazardous material site, labeled Asbestos Containing Material (ACM).** When necessary to dispose of ACM, a hazardous waste company (i.e. Waste Manangement in Houston, Texas) must be called to pick up positive samples. Negative samples may be disposed of through Atlantic Waste, who we have an account with.

Determination of Asbestos and Other Materials in Bulk Samples by Polarized Light Microscopy with Dispersion Staining

Scope

The purpose of this section is to outline every method that will be used by CA Labs analysts and reference all methods, regulations, and courseswork required for asbestos quantification and qualification by polarized light microscopy.

Rea

Equipment Required

Required equipment for asbestos analysis by polarized light microscopy include:

1. A compound microscope with two polarizers (polarizer and analyzer), oriented exactly ninety degrees from each other (polarized light microscope), objectives necessary are 10x. 40x. and a dispersion staining objective (fixed if scope does not have Bertrand lens, or adjustable), and a retardation (550nm) plate;
2. A stereo microscope capable of a range from 10x to 100x;
3. A HEPA (99.99% effective to 0.3μm) filtered negative pressure table top sample prep hood capable of 100cfm;
4. Asbestos (NIST OSRM 1866a, Asbestos - Common, 1877, Asbestos - Uncommon) and Mineralogical standards;
5. Tools used include forceps. scalpels, razors. small spatulas or spoonulas, mortar and pestles:

Non-mandatory equipment includes:

1. Muffle furnace for ashing samples;
2. Scales for quantification of gravimetric samples;
3. Hot plate(s) for drying samples and for catalyzing chemical reactions in preps;
4. In-house standards of permanent mounted asbestos, non-asbestos, and mineralogical standards:.

Reagents Required

Chemicals used for asbestos analysis include:

1. Cargille Refractive Index sets: full incremental sets (series A: 1.460-1.640, 0.004 increments, series B: 1.644-1.700, 0.004 increments, series M: 1.705-1.720, 0.005 increments), full high dispersion sets (Series E: 1.550HD, 1.580HD, 1.605HD, 1.640HD, 1.680HD. and 1.700HD), and extra reserves of the most used oils (1.550HD and 1.680);
2. Hydrochloric acid, trace metal grade;
3. Acetone, trace metal grade;
4. Chloroform. trace metal grade.

Methodology

Asbestos analysis by polarized light microscopy must follow the federal regulations included in the Interim Method (Improved Interim, 40CFR Part 763, Appendix E to Subpart E), and AHERA (Asbestos Hazards Emergency Response Act, EPA-600/R-93/116), where applicable. If samples are taken from a school or federal building, AHERA regulations apply, and Interim regulations apply to all samples. When point counting, NESHAPS (40 CFR Part 61 to Part 71) counting rules apply.

Note - Because asbestos fibers can be dangerous, all samples must be contained at all times. When a sample container is opened. it must be inside a HEPA filtered negative pressure hood. This prevents the release of fibers into the air which could cause both contamination and health problems. At all stages of the preparation. the samples must be kept from the air in the lab.

When the samples are moved. they must be contained with a second ziploc bag. If gravimetric reduction is used. the samples must be in covered crucibles at all times. All sample preps are contained in liquid and covered by a glass cover slip. All tools and work areas where samples are handled must be wiped with a damped kimwipe after every sample (layer). Employees must wash hands and forearms when leaving the PLM area. Any cleanup in the PLM area must be done with the HEPA vacuum cleaner. All surfaces must be wetted before wiping or dusting. The cleanliness of the air in the PLM lab will be monitored quarterly and posted in a common area for all employees to see.

The analysis of bulk samples consists of three main steps: Stereoscopic examination of the bulk sample, preparations of subsamples, and polarized light microscope examination of each subsample prep. The following section outlines the instructions required for each step:

1. Stereo Microscope Analysis:
    - The sample is removed from its container and placed on a single sheet of weighing paper, in a weighing boat, or an appropriate dish such as a watch glass.
    - The sample is examined under the stereo scope in order to determine whether or not fibers are present, including a rough percentage of fibers, and to determine how many layers and/or material types are in a sample. Fiber identification can be done to an extent, but the polarized light microscope allows much better qualification.
2. Sample Preparation:
    - Each layer from every sample must be prepped, analyzed, and reported as individual samples. This was recently passed in both Interim and AHERA regulations for PLM asbestos analysis.
    - Each individual layer requires at least three preps for AHERA analysis, or enough preps to identify all asbestos fibers in the Interim method. Please see the diagram, flow chart for PLM analysis in the Interim method. At least two preps per sample layer should be enough to satisfy these requirements. More preps will be made as necessary.
    - To prep each sample layer, a small amount needs to be scraped from the sample layer without getting material from other layers. A scalpel or razor blade can be used, or tweezers can be used to grab a small amount of sample material. Forceps are also used to pull out a fiber bundle to be qualified, if necessary. In most cases, the subsample prep must have a representative amount of material for the entire subsample layer of the sample.
    - The subsample is put on a slide, and one or two drops of liquid is carefully dropped on the subsample prep. Care must be taken not to touch the dropper to the slide or sample; this will prevent contamination of refractive index oils and chemicals. At least one prep will be mounted in the appropriate refractive index oil for suspected asbestos fibers, which is 1.550HD in most cases. Analysts are encouraged to use different media for different preps of the same subsample, such as HCL for dissolving carbonates out of samples or chloroform for chemical reduction of organically bound components of samples.
    - Once the subsample prep is immersed in liquid, it must be crushed, in order to achieve a flat prep evenly loaded. This can be done with a spatula or the back side

of curved #7 tweezers. All large sized particles such as quartz sand and mineral wool shot must be crushed to smaller sizes. If the sample consists of mostly coarse particles, it can be crushed with a mortar and pestle, and then prepped.

- When the sample is crushed and evenly distributed, a slide cover is placed on top. The slide cover is adjusted by using a pencil eraser or cuticle pusher, so as not to leave fingerprints or markings on the cover glass which will alter the view through the PLM scope. The sample must be flat with all air bubbles pushed out. More liquid can be dropped along the edge of the cover glass if necessary, being careful not to touch slide or coverslip. It will be absorbed by the prep if it is too thick for one or two drops of liquid. If the cover slip does not lay flat, it may affect the dispersion staining colors. If the cover slip breaks, the subsample must be reprepped, and it is recommended to use the mortar and pestle.
- Once the subsample is mounted on the slide with a cover slip, it is ready to be analyzed. It can be set aside to analyze later, if it has been labeled with a discrete sample number that will not conflict with others.

3. Polarized Light Microscope Analysis:
   - Each subsample prep must be analyzed under the polarized light microscope before a sample is finished.
   - All of each sample prep is scanned under the PLM, and all components in the preps are identified and given a calibrated visual estimate of the percentage of the sample. Some fibers may be quantified by stereoscope, but it is more accurate to quantify them under the PLM scope, when the prep represents the material properly (the proper amounts were used in subsample prep). Qualification of all mineral, fiber, and asbestos types must be done with PLM.
   - To qualify asbestiform mineral types, the following criteria must be measured:
     a. **color and pleochroism** (strong or weak pleochroism if applicable); With the analyzer in the out position (plane polarized light - white light background), color of a specimen can be viewed. If the color changes in tint (displays selective absorption) as the stage is rotated, it is pleochroic. This is measured in weak to strong absorption changes.
     b. **refractive indices** (both parallel and perpendicular to the direction of elongation of the mineral); To measure refractive indices, either becke line method or dispersion staining method is used. To determine refractive indices by Becke Line method, refer to Donald F. Bloss, *An Introduction o the Methods of Optical Crystallography*, chapter 5. For determination of refractive indices by dispersion staining, the steps must be followed exactly in Shu-Chun Su, *Rapidly and Accurately Determine Refractive Indices of Asbestos Fibers by Using Dispersion Staining Method (A Standard Operating Procedure for PLM Bulk Asbestos Analysis*;
     c. **morphology** of mineral (wavy, curly, or straight); Morphology is determined by the habit or appearance of the particle in question;
     d. **sign of elongation** (positive or negative); With the retardation plate in, a particle will show addition and subtraction of wavelength when the stage is rotated. If the edges of the particle are blue in the NE-SW quadrants of the field of view, signifying addition of wavelength, the particle is length slow (positive sign of elongation); If the edges of the particle are yellow

in the NE-SW quadrants of the field of view, signifying subtraction of wavelength, the particle is length fast (negative sign of elongation);

e. **birefringence** (low, medium, or high): Birefringence can be calculated by the difference of the refractive indices in a biaxial material. It can also be calculated with a known thickness of a particle, if available. Birefringence is observed in the microscope as bands of colors, from first order red to second order (blue to red), third order, and so forth. If a sample has low birefringence, it will show mostly grey colors, and maybe some first order coloring if the particle is thicker (with retardation plate out). If birefringence is high, many bands of colors will be observed. If birefringence is very high, the bands of colors tend to blend together, and white light is observed, known as high-order white. With the retardation plate in, the first order colors will show addition (first order red goes to 2nd order red) and subtraction (first order red goes to black) when the stage is rotated;

f. **extinction angle** (parallel or inclined at a measured angle); When the polarizer and analyzer are oriented correctly (exactly N-S and E-W, respectively), angles of extinction can be properly measured from the N-S and E-W directions. A particle goes extinct every 90 degrees when it is rotated. When the particle is extinct, no light passes through it, and it appears black, like the background (with retardation plate out). If the particle goes extinct exactly at 90 degrees, it is known as parallel extinction. If it goes extinct at an angle off of N-S or E-W, it is known as oblique, or inclined extinction, and the angle is measured. Because asbestos fibers are too small to be seen by PLM, only bundles are observed. When many fibers make a bundle, their values tend to average together, so most fiber bundles will show parallel extinction, even if the non-fibrous variety of the mineral does show extinction

- To qualify non-asbestiform fiber types, the following criteria must be measured:
  a. **color**, in plane polarized light
  b. **one optical property**, from the previous list.
- To qualify mineral types, all of these properties are used, but not logged. Other properties which can be used include but are not limited to twinning, exsolution lamellae, known solid solution series of minerals, and mineral associations from known ores of geological materials.
- To quantify mineral and fiber percentages accurately, each analyst must use a percentage chart, as well as having known percent standards to refer to. Also, reanalyses by TEM Chatfield and PLM Point Counting allow calibration of quantification for each analyst.

When quantifying percentages, variance will occur. Analysts accuracy is measured by the same analyst analyzing replicates. Laboratory accuracy is measured by different analysts analyzing duplicates. Each analyst must fall into a certain range of percentages, based on the true amount of asbestos in the product:

% Area Asbestos	Acceptable Mean Result	% Area Asbestos	Acceptable Mean Result
1	>0-3%	50	40-60%
5	>1-9%	60	50-70%
10	5-15%	70	60-80%
20	10-30%	80	70-90%
30	20-40%	90	80-100%
40	30-50%	100	90-100%

1. Point Counting Analysis:
   - If requested by the client, point counting can be done on non-organically bound samples containing ten percent or less asbestos.
   - The entire sample may be homogenized if necessary, by grinding with a mortar and pestle.
   - A total of 400 points will be counted in two to eight preps of the sample. The more preps made, the better the chances are of the overall result being the average of each individual prep. If two preps are made, 200 points are counted in each prep; if eight preps are made, 50 points are counted in each prep.
   - Particulate which lands directly on the numbers of the Walton-Becket graticle are counted (up to eleven for one field of view). Particulate between numbers are not counted.
   - The fields of view are acquired by moving the slide randomly; this is repeated until the proper number of points per prep is reached.
   - Asbestos points are counted, and non-asbestos points, including all other fibers and particulate, are counted.

     The sum of all of the points must equal 400, and the end result is calculated by dividing the total number of asbestos points by four. This enables the precision of the analysis to be better, with a detection limit of one quarter of a percent. Please note that because this analysis is more precise, that does not mean it is more accurate. Because of the random viewing, asbestos could easily be missed or overestimated, so the accuracy of the analysis varies more than with PLM.

Quality Control

As an analyst analyzes samples in a project, he / she must set aside one out of every ten sample preps to be analyzed by duplicate. There will be a designated area in the PLM lab for this, with slide trays provided for QC samples. One sample per job of about eighty sample layers or more is re-prepped, reanalyzed by replicate, and recorded. The total number of duplicates and replicates is outlined in the CA Labs Quality Assurance Manual.

Analysts will be subject to monthly testing, including identification of unknown material types, qualitative, and quantitative standards. Analysts are required to do preps of NIST OSRM Glass in order to check for asbestos contamination monthly. Analysts are required to do daily contamination checks on tools and work areas, which are cleaned between samples.

Analysts will participate in inter-laboratory Round Robin sample sets, so results can be compared with other laboratories. All analysts are required to read all test samples provided by NVLAP. although: only one analyst is required to report results. It is very important that all analysts see these samples. even though it is not required by NVLAP.

Analysts are encouraged to find different methods of finding and identifying asbestos in bulk samples. If an analyst finds a new procedure which saves time, it will be documented in this manual. and it will be compared with different preps of the same material for accuracy, and reported on the monthly QC summary by the Laboratory Director. Any new methods mentioned above must be thoroughly tested and approved by the Lab Director and QA Manager. Also see CA Labs Quality Assurance Manual.

Any custody errors such as mixing up or losing samples must be documented and resolved. This data must be reported on the monthly QC summary. Any corrective actions for an analyst must also be kept on record. Deficiency corrections and a total failure rate of the laboratory are also required on the monthly QC summary. Total failure rate is calculated by the total number of failed analyses divided by the total number of samples in a month.

Calculations

Birefringence - measured by the following calculations:

$$r = 1000t \times B$$

where r = retardation in nm
t = thickness in nm
B = birefringence, $n_2 - n_1$ (the difference between the two refractive indices of a biaxial substance.)

Calculation of Refractive Indices:

For refractive index measurements, refer to Shu-Chun Su, *Rapidly and Accurately Determine Refractive Indices of Asbestos Fibers by Using Dispersion Staining Method (A Standard Operating Procedure for PLM Bulk Asbestos Analysis.*

Standard Deviations - calculated by the following equation:

$$sx = \sqrt{\Sigma(x_i + x_{avg})^2/(n)}$$

Standard deviations will be calculated for groups of percentages. including <1-2%. 3-5%, 6-10%. 11-20%, 21-40%, 41-60%, and 61-100%

Variance - occurs when an analyst reads a sample inside the range of acceptable results. Depending on the amount of the sample and its range of acceptable answers, variance is measured by the following chart:

% Area Asbestos	Acceptable Variance
<1%	+/- <1%
1%	+/- 1%
2-3%	+/- 2%
4-6%	+/- 4%
7-10%	+/- 5%
11-19%	+/- 8%
20-100%	+/- 10%

If measured variance is outside the acceptable results, it shows up as an outlier.

Average Variance - calculated by the following equation:

$$var_{avg} = \Sigma(var_n)/n$$

where the variance is calculated for every sample on the PLM QC Log.

Cumulative False Positive - False positives are logged by the number in which they occur for each analyst. The cumulative false positive is calculated by dividing the total number of false positives by the number of QC samples for that analyst:

$$FP_{cum} = FP_{total}/QC_{total}$$

Cumulative False Negative - False negatives are logged by the number in which they occur for each analyst. The cumulative false negative is calculated by dividing the total number of false negatives by the number of QC samples for that analyst:

$$FN_{cum} = FN_{total}/QC_{total}$$

Mean - The average of a number set:

$$x_{mean} = \Sigma(x_n)/n$$

Median - The median is a number inside a set of numbers; half of the numbers in the data set have a value greater than the median and half have values lower. The median is used to calculate bias, not the Mean.

Bias - The median of the differences between the first and second results is used to estimate bias. There is a bias if the median is large in absolute value.

Average Bias - The average of the total numbers of reported bias.

Interquartile Range (IQR) - The IQR encompasses the central 50% of the data and gives an estimate of the spread or scatter of the data. This value can be used instead of standard deviation because it is relatively insensitive to outliers. The calculation, done via spreadsheet, can also be approximated by sorting data and dividing it into four segments.

Control Limits - Control Limits are calculated from the IQR to approximate a 2xSD limit and to serve to identify points as in or out of control. The IQR is related to the SD through the relation 0.741 x IQR=SD for the normally distributed area. If Control Limits are calculated by 2xSD, the following equation is used:

$$2xSD = [\sqrt{\Sigma(x_i + x_{avg})^2/(n)}] \times 2$$

Point Counting - Point counting analysis requires a total of 400 points to be counted. The equation for calculating percentage based on points counted is as follows:

$$x = point_{tot}/400 \times 100\%$$

where x is the calculated percentage.

References

Laws and Regulations:

U.S. Environmental Protection Agency, *Interim Method for the Determination of Asbestos in Bulk Samples. 40CFR Part 763*, Appendix E to Subpart E, 7-1-97 Edition

U.S. Environmental Protection Agency, *Method for the Determination of Asbestos in Bulk Samples*. EPA/600/R-93/116, July 1993

Asbestos NESHAPS, *National Emission Standards for Hazardous Air Pollutants*, 40CFR Part 61 to Part 71. 7-1-96 Edition

Jennifer R. Verkouteren and David L. Duewer, *Guide for Quality Control on theQualitative and Quantitative Analysis of Bulk Asbestos Samples*, Version 1. NISTIR 5951

Geological and Microscopy References:

Shu-Chun Su, *Rapidly and Accurately Determine Refractive Indices of Asbestos Fibers by Using Dispersion Staining Method (A Standard Operating Procedure for PLM Bulk Asbestos Analysis)*

Cornelius Klein and Cornelius S. Hurlbut (Dana), *Manual of Mineralogy*, Twentieth Edition

Dr. Donald F. Bloss, *An Introduction to the Methods of Optical Crystallography*

Walter C. McCrone, *Polarized Light Microscopy*

Walter C. McCrone, *Asbestos Identification*

Walter C. McCrone, *The Particle Atlas*, Volume I

McCrone, Brown, Stewart, *The Particle Atlas*, Edition Two, Volume VI, Electron-Optical Atlas and Techniques

Fleisher and Others, *Microscopic Determination of the Nonopaque Minerals*, U.S. Geological Survey Bulletin 1627

M.B. Boisen, Jr. and G.V. Gibbs, *Mathematical Crystallography*, Reviews in Mineralogy, Volume 15. Revised Edition

Donald W. Hyndman, *Petrology of Igneous and Metamorphic Rocks*, Second Edition

Anthony R. Philpots, *Petrography of Igneous and Metamorphic Rocks*

Internal Quality Assurance Reviews

Scope

Internal Quality Assurance Reviews - All internal audits will use paperwork and checkpoints set aside by the appropriate accreditation agency. So the paperwork is not confused with the accreditation agency, "CA Labs Internal Audit" will be clearly written at the beginning of the paperwork, and the pages completed will be signed by CA Labs personnel. Internal audit information can be made available to clients or the public, if necessary.

Methodology

For general operations and bulk asbestos specific checkpoints, a copy of NVLAP paperwork is used, from NIST Handbook 150-3. CA Labs Internal Audit is marked on the upper left side of the paperwork, and the NVLAP code on the upper right side. The inspection must also be dated.

Appendix B: General Operations Checklist and Appendix C: Specific Operations Checklist contain the requirements which must all be met and exceeded by any facility of CA Labs. Each item on the NVLAP paperwork contains a blank on the left side which is checked when that requirement is satisfied. Notes can also be written next to the checkpoint, or on additional notes papers, with specific reference to that checkpoint.

An original copy of these checklists and additional notes paperwork will be kept with the original version of CA Labs PLM Standard Operating Procedures in the managerial front office. When an internal audit is deemed necessary by the Laboratory Director or QC Manager, copies of the blank forms will be made and dated, and filled out following these procedures.

References

NIST Handbook 150-3, NVLAP: *Bulk Asbestos Analysis.*
- Appendix B: General Operations Checklist
- Appendix C: Specific Operations Checklist

Enclosures

NIST Handbook 150-3, NVLAP: *Bulk Asbestos Analysis.*
- Appendix B: General Operations Checklist, pg. B1-B30
- Appendix C: Specific Operations Checklist, pg. C1-C11

External Quality Assurance Reviews

Scope

All external audits will be done through the appropriate accreditation agency, when accreditation enrollment is deemed necessary by the Laboratory Director:

- NVLAP for bulk and airborne asbestos analysis;
- Texas Department of Health for asbestos analysis by PLM, TEM, and PCM;
- AIHA for lead and PCM, if applicable;
- any other accreditations as scope of analysis increases (also see section 12 of CA Labs Quality Assurance Manual, review procedures for new / specialized analyses).

Once CA Labs in enrolled with an accreditation agency, it is subject to periodic inspections by each agency, with intervals set by that agency.

Methodology

External audits performed by NVLAP will be once every two years, after the initial lab opening inspection. Information regarding NVLAP inspections is considered confidential, and will not be furnished to clients or the public. NVLAP is required to keep all audit information confidential. NVLAP proficiency results can be made available if necessary.

Samples Sent to Other Offices of CA Labs

When one lab is overloaded with samples, the Lab Director may choose to send some to another location of CA Labs. The lab sending the samples shall have the project(s) logged in before releasing the samples to another branch. The branch taking the samples will go through the appropriate sample log-in procedures if necessary, using the reference number assigned by the first lab. The second lab will report the project and return the hard copy report to the original lab by mail. The original lab will invoice the project(s), using their original reference number. All reports contain a section at the bottom of the disclaimers stating the location and contact numbers where the samples were analyzed, as well as referencing that lab's NVLAP assigned number.

If a lab is only accredited for PLM:
All TEM and lead samples received will be sent to the main office, (equipped with TEM and lead) after logging the projects. The main lab will log the samples, using the first lab's project reference numbers, and return the completed report and worksheets by mail. The original lab will invoice the projects. The disclaimers on the report will state the location and contact numbers of the main office, where the samples were analyzed, and reference the main office's NVLAP acreditation and assigned number.

Each lab performing sample analysis for another branch will use a form of samples in transit, which will have information regarding the project reference number, the analyst(s), and how much work was done for that project, including reporting and analysis time. This form will be forwarded to the Accountant for crediting the lab performing the work. All projects are logged and invoiced from the original lab in order to maintain that branch's revenue for the samples by the Accountant.

Crisp Analytical Laboratories, L.L.C.
C.A. Laboratories, L.L.C.
Crisp Analytical Laboratories at Houston, L.L.C.

Quality Assurance Manual

Revision 4
4 August 2003

Latest Update
July 20, 2004

Authorized Signatories:

Arthur Hernandez, Lab Director-Owner

Issued to:

ECS- Sherri

Title: Metal analysis Quality Control

Scope: This procedure outlines the way in which quality control, for metal analysis is to be conducted in accordance with NIOSH Method 7082, Issue 2: August 15,1994.

Procedure:

1. Along with appropriate matrix quality control for each batch and type of matrix these samples must also be prepared :

   Initial calibration verification (ICV) / continuing calibration verification (CCV), this is 5mL HNO_3, 1mL H_2O_2 and H_2O, and measured amount of sample with known concentration (ELPAT). This must be run at the beginning and end of a batch, and after every 10 samples.

   Initial calibration blank (ICB) / continuing calibration blank (CCB), this is 5mL HNO_3, 1mL H_2O_2 and H_2O. This sample is run after successful calibration of AAS, after each CCV.

2. Bulk sample qc is as follows: 1 blank per twenty samples
   1 duplicate per twenty samples
   2 matrix spikes per twenty samples

   Matrix spikes are prepared by spiking a bulk sample with 1 mL of spiking stock (100 ppm std.). Percent recovery is calculated as follows:

$$PPM_{SAM} = [(AA_{READ} \times V_{SAM})] \div W_{SAM}$$

$$PPM_{SPIKE} = [(AA_{READ} \times V_{SAM})] \div W_{SAM}$$

$$PPM_{THE} = [(AA_{READ} \times V_{SAM})] \div W_{SAM}$$

$$PPM_{SPIKE} - PPM_{SAM} = PPM_{REC}$$

$$\% \text{ Recovery} = (PPM_{REC} \div PPM_{THE}) \times 100\% \quad \text{where}$$

PPM_{SAM} = concentration of metal in sample ($\mu g/g$)
PPM_{SPIKE} = concentration of metal in sample ($\mu g/g$)
PPM_{THE} = theoretical concentration of metal in sample ($\mu g/g$)
AA_{READ} = reading form AAS ($\mu g/mL$)
V_{SAM} = volume of sample (mL)
W_{SAM} = weight of sample (g)

3. Air sample qc is as follows: 1 blank per twenty samples
2 matrix spikes per twenty samples

Blanks are made form 25mm MCE filter prepared as a regular sample. Matrix spikes are prepared by adding 0.5 mL (50 ug) of spiking stock to a 25 mm MCE filter piror to digestion. Matrix spike sample percent recoveries are calculated as follows:

$$\% \text{ Recovery} = [\ (C_{AAS} \times V_{SAM}) / 50\mu g\ ] \times 100\% \quad \text{where}$$

C_{AAS} = concentration from AAS
V_{SAM} = sample diluted volume

4. Wipe sample qc is as follows: 1 blank per twenty samples
2 spikes per twenty samples

Blanks are prepared from clean wipes supplied by the laboratory and prepared as a wipe sample. Matrix spikes are prepared by adding 5 mL spiking stock (100 ppm) to the wipe prior to digestion. Matrix spike sample percent recoveries are calculated as follows:

$$\% \text{ Recovery} = [\ (C_{AAS} \times V_{SAM}) / 500\mu g\ ] \times 100\% \quad \text{where}$$

C_{AAS} = concentration from AAS
V_{SAM} = sample diluted volume

5. Relative percent difference is calculated from a sample and its duplicate, or a sample spike and its duplicate. Relative percent difference is calculated as follows:

$$\% \text{ RPD} = [\ |X_{SAM} - X_{DUP}| \div X_{AVG}\ ] \times 100\% \quad \text{where}$$

% RPD = relative percent difference
X_{SAM} = concentration metal in sample
X_{DUP} = concentration metal in sample duplicate
X_{AVG}= average of X_{SAM} and X_{DUP}

6. Acceptable quality control is as follows:

	warning limit	action limit
matrix spike	±15%	±25%
laboratory control sample	±15%	±20%
% RPD	±20%	±25%
Blank	>Detection limit	1/5 action level

6. QUALIFICATIONS AND LIMITATIONS

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with customary principles and practices in the fields of environmental science and engineering. This warranty is in lieu of all other warranties either expressed of implied. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.

The conclusions and recommendations describe only the conditions present at the time of our assessment, in areas that were observed. Opinions and recommendations presented herein apply to facility conditions existing at the time of our investigation and those reasonably foreseeable.

This report is prepared for the sole and exclusive use of the City of Houston, its contractors or agents. It is designed to aid the building owner, architect, construction manager, general contractor, and potential abatement contractor in locating Asbestos-Containing Materials (ACM) and Lead-Based Paint (LBP).

Reasonable efforts were made to obtain representative samples of building materials and have those materials analyzed for asbestos or lead content. Should suspect materials be discovered during building renovation/demolition that have not been addressed, samples of the materials should be collected and analyzed for asbestos or lead content prior to renovation and/or demolition.

Notification to the Texas Department of State Health Services (DSHS) must be given prior to any renovations or demolition activities.