

# Phase Separation Science, Inc.



## Statement of Qualifications

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# INTRODUCTION

## ***INTRODUCTION***

Phase Separation Science, Inc. (PSS) is a NELAP accredited environmental analytical testing laboratory with expertise in a broad range of testing applications for organic and inorganic parameters. PSS has been providing environmental testing services for over 20 years. Our priority is to provide the highest quality analytical services available, in the timeliest manner in the industry. To accomplish this, we utilize technologically advanced, state-of-the-art analytical instrumentation and approved procedures.

PSS was established in 1989 on the principle of offering our clients personalized laboratory services with close project management coordination. We emphasize attention to detail and accuracy from sample receipt to final report submission. Our approach has resulted in steady growth and recognition in the industry.

The PSS laboratory staff includes degreed analysts and environmental scientists, specifically trained in the analytical field and always available to provide detailed technical assistance. Our qualifications, as well as our dedication and emphasis to customer service, has enabled us to establish sincere, long-term working relationships with our clientele.

# **CERTIFICATIONS**

## ***CERTIFICATIONS***

PSS is National Environmental Laboratory Accreditation Program (NELAP) certified through the states of Pennsylvania and Virginia and additionally maintains accreditations for organic and inorganic parameters in Maryland, Delaware and West Virginia.

PSS has served as a contract laboratory for both the State of Maryland Laboratories Administration, the Maryland Department of the Environment and the Government of the District of Columbia, PSS has the recognition and confidence of all local regulatory agencies. PSS is also certified by the U.S. Department of Agriculture to import foreign soils for overseas projects.

- **State of Maryland**, Department of the Environment, Water Supply Program, State of Maryland Water Quality Laboratory, Certification #179. Reciprocity agreement in **Delaware**.
- **Commonwealth of Pennsylvania**, Department of Environmental Protection, National Environmental Laboratory Accreditation Program (NELAP): Laboratory ID #68-3330
- **Commonwealth of Virginia**, Department of General Services, Division of Consolidated Laboratory Services, National Environmental Laboratory Accreditation Program (NELAP): Laboratory ID #460156
- **State of West Virginia**, Department of Environmental Protection, Certificate #303
- **U.S. Department of Agriculture Foreign Soil** Permit #P330-12-00268
- **Metropolitan Washington Airports Authority (MWAA) Local Disadvantaged Business Enterprise (LDBE)**, Certification #LD1997-0016-2018

# **QUALITY ASSURANCE**

## ***QUALITY ASSURANCE***

The Quality Assurance/Quality Control at Phase Separation Science, Inc. is maintained by a management control system designed to accompany each sample throughout the analytical process.

### **Sample Custody**

Each sample(s) and/or project(s) received by PSS is compared to its chain-of-custody (COC) and examined to ensure that all required information is available and the samples meet the criteria necessary to perform the analytical process. In the event that there is a discrepancy with the provided information, or sample integrity, a notation explaining the nature of the discrepancy will be made on the Sample Receipt Checklist, and the client shall be contacted regarding the matter.

Every project is logged with a Laboratory Work Order Number, a numerical designation which is discrete for the given sample delivery group. The work order number appears on each Certificate of Analysis (COA), as well as the sample data, if applicable. All samples are maintained in the appropriate conditions, as defined by documented analytical protocol.

### **Sample Extraction/Analysis**

Samples are extracted and/or analyzed in accordance to procedures described in documented EPA methods or, where suitable for superior data, method modifications based on client needs and/or analytical expertise. Specifically, adherence to SW-846, Standard Methods, CFR, ASTM, and Standard Operating Procedures is maintained for each analysis where applicable.

Samples are analyzed in conjunction with blanks, internal or external standards, system monitoring compounds, laboratory control standards, matrix spikes, and continuing calibration standards to monitor both analyst and instrument performance according to the method.

## **Instrument Maintenance**

In order to maintain the stability of analytical instruments, preventative maintenance is performed and recorded in the instrument log in the Laboratory Information Management System (LIMS). The instrument log also contains details pertaining to any symptom or malfunction of each instrument and the corrective action taken. Service contracts and/or an adequate supply of replacement parts are maintained to provide analytical testing capability.

Analytical instruments are operated according to the manufacturer's recommendations. The analysis of calibration standards is used to observe instrument conditions on a daily basis. Historical instrument data are retained to evaluate effectiveness of repairs and instrument degradation.

## **Electronic Data Downloads (EDD)**

Electronic deliverables are available in a number of formats. Additionally, electronic deliverables may be custom formatted to meet client content or format requirements.

These requirements must be defined and agreed upon prior to the commencement of project work. Laboratory generated data are thoroughly reviewed prior to preparation of electronic deliverables. Files are e-mailed to a client and large data deliverables may be sent on a CD if preferred.

## **Report Generation**

Outliers or other abnormal values are carefully scrutinized, and samples are reanalyzed if the abnormalities cannot be explained. In cases where results from spiked samples suggest interference, attempts are made to resolve the interference problem, or alternate analytical procedures may be used with client approval. If the interference problem cannot be resolved, it is annotated in the report. Reports and electronic deliverables may be customized to meet project requirements and arranged during project planning discussion with the PSS Project Manager.

## **Validatable Data Package Deliverables**

PSS is able to perform analyses in accordance with specific federal or state program requirements and provide complete data packages or “CLP-like” deliverable formats for non-CLP parameters which can be validated by the EPA, state or corporate QA concerns. Additionally, data packages may be provided in corporate or third-party data-validator specific report formats as defined for project specific concerns.

# **PROFESSIONAL PROFILES OF SENIOR STAFF MEMBER**

## ***QUALIFICATIONS OF KEY PERSONNEL***

**John G. Richardson**  
***President and Technical Director***

Mr. Richardson is the founder of Phase Separation Science, Inc., and a respected leader in the environmental services community. He graduated with an Associates degree in Chemical Technology & Toxic Waste Management with high honors from Catonsville Community College. He continued his education at Towson State University and obtained his Bachelors degree with high honors in Chemistry with a dual major of Environmental Science in 1988.

His training and background are specific to the utilization of state-of-the-art analytical instrumentation for strategic methodology and in-depth interpretation of chemical analysis. He has interfaced a complex array of GC, GC/MS, ICP/MS and analytical instrumentation with advanced computer capabilities to develop the most reliable and efficient analytical data analysis systems in the industry. Mr. Richardson has also developed systems exceeding the capabilities of existing methods in order to meet the needs of valued clients. These unique capabilities provide Phase Separation Science, Inc. with a broad base of technical expertise combined with practical experience. Thus, PSS's clients are assured of the most advanced analytical technology available.

John has served for federal grand jury proceedings and has been entered as an expert analyst. He also serves as a quality assurance manager for data generated at the laboratory.

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**Dan Prucnal**

***Laboratory Manager and Deputy Technical Director***

Mr. Prucnal serves as Phase Separation Science's Laboratory Manager and Deputy Technical Director. In his capacity, he draws upon his vast experience as an operator of a variety of analytical instruments including GC (ECD, FID, PID, ELCD), GC/MS, HPLC and IC. His experience also includes operation, troubleshooting, and maintenance of these instruments.

He has in depth knowledge of EPA CLP, solid waste SW-846, drinking water and wastewater methodologies. In addition, he has supervisory experience that has included the hiring and training of bench level chemists, preparing Standard Operating Procedures (SOPs), preparing laboratory QA Plans, project data review, and laboratory quality control data review.

In the over twenty years he has worked in the environmental testing industry, Mr. Prucnal has acquired in depth knowledge of regulatory requirements including many states and federal (DOD) programs. He has project experience under these programs and is intimately familiar with their data quality objectives and QA requirements.

**Cathy Thompson**

***Quality Assurance Officer***

In her capacity as QA Officer, Ms. Thompson monitors the laboratory quality system for compliance with NELAC and ISO 17025 requirements. She evaluates laboratory adherence to the QA/QC program through the use of internal audits, data review, performance evaluation studies, and oversight of the corrective action process.

Cathy oversees the writing and periodic review of Standard Operating Procedures and the Phase Separation Science, Inc. Quality Assurance Plan. She monitors laboratory handling of out of control events and client initiated concerns and assists in resolution of nonconformance / corrective action reports.

Ms. Thompson serves as the Data Integrity Officer and provides data integrity training. She prepares data packages ranging from those with summary QC to fully validatable CLP-like data packages. She has oversight of our QA/QC program and ensures that the quality of data that we transmit to a client is technically sound and of known and documented quality.

**Lynn Jackson**  
***Project Manager***

Lynn Jackson currently serves as Project Manager. She was graduated from Towson University with a Bachelors degree in Environmental Geology and a minor in Geography. While at Towson University, she researched the effects of predicted sea level rise on Block Island, Rhode Island funded by the Jess & Mildred Fisher College of Science and Mathematics grant. She also held a Geochemistry internship with Towson University obtaining field soil samples and preparing them in a clean room environment for trace metals analysis by ICP-MS.

Ms. Jackson's professional experience includes classical chemistry analyses such as Total Suspended Solids, Total Dissolved Solids, Settable Solids, pH, Turbidity, Chlorine, Conductivity, and Salinity by Standard Methods. She has also run the Dionex Ion Chromatography per EPA Method E300.0 for anions and performed maintenance and trouble shooting.

In her current capacity, she serves as the main link between the customer and the laboratory handling all project aspects and ensuring that projects run smoothly. This includes ensuring the correct data deliverables are generated on time and data quality objectives are met as required by the appropriate regulatory program.

**Amber Confer**  
***Project Manager***

Amber Confer currently serves as Project Manager. She graduated cum laude from Rider University with a Bachelors degree in Marine Science and Biology. While at Rider, she participated in several research internships ranging from invasive species to shark biology, and has presented the research at science symposiums at both Rider University as well as Rutgers University.

Ms. Confer's professional experience includes chemistry analyses such as pH, turbidity, residual chlorine, hardness, and alkalinity. She also has several years' experience in sample receiving, project management, and served as deputy technical director at another environmental laboratory.

In her current capacity, she serves as the main link between the customer and the laboratory handling all project aspects and ensuring that projects run smoothly. This includes ensuring the correct data deliverables are generated on time and data quality objectives are met as required by the appropriate regulatory program.

## **MAJOR INSTRUMENTATION**

**System I (SVOC #1)**

***Gas Chromatograph with Mass Spectroscopy***

System I is primarily for the analysis of EPA listed Semi-Volatile Organic Compounds. This system is also capable of qualitatively determining unknown compounds using the National Institute of Standards & Technology Mass Spectroscopy Library reference.

- Agilent 7890B Gas Chromatograph with Capillary Separation
- Smartcard Agilent 5977A Mass Selective Detector with triple-axis detector
- Agilent 7693 Injector Autosampling System

**System III (VOC #2)**

***Gas Chromatograph with Mass Spectroscopy***

System III is primarily for the analysis of EPA listed Volatile Organic Compounds. This system is also capable of qualitatively determining unknown compounds using the National Institute of Standards & Technology Mass Spectroscopy Library reference.

- Agilent 7890B Gas Chromatograph with Capillary Separation
- Agilent 5977A Mass Selective Detector with triple-axis detector
- Teledyne Tekmar ATOMX Purge & Trap Sample Concentrator with Autosampler

**Systems IV (BTEX/GRO #1) & V (BTEX/GRO #2)**

***Gas Chromatograph with Dual Tandem Photoionization/Flameionization Detectors***

Systems IV & V are primarily for the analysis of Purgeable Aromatics and Petroleum Distillate Fuels and Solvents.

- Hewlett Packard 5890 Series II Gas Chromatographs with Capillary Separation (2)
- OI Analytical 4430 Tandem Photoionization/Flameionization Detectors (2)
- OI Analytical 4560A Purge & Trap Sample Concentrators (2)
- Varian Archon Purge & Trap Autosamplers (2)

**System VI (Solvent GC)**

***Gas Chromatograph with Dual Flame Ionization Detectors***

System VI is a custom unit dedicated for the analysis of organic liquid characterization. Organic liquids used for industrial applications as well as liquids found in abandoned drums and tanks during environmental assessments are routinely identified and quantified.

- Hewlett Packard 5890 Series II Gas Chromatograph with Capillary Column Separation (1)
- Hewlett Packard Flame Ionization Detectors (1)

**System VII (Dual ECD #1)**

***Gas Chromatograph with Electron Capture Detection***

System VII is primarily designed for the analysis of Chlorinated Pesticides, Chlorinated Herbicides, & Polychlorinated Biphenyls.

- Hewlett Packard 6890 - Plus Gas Chromatograph with Capillary Separation
- Hewlett Packard G2397A Electron Capture Detectors (2)
- Hewlett Packard 7683 Dual Injector Autosampling System

**System VIII (Dual ECD #2)**

***Gas Chromatograph with Electron Capture Detection***

System VIII is primarily designed for the analysis of Chlorinated Pesticides, Chlorinated Herbicides, & Polychlorinated Biphenyls.

- Hewlett Packard 5890 Series II – Plus Gas Chromatograph with Capillary Separation
- Hewlett Packard CG1223A Electron Capture Detectors (2)
- Hewlett Packard 7673C Injector Controller
- Hewlett Packard 7673C Dual Injector Autosampling System

**System IX (DRO #1)**

***Gas Chromatograph with Dual Tandem Flameionization Detection***

System IX is primarily for the analysis of extractable petroleum hydrocarbons, such as Diesel/No. 2 Fuel Oil and heavier petroleum distillates.

- Hewlett Packard 5890 Series II Gas Chromatograph with Capillary Separation (2)
- Hewlett Packard Flameionization Detector (2)
- Hewlett Packard 7673C Controller
- Hewlett Packard 7673C Autosampling System
- Zip Scientific GC Racer

**System X (ICP-MS #1)**

Inductively Coupled Plasma with Mass Spectroscopy  
System X is configured for the analysis of Metals.

- Agilent 7900 Series ICP/MS with UHMI and ORS
- G1879B Heat Exchanger
- ASX 560 Autosampler with enclosure

**System XI (ICP-MS #2)**

***Inductively Coupled Plasma with Mass Spectroscopy***

System XI is configured for the analysis of Metals.

- Agilent 7900 Series ICP/MS with UHMI and ORS
- G1879B Heat Exchanger ASX 520 Autosampler with enclosure

**System XII (DRO #2)**

***Gas Chromatograph with Dual Tandem Flameionization Detection***

System XII is primarily for the analysis of extractable petroleum hydrocarbons, such as Diesel/No. 2 Fuel Oil and heavier petroleum distillates.

- Hewlett Packard 5890 Series II Gas Chromatograph with Capillary Separation (2)
- Hewlett Packard Flameionization Detector (2)
- Hewlett Packard 7673C Controller
- Hewlett Packard 7673C Autosampling System
- Zip Scientific GC Racer

**Systems XIII (VOC #3)**

***Gas Chromatograph with Mass Spectroscopy***

System XIII is primarily for the analysis of EPA listed Volatile Organic Compounds. This system is also capable of qualitatively determining unknown compounds using the National Institute of Standards & Technology Mass Spectroscopy Library reference.

- Hewlett Packard 5890 Series II Gas Chromatograph with Capillary Separation
- Hewlett Packard 5972 Mass Selective Detector
- Varian Archon Purge & Trap Autosampler
- Tekmar 3000 Purge & Trap Autosampler

**System XIV (IC)**

**Integrion Ion Chromatography (HPIC) System, Dionex, model # 22153-60313**

- Ion Pac AG18 Guard Column, 4x50 mm, Dionex Product# 060551
- 6.5 Ion Pac AS18 Analytical Column, 4x250 mm, Dionex Product#
- Heated conductivity cell, Dionex product # 072044
- EGC 500 KOH Cartridge, Dionex product # 075778
- Injection Valve, 6 port, Dionex product # 22153-60014
- Suppressor – ADRS 600, 4mm, Dionex product # 088666CMD
- Chromeleon 7.0 Chromatography Management System
- AS-DV Automated Sampler

**System XV (SVOC #2)**

***Gas Chromatograph with Mass Spectroscopy***

System XV is primarily for the analysis of EPA listed Semi-Volatile Organic Compounds. This system is also capable of qualitatively determining unknown compounds using the National Institute of Standards & Technology Mass Spectroscopy Library reference.

- Agilent 6890 Series II Gas Chromatograph
- Agilent 5975C Mass Selective Detector with triple-axis detector
- Agilent 7683B Series Injector Autosampler System

**System XVI (Discrete Analyzer)**

**AQ300**

System XVI is primarily for wet chemistry analyses, such as alkalinity, ammonia, ortho-phosphate, and TKN. This system is a computer controlled multi-chemistry discrete analyzer where sample and reagent pickup and dispense is by means of a diluter system. The entire system is fluid-filled with deionized water and designed so that sample and/or reagent are never drawn into contact with the syringe and valve.

- Seal AQ1 Discrete analyzer
- Reaction ring – controlled incubation at 37°C
- Aspirator – robotic arm with probe to aspirate reaction mixture by a peristaltic pump
- Photometer – 1 Quartz-Tungsten Halogen Lamp
- Detector – Silicon photodiode
- Hot Block/ Distillation Apparatus

**Systems XVII (VOC #4)**

***Gas Chromatograph with Mass Spectroscopy***

System XVII is primarily for the analysis of EPA listed Volatile Organic Compounds. This system is also capable of qualitatively determining unknown compounds using the National Institute of Standards & Technology Mass Spectroscopy Library reference.

- Agilent 7890A Gas Chromatography System (GC)
- Agilent 5977A Mass Selective Detector with triple-axis detector
- Entech model 7200 preconcentrator
- 7650 model Autosampler
- SL2A Precision Static Diluter
- 3100A canister cleaning system with humidifier
- Flow Professor (2)

**Systems XVIII (VOC #5)**

***Gas Chromatograph with Mass Spectroscopy***

System XVIII is primarily for the analysis of EPA listed Volatile Organic Compounds. This system is also capable of qualitatively determining unknown compounds using the National Institute of Standards & Technology Mass Spectroscopy Library reference.

- Agilent 7890B Gas Chromatograph with Capillary Separation
- Agilent 5975C Mass Selective Detector with triple-axis detector
- Teledyne Tekmar ATOMX Purge & Trap Sample Concentrator with Autosampler

**System XIX (Instrument ID# 380)**

***Automated Analyzer***

System XIX is for the determination of mercury by Cold Vapor Atomic Absorption Spectroscopy.

- Teledyne Leeman Labs Hydra IIAA Analyzer

**Additional Equipment**

Balances, Ohaus Analytical (3)  
Balances, Ohaus Top-Loading (6)  
Chlorinated Organics Analyzer, Dexsil L2000  
Chlorine Colorimeter, LaMotte Digital  
Cyanide Distillation System, Kontes MidiVap 2000  
Cyanide Distillation System Chiller, VWR  
Drying Ovens (4)  
Close Cup Flash Point Tester (2)  
Fluoride Pocket Colorimeter, Hach  
Freezers (3)  
Extraction Heater, Barnstead Lab-Line Multi Unit (2)  
HACH DR 3900  
HACH DRB 200 (2)  
Blender  
Hot Block, Environmental Express Digestion 54 position (2)  
Hot Block, SCP Science DigiPrep MS 48 position  
Hot Plate (Cr<sup>6+</sup>), PMC Six Position Stirring  
Ice Maker  
Muffle Furnace, Fisher  
Mini-vortexor (2)  
pH Meter, Mettler  
Reagent Water System, Neu-Ion Carbon Exchange (Organic Extraction Laboratory)  
Reagent Water System, Neu-Ion Mixed Bed Deionizer (Metals Digestion Laboratory)  
Reagent Water System, Oasis Reverse Osmosis Deionized (Volatiles Laboratory)  
Refrigerators, Reach-In Sample Storage (6)  
Refrigerator/ Freezer Units (4)  
Freezers, stand alone (2)  
Refrigerator, stand alone  
Platform Shaker, New Brunswick Innova 2100  
Bench Top Shakers, Glas-Col (2)

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Sonic Dismembrator (3)  
TCLP ZHE Extractors, Thames (2)  
TCLP ZHE Extractor, Millipore  
TCLP Extractor Rotator, Thames  
TCLP Extractor Rotator, Environmental Express  
TCLP Filtration Apparatus, Gelman  
Spectrophotometer, Milton Roy Spectronic 21  
Turbidimeter, Hach Pocket  
Turbidimeter, Hach 2100P  
Turbidimeter, HF Scientific Micro 100  
Zymark Turbo Vap II (3)  
Four position steambath  
Horizon, SPE-Z Oil and Grease Manifold  
Sonic Bath, Fisher Scientific FS60H  
Environmental Express, Stableweigh Filling Station (7 positions)  
Imhoff Cone (3)  
Fisher Scientific, Accuspin 400 Centrifuge  
Lachat, Microdistillation System (21 position)

## **Summary of Analytical Capability**

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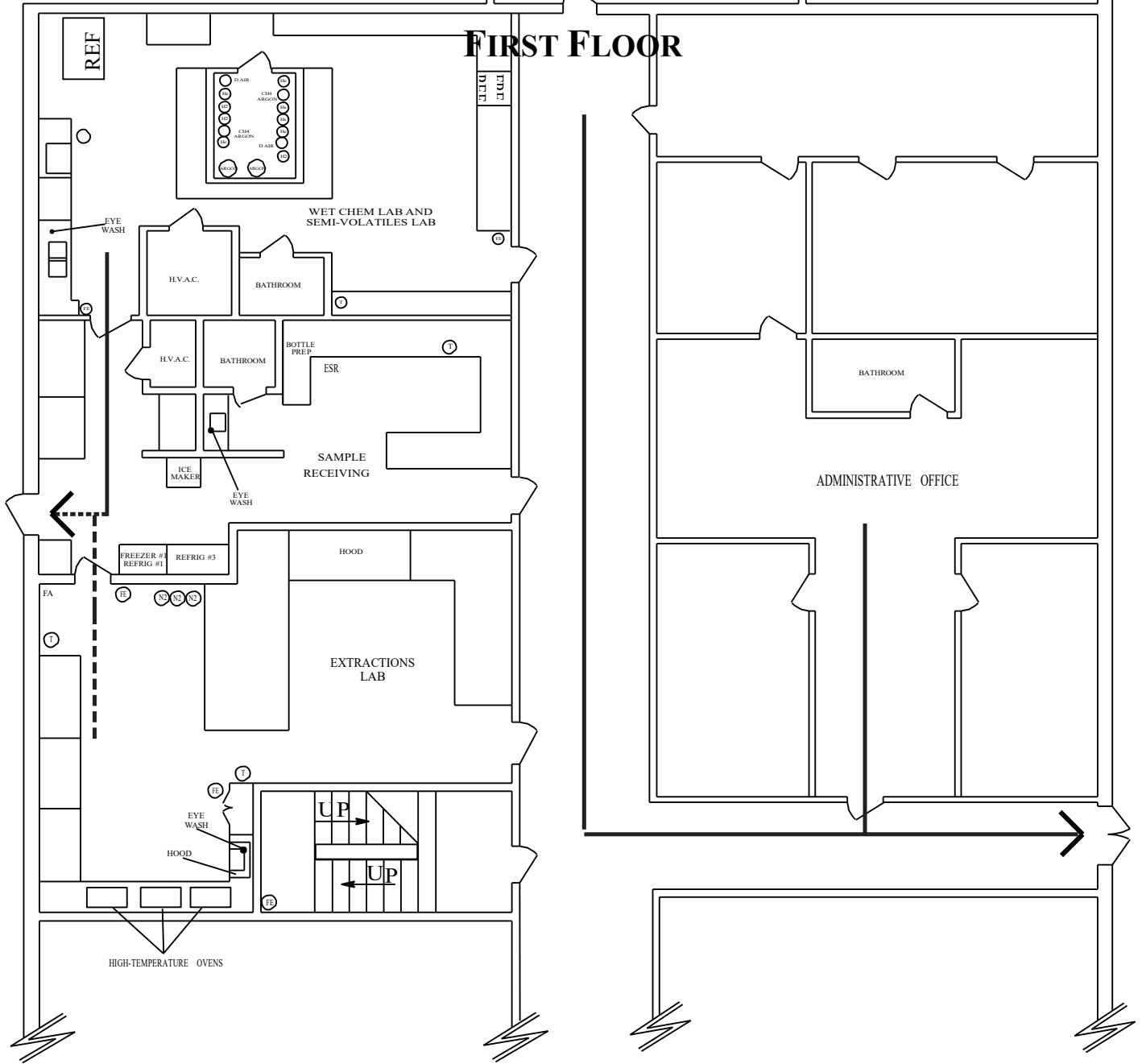
	<b>Soil/Sediment Air</b>	<b>Groundwater</b>	<b>Waste Water</b>	<b>Drinking Water</b>
<u>Organics</u>				
Herbicides	8151A	8151A	8151A	N/A
Pesticides / PCBs	8081B/8082A	8081B/8082A	608.1	N/A
SemiVolatiles	8270C	8270C	625.1	N/A
TPH-GC (DRO)	8015C	8015C	8015C	8015C
TPH-GC (GRO)	8015C	8015C	8015C	8015C
Volatile Organics	8260B/8021B	8260B/8021B	624.1	524.2
	TO-15			
Organics Prep	3550C, 3580A, 3665A 5030, 5035A	3510C, 3520C 3665A, 5030B	Various	
<u>Inorganics</u>				
Alkalinity	N/A	310.2/SM2320B	310.2/SM2320B	310.2/SM2320B
Ammonia	SM 4500NH3 BF	SM 4500NH3 B,F	SM 4500NH3 B,F	N/A
Chemical Oxygen Demand	N/A	SM5220D	SM5220D	N/A
Chlorine	N/A	SM4500CI-G	SM4500CI-G	SM4500CI-G
Conductivity	9050A	SM2510B	SM2510B	SM2510B
Cyanide	9010C/9014	9010C/9014	SM4500CN-C, E	SM4500CN-C, E
Hardness	N/A	6020A	200.8	200.8
Hex. Chromium	7196A	7196A	SM 3500 Cr B	N/A
Hex. Chromium Prep	3060A			
Inorganic Anions (Br, Cl, F, NO <sub>2</sub> , NO <sub>3</sub> , SO <sub>4</sub> )	300.0	300.0	300.0	300.0
Mercury	6020A	6020A	N/A 200.8	
Metals	6020A	6020A	200.8	200.8
Metals Prep	3050B 200.8	3010A, 3005A	200.8	
Oil & Grease (HEM)	1664B, 9071B	1664B	1664B	N/A
pH	9045 SM4500-H+B	SM4500H+B	SM4500-H+B	
Salinity	N/A	SM2520B	SM2520B	N/A
Total Dissolved Solids	N/A	SM2540C	SM2540C	SM2540C
Total Settleable Solids	N/A	SM2540F	SM2540F	N/A
Total Solids/ Volatile	N/A	SM2540B/E	SM2540B/E	N/A
Total Suspended Solids/Vol.	N/A	SM2540D/E	SM2540D/E	N/A
TPH (SGT-HEM)	1664B, 9071B	1664B	1664B	N/A
Turbidity	N/A	180.1	180.1	180.1
<u>TCLP/ SPLP</u> (VOC, SVOC, Pest, Herb and/or Metals)	1311/1312/Various	1311/1312/Various	N/A	N/A

# **LABORATORY LAYOUT**

Phase Separation Science, Inc.  
Analytical Chemistry – Environmental Science

SWAA#6  
WASTE STORAGE AREA

FIRST FLOOR



Phase Separation Science, Inc.  
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SECOND FLOOR

