

## **Appendix E Background Areas (BGA)**

Appendix E –  
BGA 1 COC Field Copies

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## GEL Chain of Custody and Analytical Request

\*\*See www.gel.com for GEL's Sample Acceptance SOP\*\*

**GEL Laboratories, LLC**  
 2040 Savage Road  
 Charleston, SC 29407  
 Phone: (843) 556-8171  
 Fax: (843) 766-1178

Project #: \_\_\_\_\_  
 GEL Quote #: \_\_\_\_\_  
 COC Number (4): \_\_\_\_\_  
 PO Number: \_\_\_\_\_

**GEL Work Order Number:** \_\_\_\_\_

Client Name:	Phone #:	Sample Analysis Requested (5) (Fill in the number of containers for each test)															
Project/Site Name:	Fax #:	Should this sample be considered:															
Address:			Preservative Type (6)														
Collected by:	Send Results To:		Comments Note: extra sample is required for sample specific QC														
Sample ID <small>* For composites - indicate start and stop date/time</small>	*Date Collected <small>(mm-dd-yy)</small>	*Time Collected <small>(Military) (hhmm)</small>															QC Code (4)
BGA1.1.1	12/21/15																
BGA1.1.2	12/21/15																
BGA1.1.3	12/21/15																
BGA1.1.4	12/21/15																
BGA1.1.5	12/21/15																
BGA1.2.1	12/21/15																
BGA1.2.2	12/21/15																
BGA1.3.1	12/21/15																
BGA1.3.2	12/21/15																
BGA1.4.1	12/21/15																

TAT Requested: Normal: \_\_\_\_\_ Rush: \_\_\_\_\_ Specify: \_\_\_\_\_ (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards \_\_\_\_\_

Sample Collection Time Zone  
 Eastern Pacific  
 Central Other \_\_\_\_\_  
 Mountain

Chain of Custody Signatures					Sample Shipping and Delivery Details			
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time	GEL PM:		
1			1			Method of Shipment	Date Shipped	
2			2			Airbill #		
3			3			Airbill #		

1) Chain of Custody Number - Client Determined  
 2) QC Codes: N = Nominal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite  
 3) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered  
 4) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, ML = Misc Liquid, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = N  
 5) Sample Analysis Requested: Analytical method requested (i.e. 8160D, 6010D/7470A) and number of containers provided for each (i.e. 8240B - 3, 6010B/7470A - 1)  
 6) Preservative Type: HA = Hydrochloric Acid, NA = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

*For Lab Receiving Use Only*

Custody Seal Intact?  
 YES NO

Cooler Temp.  
 C

WHITE = LABORATORY      YELLOW = FILE      PINK = CLIENT

Page: \_\_\_\_\_ of \_\_\_\_\_  
 Project #:  
 GEL Quote #:  
 COC Number (1):  
 PO Number:

## GEL Chain of Custody and Analytical Request

\*\*See [www.gel.com](http://www.gel.com) for GEL's Sample Acceptance SOP\*\*

GEL Laboratories, LLC  
 2040 Savage Road  
 Charleston, SC 29407  
 Phone: (843) 556-8171  
 Fax: (843) 766-1178

GEL Work Order Number:

Client Name: \_\_\_\_\_ Phone #: \_\_\_\_\_

Sample Analysis Requested (5): (Fill in the number of containers for each test)

Project/Site Name: \_\_\_\_\_ Fax #: \_\_\_\_\_

Should this sample be considered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	← Preservative Type (6)															

Address: \_\_\_\_\_

Collected by: \_\_\_\_\_ Sent Results To: \_\_\_\_\_

**Comments**  
 Note: extra sample is required for sample specific QC

Sample ID <i>*For composites - indicate start and stop date/time</i>	Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code (n)	Field Filtered (0)	Sample Matrix (9)	Radiactive (0)	TSC A Regulated (0)	ber of (9)
BCA1.4.2	12/21/15							
BCA1.5.1	12/21/15							
BCA1.5.2	12/21/15							
BCAZ.1.1	12/21/15							
BCAZ.1.2	12/21/15							
BCAZ.1.3	12/21/15							
BCAZ.1.4	12/21/15							
BCAZ.1.5	12/21/15							
BCAZ.2.1	12/21/15							
BCAZ.2.2	12/21/15							

TAT Requested: Normal: Rush: Specify: (Subject to Surcharge) Fax Results: Yes / No

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards

Sample Collection Time Zone  
 Eastern Pacific  
 Central Other \_\_\_\_\_  
 Mountain

### Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1			1		
2			2		
3			3		

### Sample Shipping and Delivery Details

GEL PM: \_\_\_\_\_  
 Method of Shipment: \_\_\_\_\_ Date Shipped: \_\_\_\_\_  
 Airbill #: \_\_\_\_\_  
 Airbill #: \_\_\_\_\_

1.) Chain of Custody Number - Client Determined  
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite  
 3.) Field Filtered: For liquid matrices, indicate with a Y for yes the sample was field filtered or N for sample was not field filtered.  
 4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=...  
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. X260B - 3, 6010B/7470A - 1).  
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate; If no preservative is added - leave field blank

**For Lab Receiving Use Only**

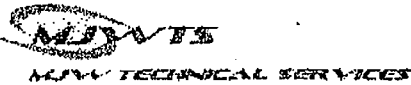
Custody Seal Intact?  
 YES NO  
 Cooler Temp:  
 C: \_\_\_\_\_

**WHITE = LABORATORY**

**YELLOW = FILE**

**PINK = CLIENT**

Appendix E –  
BGA 1 Instrument Field Sheets



Rev 1 10/18/15

Instrument Field Response Check Log

1. Instrument Information

Ratemeter: Make/Model: LUDLUM 2241-2 Serial No. 262737 Cal. Due Date: 9/2/16  
 Detector 1: Make/Model: LUDLUM 44-10 Serial No. PR 111127  
 Bicron MicroRam Meter: Serial No. A224U Cal. Due Date: 8/4/16

2. Check Source Information:

Source 1 Isotope: Th-232 Serial No.: 116 Activity: <0.1 units: µCi Assay Date: 12/30/10  
 Response Acceptance Range (+/-20%): uRem/hr +20% uRem/hr -20% net cpm + 20% 22926 net cpm -20% 15284  
 Source 2 Isotope: Cs-137 Serial No.: 87F13-48 Activity: 0.02 units: µCi Assay Date: 1/20/10  
 Response Acceptance Range (+/-20%): uRem/hr +20% uRem/hr -20% net cpm + 20% 13375 net cpm -20% 8919

3. Technician/Worker Performing Checks:

Name: STEVE KINSMAN Title: RC Date: 12/21/15 Time: 0830

4. Site or Location:

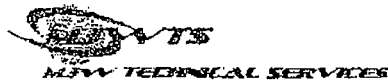
Site/Job: BGA 1 Location Description: FIELD

GPS Coordinates (when required): X-Coord: N 42 25 54.49 Y-Coord: W 78 38 17.24

Instrument Field Response*					Use Acceptance Criteria					Remarks
Meter	Bkg Cnt Time (min)	Bkg Counts (cpm) or uRem/hr	Source Cnt Time (min)	Source Response (gross cpm or uRem/hr)	+/- 20% source gross cpm or uRem/hr (Y/N)	Inst. Callib. current (Y/N)	Battery Check (Y/N)	Time Of check	Ambient Temp. (°F)	Initials and Comments (add? Info: Inst. Condition, etc.)
Ratemeter	1	6705	1	19313	Y	Y	Y	0830	48.2	TH232 SK
Ratemeter	1	6705	1	19335	Y	Y	Y	0830	48.2	Cs137 SK
Ratemeter	1	7729	1	19444	Y	Y	Y	1200	46.1	Th232 SK
Ratemeter	1	7729	1	10722	Y	Y	Y	1200	46.1	Cs137 SK
Ratemeter	1	7713	1	20402	Y	Y	Y	1500	45.1	Th232 SK
Ratemeter	1	7713	1	11311	Y	Y	Y	1500	45.1	Cs137 SK
Bicron	NA	5	NA	17	Y	Y	Y	0830	48.2	Th232 SK
Bicron	NA	6	NA	18	Y	Y	Y	1200	46.1	Th232 SK
Bicron	NA	8	NA	19	Y	Y	Y	1500	45.1	Th232 SK

- Instrument designated check source is listed on calibration sticker. Record check source response (net cpm) prior to field deployment for all check sources being used.
- Source and Background count rate should be determined from the average of three static counts at the same location. Repeat counts should be within 20%. If count rate diverges significantly, perform additional counts to evaluate instrument stability.

Appendix E –  
BGA 1 Sample Location Data Sheets



**SAMPLE LOCATION DATA SHEET**

Date: 12/21/15 Project: NY SERDA Name: J. Brown

Weather: cloudy, windy, 30's

**1. Sample Area (SA):**

SA Designation: BC-A1 Description: open field off Thurnward Dr.  
 SA Origin Location: A Coord. System: \_\_\_\_\_  
 SA Land Mark Description: \_\_\_\_\_ Coord: \_\_\_\_\_

**2. Sample Location Data:**

Sample Area ID: BC-A1.1 Matrix: Soil

Location Coord: 42° 25' 55.31" N 78° 38' 16.20" W

Alternate Location Measurements (distance from SA origin and Local Coord.)  
 X Dist. from Origin (0,0) \_\_\_\_\_ Y Dist. from Origin: \_\_\_\_\_

Site Sketch Attached (Yes) (NO):

Sample Location Description: flat, open, ~ 3" snow (clear), grass (clear)

Canopy Type: open Land Use: hiking Soil Moisture (Wet, dry, etc.): comp

**3. Location Radiation Readings:**

Count time (min)	2x2 NaI (cpm)		Bicron (uRem/hr)		Notes
	1 cm	1m	1 cm	1m	
1	7106	6576	5	4	Bios. Microorganism # A224U cal dete 8/4/10 Lidlum 2241-Z # 262737 with 44-16 probe PR 11127 cal dia
1	7294	6390			

**4. Sample Information:**

Sample Area ID: BC-A1.1.1-5 7/2/16

**Description by Depth:**

Depth Interval (cm)	Soil Type (Org; clay; sand, etc.)	Soil Color	Sample ID	Sampling Description (Surface litter type/depth, sample depth retention, refusal, stone or rock, topography, erosion features)
0-15	topsoil	dk brown	BC-A1.1.1	rocky, roots
15-30	topsoil	dk brown	BC-A1.1.2	rocky, roots
30-60	topsoil	dk brown	BC-A1.1.3	rocky, roots
60-100	topsoil	dk brown	BC-A1.1.4	rocky, roots
0-15	topsoil	dk brown	BC-A1.1.5	rocky, roots

Sample Recorded on Laboratory COC form and Container Labeled:  (Y)  (N)





**SAMPLE LOCATION DATA SHEET**

Date: 12/21/15 Project: NYSE RDA Name: J. Brown

Weather: cold, windy, 36's

**1. Sample Area (SA):**

SA Designation: BG-A1 Description: Geopline off Thompson Drive  
 SA Origin Location: \_\_\_\_\_ Coord. System: \_\_\_\_\_  
 SA Land Mark Description: \_\_\_\_\_ Coord: \_\_\_\_\_

**2. Sample Location Data:**

Sample Area ID: BG-A1.2 Matrix: Soil  
 Location Coord: 42°25'55.35" N 78°38'16.45" W

Alternate Location Measurements (distance from SA origin and Local Coord.)  
 X Dist. from Origin (0,0) \_\_\_\_\_ Y Dist. from Origin: \_\_\_\_\_

Site Sketch Attached (Yes)  (NO)

Sample Location Description: flat, open, ~3" snow (cleared), grass (cleared)

Canopy Type: open Land Use: hiking, etc. Soil Moisture (Wet, dry, etc.): damp

**3. Location Radiation Readings:**

Count time (min)	2x2 NaI (cpm)		Bicron (uRem/hr)		Notes
	1 cm	1m	1 cm	1m	
1	6659	6256	5	4	Bicron Microlog #A2241, 0.17 uSv
1	6685	6193			Carlson 2241 2# 242737 with 44-10 probe, PR 11127 cal'd

**4. Sample Information:**

Sample Area ID: BG-A1.2.1-2

**Description by Depth:**

Depth Interval (cm)	Soil Type (Org, clay, sand, etc.)	Soil Color	Sample ID	Sampling Description (Surface litter type/depth, sample depth retention, refusal, stone or rock, topography, erosion features)
0-15	topsoil	dk brown	BG-A1.2.1	rocky, roots
15-30	topsoil	dk brown	BG-A1.2.2	rocky, roots

Sample Recorded on Laboratory COC form and Container Labeled:  (Y)  (N)



**SAMPLE LOCATION DATA SHEET**

Date: 12/21/15 Project: N45LRDH Name: J. Brown

Weather: cloudy, 30's

**1. Sample Area (SA):**

SA Designation: BG-A1 Description: open field off Throckmold Drive  
 SA Origin Location: \_\_\_\_\_ Coord. System: \_\_\_\_\_  
 SA Land Mark Description: \_\_\_\_\_ Coord: \_\_\_\_\_

**2. Sample Location Data:**

Sample Area ID: BG-A1.3 Matrix: Soil  
 Location Coord: 42° 25' 55.47" N 75° 38' 16.32" W

Alternate Location Measurements (distance from SA origin and Local Coord.)  
 X Dist. from Origin (0,0) \_\_\_\_\_ Y Dist. from Origin: \_\_\_\_\_

Site Sketch Attached (Yes)  (NO)

Sample Location Description: flat, open area (wood) grass (bare)

Canopy Type: open Land Use: hiking, etc Soil Moisture (Wet, dry, etc.): \_\_\_\_\_

**3. Location Radiation Readings:**

Count time (min)	2x2 NaI (cpm)		Bicron (uRem/hr)		Notes
	1 cm	1m	1 cm	1m	
1	6742	6188	5	4	Bicron microRem # 22412 cal dly
1	6703	6103			Ludlum 22412 # 262731
					cal 4410 # PR 11127 cal dly

**4. Sample Information:**

Sample Area ID: BG-A1.3.1-2

**Description by Depth:**

Depth Interval (cm)	Soil Type (Org; clay; sand, etc.)	Soil Color	Sample ID	Sampling Description (Surface litter type/depth, sample depth retention, refusal, stone or rock, topography, erosion features)
0-15	topsoil	dk brown	BG-A1.3.1	rocky, roots
15-30	topsoil	dk brown	BG-A1.3.2	rocky, roots

Sample Recorded on Laboratory COC form and Container Labeled:  (Y)  (N)



**SAMPLE LOCATION DATA SHEET**

Date: 12/2/15 Project: NHSLRDA Name: J. Brown

Weather: cold, 20's, drizzle

**1. Sample Area (SA):**

SA Designation: BG A1 Description: open field off Thruway Dr.  
 SA Origin Location: \_\_\_\_\_ Coord. System: \_\_\_\_\_  
 SA Land Mark Description: \_\_\_\_\_ Coord: \_\_\_\_\_

**2. Sample Location Data:**

Sample Area ID: BG A1.4 Matrix: Soil  
 Location Coord: 42° 25' 55.44" N 78° 38' 16.22" W

Alternate Location Measurements (distance from SA origin and Local Coord.)

X Dist. from Origin (0,0) \_\_\_\_\_ Y Dist. from Origin: \_\_\_\_\_

Site Sketch Attached (Yes)  (NO)

Sample Location Description: flat, open ~ 3" snow (cleared), grass (cleared)

Canopy Type: open Land Use: hiking, etc Soil Moisture (Wet, dry, etc.): damp

**3. Location Radiation Readings:**

Count time (min)	2x2 NaI (cpm)		Bicron (uRem/hr)		Notes
	1 cm	1m	1 cm	1m	
1	6484	6387	5	4	Bureau Microfilm # A22416 col 100 3/4/16 in 11/16 2241-2 #202737 with 44-10 prob. # PR11127 cal date 7/2/16
1	6582	6587			

**4. Sample Information:**

Sample Area ID: BG A1.4.1-2

**Description by Depth:**

Depth Interval (cm)	Soil Type (Org; clay; sand, etc.)	Soil Color	Sample ID	Sampling Description (Surface litter type/depth, sample depth retention, refusal, stone or rock, topography, erosion features)
0-5	top soil	dk brown	BG A1.4.1	rocky, roots
5-30	top soil	dk brown	BG A1.4.2	rocky, roots

Sample Recorded on Laboratory COC form and Container Labeled:  (Y)  (N)



**SAMPLE LOCATION DATA SHEET**

Date: 1/2/16 Project: WISCONSIN Name: J. Brown

Weather: cold, wind 30s

**1. Sample Area (SA):**

SA Designation: BG A1 Description: open field off Thruway Dr  
 SA Origin Location: \_\_\_\_\_ Coord. System: \_\_\_\_\_  
 SA Land Mark Description: \_\_\_\_\_ Coord: \_\_\_\_\_

**2. Sample Location Data:**

Sample Area ID: BG A1.5 Matrix: Soil  
 Location Coord: 42° 25' 55.26" N 78° 38' 16.1" W

Alternate Location Measurements (distance from SA origin and Local Coord.)  
 X Dist. from Origin (0,0) \_\_\_\_\_ Y Dist. from Origin: \_\_\_\_\_

Site Sketch Attached (Yes)  (NO)

Sample Location Description: flat, open, ~ 3" snow (cleared), grass (cleared)

Canopy Type: Open Land Use: hiking, etc Soil Moisture (Wet, dry, etc.): dry

**3. Location Radiation Readings:**

2x2 NaI (cpm)			Bicron (uRem/hr)		Notes
Count time (min)	1 cm	1m	1 cm	1m	
1	6728	6353	4	3	Bicron MicroRm # A 2246 cal date 8/4/16 Ludlum 2241-2 # 262737 with 44-10 probe # 111127 cal date 9/2/16
1	6797	6404			

**4. Sample Information:**

Sample Area ID: BG A 1.5.1-2

**Description by Depth:**

Depth Interval (cm)	Soil Type (Org; clay; sand, etc.)	Soil Color	Sample ID	Sampling Description (Surface litter type/depth, sample depth retention, refusal, stone or rock, topography, erosion features)
0-5	topsoil	dk brown	BG A 1.5.1	rocky, roots
5-10	topsoil	dk brown	BG A 1.5.2	rocky, roots

Sample Recorded on Laboratory COC form and Container Labeled:  (Y)  (N)

Appendix E-  
BGA 1 Static Survey Table

### Background Area 1 Sampling Table

Date		Sample	Elevation				Location	Coordinates	
Collected	0-15 cm		15-30 cm	30-60 cm	60-100c cm				
12/21/15		BGA1.1.1	X				open field off	42° 25' 55.31" N	78° 38' 16.27" W
12/21/15		BGA1.1.2		X			Thornwood Drive		
12/21/15		BGA1.1.3			X				
12/21/15		BGA1.1.4				X			
12/21/15		BGA1.1.5	X						
12/21/15		BGA1.2.1	X					42° 25' 55.35" N	78° 38' 16.45" W
12/21/15		BGA1.2.2		X					
12/21/15		BGA1.3.1	X					42° 25' 55.47" N	78° 38' 16.32" W
12/21/15		BGA1.3.2		X					
12/21/15		BGA1.4.1	X					42° 25' 55.44" N	78° 38' 16.22" W
12/21/15		BGA1.4.2		X					
12/21/15		BGA1.5.1	X					42° 25' 55.26" N	78° 38' 16.1" W
12/21/15		BGA1.5.2		X					

fenced off  
 area for  
 NY SERDA  
 designated  
 background area

BGA 1.2

BGA 1.3 — 212 — BGA 1.4

BGA 1.5

BGA 1.1

Drawing not  
to scale.

Thornwood  
↓

