

N00639.AR.002492
NSA MID SOUTH
5090.3a

SAMPLING AND ANALYSIS PLAN (SAP) MODIFICATION 5 FORM FOR THE SAMPLING
AND ANALYSIS PLAN FOR AREA OF CONCERN (AOC) A AND SOLID WASTE
MANAGEMENT UNIT (SWMU) 15 MILLINGTON SUPPACT TN
6/2/2016
RESOLUTION CONSULTANTS

Site Name: SWMU 15 – Former North Fuel Farm (Mod #5)		Location: NSA Mid-South; Millington, TN		CTO: JM50	
Type of modification:					
<input checked="" type="checkbox"/> Analytical method change		<input checked="" type="checkbox"/> Sampling scope (e.g., quantities)		<input checked="" type="checkbox"/> Field SOP mod	
<input type="checkbox"/> Lab SOP change		<input type="checkbox"/> Field variance (e.g., location)		<input checked="" type="checkbox"/> New field SOP	
<input type="checkbox"/> QA sample mod		<input type="checkbox"/> DQO/screening level change		<input type="checkbox"/> Personnel change	
Document (plan or SOP, including title, revision number, and date):					
<i>Draft Final Sampling and Analysis Plan – Area of Concern A – Fluvial Deposits Groundwater; Naval Support Activity Mid-South; September 2012.</i>					
<i>Draft Final Sampling and Analysis Plan Amendment – Area of Concern A – Fluvial Deposits Groundwater (SWMU 15); Naval Support Activity Mid-South; September 2014.</i>					
Proposed Modification:					
The following changes are being incorporated in the above SAP Amendment for evaluating whether sulfate reduction can be used to remediate benzene in groundwater:					
<ul style="list-style-type: none"> • Five locations will be sampled for sulfate (USEPA 300.0) and ferrous iron test kit. • Operating instructions for ferrous iron Hach test kit are attached. • Water quality parameters dissolved oxygen, pH, and ORP will also be collected from each location using the YSI. • Well locations are shown on Worksheet 17-1. 					
Reason for Change:					
New data requested by remedial vendor to evaluate remedial alternative for groundwater.					
Effective Date:					
2 June 2016					
Submitted by:			Date:		
Ben Brantley Resolution Consultants Task Order Manager			2 June 2016		
Project QA Officer Approval:			Date:		
Resolution Consultants Quality Assurance Officer 			2 June 2016		
CTO Manager Approval:			Date:		
			2 June 2016		
Internal distribution:					
<input checked="" type="checkbox"/> CTO Manager		<input checked="" type="checkbox"/> QA Officer		<input checked="" type="checkbox"/> Field Team Leader	
<input checked="" type="checkbox"/> Project file					
External Distribution:					
<input checked="" type="checkbox"/> Navy RPM		<input type="checkbox"/> Navy Chemist		<input type="checkbox"/> EPA Regulator	
<input type="checkbox"/> State Regulator					
Attachments:					
The SAP and SAP Amendment cited above will be used and Worksheets that cover the scope changes are attached to this form.					
Worksheet Figure 17-1 Worksheets #18, 19, 20, 30					



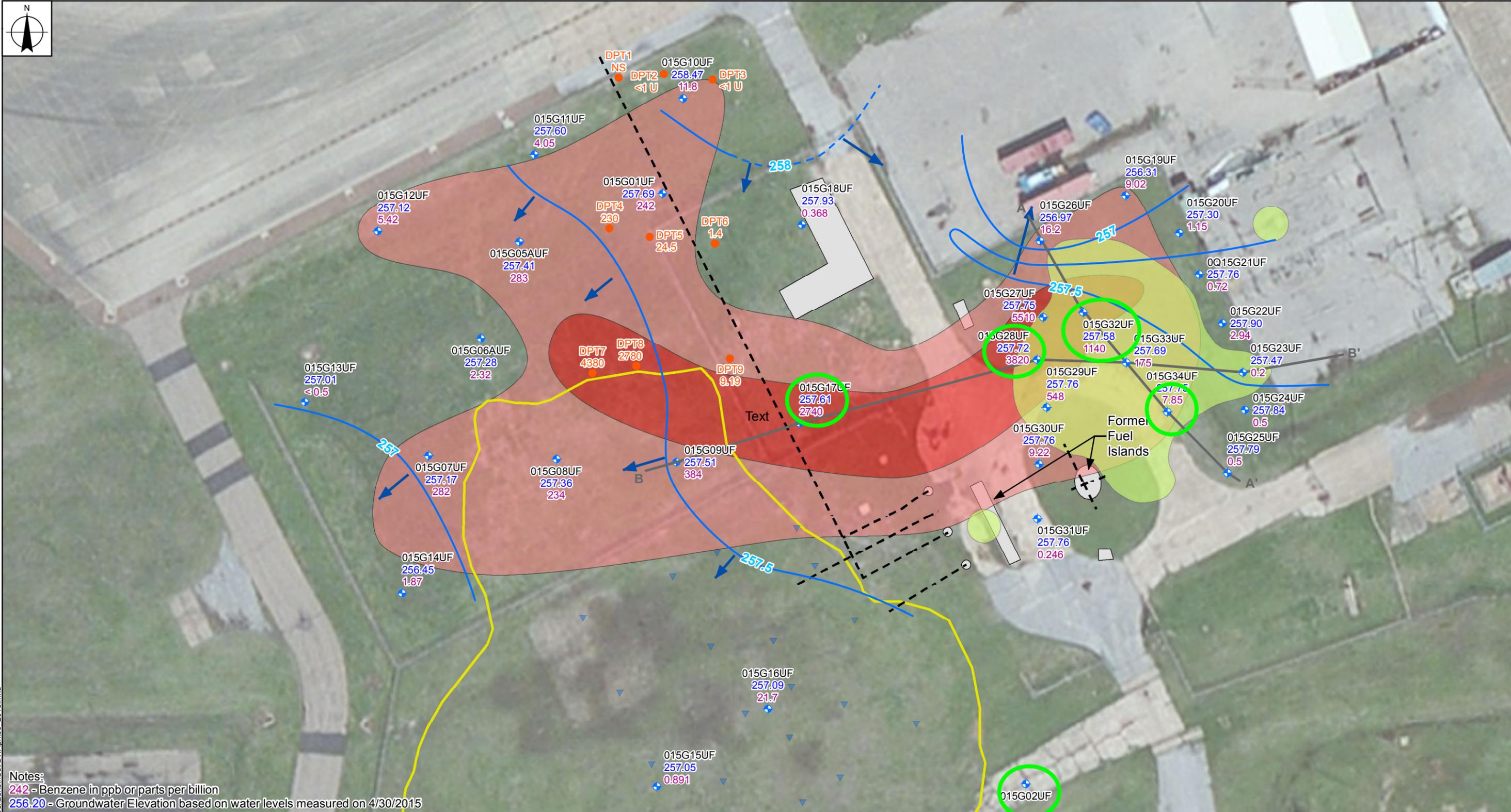
SAP WORKSHEET #18: LOCATION-SPECIFIC SAMPLING METHODS/SOP REQUIREMENT TABLE
SAP WORKSHEET #19: FIELD SAMPLING REQUIREMENTS TABLE
SAP WORKSHEET #20: FIELD QUALITY CONTROL SAMPLE SUMMARY TABLE
SAP WORKSHEET #30: ANALYTICAL SERVICES TABLE

(UFP-QAPP Manual Section 3.1.1), (UFP-QAPP Manual Section 3.5.2.3)

NSA Mid-South CTO JM 50 AOC A				Analysis Group:			Sulfate
SWMU 15 MNA Sampling – Upper Fluvial Deposits				Preparation and Analytical Method:			USEPA 300.0
Laboratory				Analytical Laboratory SOP Reference:			SOP 145
Empirical Laboratories, LLC, 621 Mainstream Drive, Suite 270, Nashville, TN 37228, (615) 345-1115, Sonya Gordon, sgordon@empirlabs.com				Data Package Turnaround Time:			21 Days
				Container Type/Volume Required:			1 – 250mL Poly
				Preservative:			Cool to ≤6°C
				Holding Time Preparation/Analysis):			28 days
	Matrix	Well ID	Sample ID	X	Y	Depth	
	Groundwater	015G02UF	015G02UF 6 16	813100.00	391544.20	46	1
	Groundwater	015G17UF	015G17UF 6 16	812980.08	391734.94	43	1
	Groundwater	015G28UF	015G28UF 6 16	813105.96	391768.27	47	1
	Groundwater	015G32UF	015G32UF 6 16	813130.16	391793.30	49	1
	Groundwater	015G34UF	015G34UF 6 16	813174.94	391740.90	41	1
QA	Field Duplicates						1
							7

Notes:

- SOP = Standard operating procedure
- °C = Degrees Celsius
- mL = Milliliters
- Field Duplicate — One per event



Notes:
 242 - Benzene in ppb or parts per billion
 256.20 - Groundwater Elevation based on water levels measured on 4/30/2015

- Upper Fluvial Monitoring Wells
- DPT Groundwater Sample (Oct./Nov. 2012)
- RFI DPT Fluvial Groundwater Sampling Point
- Approximate Location of Former Pipe Line
- Potentiometric Surface Contour - 4/30/15
- Groundwater Flow Direction
- Approximate Structure Location
- Benzene > 52 µg/kg (or Dilution Attenuation Factor = 20)
- Benzene in Groundwater Concentration Plume (µg/L) >5 ppb
- Benzene in Groundwater Concentration Plume (µg/L) >1,000 ppb
- Former SWMU 15 Removal Area

- Well Proposed for sampling Sulfate, dissolved iron, pH, ORP and DO

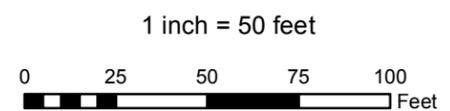


Figure 17-1
 Benzene in Soil Groundwater
 SWMU 15
 NSA Mid-South
 Millington, Tennessee

NAVFAC
 Naval Facilities Engineering Command

RESOLUTION
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REQUESTED BY: B. BRANTLEY DATE: 5/15/2015
 DRAWN BY: J. London TASK ORDER NUMBER: JM17

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Iron, Ferrous, Test Kit

IR-18C (2667200)

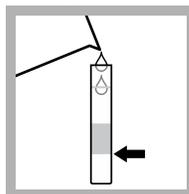
DOC326.97.00063

Test preparation

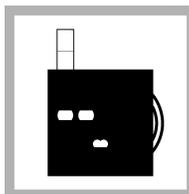
CAUTION: ⚠ *Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.*

- Analyze samples immediately after collection.
- Put the color disc on the center pin in the color comparator box (numbers to the front).
- Use the indoor light color disc when the light source is fluorescent light. Use the outdoor light color disc when the light source is sunlight.
- Rinse the tubes with sample before the test. Rinse the tubes with deionized water after the test.
- If the color match is between two segments, use the value that is in the middle of the two segments.
- If the color disc becomes wet internally, pull apart the flat plastic sides to open the color disc. Remove the thin inner disc. Dry all parts with a soft cloth. Assemble when fully dry.
- Undissolved reagent does not have an effect on test accuracy.
- To verify the test accuracy, use a standard solution as the sample.
- This test kit measures ferrous iron. To determine ferric iron (Fe^{3+}), subtract the ferrous iron result from a total iron test.

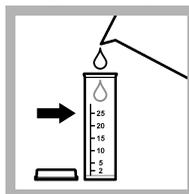
Test procedure—Iron, ferrous (0–7 mg/L Fe^{2+})



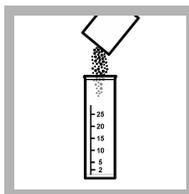
1. Fill a tube to the first line (5 mL) with sample.



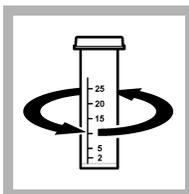
2. Put the tube into the left opening of the color comparator box.



3. Fill the vial to the 25-mL mark with sample.



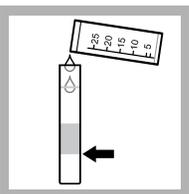
4. Add one Ferrous Iron Reagent Powder Pillow to the vial.



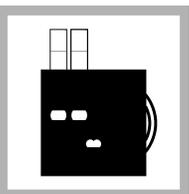
5. Swirl to mix. A orange color develops if ferrous iron is in the sample.



6. Wait 3 minutes.



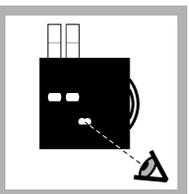
7. Fill a second tube to the first line (5 mL) with the prepared sample.



8. Put the second tube into the color comparator box.



9. Hold the color comparator box in front of a light source. Turn the color disc to find the color match.



10. Read the result in mg/L in the scale window.

Replacement items

Description	Unit	Item no.
Ferrous Iron Reagent Powder Pillows	100/pkg	103769
Color disc, iron, indoor light, 0–7 mg/L	each	9261000
Color disc, iron, outdoor light, 0–7 mg/L	each	9263700
Color comparator box	each	173200
Plastic viewing tubes, 18 mm, with caps	4/pkg	4660004
Vial with 2, 5, 10, 15, 20 and 25-mL marks	each	219300

Optional items

Description	Unit	Item no.
Caps for plastic viewing tubes (4660004)	4/pkg	4660014
Glass viewing tubes, glass, 18 mm	6/pkg	173006
Stoppers for 18-mm glass tubes and AccuVac Ampuls	6/pkg	173106
Water, deionized	500 mL	27249

