N60508.AR.000626
NAS WHITING FIELD
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LETTER WITH ATTACHED AUDIT REPORT REGARDING SURFACE WATER AND SEDIMENT SAMPLING DURING PHASE 2A REMEDIAL INVESTIGATION FEASIBILITY STUDY NAS WHITING FIELD FL
8/15/1992
ABB ENVIRONMENTAL

ABB
ASEA BROWN BOVERI

03.01.00.0012
1000038

August 15, 1992

Commanding Officer
Attn: Ms. Kimberly Queen, Code 1859
Souther Division
Naval Facilities Engineering Command
2155 Naval Eagle Drive
Charleston SC 29411-0068

SUBJECT: **Field Audit Report - Surface Water and Sediment Sampling**
Remedial Investigation and Feasibility Study - Phase IIA
NAS Whiting Field, CTO-050
Navy CLEAN District I
Contract N62467-89-D-0317

Dear Kim:

Enclosed please find the field audit report prepared by Dr. Michael Keirn. The audit was conducted on 13 and 14 July 1992. All deficiencies noted in Dr. Keirn's report have been addressed and corrective actions have been implemented.

If you have any questions, please call me at (904) 656-1293 [ext. 314].

Very truly yours,

ABB ENVIRONMENTAL SERVICES INC.

Rao V.R. Angara
Task Order Manager

cc: File: CTO-050

ABB Environmental Services Inc.

2590 Executive Center Circle East
Berkeley Building
Tallahassee, Florida 32301

Telephone (904) 656-1293
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ASEA BROWN BOVERI

TO: **Rao Angara**

FROM: **Mike Keirn**

DATE: **August 17, 1992**

SUBJECT: **Field Audit, Surface Water and Sediment Sampling, NAS Whiting Field, 13 and 14 July, 1992 Project No. 07560-01, CTO No. 050**

The purpose of this memorandum is to transmit the findings of the above audit. This audit was requested by the Task Order Manager and performed by the Project Technical Director. The audit was performed on 14 July 1992 following informal training of the sampling team on 13 July 1992. The audit was performed over the first two days of a programmed one week sampling event conducted as a component of the Phase IIA Remedial Investigation and Feasibility Study (RI/FS) at Naval Air Station (NAS) Whiting Field. Clear Creek, located along the west and southwest boundary of the Air Station was sampled to evaluate general water quality conditions (dissolved oxygen, pH, specific conductance, turbidity, and temperature) and to evaluate whether Target Compound List (TCL) or Target Analyte List (TAL) chemicals were migrating in the stream system or whether such chemicals were present as residers in the stream sediments, flood plain wetland sediments, or were present in groundwater discharge into the floodplain wetlands.

A general description of the sampling locations is contained in Technical Memorandum No. 6 from the Phase I RI. During the week prior to the sampling event, the Project Technical Leader, Field Operations Leader (FOL), and Technical Director performed a detailed reconnaissance to locate, flag, and clear access routes to each sampling location. The FOL and sampling/reconnaissance team cleared and constructed temporary 2 ft x 2 ft (approximately) wooden sumps, to allow for floodplain water sampling, one week prior to the sampling event. This was done to allow sufficient time for the floodplain/swamp sampling points to re-stabilize to provide representative water quality conditions. Because of the distance (up to 0.5 miles) and thick brush/forest and swamp between the nearest vehicle access and the sampling locations, the sampling program was extremely difficult logistically and physically.

General audit findings and discussions are presented in the following narrative. Specific findings are presented in checklist form, following the format of the February 1991 USEPA Region IV Engineering Support Division Field Overview Checklist. Backup support with comments are provided as attachments. This support includes: Attachment A, Field Procedures and Instructions of samples to be collected by station; Attachment B, Field Notes and Calibration Logs for 14 July 1992; and, Attachment C, Chain of Custody copies for 13 and 14 July 1992.

GENERAL FINDINGS

(1) Overall the program was carried out without any non-compliance that would potentially compromise data during the period observed.

(2) No serious health and safety problems were observed during the audit. Each team member understood the HASP, a copy of the HASP was available and the route to the hospital was posted. Signed site and training certificates were available on site as well. A pre-field briefing was held. Significant risks existing at the site of concern to the program were:

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A. Heat stress
B. Poisonous plants (poison ivy/oak)
C. Walking hazards (briars, vines, quicksand, heavy brush)
D. Biting/poisonous insects/snakes, (spiders, wasps, bees, water moccasins)
E. Use of corrosives/poisons in the field (HNO_3, NaOH, lead acetate paper)
F. Use of cutting equipment (machetes, chainsaw)
G. Working in woods under rain squall (wind and lightning)

The following things which needed attention were pointed out.

A. Storage of POL (gasoline oil) should be in a flammables cabinet separate from storage of decontamination fluid (isopropanol).

B. A corrosives storage cabinet and more adequate carrying containers for field use are needed.

C. The site HSO was the least field experienced of the team.

D. A map showing directions to emergency medical care and telephone numbers should be available in each vehicle.

(3) An appropriate decontamination procedure was being carried out with thorough rinsing of equipment using organic free, deionized water in copious quantities (use of portable water trailer). Gear was appropriately cleaned and staged on visqueen and aluminum foil then air dried (note that later in the week the Task Order Manager observed that due to a shortage of visqueen, equipment was laid on plastic garbage bags which is not compliant). Appropriate rinsate blanks were collected, however, the rinsate for 7/13/92 was taken from a sampler decontaminated 7/13/92 and sampled (for the rinsate) on 7/14/92 in the morning.

The following things that need attention were pointed out.

A. Sampling equipment was being decontaminated and the liquid rinsate (water) allowed to flow onto the ground. This was corrected using visqueen. The decon area will be moved to the wash rack where rinsate can flow to the base wastewater treatment plant.

B. POL should be strictly segregated from any decontamination fluids or sampling gear or bottles, both in storage and during transport and use.

(4) Overall, the program, duties and responsibilities were well defined and understood. A detailed procedure had been prepared as well as an equipment and a sample/analysis requirement checklist. These are appended as Attachment A. The organization (spelled out on attachment A) is as follows:

Task Order Manager	R. Angara
Technical Lead	E. Blomberg
Field Operations Leader	S. Consalvi
Sampling Crew Chief	P. Craine
Crew Members	G. Kanchibhatla, J. Bleiler
Chain of Custody Custodian	G. Kanchibhatla
Site Health/Safety officer	G. Kanchibhatla

The following things that needed attention were pointed out.

A. Some lack of training was evident in the questions regarding chain of custody procedures.

B. Field notebooks and calibration logs were not being signed on each page. This was corrected on site.

C. No calibration standards were on site for checking the YSI conductivity meter although it had been checked prior to shipment. (Standards were ordered).

D. Rigorous adherence to checklists was not always followed, resulting in several trips back to trailer from sampling stations to supply missing equipment or sample bottles.

E. Additional training in the calibration and use of field equipment (dissolved oxygen meter, pH meter, turbidimeter) should be performed.

F. The pH meter supplied (Hydac #656104) is difficult to calibrate and use. Electrode supplied was unresponsive in the soft water (conductivity < 20 umho/cm) of Clear Creek.

G. While the team was able to sample appropriately and make valid field measurements, additional training is needed in:

1. sequence of sampling vs field reading,

2. proper preservation checking.

(5) Considering the environmental conditions (difficult access; extreme heat/humidity, poor weather conditions, several thunder showers per day, and early Federal Express deadline) the team did well to stay on schedule during the first two days of the field program. Field notes and calibration logs are attached as Attachment B, Chain of Custody forms are attached as Attachment C. These appeared to be adequate and generally complete.

(6) During the first two days of the program appropriate contact was maintained with the laboratory subcontractor.

(7) The field trailer is well set up with ice maker, staging area, equipment area and, office space, and has appropriate reference materials and communication equipment (telephone/answering machine, radio, telefax, xerox).

CORRECTIVE ACTIONS

Other than the specific items noted above or in Exhibit I, the checklist, the audit suggests overall room for improvement of CLEAN field programs in the following training and other issues. These should be addressed on a program wide basis.

1. Training in the documentation of field notes.

2. Training in Chain of Custody requirements.

3. Training in "checking off" prior to going to the field to ensure all needed equipment and supplies are present.

4. Handling of corrosives/flammables and POL.

5. Surface water/sediment sampling practices.

6. Importance of handling of rinsates from decontamination properly and efficient, legal, and proper disposal methods.

7. More training in calibration and use of field equipment.

8. Better (more effective) field pH meters.

9. Training in checking preservatives and in preservative handling and use.

cc: E. Blomberg (w/o attachments)
S. Consalvi (w/o attachments)
J. Frost (w/o attachments)
D. Daniel (Health/Safety Committee) (w/o attachments)
J. Daniel (Training Committee) (w/o attachments)
File (with attachments)

Attachments A, B, C
Exhibit I

NOTE A

1. Samples, with the exception of the cyanide fraction, are taken with pre-preserved bottles. This is acceptable for VOCs. EPA and FDER do not approve of pre-preservation but do allow it. ABB-ES should strongly consider changing its procedures to comply.

   (1) It does not significantly increase the time required over that required to check each fraction/each sample.

   (2) It is most desirable to regulators.

   (3) There is less chance of accident or loss of preservative or cross contamination (if sampling team is properly trained).

   (4) Changes in air shipping policy may require such a change.

2. No direct preservative blanks are taken, negative findings in field blanks and rinsate blanks indicate status of preservation reagents.

3. Special care should be taken in the handling of lead acetate paper (for checking sulfide) and cadmium carbonate (for treating H_2S in cyanide fraction) both contain highly toxic metals that could be a hazard to field personnel and must be disposed of as hazardous waste after use.

   Also, extreme care should be used to prevent cross contamination of samples due to handling of these chemicals. Especially the handling of metals fraction or HNO_3 after handling lead acetate paper. **ALWAYS CHANGE GLOVES IN BETWEEN.**

KDO Whitingfield 7560-85 Attachment A 10 pages

Field Procedures

1. The sample team will locate and stake a background area a sufficient distance upstream from the sample locations (distance should be based on approximate flow velocity) and test the water for pH, conductivity and salinity at three points within the background area.

2. Sampling team consisting of the site team leader (STL), sampler, FOL (optional) and chain of custody (COC) officer will mobilize to the first of two locations.

FOL:	Sal Consalvi
STL:	~~Chuck Goodwin~~ Patrick Crain
COC Officer:	Gopi Kanchibhatla
Sampler:	John Bleiler

3. The FOL and STL will locate and stake the sample area (if not already completed during site reconnaissance).

4. Photograph location and note in field book (STL)

5. Describe the location in SWSD Log Book (STL)

   a. Weather
   b. Previous day/week rainfall
   c. Depth of Water (Estimate velocity)
   d. Width of channel
   e. Type of Flow (turbulent or laminar)
   f. Appearance of water (color, odor, turbidity and clarity)
   g. Note whether influent or effluent to treatment plant
   h. Type and thickness of vegetation
   i. Stratification of sediment
   j. Distances to confluence of drainage features
   k. local bends, sand bars and creek features.

6. Sketch location in SWSD field book (STL)

7. The COC officer will complete the labels and turn the sample bottles over to the samplers(date, time, analyte, etc.)

8. Begin SWSD field sample data record and chain of custody (COC Officer)

9. Collect SWSD samples (Sampler & STL) from furthest downstream sample location

   The sample will be taken in the following manner:

   1. Collect the sample from the surface water body by immersing a clean beaker or the sample bottle. If a stream is being sampled, collect the sample upstream of the sample team with the opening of the sampling device oriented upstream but avoiding floating debris.

   2. Directly fill the appropriate sample containers from a sampling device if necessary. (e.g., a ladle if very low water conditions exist)

   3. Fill sample bottles completely allowing a portion to be split off by the COC officer and tested for PH, conductivity, and salinity.

A1
2-14

4. Log pH, conductivity and salinity values in the field log book.

5. If a chlorine residual is potentially present, using a beaker, check for chlorine content with KI paper or a chlorine residual comparator. If a residual chlorine content is detected, add three drops of ten (10) percent sodium thiosulfate to the cyanide sample container prior to filling.

VOA Sample Collection

Water sample containers are generally filled directly from the source, sampler or pump discharge without special considerations. A major exception is the collection of VOA samples. Volatile Organic Analyte samples must be collected as specified below. Each sample is taken in duplicate.

1. Uncap the sample bottle, taking care not to touch the Teflon-faced septa. If the septa is contaminated in any way, it should be replaced.

2. Fill the sample vial slowly from bailer or pump discharge, minimizing air entrainment, until the vial overflows.

3. Place the Teflon-faced silicon rubber septa on the convex meniscus, Teflon side (shiny side) down and screw cap on.

4. Invert and lightly tap the bottle to check for air bubbles.

Sediment Sample Collection

- Sediment samples are collected by wading upstream. Facing upstream, use a scoup or spoon to collect the sample.
- If water is too deep for this method, alternate devices may be employed.
- Sediment samples, excluding VOC sample, should be thoroughly mixed in a glass bowl and placed in the appropriate containers.
- The VOC sample can be scooped directly into the sample container and completely filled leaving no space in the container.

Floodplain Sample Collection

- Sediment samples in the floodplain can be sampled as described in the previous section.
- If water is not present during the sampling initiative, a hole should be dug with a shovel approximately 6" to 18". If shallow ground water is encountered, it can be sampled using a ladle to transfer the water into the sample containers.

10. Sampler and STL will rinse the bottles with organic free water prior to handing them over to the chain of custody officer.

11. COC officer will pack the samples with ice and return with samples to the site trailer.

12. The samplers will mobilize to the second site.

13. When the STL and sampler return with the second group of samples they will assist the COC officer if necessary and prepare for sampling at two more locations.

14. Upon arrival at the trailer, COC officer will:

1. Add proper preservatives to samples (see chart)

2. Complete COC and Data Tracking Form

Preservation

- All samples are to be cooled to 4 degrees C
- Metals are to be filtered and preserved using HNO_3(Nitric Acid) to bring the pH below 2
- The cyanide sample is to be tested for residual chlorine. If present (1ml of 10%) (0.6g) ascorbic acid should be added [or 3 drops of 10% sodium thiosulfate] KI(potassium Iodine) paper or a chlorine residual comparator may be used to test for residual chlorine. They cyanide sample should also be preserved with NAOH (Sodium Hydroxide) to a pH>12.

3. Complete chain of custody

The COC description section requires:
- the sample number and sample bottle identification number, where applicable;
- the names of the sampler(s) and the person shipping the samples;
- the date and time that the samples were delivered for shipping; and the air bill number used by the shipper;
- the names of those responsible for receiving the samples at the laboratory.

A COC record is attached.

The COC record is completed in quadruplicate. Two copies accompany the samples to the laboratory, another is kept by the sample crew chief and transferred to the Laboratory Services Coordinator (LSC) and the last copy is maintained in the project file. Additional copies can be provided if needed for the project.

The COC protocol followed by the sampling crews involves:

- Documenting procedures and amounts of reagents or supplies (e.g., filters) which become an integral part of the sample from sample preparation and preservation.

- Recording sampling locations, sample bottle identification, and specific sample acquisition measures on the appropriate form.

4. Complete sample tracking form
5. Package samples for shipment

1. Wrap sample containers in bubble wrap
2. Place ice in double 1 gallon ziploc bags
3. Pack ice tightly in the cooler (bottom and between containers)
4. Place all paperwork in 1 gallon ziploc bag and tape to inside of cooler door.
5. If necessary, fill remaining space with vermiculite.
6. Tape cooler closed with strapping tape
7. Sign and date custody seals
8. Tape custody seals (clear tape) to the front and back of the cooler door.

SHIPPING

1. While samples are being packaged call Federal Express to set up pick-up time.
2. Prior to leaving the site notify the ABB laboratory sample coordinator (LSC) of the number, type and date of shipment. Notify the LSC of the arrival date and of any changes which may occur in the field.
3. Wait for federal express to arrive.
4. Maintain and file the airbill, COC and sample tracking form.
5. Send copies of all paperwork to ABB Tallahassee.

A-1
5-10

SWSD IN TRAILER PREPARATIONS

- Start organic free water trailer

- Load vehicles with:

    1. Coolers, and sufficient amount of ice in doubled 1 gallon plastic bags.

    2. 1 gallon amber jugs with organic free water.

    3. Hip waders

    4. Plastic garbage bags for trash.

    5. Supplies on supply list.

- Decontaminate all field equipment at wash rack by:

    1. Clean with tap water and laboratory detergent using a brush if necessary to remove particulate matter and surface films.

    2. Rinse thoroughly with tap water.

    3. Rinse thoroughly with deionized water.

    4. Rinse twice with solvent.

    5. Rinse thoroughly with organic-free water and allow to air dry as long as possible.

    6. If organic-free water is not available, allow equipment to air dry as long as possible. Do not rinse with deionized or distilled water.

    7. Wrap with aluminum foil, if appropriate, to prevent contamination if equipment is going to be stored or transported.

- chain of custody officer will prepare 2 coolers with sample bottles for two locations, ice and necessary paperwork.

- calibrate pH, conductivity, and temperature meters.

- site team leader will prepare sampling equipment necessary for two pre-determined locations. If sample containers for one sample point prove to be too cumbersome for one person to carry, only prepare to sample the one location.

A-1
6-10

SWSD Supplies

- Aluminum Foil
- Isopropanol and sprayer
- 1 gallon amber bottles (organic free H20)
- Alconox

- flagging
- Stakes and black marker
- Sample coolers
- pH/Conductivity meter
- glass mixing bowls
- glass trows and sampling devices
- portafid
- site maps (drainage, etc.)
- salinity meter
- beakers
- disolved O_2 meter

- Bubble wrap
- 1 gallon ziploc bags (for ice and paperwork)
- preservatives (NAOH, HNO3, sodium thiosulfate)
- other packing material (vermiculite)
- metals filter (if required)
- strapping tape
- clear tape
- custody seals

- 200 ft measuring tape
- rod for depth measurements
- deep water samplers
- deep water measuring tools
- Potassium Iodine (KI) paper (chlorine test for cyanide sample)
- Ascorbic acid (cyanide)
- sediment description charts
- deet
- machetes
- thermometer
- fluorescent tape
- rain gear

C.3 SHIPMENT OF ENVIRONMENTAL SAMPLES

Samples collected by Branch personnel and designated by the project leader as environmental samples shall be shipped using the method described below. However, if the environmental samples are preserved, the amount of preservative must not exceed the amounts indicated in Table APP C.3.1. If the amount of preservative added to a sample exceeds that listed in Table APP C.3.1, then that sample may be considered dangerous goods and shall be shipped in accordance with procedures described in the current Dangerous Goods Regulations (IATA). In addition, the shipment of prepreserved sample containers or bottles of preservatives (i.e., NaOH pellets, HCl, etc.) which are designated as dangerous goods by IATA pursuant to the appropriate IATA regulations. The shipment of nitric acid is forbidden on all aircraft.

Environmental samples shall be packed prior to shipment by air using the following procedures:

1. Select a sturdy cooler in good repair. Secure and tape the drain plug with fiber or duct tape. Line the cooler with a large heavy duty plastic bag.

2. Allow sufficient outage (ullage) in all bottles (except VOA's) to compensate for any pressure and temperature changes (approximately 10 percent of the volume of the container).

3. Be sure the lids on all bottles are tight (will not leak).

4. Place all bottles in separate and appropriately sized polyethylene bags and seal the bags with tape (preferably plastic electrical tape). Up to three VOA bottles may be packed in one Whirl-Pak® container.

5. Optionally, place three to six VOA vials in a quart metal can and then fill the can with vermiculite.

6. Place two to four inches of vermiculite in the bottom of the cooler and then place the bottles and cans in the cooler with sufficient space to allow for the addition of more vermiculite between the bottles and cans.

7. Put "blue ice" (or ice that has been placed in heavy duty polyethylene bags and properly sealed) on top of or between the samples. Fill all remaining space between the bottles or cans with vermiculite. Securely fasten the top of the large garbage bag with tape (preferably plastic electrical tape).

8. Place the Chain-of-Custody Record and the CLP Traffic Report Form (if applicable) into a plastic bag, tape the bag to the inner side of the coolers lid, and then close the cooler and securely tape (preferably with fiber tape) the top of the cooler shut. Chain-of-custody seals should be affixed to the top and sides of the cooler within the securing tape so that the cooler cannot be opened

without breaking the seal.

9. The shipping containers must be marked "THIS END UP", and arrow labels which indicate the proper upward position of the container should be affixed to the container. A label containing the name and address of the shipper shall be placed on the outside of the container. Labels used in the shipment of hazardous materials (such as Cargo Only Air Craft, Flammable Solids, etc.) are not permitted to be on the outside of the container used to transport environmental samples and shall not be used.

WHF-2A-STA1-SDO1	CLEARCREEK, STATION 1	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA2-SD01	CLEARCREEK, STATION 2	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA3-SD01	CLEARCREEK, STATION 3	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA4-SD01	CLEARCREEK, STATION 4	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA5-SD01	CLEARCREEK, STATION 5	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA6-SD01	CLEARCREEK, STATION 6	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA7-SD01	CLEARCREEK, STATION 6	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA8-SD01	CLEARCREEK, STATION 6	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA9-SD01	CLEARCREEK, STATION 7	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA10-SD01	CLEARCREEK, STATION 8	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA10-SD01A	CLEARCREEK, STATION 9	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA10-SD03 MS/01MSD	CLEARCREEK, STATION 10	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA11-SD01	CLEARCREEK, STATION 11	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	
WHF-2A-STA12-SD01	CLEARCREEK, STATION 12	TCL-COP VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		PEST/PCB'S	COOL 4° C
		TALCIP METALS	
		TOTAL CYANIDE	

A-1 10-11

SAMPLE NUMBER	LOCATION	ANALYT	PRESERVATIVE
WHF-2A-STA1-SW01	CLEARCREEK, STATION 1	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA2-SW01	CLEARCREEK, STATION 2	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA3-SW01	CLEARCREEK, STATION 3	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA4-SW01	CLEARCREEK, STATION 4	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA5-SW01	CLEARCREEK, STATION 5	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA6-SW01	CLEARCREEK, STATION 6	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA7-SW01	CLEARCREEK, STATION 6	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA8-SW01	CLEARCREEK, STATION 6	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA9-SW01	CLEARCREEK, STATION 7	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA10-SW01	CLEARCREEK, STATION 8	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA10-SW01A	CLEARCREEK, STATION 9	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA10-SW03 MS/01 MSD	CLEARCREEK, STATION 10	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA11-SW01	CLEARCREEK, STATION 11	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-STA12-SW01	CLEARCREEK, STATION 12	TCL-COP TCLVOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		TCL CIP TAL METALS	HNO3
		TCL-COP TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE

CN

WHF-2A-SW/SD-RB01	N/A	TCL-COP TCL VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		TCL-COP PEST/PCB'S	COOL 4° C
		~~TCL~~ CIP TAL METALS	HNO3
		~~TCL-COP~~ TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-SW/SD-RB02	N/A	TCL-COP TCL VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		~~TCL-COP~~ PEST/PCB'S	COOL 4° C
		~~TCL~~ CIP TAL METALS	HNO3
		~~TCL-COP~~ TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-SW/SD-RB03	N/A	TCL-COP TCL VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		~~TCL-COP~~ PEST/PCB'S	COOL 4° C
		~~TCL~~ CIP TAL METALS	HNO3
		~~TCL-COP~~ TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-SW/SD-RB04	N/A	TCL-COP TCL VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		~~TCL-COP~~ PEST/PCB'S	COOL 4° C
		~~TCL~~ CIP TAL METALS	HNO3
		~~TCL-COP~~ TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-SW/SD-RB05	N/A	TCL-COP TCL VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		~~TCL-COP~~ PEST/PCB'S	COOL 4° C
		~~TCL~~ CIP TAL METALS	HNO3
		~~TCL-COP~~ TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2A-SW/SD-RB06	N/A	TCL-COP TCL VOC'S	COOL 4° C HCL
		TCL-COP SVOC'S	COOL 4° C
		~~TCL-COP~~ PEST/PCB'S	COOL 4° C
		~~TCL~~ CIP TAL METALS	HNO3
		~~TCL-COP~~ TOTAL CYANIDE	NAOH/SODIUM THIOSULFATE
WHF-2ASWSD-ISOPROPANOL	N/A	ACETONE	COOL 4° C

WHF-2A-SW/SD-TB01	N/A	TALCOPVOC	COOL 4° C HCL
HF-2A-SW/SD-TB02	N/A	TALCOPVOC	COOL 4° C HCL
WHF-2A-SW/SD-TB03	N/A	TALCOPVOC	COOL 4° C HCL
WHF-2A-SW/SD-TB04	N/A	TALCOPVOC	COOL 4° C HCL
WHF-2A-SW/SD-TB05	N/A	TALCOPVOC	COOL 4° C HCL
WHF-2A-SW/SD-TB06	N/A	TALCOPVOC	COOL 4° C HCL
WHF-2A-SW/SDFB01	NA	TALCOPVOC	COOL 4° C HCL
WHF-2A-SW/SDFB02	NA	TALCOPVOC	COOL 4° C HCL

ATTACH. B
18 pages

7-14-92

0837 Field crew arrive at Site 09. (JAB / PY / SAS / M.H)
- Zero Field instruments
- Site located in forested swamp in 2 x 4' frame
- Dense forest cover, @ herb layer @ Hydrocotyle umbellata, Iris sp, Carex sp, Osmunda regalis, Woodwardia sp, other herbaceous spp
- Shrubs include Magnolia virginiana, Ilex sp,
- trees include Magnolia virginiana, Acer rubrum, Fraxinus
- Similar to ... etc

0840 - Prepare for surface H2O sampling
- 2 - 4" standing H_2O in swamp
- highly organic rich soil (peaty muck)

- 0855 Surface H_2O samples collected

0900 Sediment sample collected

7-14-92

0850 2 photos taken
- (1) staging area
- (1) site (sampling station 9)
- Water stagnant - no movement
- slight sheen on H_2O, bacterial (breakdown)
- green frog calling

0850 2" of stg H_2O in sed frame
- three full rinses of teflon pan @ in seg prior to VOA collection

Weather - ca 85° F, sunny @ intermittent clouds, high humidity, no wind, occasional thunder showers

- Water clear + white
- VOAs collected (w/out incident)
* small amounts of organic detritus in all H_2O samples
- No Chlorine / negative (readable) lead content
- sample @ moderate ... small (trace oil) film

7-14-92
0911 hours
[illegible] = 22°C
- [illegible]ssolved oxygen = 1.2 mg/l

[illegible] sample collected in [illegible]
Temp = 23°C

[illegible]ity = 0

[illegible]nductivity = 70

Sample
- [illegible] 8" of leaves, twigs, detritus
mucky [illegible]
S.08 [illegible] S.09)
[illegible] sand, silt substrate (w
[illegible] organics

[illegible]TATION 8
Arrive at station 8
([illegible] / Sol / Bat C)

- [illegible] through dense floodplain
[illegible]tomland hardwood swamp
- [illegible]te located at [illegible]

7-14-92

Attach B
2-18

- stream channel @ island in middle
- island + stream channel @ hard packed reddish sand
- considerable scouring in channel, nice depositional areas adj
- flow to SE, through floodplain forest
- Myrica cerifera, elderberry in shrub layer
- Hypericum, Royal fern, Alnus sp,
- Smilax, oaks, PI
- (site of Aghistrodon piscivorous)
- aquatic macrophytes in stream (green, etc)
- Lyonia, royal fern

- Weather - 85°F, high humidity, thunder but not significant rain
- high Smilax, wood [illegible]

7-14-92

Surface H_2O sample collected @ 10:30 AM

Potassium iodide + lead acetate - negative

pH > 12 + pH < 2 in cyanide + metals

2 ml 6N NaOH per cyanide sample

temperature on conductivity 24°C

DO = conductivity ?

0 salinity

pH = 8.04

heavy rain at 10:50

7-14-92

DO = 8.2 mg/L

23° C

stream width = from west Bank to center of island = 26.5'

Stream depth = 3.02 ft at center of stream

sediment depth of water = 3.2"

stream width from center to east bank = 17'

- Little defined bank (less than one foot high) greater than 5:1 slope into floodplain forest

- Sediment sampling at 11:10

- Sediment samples collected at 10' 3.0' (from bank) at N's

- heavy rain after surface water sampling, before sediment samples

- Back in channel = Scripps SP

- out 11:45 AM

Attach B
3-18

7-14-92

1:00 Arrive at Station 7
crew = Mike/ Eric/ BB/ Sal/ P.
Surface water collected
Habitat - site located in
mixed mesic hardwoods, w
red maple + magnolia
canopy
shrubs! - Ilex, Vaccinium,
Myrica, Ilex, etc
Lianoid - Vitis rotundifolia,
Smilax, sp
Herb - Osmunda regalis,
Woodwardia
Weather - Cloudy @ thunder
- dense hard rainfall 2 h
prior to visit, etc.
Sampled at 14:15
- dy H_2O in from 2"-4"
water clear, @ slight
amts of organic matter
- Weir
Instrument Station

- 4 of metals C2

7-14-92

ATTACH B
4-18

Sediments at 14:20 hr.

- NO change in cyanide paper
(lead acetate or ...)
pH of cyanide ≥12

pH of stdy. H_2O = 6.8
Sediments dark to brown silty
@ high organic content
- Temp from sediment water
= 23°
- Conductivity = ~~100~~ 10,
- Temp on DO reading = 23°C
- DO reading not possible
due to lack of stdy H_2O
of sufficient depth
- heavy rain + thunder
throughout sampling period

- 3:00 hr ± exit field + return
to trailer in heavy rain
- COMPLETE FIELD ACTIVITIES
FOR 7-14-92
TVC

- 1603 BEGIN TO TAKE TURBIDITY

Attach B
5-18

5-14-92

Readings from Today's Samples.

SW/SD STA 8 Did Not have Turbidity Readings + AS Turbidity Readings Where Not Required Did Not open Samples To get SAMPLE.

Turbidity Readings

1610 - Begin Initialing Book for Void Zones

ATTACH B
6-18

TURBIDITY
METER
LA MOTTE
MODEL 2008
NO ITRB001
0000106

TELEDYNE
430

MADE IN U.S.A.

ATTACH
B
7-13

6-3-92

Calibration w/ 5.01
standard Instrument
charged over night
8:10

13 July 1992 0910 W
Bleiler/Crane

Calibrate at 5.01/

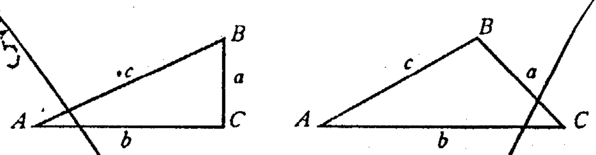
ATTACH B
8-18

HYDAC PH
DAILY cal/USE
LOG BOOK
656 104

TELEDYNE
430

MADE IN U.S.A.

FORMULAE FOR SOLVING RIGHT TRIANGLES



$\text{Sin } A = \frac{a}{c} = \text{Cos } B$ $\text{Cot } A = \frac{b}{a} = \text{Tan } B$

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Given	Required	Solution
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A, a	B, b, c	$B = 90° - A, b = a \cot A, C = \frac{a}{\sin A}.$
a, c	A, B, b	$\sin A = \frac{a}{c}, \cos B = \frac{a}{c}, b = \sqrt{(c+a)(c-a)}$
a, b	A, B, c	$\tan A = \frac{a}{b}, \cot B = \frac{a}{b}, c = \sqrt{a^2 + b^2}$

FORMULAE FOR SOLVING OBLIQUE TRIANGLES

Given	Required	Solution
A, a, b	B, c	$\sin B = \frac{b \sin A}{a}, c = \frac{a \sin C}{\sin A}$
A, B, a	b	$b = \frac{a \sin B}{\sin A}$
a, b, C	A, c	$A + B = 180° - C, C = \frac{a \sin C}{\sin A}$
a, b, c	Area	$\text{side} = \frac{a+b+c}{2}, \text{area} = \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	$\text{area} = \frac{bc \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

ATTACH B 9-18

Calibrated unit 7-2-92
w/o MPs

7-13-92 P. Claire / G/
0915 hrs
SOUTH NAV FACE ENCOM # 656104
S/N 9107
PREPARE FRESH SOULUTION; AFTER
DECON OF BUFFER SOLUTION

FIRST READING BUFFER 4.0
READING 2.99

READING BUFFER 10
READING 8.99
ADJUSTING SLOPE TO 9.02

4 BUFFER SOLUTION
INITAL 2.6
ZERO TO 2.9

10 BUFFER
9.78 (10 seconds)

4 BUFFER
3.98

Attach B
[illegible] work

10-18

10 Buffer
10.6
Adjusted to 10.11

4 Buffer
3.33 Inital Reading
zero 3.61

10 Buffer
10.40
Adjustment 10.2

4. Buffer
3.85
3.94 Adjustment

10 Buffer
10.33 Inital
10.15

4 Buffer
4.18
PC ~~4.04~~ 4.04

10. Buffer
9.99 Inital
9.99

7 Buffer
7.01 Inital

4 Buffer
4.01 Inital

10 Buffer
9.98 Inital

0938 Decon of Holding Tube
Calibration complete

ATTACH. B
11-18 ~~10-13~~

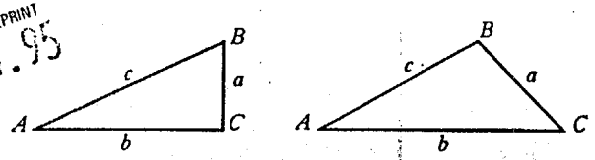
YSI 51B
Dissolved
O_2 meter

Daily Cal and
USE LOG
#000234
SN 91G030554

TELEDYNE
430

AAA BLUEPRINT
$4.95

FORMULAE FOR SOLVING RIGHT TRIANGLES



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FORMULAE FOR SOLVING OBLIQUE TRIANGLES

Given	Required	Solution
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A, B, a	b	$b = \frac{a \sin B}{\sin A}$
a, b, C	A, c	$A + B = 180° - C, C = \frac{a \sin C}{\sin A}$
a, b, c	Area	side $\frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{bc \sin A}{2}$
A, B, C, a	Area	area $= \frac{a^2 \sin B \sin C}{2 \sin A}$

Attach B

~~# T@~~ 12-15

7-13-92

J. Bleiler / Gogi Ho

0822 hrs.

South Div Nav Fac # 000234

Serial # - 91 G 030554

- Air Calib. Method

- Add few drops H_2O to Calib. chamber

- Let sit until 0842

- calibrate altitude to clear to sea level (drop from 5000 → 0)

- check altitude ca 25'

- adjust temp to ca 23.2 C
- O2 Readij = 8.6 mg/l
- chk table (page 6 - manual)
  ⇒ 8.58 mg/l at 23°C
- complete calibration at 0847

0730 DO Meter Calibration

Temperature 27.8°C

Zero Adjustment OK

Full Scale Adjustment slightly Adjusted.

Temp reading 27.5°C.

Adjust Calib Altitude to Sea level by waving the probe around moist air.

Read Steady DO reading by Gently waving the probe near loc. moist air.

Read as 8.55 mg/l.

Check with calib table DO Solubility at sealevel at 28°C =

K. Lynn Kniffin

7/14/92

ATTACH 12-18 14-18

YSI; 5A1191A022924

Salinity Conductivity Temp Meter

NO! SCT001

Source # 000099

Daily Calibration

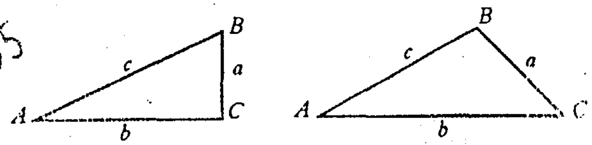
AND USE Log Book

TELEDYNE

430

FORMULAE FOR SOLVING RIGHT TRIANGLES

AAA BLUEPRINT $3.95



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Given	Required	Solution
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A, b	B, a, c	$B = 90° - A,\ a = b\tan A,\ C = \frac{b}{\cos A}.$
A, a	B, b, c	$B = 90° - A,\ b = a\cot A,\ C = \frac{a}{\sin A}.$
a, c	A, B, b	$\sin A = \frac{a}{c},\ \cos B = \frac{a}{c},\ b = \sqrt{(c+a)(c-a)}$
a, b	A, B, c	$\tan A = \frac{a}{b},\ \cot B = \frac{a}{b},\ c = \sqrt{a^2 + b^2}$

FORMULAE FOR SOLVING OBLIQUE TRIANGLES

Given	Required	Solution
A, a, b	B, c	$\sin B = \frac{b\sin A}{a},\ c = \frac{a\sin C}{\sin A}$
A, B, a	b	$b = \frac{a\sin B}{\sin A}$
a, b, C	A, c	$A + B = 180° - C,\ C = \frac{a\sin C}{\sin A}$
a, b, c	Area	side $\frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{bc\sin A}{2}$
A, B, C, a	Area	area $= \frac{a^2\sin B\sin C}{2\sin A}$

Office Cal. Cond stds verify unit 7/13/93 MPS

ATTACH B ~~14-14~~ 15-18

7-2-92 ✓ unit to MPS Changed batteries DiWhm

7-3-92

1000 There is no specific Calibration Control in Model 33
Inst ID
YSI Model 33
SOUTH DIVNAVFAC 000049
Conductivity Standard 3960 MMHOS is used to check the meter.

1025 place conductivity cell into standard conductivity Solution 3960 MMHOS

MPS ✓

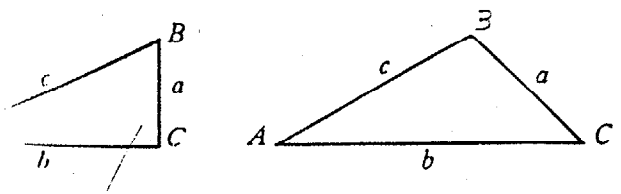
1030 Turn the mode switch to 10 multiplier
Adjust the Temp. Scale to 22°C (local temperature)
Read the Upper scale on the reading dial.
Reading = 390
Actual value = 390 X 10 = 3900 MMHOS

CS 00 Conductivity Salinity meter
Check No calibration
Solution at the station.

K. Lynn-Kirschner

7/14/92

FORMULAE FOR SOLVING RIGHT TRIANGLES



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A, c	B, a	$B = 90° - A, b = a \cot A, C = \frac{a}{\sin A}.$
a, c	A, B, b	$\sin A = \frac{a}{c}, \cos B = \frac{a}{c}, b = \sqrt{(c+a)\,(c-a)}$
a, b	A, B, c	$\tan A = \frac{a}{b}, \cot B = \frac{a}{b}, c = \sqrt{a^2 + b^2}$

FORMULAE FOR SOLVING OBLIQUE TRIANGLES

Given	Required	Solution
A, a, c	C	$\sin B = \frac{b \sin A}{a}, c = \frac{a \sin C}{\sin A}$
	b	$b = \frac{a \sin B}{\sin A}.$
a, b, c	A, B, C	$A + B = 180° - C, C = \frac{a \sin C}{\sin A}$
a, b, c	Area	side $\frac{a+b+c}{2}$, area $= \sqrt{s(s-a)\,(s-b)\,(s-c)}$
A, b, c	Area	area $= \frac{bc \sin A}{2}$
A, B, c	b	

ATTACH B

CALIBRATION RECORD

HACH Turbidimeter

5-27-92

Primary + sealed secondary calibration w/ 5.01 NTU turbidity standard 11:00. Charged over night.

5-29-92

Sealed secondary calibration w/ 5.01 NTU standard. Instrument charged over night. 8:30

6-3-92

Calibration w/ 5.01
Standard. Instrument
Charged over night.
8:10

13 July 1992 0910 W
Bleiler/Crane

Calibrated at 5.01/

NOTE! Cylinder holding
Containers is Presently Broken
July 14 1992
SEE Page 1 for calibration fluid.
1547 -
Check .5NTU
Reading .05NTU
Adjust TO .49
Checke 5.01 NTU Turbidity

ATTAND
18-1P

Standared.
Read - .30.
Adjusted Seating Ring

Tested w/ 5.01 Turbidity Standar.
Again
Read 4.65,
Adjust 5.01

1602

7/14/92

1.00 on Base

1.10 Clean the buffer containers in the pH kit Ser No 9107 Fill them with fresh buffer. pH 4, 7, 10

Calibration Runs

Time	pH 4	pH 7	pH 10
0715	4.13	7.04	9.94
0718	4.12		10.02
0720	3.94		9.91
0722	3.90		10.01
0724	3.98		10.09
0725	4.03	7.05	10.05

K. Lynn Krishnamurthy

7/14/92

ATTACH C pg 20 1-9

CH2M HILL

QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project # 7560-05

Purchase Order #

Project Name: Whidbey Field - RI/FS Phase II A

Company Name CH2M HILL Office: ABB Environmental Services Inc.

Project Manager & Phone # (904) 656-1293

Mr. [X] Rao Angara
Ms. [ ]

Report Copy to: ~~Gopi Krishnathi~~ Rao Angara

Requested Completion Date:

Sampling Requirements: SDWA [ ] NPDES [ ] RCRA [ ] OTHER [X] CERCLA

Sample Disposal: Dispose [ ] Return [ ]

LAB TEST CODES

SHADED AREA -- FOR LAB USE ONLY

Lab 1 # | Lab 2 #

Quote # | Kit Request #

Project #

No. of Samples | Page | of

COC Rev | Login | LIMS Ver | Ack Gen

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	TCL-COP VOC's	TCL-COP SVOC's	TCL-COP Pesticide/PCBs	TAL-CLP Metals	TAL-CLP Total Cyanide	REMARKS	LAB 1 ID	LAB 2 ID
7/13/92	1500	✓	✓			WHF-2A-STA11-SW01	7	3	1	1	1	1	TAL-CLP-Met Preserved with HNO3		pH<2
7/13/92	1530	✓		✓		WHF-2A-STA11-SD01	2	2					TAL-CLP-Total Cyanide Preserved with NaOH pH>12		
7/13/92	1530	✓		✓		WHF-2A-STA11-SD01	2	0	1		1		TCL-COP-VOC bottles Preserve with HCl		
7/13/92	1600	✓	✓			WHF-2A-STA10-SW01A	3	3							
7/13/92	1645	✓	✓			WHF-2A-STA10-SW01	3	3							
7/13/92	1645	✓	✓			WHF-2A-STA10-SW01MS	3	3							
7/13	1645	✓	✓			WHF-2A-STA10-SW01MSD	3	3							
7/13			✓			Trip Blank 1	3	3							
7/13	1710	✓		✓		WHF-2A-STA10-SD01MS	2	2							
7/13	1710	✓		✓		WHF-2A-STA10-SD01A	2	2							
7/13	1710	✓		✓		WHF-2A-STA10-SD01	2	2							

Sampled By & Title (Please sign and print name): Patrick V. Crane Sr. Tech	Date/Time: 7-13-92	Relinquished By (Please sign and print name): Patrick V. Crane	Date/Time: 7-13-92	HAZWRAP/NESSA: Y N	
Received By (Please sign and print name): R. Gynikothmc	Date/Time: 7-13-92	Relinquished By (Please sign and print name): R. Gynikothmc	Date/Time: 7-13-92	QC Level: 1 2 3 Other:	
Received By (Please sign and print name):	Date/Time:	Relinquished By (Please sign and print name):	Date/Time:	COC Rec	ICE
				Ana Req	TEMP
				Cust Seal	Ph
Received By (Please sign and print name):	Date/Time:	Shipped Via: UPS BUS Fed-Ex Hand Other	Shipping #:		
Work Authorized By (Please sign and print name):		Remarks: Sampling containers cooled with ice bags at 4°C			

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: ORIGINAL - LAB, Yellow - LAB, Pink - Client

Continued 1/5

CH2M HILL

QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project # 7560-05

Purchase Order #

Project Name: Whitty Field RI/FS Phase IIA

Company Name/CH2M HILL Office: ABB Environmental Services Inc.

Project Manager & Phone # Mr. [X] Ms. [ ]: Ravi Angaren

Report Copy to: Ravi Angaren.

Requested Completion Date:

Sampling Requirements: SDWA [ ] NPDES [ ] RCRA [ ] OTHER CERCLA

Sample Disposal: Dispose [ ] Return [ ]

LAB TEST CODES

SHADED AREA -- FOR LAB USE ONLY

Lab 1 # | Lab 2 #

Quote # | Kit Request #

Project #

No. of Samples | Page | of

COC Rev | Login | LIMS Ver | Ack Gen

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	ANALYSES REQUESTED	REMARKS	LAB 1 ID	LAB 2 ID
7/13/92	1710	V		V		WHF-2A STA10-DD(MS)	2	2 TCL-CLP-VOCs	All TCL-CLP-VOCs are to be performed with HCL.		

Sampled By & Title (Please sign and print name): P. CLAINE SR TECH — Date/Time: 7-13-92

Relinquished By (Please sign and print name): P. CLAINE SR TECH — Date/Time: 1900 7/13/92

Received By (Please sign and print name): K. Gopikrishna Gopi Kanchibhatla — Date/Time: 7/13/92

Relinquished By (Please sign and print name): K. Gopikrishna Gopi Kanchibhatla — Date/Time: 7/13-92

Received By (Please sign and print name): — Date/Time:

Relinquished By (Please sign and print name): — Date/Time:

Received By (Please sign and print name): — Date/Time:

Shipped Via: UPS BUS Fed-Ex Hand Other

Shipping #

Work Authorized By (Please sign and print name):

Remarks

HAZWRAP/NESSA: Y N

QC Level: 1 2 3 Other:

COC Rec | ICE

Ana Req | TEMP

Cust Seal | Ph

Coolers Number 4/5

C 9

CH2M HILL

QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project # 7560-05

Purchase Order #

Project Name: Whiting Field - RI/FS Phase IIA

Company Name/CH2M HILL Office: ABB Environmental Services Inc.

Project Manager & Phone # Mr. [X] Ms. [ ]: Rao Angara.

Report Copy to: Rao Angara

Requested Completion Date:

Sampling Requirements: SDWA [ ] NPDES [ ] RCRA [ ] OTHER [ ]

Sample Disposal: Dispose [ ] Return [ ]

LAB TEST CODES

SHADED AREA – FOR LAB USE ONLY

Lab 1 #

Lab 2 #

Quote #

Kit Request #

Project #

No. of Samples

Page

of

COC Rev

Login

LIMS Ver

Ack Gen

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	ANALYSES REQUESTED: TCL-COP-VOC's	TCL-COP-SVOCs	TCL-COP-Pest/PCB's	CLP TAL-Metals	CLP TAL-Total Cyanide	REMARKS	LAB 1 ID	LAB 2 ID
~~7/13~~	~~1710~~	✓		✓		WHF-2A-STA10-SD01MSD	2	2					Kq	All TCL-COP-Volcans Pre preserved with HCl	
7/13	1710	✓		✓		WHF-2A-STA10-SD01MSD	2		1		1			All TAL-CLP-Metals are Pre preserved with HNO3 and PH wer below 2	
7/13	1655	✓	✓			WHF-2A-STA10-SW01MSD	4	2 Kq	1	1	1	1		All TAL-CLP-Total Cyanide wise preserved with NaOH and PH 7/2	

Sampled By & Title (Please sign and print name): P. CRAINE SR TECH — Date/Time:

Relinquished By (Please sign and print name): P CRAINE — Date/Time: 7-13-92 1900

Received By (Please sign and print name): K. Gopi Krishna GOPI Kanchibhatla — Date/Time: 7/13/92 1900

Relinquished By (Please sign and print name): K. Gopi Krishna GOPI Kanchibhatla — Date/Time: 1900 7/13/92

Received By (Please sign and print name) — Date/Time:

Relinquished By (Please sign and print name) — Date/Time:

Received By (Please sign and print name) — Date/Time:

Shipped Via: UPS BUS Fed-Ex Hand Other

Shipping #

Work Authorized By (Please sign and print name)

Remarks: All the Sample Containers were preserved with ICE Bags around to a temperature of 4°C

HAZWRAP/NESSA: Y N

QC Level: 1 2 3 Other:

COC Rec | ICE

Ana Req | TEMP

Cust Seal | Ph

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: ORIGINAL - LAB, Yellow - LAB, Pink - Client

Cooler Number 3/5

C 3-9

CH2M HILL

QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project # 7560-05

Purchase Order #

Project Name: Whiting Ferd - RI/FS Phase IIA

Company Name/CH2M HILL Office

Project Manager & Phone #: Mr. [ ] Ms. [ ] Rao Angara (914) 565 1293

Report Copy to: Rao Angara

Requested Completion Date:

Sampling Requirements: SDWA [ ] NPDES [ ] RCRA [ ] OTHER [ ] CERCLA

Sample Disposal: Dispose [ ] Return [ ]

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	TCL-COP VOCs	TCL-COP SVOCs	TCL-COP-Pest/PCBs	TAL-CIP-Metals	TAL-CIP-Cyanide	REMARKS
~~7/13/92~~	~~1410~~	~~✓~~		~~✓~~		~~WHF-2A-STA10-SD01MS~~	~~2~~	2					
7/13/92	1710	✓		✓		WHF-2A-STA10-SD01MS	2	0	1		1		
7/13/92	1655	✓		✓		WHF-2A-STA05-SW01MS	4	0	1	1	1	1	

Kg

All TCL COP-VOCs are Preserved with HCl

All TAC-CIP-Metals are Preserved with HNO_3 to a pH < 2

All TAC-CIP-Cyanide are Preserved to a pH > 12 with NaOH

LAB TEST CODES

SHADED AREA -- FOR LAB USE ONLY

Lab 1 #

Lab 2 #

Quote #

Kit Request #

Project #

No. of Samples

Page

of

COC Rev

Login

LIMS Ver

Ack Gen

REMARKS

LAB 1 ID

LAB 2 ID

Sampled By & Title: P. CRAINE (Please sign and print name)

Date/Time: 7-13-92

Relinquished By: P. CRAINE (Please sign and print name)

Date/Time: 1900 1700

Received By: K. Gopikrishna Gopi Kanchibhatla (Please sign and print name)

Date/Time: 7-13-92 1920

Relinquished By: K. Gopikrishna Gopi Kanchibhatla (Please sign and print name)

Date/Time: 7/13/92 1920

Received By (Please sign and print name)

Date/Time

Relinquished By (Please sign and print name)

Date/Time

Received By (Please sign and print name)

Date/Time

Shipped Via: UPS BUS Fed-Ex Hand Other

Shipping #

Work Authorized By (Please sign and print name)

Remarks: All the Samples Containers are preserved to a temperature of 4°C with ICE Bags.

HAZWRAP/NESSA: Y N

QC Level: 1 2 3 Other:

COC Rec | ICE

Ana Req | TEMP

Cust Seal | Ph

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: ORIGINAL - LAB, Yellow - LAB. Pink - Client

Cooler Number 4/5

2/4-9

CH2M HILL

QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project # 7560-05

Purchase Order #

Project Name: Whiting Fed W.-RI/FS Phase II A

Company Name/CH2M HILL Office: ABB Environmental Services Inc.

Project Manager & Phone # 904 656 1293
Mr. [X] Rao Angara
Ms. [ ]

Report Copy to: Rao Angara

Requested Completion Date:

Sampling Requirements: SDWA [ ] NPDES [ ] RCRA [ ] OTHER [ ]

Sample Disposal: Dispose [ ] Return [ ]

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	TCL-COP-Vols	TCL-COP-SVOCs	TCL-COP-Pesticides/PCBs	TAL-CIP-Metals	TAL-CIP-Total Cyanides
7/8/92	1655	✓	✓			WHF-2A-STA-10-SW01A	4	0	1	1	1	1
7/8/92	1710	✓	✓			WHF-2A-STA-10-SD01A	2	~~2~~ kg		1	1	

LAB TEST CODES

ANALYSES REQUESTED

SHADED AREA -- FOR LAB USE ONLY

Lab 1 # | Lab 2 #

Quote # | Kit Request #

Project #

No. of Samples | Page | of

COC Rev | Login | LIMS Ver | Ack Gen

REMARKS | LAB 1 ID | LAB 2 ID

All TCL-COP Vols are preserved with HCl
All TAL-CIP-Metals are preserved with HNO3 to a pH < 2
All TAL-CIP-Cyanides are preserved with NaOH to a pH 12

Sampled By & Title (Please sign and print name): K. Crane

Date/Time: 7-13-92

Received By (Please sign and print name): Kalpni Krishna Gopi Kanchibhatla

Date/Time: 1920 7/13/92

Received By (Please sign and print name):

Date/Time:

Received By (Please sign and print name):

Date/Time:

Work Authorized By (Please sign and print name):

Relinquished By (Please sign and print name): J. Crane

Date/Time: 1900 7-13-92

Relinquished By (Please sign and print name): K. Krishna Gopi Kanchibhatla

Date/Time: 1920 7/13/92

Relinquished By (Please sign and print name):

Date/Time:

Shipped Via: UPS BUS Fed-Ex Hand Other

Shipping #

Remarks: All sample containers are preserved at a temperature of 4°C using Ice Bags.

HAZWRAP/NESSA: Y N

QC Level: 1 2 3 Other:

COC Rec | ICE

Ana Req | TEMP

Cust Seal | Ph

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: ORIGINAL - LAB, Yellow - LAB, Pink - Client

Cooler Number 2

1/F-9

CH2M HILL

QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project # 7560-05

Purchase Order #

Project Name: Whiting Field RI/FS Phase II A

Company Name/CH2M HILL Office: ABB Environmental Services Inc.

Project Manager & Phone #: Mr. [X] Rao Angara 904 656 1293 Ms. [ ]

Report Copy to: Rao Angara.

Requested Completion Date:

Sampling Requirements: SDWA [ ] NPDES [ ] RCRA [ ] OTHER ____

Sample Disposal: Dispose [ ] Return [ ]

LAB TEST CODES

SHADED AREA -- FOR LAB USE ONLY

Lab 1 # | Lab 2 #

Quote # | Kit Request #

Project #

No. of Samples | Page | of

COC Rev | Login | LIMS Ver | Ack Gen

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	ANALYSES REQUESTED: TCL-CLP-VOA's	TCL-CLP-SVOC's	TCL-CLP-Pest/PCBs	TAL-CLP-Total Cyanide	TAL-CLP-Metals	REMARKS	LAB 1 ID	LAB 2 ID
7/13/92	1310	X		X	WHF-2A-STA10-SDO1A	2	0		1		1		All TAL-CLP metals are Preserved w/ HNO3 to a pH <2 All TAL-CLP Cyanide are preserved w/ NaOH to a pH >12		
7/13/92	1655	X	X		WHF-2A-STA10-SWO1	4	0	1	1	1	1				

Sampled By & Title: F CLAIR (Please sign and print name): F Clair — Date/Time: 7-13-92

Received By: K. Yamikkan Gopi Kanchibhatla — Date/Time: 7/13/92 1915

Received By — Date/Time

Received By — Date/Time

Work Authorized By

Relinquished By: F. Clair (Please sign and print name) — Date/Time: 1700 7-13-92

Relinquished By: K. Yamikkan Gopi Kanchibhatla — Date/Time: 7/13/92 1915

Relinquished By — Date/Time

Shipped Via: UPS BUS Fed-Ex Hand Other ____ — Shipping #

Remarks: All the Sample Containers are Cooled to a temperature 4°C using Ice Bags.

HAZWRAP/NESSA: Y N

QC Level: 1 2 3 Other: ____

COC Rec | ICE

Ana Req | TEMP

Cust Seal | Ph

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: ORIGINAL - LAB, Yellow - LAB, Pink - Client

ATTACH C
6-9

CH2M HILL

QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project # 7560-05

Purchase Order #

Project Name: Whiting Field RI/FS Phase IIA

Company Name/CH2M HILL Office: ABB Environmental Services Inc.

Project Manager & Phone #: Mr. [X] Rao Angara Ms. [ ] (904) 656-1293

Report Copy to: Rao Angara

Requested Completion Date:

Sampling Requirements: SDWA [ ] NPDES [ ] RCRA [ ] OTHER CERCLA

Sample Disposal: Dispose [ ] Return [ ]

LAB TEST CODES

SHADED AREA -- FOR LAB USE ONLY

Lab 1 # | Lab 2 #

Quote # | Kit Request #

Project #

No. of Samples | Page | of

COC Rev | Login | LIMS Ver | Ack Gen

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	ANALYSES REQUESTED: TCL-COP-VOCs	TCL-COP-SVOCs	TCL-COP-PEST/PCBs	TAL-CIP-Metals	TAL-CIP-Total Cyanide	REMARKS	LAB 1 ID	LAB 2 ID
7/14/92	0855	✓	✓			WHF-2A-STA9-SW01	7	3	1	1	1	1	All TAL-CIP-Metals preserved with HNO_3 to pH < 2		
7/14	0900	✓		✓		WHF-2A-STA9-SD01	4	2	1		1				
7/14	1030	✓	✓			WHF-2A-STA8-SW01	3	3					All TAL-CIP-Cyanides Preserved with NaOH to pH > 12		
7/14	0925	✓	✓			WHF-2A-SW/SD-RB01	3	3							
7/14	1110	✓		✓		WHF-2A-STA8-SD01	2	2					All TCL-COP-VOCs Preserved in bottles with HCl		
7/14		✓	✓			WHF-2A-SW/SD-TB02	3	3							
7/14	1430	✓	✓			WHF-2A-SW/SD-SD-FB01	3	3							
7/14	1410	✓		✓		WHF-2A-STA7-SD01	2	2							
7/14	1410	✓	✓			WHF-2A-STA7-SW01	3	3							

Sampled By & Title (Please sign and print name): P. CRAINE	Date/Time: 7-14-92	Relinquished By (Please sign and print name): P. CRAINE	Date/Time: 7-14-92 1533
Received By (Please sign and print name): K. Gomikiewicz / Gopi Kancherla	Date/Time: 7/14/92 1530	Relinquished By (Please sign and print name): K. Gomikiewicz	Date/Time: 7/14/92 1530
Received By (Please sign and print name):	Date/Time:	Relinquished By (Please sign and print name):	Date/Time:
Received By (Please sign and print name):	Date/Time:	Shipped Via: UPS BUS Fed-Ex Hand Other	Shipping #:
Work Authorized By (Please sign and print name):	Remarks: All the samples are preserved at a temperature 4°C using Iceboxes. Airbill # 884504949451 (4 coolers)		

HAZWRAP/NESSA: Y N

QC Level: 1 2 3 Other:

COC Rec	ICE
Ana Req	TEMP
Cust Seal	Ph

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: ORIGINAL - LAB, Yellow - LAB, Pink - Client

C/7??

CH2M HILL
QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project #: 7560-05
Purchase Order #:
Project Name: Whiting Field - RI/FS - Phase IIA
Company Name/CH2M HILL Office: ABB Environmental Services Inc.
Project Manager & Phone #: Mr. [X] Rao Angara Ms. [ ] (904) 656-1293
Report Copy to: Rao Angara
Requested Completion Date:
Sampling Requirements: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____
Sample Disposal: Dispose ☐ Return ☐

LAB TEST CODES

SHADED AREA -- FOR LAB USE ONLY: Lab 1 # | Lab 2 # | Quote # | Kit Request # | Project # | No. of Samples | Page | of | COC Rev | Login | LIMS Ver | Ack Gen

ANALYSES REQUESTED

Date	Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	TCL-COP-VOC's	TCL-COP-SVOC's	TCL-COP-Pest/PCB's	TAL-CIP-Metals	TAL-CIP-Total cyanide	REMARKS	LAB 1 ID	LAB 2 ID
7/14/92	1030	X		✓	✓	WHF-2A-STA8-SW01	4	0	1	1	1	1	All the TAL-CIP-Metals are preserved with HNO3 to a pH <2. All the TAL CIP Total cyanide are pres. with NaOH to a pH>12		
7/14	1110	X		✓		WHF-2A-STA8-SD01	2	0	1		1				

Sampled By & Title (Please sign and print name): [signature] P. Lcaine Sr. Tech — Date/Time: 7/14/92
Relinquished By (Please sign and print name): [signature] P. Lcaine — Date/Time: 1530 7/14/92
Received By (Please sign and print name): [signature] Gopi Kanchibhatla — Date/Time: 1530 7/14/92
Relinquished By (Please sign and print name): [signature] Gopi Kanchibhatla — Date/Time: 1530 7/14/92
Received By (Please sign and print name): — Date/Time:
Relinquished By (Please sign and print name): — Date/Time:
Received By (Please sign and print name): — Date/Time:
Shipped Via: UPS BUS Fed-Ex Hand Other____
Shipping #:
HAZWRAP/NESSA: Y N
QC Level: 1 2 3 Other:
COC Rec | ICE
Ana Req | TEMP
Cust Seal | Ph
Work Authorized By (Please sign and print name):
Remarks: All the samples are preserved at 4°C temperature

CH2M HILL

QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project # 7560-05

Purchase Order #

Project Name: Whiting Feed - RI/FS - Phase IIA

Company Name/CH2M HILL Office: ABB Environmental Services, Inc.

Project Manager & Phone #: Mr. [x] Rao Angara (904) 656-1293 Ms. [ ]

Report Copy to: Rao Angara

Requested Completion Date:

Sampling Requirements: SDWA ☐ NPDES ☐ RCRA ☐ OTHER CERCLA

Sample Disposal: Dispose ☐ Return ☐

LAB TEST CODES

SHADED AREA -- FOR LAB USE ONLY

Lab 1 # | Lab 2 #

Quote # | Kit Request #

Project #

No. of Samples | Page | of

COC Rev | Login | LIMS Ver | Ack Gen

REMARKS | LAB 1 ID | LAB 2 ID

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	TCL-COP-VOC's	TCL-COP-SVOC's	TCL-COP-PEST/PCB's	TAL-CIP-Metals	TAL-CIP-Total Cyanides
7/14/92	1430	✓	✓			WHF-2A-SW/SD-SDF801	4	0	1	1	1	1
7/14/92	925	✓	✓			WHF-2A-SW/SD-RB01	4	0	1	1	1	1

REMARKS: All TAL-CIP-Metals are preserved with HNO3 to a pH < 2. All TAL-CIP-Total Cyanides are preserved with NaOH to a pH > 12

Sampled By & Title (Please sign and print name): P. CRAINE SR TECH	Date/Time: 1345 7-14-92	Relinquished By (Please sign and print name): P. Craine	Date/Time: 7-14-92 1543	HAZWRAP/NESSA: Y N	
Received By (Please sign and print name): K. Gomi Krishna Gopi Kanchibhatla	Date/Time: 1545 7-14-92	Relinquished By (Please sign and print name): K. Gomi Krishna Gopi Kanchibhatla	Date/Time: 1545 7-14-92	QC Level: 1 2 3 Other:	
Received By (Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time	COC Rec	ICE
				Ana Req	TEMP
				Cust Seal	Ph
Received By (Please sign and print name)	Date/Time	Shipped Via: UPS BUS Fed-Ex Hand Other	Shipping #		
Work Authorized By (Please sign and print name)	Remarks: All the samples are preserved at a temperature 4° C using Ice Bags. Airbill # 4845 0494 51 4 coolers				

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: ORIGINAL - LAB, Yellow - LAB, Pink - Client

CH2M HILL

QUALITY ANALYTICAL LABORATORIES

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M HILL Project # 7560-05

Purchase Order #

Project Name: Whiting Field - RI/FS Phase II A

Company Name/CH2M HILL Office: ABB Environmental Services, Inc.

Project Manager & Phone #: Mr. [ ] Ms. [ ] Rao Angara (904) 656-1293

Report Copy to: Rao Angara

Requested Completion Date:

Sampling Requirements: SDWA NPDES RCRA OTHER

Sample Disposal: Dispose Return

LAB TEST CODES

SHADED AREA -- FOR LAB USE ONLY

Lab 1 # | Lab 2 #

Quote # | Kit Request #

Project #

No. of Samples | Page | of

COC Rev | Login | LIMS Ver | Ack Gen

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	TCL-COP-VOCs	TCL-COP-SVOCs	TCL-COP-Pest/PCBs	TAL-CIP-Metals	TAL-CIP-Total Cyanide	REMARKS	LAB 1 ID	LAB 2 ID
7/14/92	1410	X		✓		WHF-2A-STA7-SW01	4	0	1	1	1	1	All the TAL-CIP-Metals are Preserved with HNO3 to a pH < 2		
7/14/92	1420	X			✓	WHF-2A-STA7-SD01	2	0		1		1	All the TAL-CIP-Total Cyanide are preserved with NaOH to a pH > 12		

Sampled By & Title (Please sign and print name): T. CRAINE — Date/Time: 7/14/92 1545

Received By (Please sign and print name): K. Gopi Krishnan — Date/Time: 7/14/92 1545

Received By (Please sign and print name): Gopi Kanchibhatla — Date/Time: 7/14/92

Received By (Please sign and print name) — Date/Time

Work Authorized By (Please sign and print name)

Relinquished By (Please sign and print name) — Date/Time: 7/14/92 1545

Relinquished By (Please sign and print name): K. Gopi Krishnan — Date/Time: 7/14/92 1545

Relinquished By (Please sign and print name) — Date/Time

Shipped Via: UPS BUS Fed-Ex Hand Other

Shipping #

HAZWRAP/NESSA: Y N

QC Level: 1 2 3 Other:

COC Rec | ICE

Ana Req | TEMP

Cust Seal | Ph

Remarks: All the samples are preserved at 4°C Temperature by using ICE Bags. Airbill # 845049451 4 Total Coolers

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: ORIGINAL, LAB

EXHIBIT 1
REGION IV ESD FIELD OVERVIEW CHECKLIST

Section No. E.2.1
Revision No. 0
Date: 2/1/91

Facility/Site Name NAS Whiting Field

Address Milton

Project No. 07560-05 EPA ID No. N/A

Facility Contact Jim Holland Phone No.( ) N/A

Overview Personnel KEIRN Date 7/13-7/14/92

State/Contractor Project Leader Rao Angara

Affiliation ABB-ES Phone No.( )- N/A

Address TALLAHASSEE, FL

Sampling Personnel see cover memo

Other Personnel & Affiliation

Type of study? RI/FS

Study plan issued? Technical Memo Date issued? N/A

Study plan reviewed by ESD? Yes___ No✓ Acceptable? Yes___ No___

Was study plan followed? Yes✓ No___

Comments see cover memo

Was a safety plan prepared for the study? Yes✓ No___

Was the safety plan adequate? Yes✓ No___

Comments see cover memo

Was the safety plan followed? Yes✓ No___

Comments see cover memo

Additional Comments or Information

Checklist sections completed for this overview: 1 ✓ 2 ___ 3 ✓ 4 ✓ 5 ___ 6 ___
KEY: 1 General Procedures; 2 Ground Water Sampling; 3 Soil, Sediment Sampling
4 Surface Water Sampling; 5 Waste Sampling; 6 Monitoring Well Installation

SECTION 1 - GENERAL PROCEDURES - SAFETY, RECORDS, QA/QC, CUSTODY, ETC.

1) Type samples collected? Surface water / sediment

2) Were sampling locations properly selected? Yes ✓ No ___

Comments ___

3) Were sampling locations adequately documented in a bound field log book using indelible ink? Yes ✓ No ___

Comments ___

4) Were photos taken and a photolog maintained? Yes ✓ No ___

5) What field instruments were used during this study? DO meter, pH meter, Conductivity/Salinity meter, Turbidimeter

6) Were field instruments properly calibrated and calibrations recorded in a bound field log book? Yes ✓ No ___

Comments ___

7) Was sampling equipment properly wrapped and protected from possible contamination prior to sample collection? Yes ✓ No ___

Comments ___

8) Was sampling equipment constructed of Teflon®, glass, or stainless steel? Yes glass / stainless steel

9) Were samples collected in proper order? (least suspected contamination to most contaminated?) Yes ✓ No ___

Comments ___

10) Were clean disposable latex or vinyl gloves worn during sampling? Yes ✓ No ___

Comments ___

11) Were gloves changed for each sample station? Yes ✓ No ___

Comments ___

12) Was any equipment field cleaned? Yes ✓ No ____

13) Type of equipment cleaned? ____

14) Were proper field cleaning procedures used? Yes ✓ No ____

Comments ____

15) Were equipment rinse blanks collected after field cleaning? Yes ✓ No ____

Comments ____

16) Were proper sample containers used for samples? Yes ✓ No ____

Comments ____

17) Were split samples offered to the facility owner or his representative? Yes ____ No ____

Comments Not Applicable N/A

18) Was a receipt for samples form given to facility representative? N/A Yes ____ No ____

19) Were any duplicate samples collected? Yes ✓ No ____

Comments ____

20) Were samples properly field preserved? Yes ✓ No ____

Comments Note A

21) Were preservative blanks utilized? Yes ✓ No ____

Comments Note A

22) Were field and/or trip blanks utilized? Yes ✓ No ____

Comments ____

23) Were samples adequately identified with labels or tags? Yes ✓ No ____

Comments ____

24) Were samples sealed with custody seals after collection? Yes ____ No ✓

Comments Kept in possession - shipping containers sealed.

25) What security measures were taken to insure custody of the samples after collection?

Kept in custody - shipping containers sealed with COC seals

26) Were chain-of-custody and receipt for samples forms properly completed? Yes ✓ No_____

Comments_____

27) Were any samples shipped to a laboratory? Yes ✓ No_____

28) If yes to No. 27, were samples properly packed? Yes ✓ No_____

Comments_____

29) If shipped to a CLP lab, were Traffic Report Forms properly completed? Yes_____ No_____

Comments NOT APPLICABLE

30) What safety monitoring equipment, protection, and procedures were used prior to and during sampling?_____

NOTE BELOW

31) Was safety monitoring equipment properly calibrated and calibrations recorded in a bound field log book? Yes_____ No_____

Comments NOT Applicable

(30) Prior sampling indicated that no requirement for air monitoring was required. Due to the extreme heat/humidity it was decided that use of Tyvek suits would constitute a hazard greater than any potential chemical exposure. Personnel protection consisted of:

Waders and waterproof boots
rubber gloves

SECTION 3 - SAMPLING - SOIL, SEDIMENT, SLUDGE, ETC. (Non-containerized)

1) Type of samples collected? Agnatic Sediment / Wetland Sediment

2) General description of samples? Stream bottom - SAND
Wetland - mixture of SAND and organic silts

3) How many samples were collected? 12 + Field Duplicates 5 Observed

4) Were background and/or control samples collected? Yes ✓ No ____

Comments ____

5) Were representative samples collected? Yes ✓ No ____

Comments ____

6) Were grab or composite samples collected? GRAB - VOC Composite - others

7) Were composite samples areal or vertical? ~~N/A~~ Areal

8) How many aliquots were taken for the composite sample? ~~N/A~~ 2-4

9) What procedures and equipment were used to collect samples? ____
Use of Stainless steel Bucket auger

10) Were samples thoroughly mixed prior to putting them into the sample containers? Yes ✓ No ____

Comments Except for VOC fraction

11) Were samples properly placed into sample containers? Yes ✓ No ____

Comments ____

12) Were samples iced immediately after collection? Yes ✓ No ____

13) For what analyses were the samples collected? TCL / TAC List

14) If samples were split, what were the sample/station numbers for these?
N/A

15) Was a drilling rig, back hoe, etc., used to collect soil samples? NO

16) Were the drilling rig(s), backhoe(s), etc., properly cleaned according to the ESD SOP, Appendix B, prior to arriving on site? Yes ____ No N/A

Comments _____

17) What was the condition of the drilling and sampling equipment when it arrived on site? Good

18) Was a decontamination area located where the cleaning activities would not cross-contaminate clean and/or drying equipment? Yes ✓ No _____

Comments _____

19) Was clean equipment properly wrapped and stored in a clean area? Yes ✓ No _____

Comments _____

20) Was the drilling rig(s) properly cleaned between well borings? N/A Yes _____ No _____

Comments _____

21) Were the cleaning and decontamination procedures conducted in accordance with the ESD SOP? Yes ✓ No _____

Comments _____

22) Other comments or observations Need to contain / dispose of rinsate into ~~the~~ sewer system

SECTION 4 - SAMPLING - SURFACE WATER (Pond, Stream, River, Leachate, Etc.)

1) Type of samples collected? Surface water Stream/wetland

2) General description of samples? clear/slightly turbid stream. Groundwater seepage water in wetland

3) How many samples were collected? 12 & observed

4) Were background and/or control samples collected? Yes ✓ No ____

Comments ____

5) Were grab or composite samples collected? grab

6) How many aliquots were taken for the composite sample? N/A

7) What procedures and equipment were used to collect the samples? ~~direct~~ direct filling of bottles from pyrex beaker in wetland and for VOCs

8) Were samples collected directly into sample containers? Yes ✓ No ____

Comments ____

9) Did the sampler wade in the stream to collect the samples? Yes ✓ No ____

Comments ____

10) Were the samples collected upstream from the sampler? Yes ✓ No ____

Comments ____

11) Did the sampler insure that roiled sediments were not collected along with the water samples? Yes ✓ No ____

Comments ____

12) Were representative samples collected? Yes ✓ No ____

Comments ____

13) Was the pH of preserved samples checked to insure proper preservation? Yes ✓ No ____

Comments ____

14) Were samples iced immediately after collection? Yes ✓ No ____

15) For what analyses were the samples collected? TCL + TAL

16) If samples were split, what were the sample/station numbers for these?

N/A

Other comments or observations

EXHIBIT 2
EPA, REGION IV, ESD
STATE/CONTRACTOR OVERVIEWER - AUDIT CHECKSIST

1) Was a field overview checklist completed? Yes ✓ No ____

Comments ____

2) Was overviewer familiar with the facility and its operations? Yes ✓ No ____

Comments ____

3) Was overviewer trained in equipment handling and proper sampling techniques? Yes ✓ No ____

Comments ____

4) Did overviewer observe calibration of safety monitoring and/or field measurement equipment? Yes ✓ No ____

Comments ____

5) Did overviewer observe all phases of the field investigation? (Sampling, field measurements, record keeping, packing and shipping samples, etc.) Yes ✓ No ____

Comments ____

6) Did overviewer advise sampling personnel regarding improper procedures or practices whenever they were observed? Yes ✓ No ____

Comments ____

7) Did overviewer assist with the sampling, equipment decontamination or any other phase of the investigation? Yes ____ No ✓

Comments ____

8) Were there improper procedures or practices used which the overviewer failed to recognize? Yes ____ No ✓

9) Was sampling conducted in accordance with standard operating procedures specified by EPA? Yes ✓ No ____