

12.0 DATA ASSESSMENT

12.1 GENERAL

The purpose of data quality assessment is to document that data generated under the program are accurate and consistent with project objectives. The quality of data will be assessed based on the precision, accuracy, representativeness, comparability, and completeness of the data that are generated.

Data quality assessment will be conducted in three phases:

Phase 1. Prior to data collection, sampling and analysis procedures are evaluated in regard to their ability to generate the appropriate, technically acceptable information required to achieve project objectives. This FAP/QAPP meets this requirement by establishing project objectives defined in terms of parameters, analytical methods, and required sampling protocols.

Phase 2. During data collection, results will be reviewed to assess whether procedures are efficient and effective and that the data generated provide sufficient information to achieve project objectives. The precision and accuracy of selected measurement systems will be evaluated. In general, evaluation of data will be based on performance audits, results of duplicate and spiked sample analyses, and review of completeness objectives.

Documentation may include:

- number and identity of duplicate samples collected;
- number and identity of duplicate, spike, and field blank samples analyzed;
- identification of statistical techniques, if used, to measure central tendency, dispersion, or testing for outliers;
- use of historical data and its reference;
- identification of analytical method; and
- data validation results.

Phase 3. Following completion of data collection activities, an assessment of the adequacy of the database generated in regard to completing project objectives will be undertaken by the QAO and PM. Recommendations for improved QC will be developed, if appropriate. In the event that data gaps are identified, the auditor may recommend the collection of additional raw data to fully support the project's findings and recommendations.

Each phase of the assessment will be conducted in conjunction with appropriate project staff.

13.0 CORRECTIVE ACTION

Corrective or preventive action is required when potential or existing conditions are identified that may have an adverse impact on data quantity or quality. Corrective action can be immediate or long-term. In general, any member of the program staff who identifies a condition adversely affecting quality can initiate corrective action by notifying his or her supervisor or the QAO. The communication will identify the situation requiring corrective action and explain how it may affect data quality or quantity.

13.1 IMMEDIATE CORRECTIVE ACTION

Immediate corrective action is usually applied to spontaneous, non-recurring problems, such as an instrument malfunction. The individual who detects or suspects nonconformance to previously established criteria or protocol in equipment, instruments, data, methods, etc., will immediately notify their supervisor. The supervisor and the appropriate Task Leader, Site Manager, or PM will then investigate the extent of the problem and take the necessary corrective steps. If a large quantity of data is affected, the Task Leader must prepare a memorandum to the PM and QAO. These individuals will collectively decide how to proceed. If the problem is limited in scope, the Task Leader or Site Manager will decide on the corrective action measure, document the solution and notify the PM and the QAO in memorandum form.

13.2 LONG-TERM CORRECTIVE ACTION

Long-term corrective action procedures are devised and implemented to prevent the recurrence of a potentially serious problem. The QAO will be notified of the problem and will conduct an investigation to determine the severity and extent of the problem. They will then file a corrective action request with the PM and project leaders.

In case of dispute between the QAO and the PM, the MACTEC Program Manager will make a final determination for the company.

Corrective actions may also be initiated as a result of other activities, including:

- performance audits;
- systems audits;
- laboratory/field comparison studies; and
- QA project audits conducted by the QAO.

The need for laboratory audits or field program audits will be determined on a project-specific basis as described in Section 10.

The QAO will be responsible for documenting all notifications, recommendations, and final decisions. The PM and the QAO will be jointly responsible for notifying program staff and implementing the agreed upon course of action. The QAO will be responsible for verifying the efficacy of the implemented actions. The development and implementation of preventive and corrective actions will be timed, to the extent possible, so as not to adversely impact either project schedules or subsequent data generation/processing activities. The QAO will also be responsible for developing or identifying and implementing routine program controls to minimize the need for corrective action.

14.0 REPORTS TO MANAGEMENT

Management personnel at all levels receive QA reports appropriate to their level of responsibility. The PM receives copies of all QA documentation. QC documentation is retained within the department which generated the product or service (e.g., field data documentation) except where this documentation is a deliverable for a specific contract. QC documentation is also submitted to the QAO for review and approval. Previous sections detailed the QA activities which are integral to MACTEC QA Program and the reports which they generate. A final audit report for each project may also be prepared. The reports would include:

- periodic assessment of measurement data accuracy, precision and completeness;
- results of performance audits and/or systems audits;
- significant QA problems and recommended solutions for future projects; and
- status of solutions to any problems previously identified.

Additionally, any incidents requiring corrective action will be fully documented. Procedurally, the PM will prepare the reports to management. These reports will be addressed to the Task Leader, or Site Manager and QAO. The summary of findings shall be factual, concise, and complete. Any required supporting information will be appended to the report.

15.0 SUSTAINABILITY AND GREEN REMEDIATION

Green remediation is a component of MACTEC's overall quality assurance program. Green remediation seeks to minimize ancillary environmental impacts such as greenhouse gas emissions through minimizing energy consumption, maximizing the reuse of land, and the recycling of materials.

During the drafting of project-specific FAPs, as well as within the remedial analysis in the project-specific feasibility studies and within the remedial design documents, emphasis will be placed on using green strategies and approaches. These strategies will include efforts to reduce direct and indirect emissions of carbon dioxide and other greenhouse gasses, conserve natural resources, reduce waste, and maximize habitat value.

All members of the project team will be briefed on current sustainability and green remediation strategies. This will include following guidance outlined in DER-31 (NYSDEC, 2010b).

16.0 REFERENCES

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NYSDEC, 2010b. "Green Remediation"; DER-31; Division of Environmental Remediation; Issued: August 11, 2010, Revised: January 20, 2011

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FIGURES

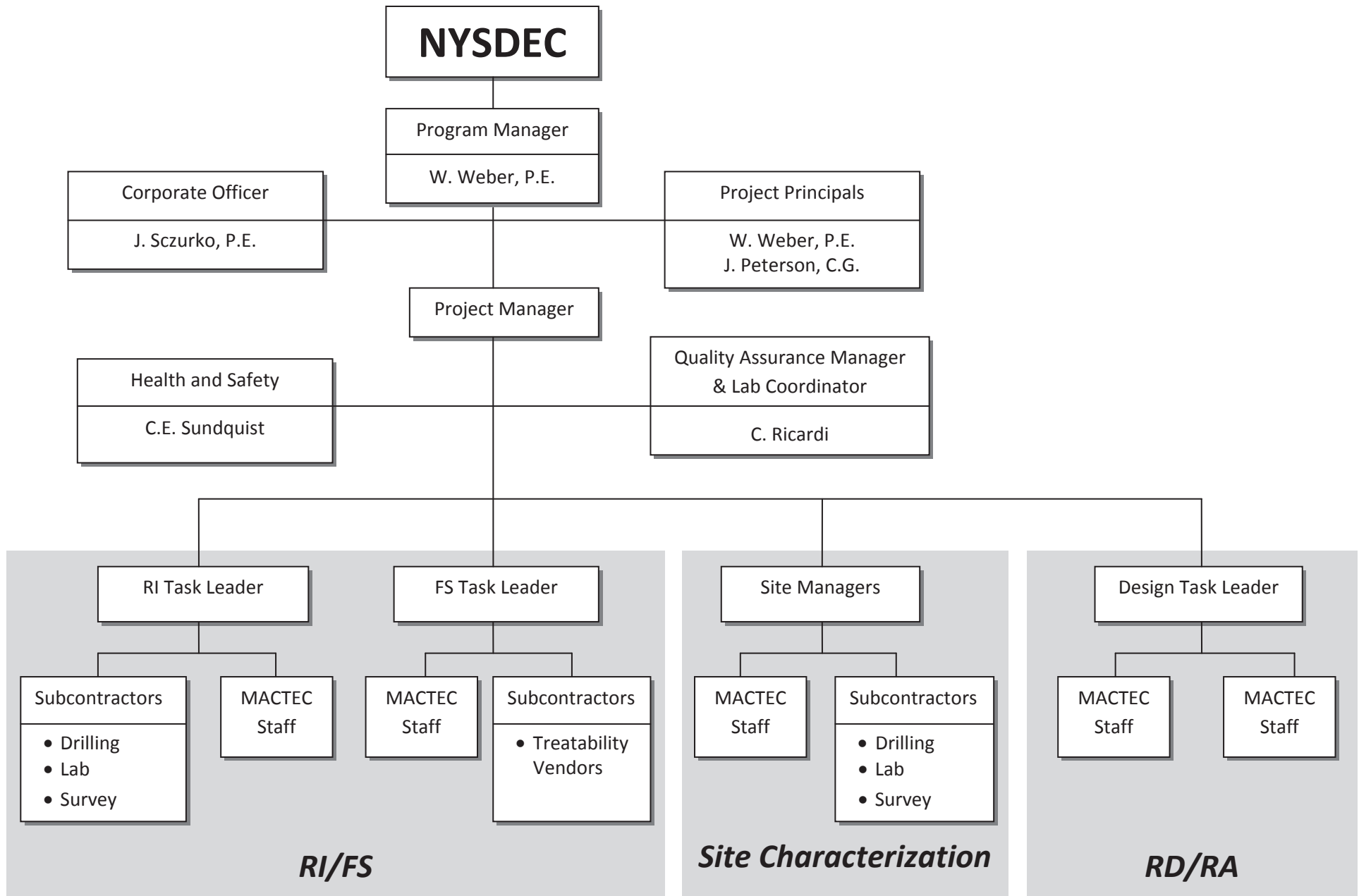
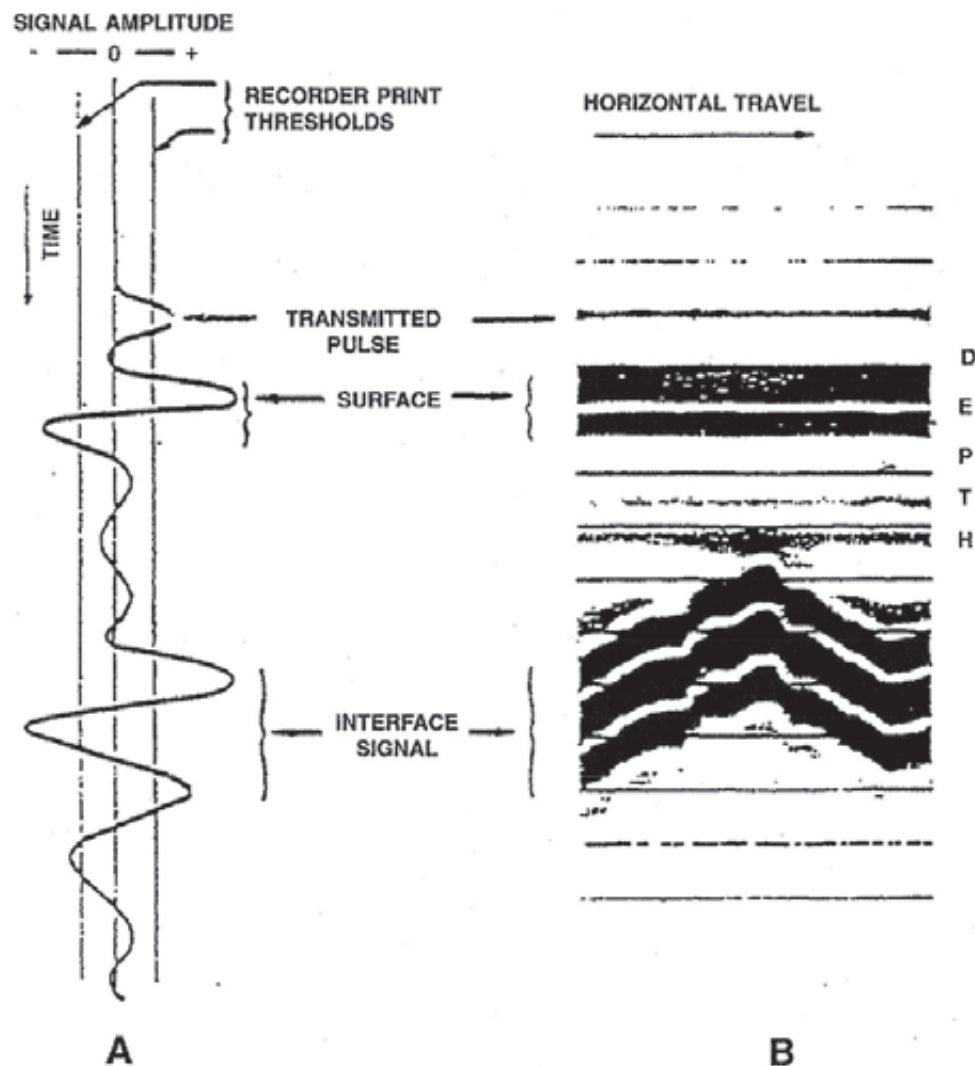


Figure 2.1
Organization Chart
NYSDEC Quality Assurance Program Plan

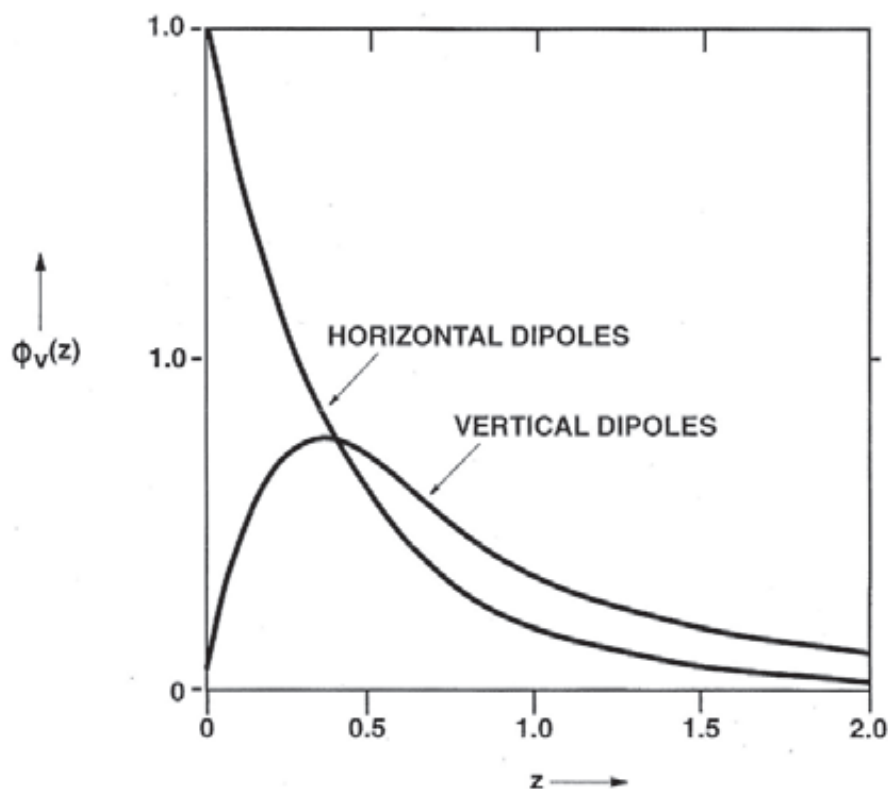


- (A) SKETCH OF A SINGLE PULSE AND REFLECTIONS AS SEEN BY THE RECEIVER.
- (B) EXAMPLE OF PROFILE INFORMATION AS DISPLAYED BY THE GRAPHIC RECORDER.



511 Congress Street
Portland, ME 04101

FIGURE 4.1
GPR SYSTEM DATA
NYSDEC QUALITY ASSURANCE PROJECT PLAN



Note: " $\Phi_V(z)$ " is the relative contribution to the secondary magnetic field intensity from material in a thin layer (dz) located at (normalized) depth " z ".

" z " is the depth of the thin layer (dz) divided by the intercoil spacing between transmitter and receiver

TEST PIT RECORD



511 Congress Street, Portland Maine 04101

Project Name:	
---------------	--

Test Pit ID: _____

Project Location:

Page No.

Project No.:	Client:
--------------	---------

Client:	of:
---------	-----

of:

Weather: _____

Photographs (Y/N):	Protection Level:
--------------------	-------------------

A diagram showing a circle labeled "Wind" with an arrow pointing upwards to a diamond labeled "N".

Surface Conditions:

Length of Exc:	Width of Exc:
----------------	---------------

Width of Exc:

Subcontractor: _____

Date Started:	Date Completed:
---------------	-----------------

Date Completed: _____

Operator:

Logged By:	Checked By:
------------	-------------

Checked By: _____

Equipment:

Refusal Depth:	Total Depth:
----------------	--------------

Total Depth:

Reference Elevation: _____

Water Level:	Time:
--------------	-------

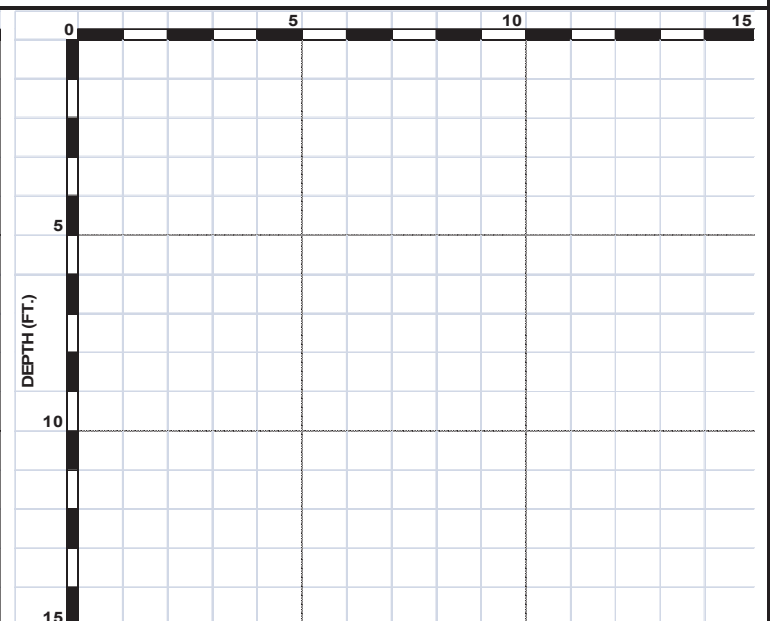
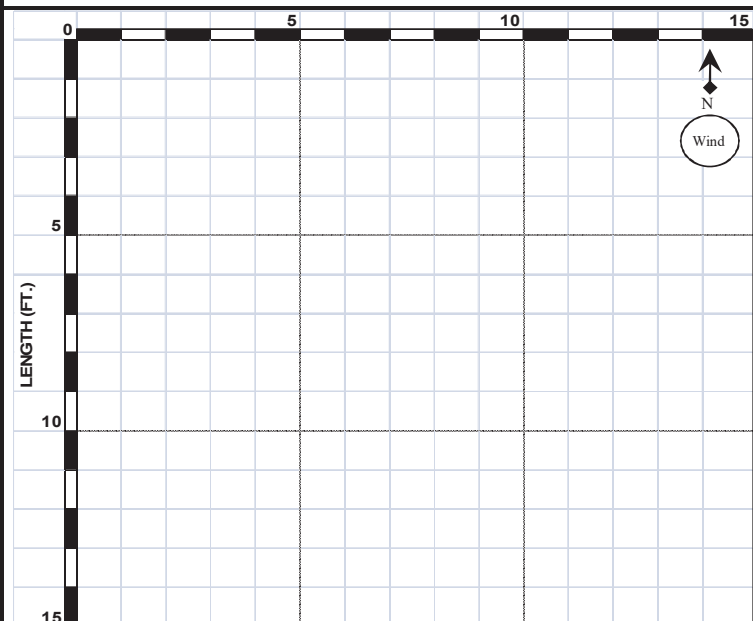
Time: _____

Sample Information			Monitoring			

[illegible]

PLAN VIEW

CROSS-SECTIONAL VIEW



TEST PIT RECORD
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

TEST PIT RECORD

NYSDEC QUALITY ASSURANCE PROGRAM PLAN

SOIL BORING LOG



511 Congress Street, Portland Maine 04101

Project Name:

Boring ID:

Project Location:

Page No.

Project No.:

Client:

of:

Boring Location:

Refusal Depth:

Total Depth:

Bore Hole ID/OD:

Weather:

Soil Drilled:

Method:

Casing Size:

Subcontractor:

P.I.D (eV):

Protection Level:

Sampler:

Driller:

Date Started:

Date Completed:

Sampler ID/OD:

Rig Type/Model:

Logged By:

Checked By: _____

Hammer Wt/Fall:

Reference Elevation:

Water Level:	
--------------	--

Time:

Hammer Type:

[illegible]

NOTES:

FIGURE 4.4

SOIL BORING LOG

NYSDEC QUALITY ASSURANCE PROGRAM PLAN

ROCK CORING LOG



511 Congress Street, Portland Maine 04101

Project Name:	
---------------	--

Boring ID:	
------------	--

Project Location:	
Project No. :	Client:

Page No.
of:

Project No.:

Client: _____

of:

Boring Location:

Refusal Depth:

Total Depth:

Bore Hole ID/OD:

Weather:

Soil Drilled:

Method:

Casing Size:

Subcontractor:

P.I.D (eV):

Protection Level:

Bit Type:

Driller:

Date Started:

Date Completed:

Bit Size:

Rig Type/Model:

Logged By: _____

Checked By: _____

Bit Use:	
----------	--

Reference Elevation: _____

Water Level:	
--------------	--

Time: _____

Core Interval:

Depth (feet bgs)									
Sample Number									
Penetration/ Recovery (feet)									
Natural Core Breaks		Type/Dip	Surface Condition	Weathered Condition					
		Total 4" Core	RQD (%)	Rock Quality Description					
Drill Rate (min/ft)									
Color									
Rock Description and Comments on Drilling									
Graphic Log									
Additional Remarks									

NOTES:

FIGURE 4.5

ROCK CORING LOG

NYSDEC QUALITY ASSURANCE PROGRAM PLAN

KEY TO SOIL DESCRIPTIONS AND TERMS

UNIFIED SOIL CLASSIFICATION SYSTEM					TERMS DESCRIBING SOILS (excludes particles > 3", organics, debris, etc.)	TERMS DESCRIBING MATERIALS i.e. particles > 3", organics, debris, etc.)			
MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	Trace: Particles present, but < 5%	Occasional: Particles present, but < 10%			
					Few: 5% - 10%	Some: 10% to 25%			
					Little: 10% - 25%	Frequent: >25%			
					Some: 25% - 45%				
COARSE-GRAINED SOILS (>50% RETAINED on the No. 200 sieve)	GRAVELS (>50% of coarse fraction RETAINED on the No. 4 sieve)	CLEAN GRAVELS (<5% fines)	GW	Well-graded gravels or gravel-sand mixtures; trace or no fines.	TERMS DESCRIBING MOISTURE		TERMS DESCRIBING STRUCTURE		
			GP	Poorly-graded gravels or gravel-sand mixtures; trace or no fines.	Dry: Absence of moisture; dusty		Layer: > 3" thick		
		GRAVEL WITH FINES (>12% fines)	GM	Silty gravels or gravel-sand-silt mixtures.	Moist: Damp, but no visible water		Seam: 1/16" to 3" thick		
			GC	Clayey gravels or gravel-sand-clay mixtures.	Wet: Visible/free water		Parting: < 1/16" thick		
	SANDS (50% or more of coarse fraction PASSES the No. 4 sieve size)	CLEAN SANDS (<5% fines)	SW	Well-graded sands or sand-gravel mixtures; trace or no fines.	CORRELATION OF STANDARD PENETRATION TEST (SPT) WITH RELATIVE DENSITY AND CONSISTENCY				
			SP	Poorly-graded sands or sand-gravel mixtures; trace or no fines.	GRAVEL, SAND & SILT (NON-PLASTIC)				
		SAND WITH FINES (>12% fines)	SM	Silty sands or sand-gravel-silt mixtures.	Relative Density		N-Value (blows per foot)		
					Very loose		0 - 4		
					Loose		5 - 10		
					Compact		11 - 30		
		Dense		31 - 50					
		Very Dense		> 51					
FINE-GRAINED SOILS (50% or more PASSES the No. 200 sieve)	SILTS AND CLAYS (liquid limit <50)		ML	Inorganic silts or rock flour, non-plastic or very slightly plastic. PI <4 or plots below "A" line.	Consistency	SPT N-Value	Su (psf)	Field Guidelines	
					Very Soft	0 - 2	0 - 250	Fist easily penetrates	
					Soft	3 - 4	250 - 500	Thumb easily penetrates	
			CL	Inorganic lean clays. Low to medium plasticity. PI >7 and plots on or above "A" line.	Medium Stiff	5 - 8	500 - 1000	Thumb penetrates with moderate effort.	
			OL	Organic silts, clays and silty clays. Low to medium plasticity.	Firm	9 - 15	1000 - 2000	Indented by thumb with great effort	
	SILTS AND CLAYS (liquid limit ≥50)		MH	Inorganic elastic silt. PI line plots on or above "A" line.	Very Stiff	16 - 30	2000 - 4000	Indented by thumbnail	
					Hard	>31	over 4000	Indented by thumbnail with difficulty	
					CH	Inorganic fat clay. High plasticity. PI line plots on or above "A" line.	ROCK QUALITY DESIGNATION (RQD)		
	HIGHLY ORGANIC SOILS		OH	Organic silts and clays. High plasticity.	RQD = sum of the lengths of intact pieces of core* >100mm (0.3ft.) length of core advance				
					*Minimum NQ rock core (1.88 in. OD of core)				
	Desired Soil Observations: (in this order) Color Primary Soil Component Secondary Soil Components Angularity and/or shape of sand/gravel particles USCS Symbol (See ASTM D 2488 Figs 1a, 1b, & 2) Density/Consistency Moisture Plasticity (as applicable) Structure Geologic Origin Fill, Alluvium, Lacustrine, Glacial Till, etc. Presence of organics (leaves, roots, rootlets, etc.) or debris (concrete, brick, wood, metal, etc.) Presence of cobbles or boulders (based on observations of drilling) Odor, PID data, Torvane or pocket penetrometer data, etc.					Quality Description		RQD	
						Very Poor		<25%	
						Poor		26% - 50%	
						Fair		51% - 75%	
Good						76% - 90%			
Excellent						>91%			
Desired Rock Observations: (in this order)									
Color (i.e. olive brown, gray, reddish brown)									
Texture (aphanitic, fine-grained, etc.)									
Lithology (igneous, sedimentary, metamorphic, etc.)									
Hardness (very hard, hard, mod. hard, etc.)									
Weathering (fresh, very slight, slight, moderate, mod. severe, severe,									
Geologic discontinuities/jointing:									
-dip (horiz - 0°-5°, low angle - 5°-35°, mod. dipping - 35°-55°, steep - 55°-85°, vertical - 85°-90°)									
-spacing (very close - <5 cm, close - 5-30 cm, mod.close 30-100 cm, wide - 1-3 m, very wide >3 m)									
-tightness (tight, open or healed)									
-infilling (grain size, color, etc.)									
Interpreted Formation (Waterville, Ellsworth, Cape Elizabeth, etc.)									
RQD and Rock Mass Description (very poor, poor, fair, etc.)									
Recovery									
Example Descriptions:									
Olive brown, fine to medium sand, little silt, trace angular gravel, SM, medium dense, moist: FILL									
- occasional concrete and brick fragments; petroleum odor; PID = 1.4 ppm									
Gray, CLAY, little fine sand, trace angular gravel, CL, stiff, moist, desiccated: LACUSTRINE									
Yellowish brown, fine SAND, trace silt, trace rounded gravel, poorly-graded, SP, loose, wet: ALLUVIUM									
- occasional partings of fine sand; 1-inch seam of olive brown silt at 8' bgs; Torvane = 0.55 tsf									



511 Congress Street, Portland, Maine

FIGURE 4.6
USCS KEY TO SOIL DESCRIPTIONS
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

WELL/PIEZOMETER CONSTRUCTION DIAGRAM STICKUP		LOCATION ID: _____	
Project Name: _____	Date Started: _____ Date Completed: _____		
Project Location: _____	Logged By: _____		
Project Number: _____ Task Number: _____	Checked By: _____ Checked Date: _____		
Subcontractor: _____ Drilling Method: _____			
Development Method: _____ Development Date: _____			
Bucking Posts/Ballards: _____			
Notes: _____			
Measuring Point Information			
Measuring Point (MP) Type	Top Of Riser		
MP Elevation (ft):	_____		

Item	Depth BMP (ft)	Elevation (ft)		Description	
Stickup	_____	_____		_____	
Riser Pipe (Top)	_____	_____		Stickup Casing Type:	_____
Ground Surface Elevation	_____	_____		Stickup Casing Diameter:	_____
				Surface Seal Type:	_____
				Backfill/Grout Type:	_____
				Riser Pipe Type:	_____
				Riser Pipe ID:	_____
				Borehole Diameter:	_____
Top of Well Seal	_____	_____		Type of Seal:	_____
Top of Sand Pack	_____	_____			
Top of Screen	_____	_____		Screen Type:	_____
				Screen ID:	_____
				Screen Slot Size:	_____
				Screen Length:	_____
Base of Screen	_____	_____		Filter/Sand Pack Type:	_____
End Cap	_____	_____	Sump:	_____	
Drilled Depth	_____	_____	Fallback/Backfill:	_____	
Bottom of Exploration	_____	_____			
Bedrock Surface	_____	_____			

NOT TO SCALE

MACTEC

PROJECT NAME	
PROJECT NUMBER	
WELL INSTALLATION DATE	WELL DEVELOPMENT DATE

LOCATION ID	PAGE
	OF
START TIME	START DATE
END TIME	END DATE

WELL DIAMETER (INCHES) ☐ 1-IN. ☐ 2-IN. ☐ 4-IN. ☐ 6-IN. ☐ 8-IN. ☐ OTHER

CASING DIAMETER (INCHES) ☐ 4-IN. ☐ 6-IN. ☐ 8-IN. ☐ 10-IN. ☐ 12-IN. ☐ OTHER

MEASUREMENT POINT (MP) ☐ TOP OF RISER (TOR) ☐ TOP OF CASING (TOC) ☐ OTHER

INITIAL WELL		FINAL WELL		SCREEN		PROT. CASING	
DEPTH (BMP)	FT	DEPTH (BMP)	FT	LENGTH	FT	STICKUP (AGS)	FT

INITIAL DTW (BMP)	FT	SEDIMENT REMOVED	FT	SCREENED INTERVAL (BMP)	TO	TOC/TOR DIFFERENCE	FT
(final well depth - initial well depth)							

WATER COLUMN		DTW AFTER DEVELOP. (BMP)		PUMPING DEPTH (BMP)		PID AMBIENT AIR	
(initial well depth - initial depth to water)	FT		FT		FT		PPH

CALCULATED		FINAL RECOVERY		APPROXIMATE		PID WELL	
GAL/VOL	GAL	DEPTH (BMP)	FT	RECHARGE RATE	FT/MIN	MOUTH	PPH
(column X well diameter squared X 0.041)							

TOTAL VOL. PURGED	GAL	FINAL RECOVERY TIME (elapsed)	MIN	FLUIDS LOST DURING DRILLING	GAL	END OF WELL DEVELOPMENT	Y 	N
(mL per minute X total minutes X 0.00026 gal/mL)								
SAMPLE TAKEN?								

FIELD PARAMETERS

[illegible]

EQUIPMENT DOCUMENTATION

☐	DEDICATED SUBMERSIBLE	☐	WATER LEVEL METER
☐	SURGE BLOCK	☐	PID _____
☐	BAILER	☐	WQ METER _____
☐	☐ 2" ☐ _____	☐	TURB. METER _____
☐	GRUNDFOS	☐	OTHER _____
☐	☐ 2" ☐ 4"	☐	OTHER _____
☐	OTHER	☐	OTHER _____

ADDITIONAL OBSERVATIONS

ADDITIONAL OBSERVATIONS		NUMBER OF GALLONS GENERATED
PURGE WATER	Y ☐ N ☐	
CONTAINERIZED	☐	

NOTES

Well Developer Signature:
Checked By:

Print Name: _____
Date: _____

WELL DEVELOPMENT CRITERIA

Well water clear to the unaided eye?
Sediment thickness remaining in well <1.0% of screen length?
Total water removed = a minimum of 5x calculated well volumes plus 5x drilling fluids lost?
Turbidity < 5NTUs?
10% change in field parameters?

WAS DEVELOPMENT CRITERIA MET? ☐ Y ☐ N

Y	N

SKETCH

GROUNDWATER/ PORE WATER GRAB SAMPLING RECORD



511 Congress Street, Portland Maine 04101

PROJECT NAME		SAMPLE LOCATION	DATE
PROJECT NUMBER		START TIME	END TIME
SAMPLE ID	SAMPLE TIME	SITE NAME/NUMBER	PAGE OF

SAMPLE TYPE ☐ GRAB ☐ WELL/PIEZOMETER ☐ GEOPROBE ☐ PORE WATER ☐ OUTFALL ☐ OTHER _____		WELL INTEGRITY YES NO N/A	
WELL DIAMETER (INCHES) ☐ 1 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ OTHER _____		CAP _____	
TUBING ID (INCHES) ☐ 1/8 ☐ 1/4 ☐ 3/8 ☐ 1/2 ☐ 5/8 ☐ OTHER _____		CASING _____	
MEASUREMENT POINT (MP) ☐ TOP OF RISER (TOR) ☐ TOP OF CASING (TOC) ☐ OTHER _____		LOCKED _____	
		COLLAR _____	
INITIAL DTW (BMP) _____ FT	FINAL DTW (BMP) _____ FT	PROT. CASING STICKUP (AGS) _____ FT	TOC/TOR DIFFERENCE _____ FT
WELL DEPTH (BMP) _____ FT	SCREEN LENGTH _____ FT	PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN _____ FT	DRAWDOWN VOLUME _____ GAL (Initial DTW - final DTW X well diam. squared X 0.041)	PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL _____ GAL (column X well diameter squared X 0.041)	TOTAL VOL. PURGED _____ GAL (mL per minute X total minutes X 0.00026 gal/mL)	DRAWDOWN/ TOTAL PURGED _____	PRESSURE TO PUMP _____ PSI

FIELD PARAMETERS

TIME	DTW (FT)	PURGE RATE (mL/min)	TEMP. (°C)	SP. CONDUCTANCE (mS/cm)	pH (units)	DISS. O ₂ (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
	BEGIN PURGING									

SAMPLE OBSERVATIONS: CLEAR _____ COLORED _____ CLOUDY _____ TURBID _____ ODOR _____ OTHER (see notes) _____

EQUIPMENT DOCUMENTATION

TYPE OF PUMP		DECON FLUIDS USED		TUBING/PUMP/BLADDER MATERIALS		EQUIPMENT USED	
☐ PERISTALTIC	☐ SUBMERSIBLE	☐ LIQUINOX	☐ DEIONIZED WATER	☐ SILICON TUBING	☐ S. STEEL PUMP MATERIAL	☐ WATER LEVEL METER	☐ PID
☐ BLADDER		☐ POTABLE WATER	☐ NITRIC ACID	☐ TEFLON LINED TUBING	☐ PVC PUMP MATERIAL	☐ WQ METER	☐ TURB. METER
☐ WATTERA		☐ HEXANE	☐ METHANOL	☐ HDPE TUBING	☐ GEOPROBE SCREEN	☐ PUMP	☐ OTHER
☐ OTHER		☐ OTHER		☐ LDPE TUBING	☐ TEFLON BLADDER	☐ OTHER	☐ OTHER
☐ OTHER		☐ OTHER		☐ OTHER	☐ OTHER	☐ FILTERS	☐ NO. _____ TYPE _____

ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS

NOTES

SKETCH

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED	YES ☐ NO ☐	NUMBER OF GALLONS GENERATED _____
NO-PURGE METHOD UTILIZED	YES ☐ NO ☐	If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

Sampler Signature:

Print Name:

Checked By:

Date:

FIGURE 4.10
GROUNDWATER/ PORE WATER GRAB SAMPLING RECORD
NYSDEC QUALITY ASSURANCE PROJECT PLAN

511 Congress Street, Portland Maine 04101

Project Name:		Boring ID:
Project Location:		Page No.
Project No.:	Client:	of:
Refusal Depth:	Total Depth:	Bore Hole ID/OD:
Soil Drilled:	Method:	Casing Size:
P.I.D (eV):	Protection Level:	Sampler:
Date Started:	Date Completed:	Sampler ID/OD:
Logged By:	Checked By:	Hammer Wt/Fall:
Water Level:	Time:	Hammer Type:
Initial He %:	Final He %:	

[illegible]

NOTES:

FIGURE 4.11
SOIL VAPOR IMPLANT SAMPLING RECORD
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

SOIL VAPOR PROBE CONSTRUCTION DIAGRAM

Project Name: _____

Project Location: _____

Project Number: _____ Task Number _____

Subcontractor: _____ Drilling Method _____

Rig Type _____ Sampling Depth _____

Notes: _____

LOCATION ID: _____

Date Started: _____ Date Completed: _____

Logged By: _____

Checked By: _____ Checked Date: _____

Measuring Point Information

Measuring Point (MP) Type: Top Of Riser

MP Elevation (ft): _____

Item	Depth BMP (ft)	Elevation (ft)	Description
Surface Casing Elevation	_____	_____	
Ground Surface Elevation	_____	_____	
Top of Bentonite Seal	_____	_____	
Top of Fill Material	_____	_____	
Top of SV Screen	_____	_____	
Base of SV Screen	_____	_____	
Drilled Depth	_____	_____	
Bottom of Fill Material	_____	_____	
Bottom of Exploration	_____	_____	
Bedrock Surface	_____	_____	

511 Congress Street, Portland Maine 04101

NOT TO SCALE

FIGURE 4.12

PERMANENT SOIL VAPOR PROBE CONSTRUCTION DIAGRAM - SINGLE POINT

NYSDEC QUALITY ASSURANCE PROJECT PLAN

SURFACE SOIL SAMPLING RECORD



PROJECT NAME	
PROJECT NUMBER	
SAMPLE ID	SAMPLE TIME

SAMPLE LOCATION	DATE
START TIME	END TIME
SITE NAME/NUMBER	PAGE OF

SAMPLE INFORMATION

TYPE OF SAMPLE

- ☐ DISCRETE
☐ COMPOSITE

QC SAMPLES

- ☐ DUPLICATE _____
☐ EQ BLK _____

MS/MSD:

- ☐ YES
☐ NO

SAMPLE INTERVAL:

TOP _____
 BOTTOM _____

TYPE OF MATERIAL:

- ☐ ORGANIC
☐ SAND
☐ GRAVEL
☐ CLAY
☐ FILL
☐ OTHER _____

COLLECTION EQUIPMENT

- ☐ HAND AUGER/CORER
☐ S.S. SPLIT BARREL
☐ ALUMINIUM PAN
☐ S.S. SHOVEL
☐ HAND SPOON/SPATULA
☐ S.S. BUCKET
☐ OTHER _____

SAMPLE OBSERVATIONS

ODOR _____
 COLOR _____
 OTHER _____
 PID _____

DECON FLUIDS USED

- ☐ ALL USED
☐ LIQUINOX/DI H₂O SOLUTION
☐ DEIONIZED WATER
☐ POTABLE WATER
☐ NITRIC ACID
☐ HEXANE
☐ 25% METHANOL/75% ASTM TYPE II H₂O
☐ ETHYL ALCOHOL

FIELD SKETCH SHOWN/ATTACHED

- ☐ YES
☐ NO

ANALYTICAL PARAMETERS

	PARAMETER	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____

NOTES

SKETCH

Sampler Signature:

Print Name:

Checked By:

Date:

FIGURE 4.13
SURFACE SOIL SAMPLING RECORD
NYSDEC QUALITY ASSURANCE PROJECT PLAN

SURFACE WATER AND SEDIMENT SAMPLING RECORD



PROJECT NAME	
PROJECT NUMBER	
SAMPLE ID	SAMPLE TIME

SAMPLE LOCATION	DATE
START TIME	END TIME
SITE NAME/NUMBER	PAGE OF

SURFACE WATER DATA

WATER DEPTH AT SAMPLE LOCATION _____ FT.
 DEPTH OF SAMPLE BELOW WATER SURFACE _____ FT.
 FLOW RATE _____ ML/MIN

WATER QUALITY PARAMETERS:

TEMPERATURE _____ °C
 SPEC. COND. _____ mS/cm
 PH _____ pH Units
 ORP _____ mV
 TURBIDITY _____ NTUs
 DO _____ mg/L
☐ WINKLER METHOD
☐ DO PROBE

EQUIPMENT USED:

☐ BEAKER
☐ BOTTLE
☐ PACS BOMB
☐ PUMP _____
☐ FILTER _____
 No. _____ Type: _____
☐ FIELD DUPLICATE COLLECTED
 DUP. ID _____

TYPE OF SURFACE WATER:

☐ STREAM
☐ RIVER
☐ LAKE
☐ POND
☐ SEEP

DECON FLUIDS USED

☐ ALL USED
☐ LIQUINOX/DI H₂O SOLUTION
☐ DEIONIZED WATER
☐ POTABLE WATER
☐ NITRIC ACID
☐ HEXANE
☐ 25% METHANOL/75% ASTM TYPE II H₂O
☐ ETHYL ALCOHOL

SAMPLING EQUIPMENT

WATER QUALITY METER MODEL NO. _____ UNIT ID NO. _____
 TURBIDITY METER MODEL NO. _____ UNIT ID NO. _____

FIELD SKETCH SHOWN/ATTACHED

☐ YES ☐ NO

SEDIMENT SAMPLE INFORMATION

TYPE OF SAMPLE

☐ DISCRETE
☐ COMPOSITE

SAMPLE INTERVAL:

TOP _____
 BOTTOM _____

QC SAMPLES

☐ DUPLICATE _____
☐ EQ BLK _____

TYPE OF MATERIAL:

☐ ORGANIC
☐ SAND
☐ GRAVEL
☐ CLAY
☐ FILL
☐ OTHER _____

COLLECTION EQUIPMENT

☐ HAND AUGER/CORER
☐ S.S. SPLIT BARREL
☐ ALUMINIUM PAN
☐ S.S. SHOVEL
☐ HAND SPOON/SPATULA
☐ S.S. BUCKET
☐ OTHER _____

DECON FLUIDS USED

☐ ALL USED
☐ LIQUINOX/DI H₂O SOLUTION
☐ DEIONIZED WATER
☐ POTABLE WATER
☐ NITRIC ACID
☐ HEXANE
☐ 25% METHANOL/75% ASTM TYPE II H₂O
☐ ETHYL ALCOHOL

MS/MSD:

☐ YES
☐ NO

SAMPLE OBSERVATIONS

ODOR _____
 COLOR _____
 OTHER _____
 PID _____

FIELD SKETCH SHOWN/ATTACHED

☐ YES
☐ NO

ANALYTICAL PARAMETERS

	PARAMETER	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____
☐	_____	_____	_____	_____	_____	_____	_____

NOTES/SKETCH

Sampler Signature: _____

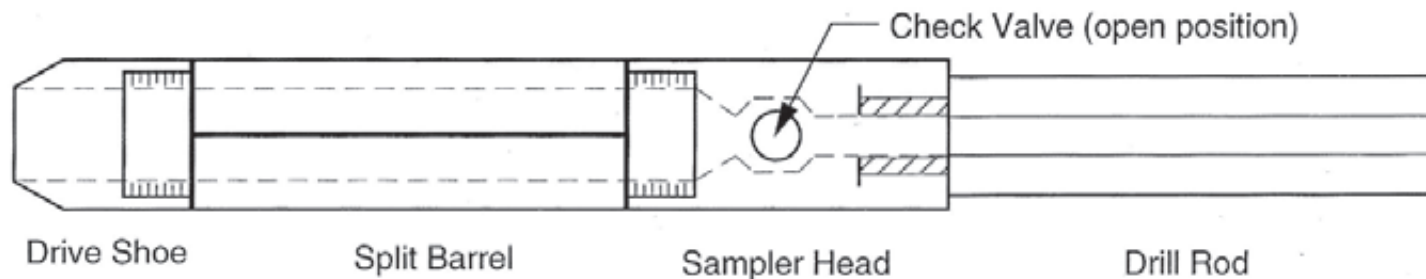
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Checked By: _____

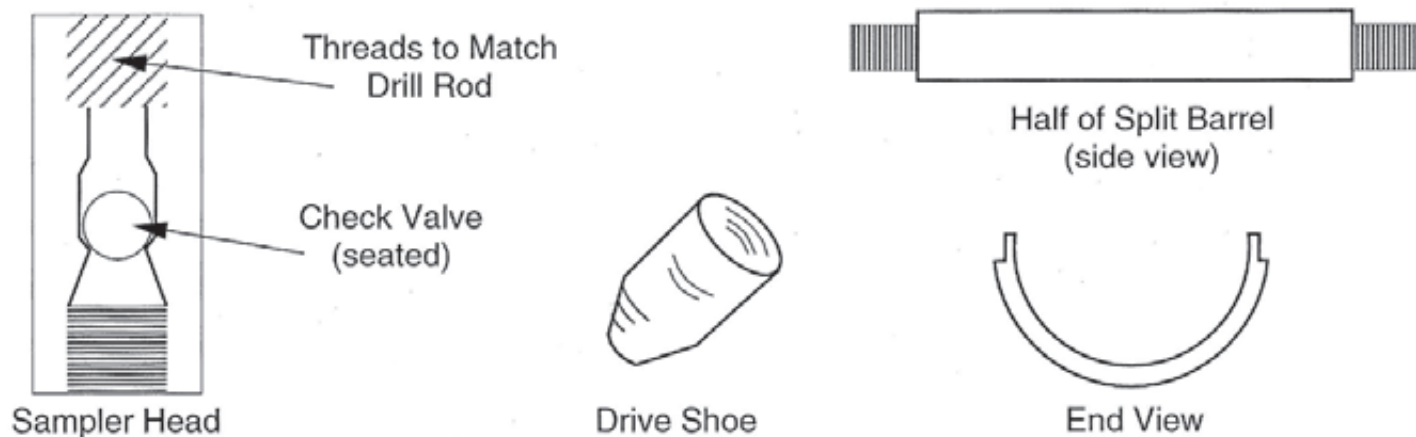
Date: _____

FIGURE 4.14
SURFACE WATER AND SEDIMENT SAMPLING RECORD
NYSDEC QUALITY ASSURANCE PROJECT PLAN

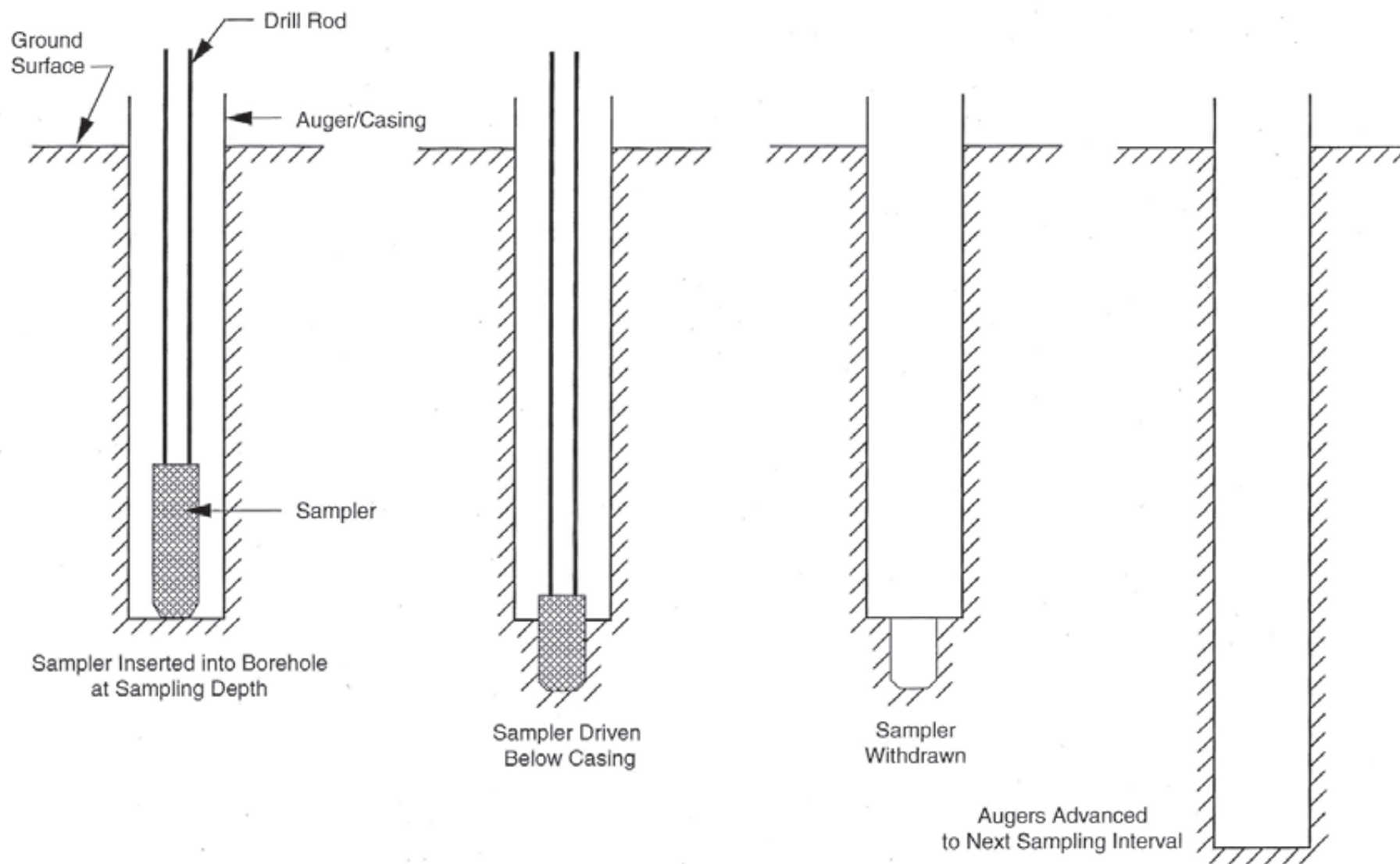
SPLIT-SPOON SAMPLER



SPLIT-SPOON SAMPLER DISASSEMBLED



NOT TO SCALE



LOW FLOW GROUNDWATER SAMPLING RECORD										
PROJECT NAME PROJECT NUMBER SAMPLE ID SAMPLE TIME				LOCATION ID START TIME SITE NAME/NUMBER		DATE END TIME PAGE OF				
WELL DIAMETER (INCHES) ☐ 1 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ OTHER _____						WELL INTEGRITY YES NO N/A				
TUBING ID (INCHES) ☐ 1/8 ☐ 1/4 ☐ 3/8 ☐ 1/2 ☐ 5/8 ☐ OTHER _____						CAP _____ CASING _____ LOCKED _____ COLLAR _____				
MEASUREMENT POINT (MP) ☐ TOP OF RISER (TOR) ☐ TOP OF CASING (TOC) ☐ OTHER _____										
INITIAL DTW (BMP)		FINAL DTW (BMP)		PROT. CASING STICKUP (AGS)		TOC/TOR DIFFERENCE				
WELL DEPTH (BMP)		SCREEN LENGTH		PID AMBIENT AIR		REFILL TIMER SETTING				
WATER COLUMN		DRAWDOWN VOLUME		PID WELL MOUTH		DISCHARGE TIMER SETTING				
CALCULATED GAL/VOL		TOTAL VOL.		DRAWDOWN/ TOTAL PURGED		PRESSURE TO PUMP				
(column X well diameter squared X 0.041)		(initial DTW- final DTW X well diam. squared X 0.041)								
		(mL per minute X total minutes X 0.00026 gal/mL)								
FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)										
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
BEGIN PURGING										
FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])									TEMP.: nearest degree (ex. 10.1 = 10) COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696) pH: nearest tenth (ex. 5.53 = 5.5) DO: nearest tenth (ex. 3.51 = 3.5) TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101) ORP: 2 SF (44.1 = 44, 191 = 190)	
EQUIPMENT DOCUMENTATION										
TYPE OF PUMP		DECON FLUIDS USED		TUBING/PUMP/BLADDER MATERIALS		EQUIPMENT USED				
☐ PERISTALTIC	☐	☐ LIQUINOX	☐	☐ SILICON TUBING	☐	☐ S. STEEL PUMP MATERIAL	☐	☐ WL METER		
☐ SUBMERSIBLE	☐	☐ DEIONIZED WATER	☐	☐ TEFLON TUBING	☐	☐ PVC PUMP MATERIAL	☐	☐ PID		
☐ BLADDER	☐	☐ POTABLE WATER	☐	☐ TEFLON LINED TUBING	☐	☐ GEOPROBE SCREEN	☐	☐ WQ METER		
	☐	☐ NITRIC ACID	☐	☐ HDPE TUBING	☐	☐ TEFLON BLADDER	☐	☐ TURB. METER		
☐ WATTERA	☐	☐ HEXANE	☐	☐ LDPE TUBING	☐	☐ OTHER _____	☐	☐ PUMP		
☐ OTHER _____	☐	☐ METHANOL	☐	☐ OTHER _____	☐	☐ OTHER _____	☐	☐ OTHER _____		
☐ OTHER _____	☐	☐ OTHER _____	☐	☐ OTHER _____	☐	☐ OTHER _____	☐	☐ FILTERS	NO. _____ TYPE _____	
ANALYTICAL PARAMETERS										
	PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS		
☐										
☐										
☐										
☐										
☐										
☐										
☐										
PURGE OBSERVATIONS				SKETCH/NOTES						
PURGE WATER CONTAINERIZED		YES ☐ NO ☐	NUMBER OF GALLONS GENERATED _____							
NO-PURGE METHOD UTILIZED		YES ☐ NO ☐	If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.							
Sampler Signature:				Print Name:						
Checked By:				Date:						
FIGURE 4.17 LOW FLOW GROUNDWATER SAMPLING RECORD NYSDEC QUALITY ASSURANCE PROJECT PLAN										

GROUNDWATER USAGE SURVEY

Name: _____

Address: _____

Telephone Number: () _____

DOMESTIC WATER SOURCE: (Circle One) Private Well City Water Supply

Do you foresee any changes in this source in the future ? _____

If so, what ? _____

If you have a private well:

How deep ? _____ How old ? _____ Diameter ? _____ Drilled or Dug ? _____

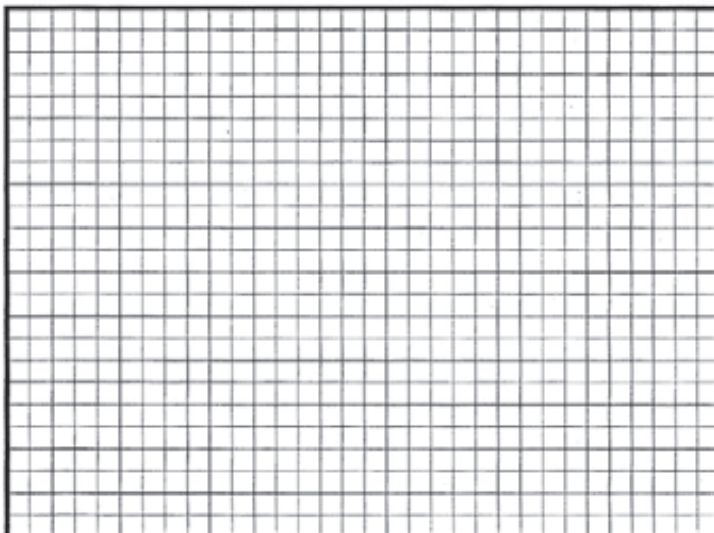
Plumbing material (Circle One) PVC (Plastic) Copper

Is the line connected to a Water Softening or other Treatment System ? _____

Any problems ? (color, odor, taste, staining, inadequate supply) _____

SEWAGE SYSTEM: (Circle One) Private Septic System City Sewer Line

Any problems ? _____



Please sketch Well location, and
Septic system with approximate
distances to each other.

INDOOR AIR SAMPLING RECORD

PROJECT NAME: _____ LOCATION ID: _____ DATE: _____
 PROJECT NO./TASK NO.: _____ CLIENT: _____
 PROJECT LOCATION: _____ SAMPLER NAME: _____
 WEATHER CONDITIONS (AM): _____ SAMPLER SIGNATURE: _____
 WEATHER CONDITIONS (PM): _____ CHECKED BY: _____ DATE: _____

SUMMA Canister Record Information

SUB-SLAB SOIL VAPOR SAMPLE		BASEMENT INDOOR AIR SAMPLE		FIRST FLOOR AIR SAMPLE		AMBIENT AIR SAMPLE	
Flow Regulator Number:		Flow Regulator Number:		Flow Regulator Number:		Flow Regulator Number:	
Flow Rate (mL/min):		Flow Rate (mL/min):		Flow Rate (mL/min):		Flow Rate (mL/min):	
Canister Serial Number:		Canister Serial Number:		Canister Serial Number:		Canister Serial Number:	
Start Date/Time		Start Date/Time		Start Date/Time		Start Date/Time	
Start Pressure ("Hg):		Start Pressure ("Hg):		Start Pressure ("Hg):		Start Pressure ("Hg):	
Stop Date/Time		Stop Date/Time		Stop Date/Time		Stop Date/Time	
Stop Pressure ("Hg):		Stop Pressure ("Hg):		Stop Pressure ("Hg):		Stop Pressure ("Hg):	
Sample ID:		Sample ID:		Sample ID:		Sample ID:	

Other Sampling Information:

Finished Basement, Crawl Space, Unfinished		Story/Level:		Story/Level:		Direction from Building	
Floor Slab Thickness:		Room:		Room:		Distance from Building:	
Potential Vapor Entry Points:		Potential Vapor Entry Points:		Potential Vapor Entry Points:		Distance from Roadway:	
Floor Surface:		Floor Surface:		Floor Surface:		Ground Surface:	
Noticable Odor:		Noticable Odor:		Noticable Odor:		Noticable Odor:	
PID Reading (ppb):		PID Reading (ppb):		PID Reading (ppb):		PID Reading (ppb):	
Intake Depth/Height:		Intake Height:		Intake Height:		Intake Height above Ground Surface:	
Helium Test Conducted? Breakthrough %:		Indoor Air Temp		Indoor Air Temp		Intake tubing?	

Comments/Location Sketch:

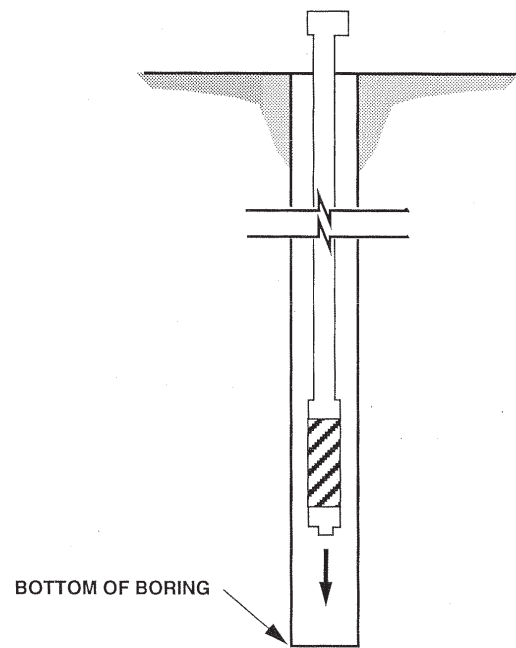
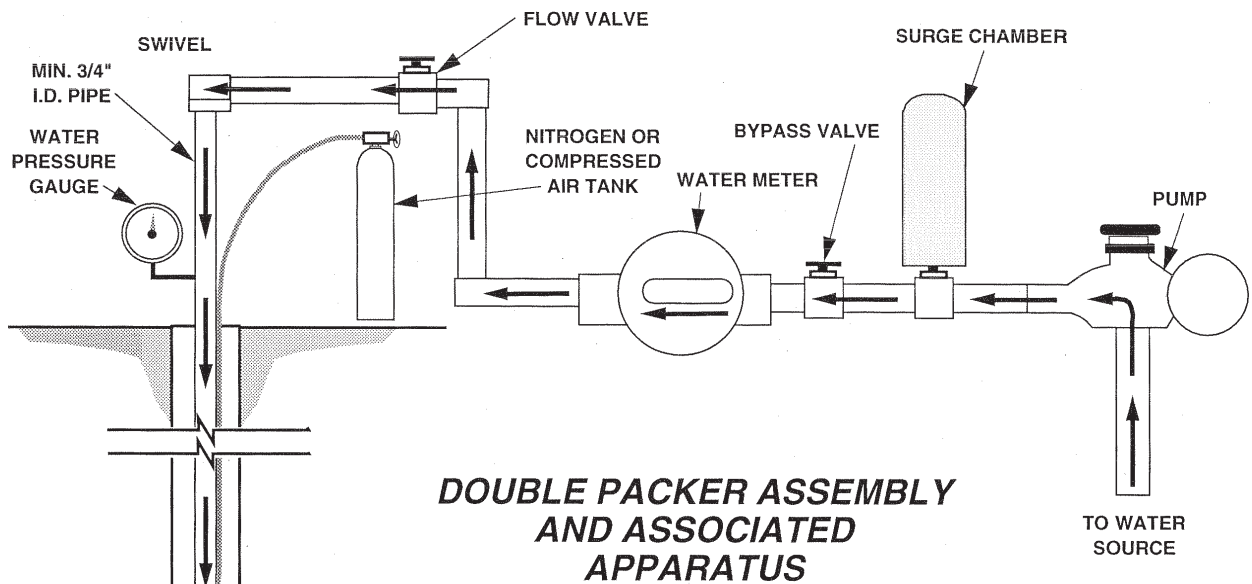


511 Congress Street, Portland, ME 04101

FIGURE 4.19
INDOOR AIR SAMPLING RECORD
NYSDEC QUALITY ASSURANCE PROJECT PLAN

AQUIFER TEST COMPLETION CHECKLIST

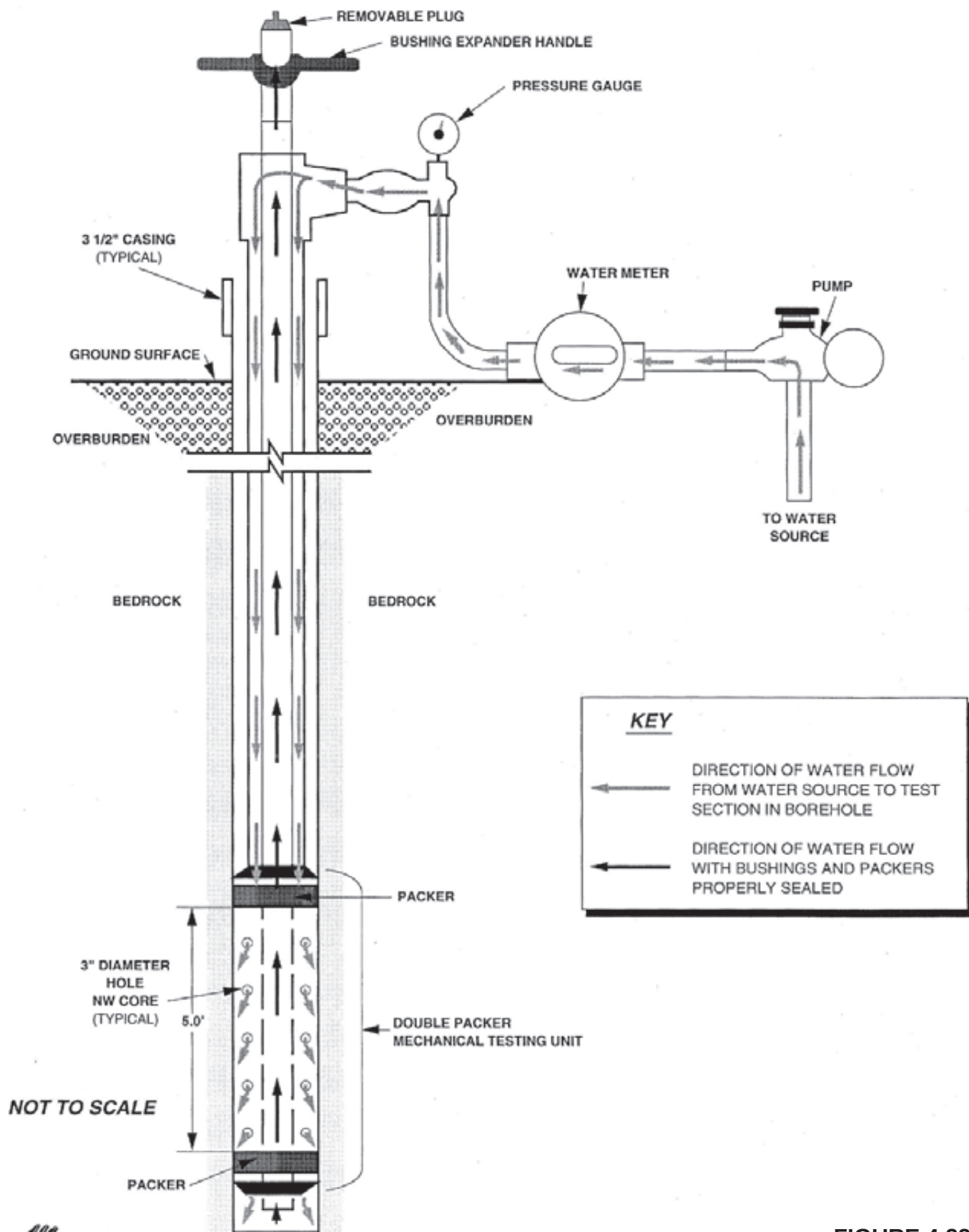
SETUP	DATE	AQUIFER TEST NO. _____ PERFORMED BY: _____
MONITORING WELL ID		
DATE OF TEST		
TYPE OF TEST		
HERMIT TYPE/SERIAL#		
TEST #		
DATA COLLECTION RATE		
TRANSDUCER		
SERIAL #		
PSIG		
SCALE FACTOR		
OFFSET		
INPUT CHANNEL		
TEST DATA		
INPUT MODE (TOC/SUR)		
STATIC WATER LEVEL (FT./TOC)		
WELL DEPTH (FT./TOC)		
XD DEPTH (FT./TOC)		
INITIAL XD REFERENCE		
SLUG DEPTH (FT./TOC)		
TIME OF SLUG PLACEMENT		
TIME OF WL EQUILIBRATION		
NEW XD REFERENCE		
START TIME OF TEST		
END TIME OF TEST		
NOTES:		



NOT TO SCALE

MACTEC
511 Congress Street
Portland, ME 04101

FIGURE 4.2
EXAMPLE OF PACKER TEST SET UP
NYSDEC QUALITY ASSURANCE PROGRAM PLAN



MACTEC
 511 Congress Street
 Portland, ME 04101

FIGURE 4.22
SCHEMATIC OF MECHANICAL PACKER
PRESSURE TEST AND RELATED EQUIPMENT
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

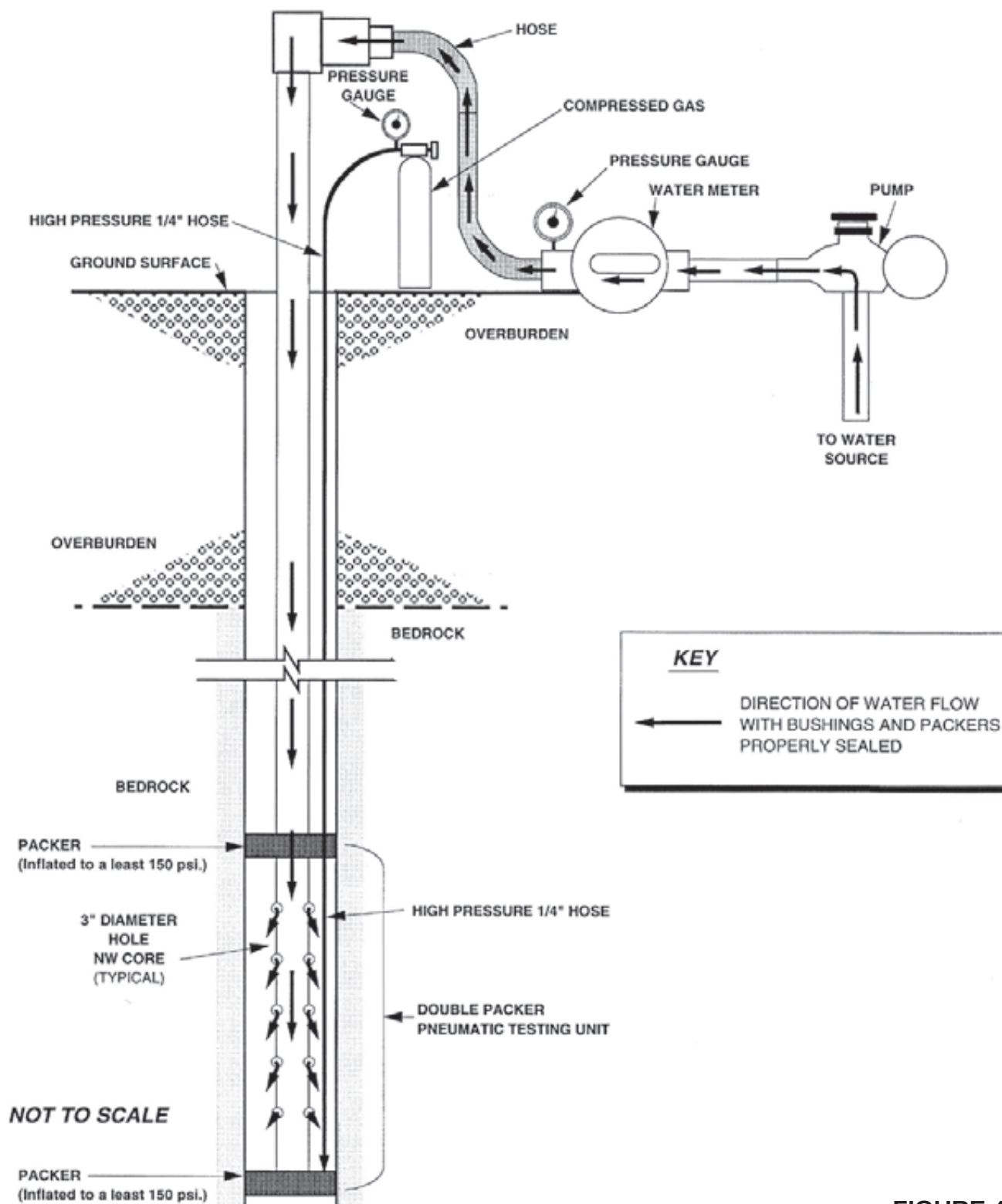


FIGURE 4.2
SCHEMATIC OF PNEUMATIC PACKER
PRESSURE TEST AND RELATED EQUIPMENT
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

PACKER TEST LOG

	Packer System	Water Meter	Water Gauge	Surge Chamber	Boring Number: _____
Type:					Test Numbers: _____
Manufacturer:					Job Number: _____
Model Number:					Location: _____
M.G.P. = (0.566 to 1.0) x Z					Elevation: _____
Computed Maximum Gauge Press (mgp): _____					Date Start: _____
Computed Internal Friction: _____					Date Finish: _____
Rock Type: _____					Driller: _____
Hole Radius (Feet): _____					Geologist: _____

[illegible]

FIGURE 4.24
PACKER TEST LOG
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

 MACTEC, Inc. 511 Congress Street P.O. Box 7050 Portland, ME 04112-7050		CHAIN OF CUSTODY FORM				Page ____ of ____		
		Agreed Turnaround Time ☐ 24 hour ☐ 72 hour ☐ 5 Day ☐ 10 Day ☐ 3 Week ☐ Other		Lab Batch No.		Lab ID:		
		Seals Intact? ☐ Yes ☐ No ☐ NA		Shipping Container Damage? ☐ Yes ☐ No ☐ NA				
PROJECT INFO			LABORATORY INFO			INVOICE (if other than MACTEC contact)		
MACTEC Contact		Project No.	Laboratory Name		Phone	Company Name		Phone
Project Title/No.		Purchase Order No.	Laboratory Contact		Fax	Company Contact		Fax
Address			Address			Address		
City/State/Zip			City/State/Zip			City/State/Zip		
Special Handling Instructions								
Lab Sample No.	Date/Time Collected	Sample ID.	Sample Type ¹	Sample Media ²	[C]omposite [G]rab	Sample Volume	Sample Location/Depth/Fraction/Etc. (describe if necessary)	Requested Analysis
¹ Type		² Sample Media		³ Analysis Requested		Relinquished by: Date/Time		Relinquished by: Date/Time
BIO - In-Vitro		VOL - Volumetric		ALPHA - Alpha Spec.		Received by: Date/Time		Received by: Date/Time
RS - Rad		AF - Air Filter		GROSS - Gross beta/gamma		Relinquished by: Date/Time		Relinquished by: Date/Time
EN - Environ.		WIPE - Smear		GAMMA - Gamma Spec.		Received by: Date/Time		Received by: Date/Time
MIX - Rad + Chem		LIQ - Liquid		LSC - Liquid Scintillation		Relinquished by: Date/Time		Relinquished by: Date/Time
HAZ - Hazardous		OTH - Other (describe)		OTH - Other (describe)		Received by: Date/Time		Received by: Date/Time
OTH - Other (describe)								

WHITE: Laboratory Copy

YELLOW: Report Copy

PINK: MACTEC Copy

FIGURE 5.1
CHAIN OF CUSTODY RECORD

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: _____ TASK NO: _____ DATE: _____
 PROJECT NUMBER: _____ MACTEC CREW: _____
 PROJECT LOCATION: _____ SAMPLER NAME: _____
 WEATHER CONDITIONS (AM): _____ SAMPLER SIGNATURE: _____
 WEATHER CONDITIONS (PM): _____ CHECKED BY: _____ DATE: _____

MULTI-PARAMETER WATER QUALITY METER

METER TYPE _____	<u>AM CALIBRATION</u>				<u>POST CALIBRATION CHECK</u>		
MODEL NO. _____	Start Time _____/End Time _____				Start Time _____/End Time _____		
UNIT ID NO. _____	Units	Standard Value	Meter Value	*Acceptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
pH (4)	SU	4.0	_____	+/- 0.1 pH Units			
pH (7)	SU	7.0	_____	+/- 0.1 pH Units	7.0	_____	+/- 0.3 pH Units
pH (10)	SU	10.0	_____	+/- 0.1 pH Units			
Redox	+/- mV	240	_____	+/- 10 mV	240	_____	+/- 10 mV
Conductivity	mS/cm	1.413	_____	+/- 0.5 % of standard	1.413	_____	+/- 5% of standard
DO (saturated)	%	100	_____	+/- 2% of standard			
DO (saturated) mg/L ¹ (see Chart 1)			_____	+/- 0.2 mg/L			+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	_____	< 0.5 mg/L			
Temperature	°C		_____				
Baro. Press.	mmHg		_____				

TURBIDITY METER

METER TYPE _____	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
MODEL NO. _____						
UNIT ID NO. _____	<0.1 Standard	NTU	<0.1	<0.1	_____	+/- 0.3 NTU of stan.
	20 Standard	NTU	20	20	_____	+/- 5% of standard
	100 Standard	NTU	100	100	_____	+/- 5% of standard
	800 Standard	NTU	800	800	_____	+/- 5% of standard

PHOTOIONIZATION DETECTOR

METER TYPE _____	Background	ppmv	<0.1	<0.1	_____	within 5 ppmv of BG
MODEL NO. _____						
UNIT ID NO. _____	Span Gas	ppmv	100	100	_____	+/- 10% of standard

O₂-LEL 4 GAS METER

METER TYPE _____	Methane	%	50	50	_____	+/- 10% of standard
MODEL NO. _____	O ₂	%	20.9	20.9	_____	+/- 10% of standard
UNIT ID NO. _____	H ₂ S	ppmv	25	25	_____	+/- 10% of standard
	CO	ppmv	50	50	_____	+/- 10% of standard

OTHER METER

METER TYPE _____						See Notes Below
MODEL NO. _____						for Additional
UNIT ID NO. _____						Information

- ☐ Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.
☐ Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

		<u>Cal. Standard Lot Number</u>	<u>Exp. Date</u>
Deionized Water Source: _____	Portland FOS	pH (4) _____	_____
Lot#/Date Produced: _____		pH (7) _____	_____
Trip Blank Source: _____		pH (10) _____	_____
Sample Preservatives Source: _____		ORP _____	_____
Disposable Filter Type: _____	0.45µm cellulose	Conductivity _____	_____
Calibration Fluids / Standard Source:		<0.1 Turb. Stan. _____	_____
- DO Calibration Fluid (<0.1 mg/L)	Portland FOS	20 Turb. Stan. _____	_____
- Other _____		100 Turb. Stan. _____	_____
- Other _____		800 Turb. Stan. _____	_____
- Other _____		PID Span Gas _____	_____
		O ₂ -LEL Span Gas _____	_____
		Other _____	_____

NOTES:

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.



FIGURE 6.1
FIELD INSTRUMENT CALIBRATION RECORD
NYSDEC QUALITY ASSURANCE PROJECT PLAN

FIGURE 8.1: FINAL RESULTS CROSS TABULATION TABLE

Parameter	Lab Sample Id	X4779-20		X4779-21		X4826-01		X4826-02		X4826-06	
	SDG	X4779		X4779		X4826		X4826		X4826	
	Location	MW-13D		MW-3		MW-16L		MW-16U		GW-14	
	Field Sample Id	HTMWD1302601XX		HTMW00301801XX		HTMW16L03001XX		HTMW16U02201XX		HTGW01402501XX	
	Field Sample Date	10/3/2006		10/3/2006		10/4/2006		10/4/2006		10/9/2006	
	Qc Code	FS		FS		FS		FS		FS	
		Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1,1-Trichloroethane		10	U	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane		10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloro-1,2,2-Trifluoroethane		10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane		10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethane		10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethene		10	U	10	U	10	U	10	U	10	U
1,2,4-Trichlorobenzene		10	U	10	U	10	U	10	U	10	U
1,2-Dibromo-3-chloropropane		10	U	10	U	10	U	10	U	10	U
1,2-Dibromoethane		10	U	10	U	10	U	10	U	10	U
1,2-Dichlorobenzene		10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethane		10	U	10	U	10	U	10	U	10	U
1,2-Dichloropropane		10	U	10	U	10	U	10	U	10	U
1,3-Dichlorobenzene		10	U	10	U	10	U	10	U	10	U
1,4-Dichlorobenzene		10	U	10	U	10	U	10	U	10	U
2-Butanone		50	U	50	U	50	U	50	U	50	U
2-Hexanone		50	U	50	U	50	U	50	U	50	U
4-Methyl-2-pentanone		50	U	50	U	50	U	50	U	50	U
Acetic acid, methyl ester		10	U	10	U	10	U	10	U	10	U
Acetone		50	U	50	U	50	U	50	U	50	U
Benzene		10	U	10	U	10	U	10	U	10	U
Bromodichloromethane		10	U	10	U	10	U	10	U	10	U
Bromoform		10	U	10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U	10	U
Carbon disulfide		10	U	10	U	10	U	10	U	10	U
Carbon tetrachloride		10	U	10	U	10	U	10	U	10	U
Chlorobenzene		10	U	10	U	10	U	10	U	10	U
Chlorodibromomethane		10	U	10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U	10	U
Chloroform		10	U	10	U	10	U	10	U	10	U
Chloromethane		10	U	10	U	10	U	10	U	10	U
Cis-1,2-Dichloroethene		10	U	0.88	J	9.8	J	6.4	J	23	
cis-1,3-Dichloropropene		10	U	10	U	10	U	10	U	10	U
Cyclohexane		10	U	10	U	10	U	10	U	10	U
Dichlorodifluoromethane		10	U	10	U	10	U	10	U	10	U
Ethyl benzene		10	U	10	U	10	U	10	U	10	U

FIGURE 8.1: FINAL RESULTS CROSS TABULATION TABLE

Parameter	Lab Sample Id	X4779-20		X4779-21		X4826-01		X4826-02		X4826-06	
	SDG	X4779		X4779		X4826		X4826		X4826	
	Location	MW-13D		MW-3		MW-16L		MW-16U		GW-14	
	Field Sample Id	HTMW1302601XX		HTMW00301801XX		HTMW16L03001XX		HTMW16U02201XX		HTGW01402501XX	
	Field Sample Date	10/3/2006		10/3/2006		10/4/2006		10/4/2006		10/9/2006	
	Qc Code	FS		FS		FS		FS		FS	
		Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Isopropylbenzene		10	U	10	U	10	U	10	U	10	U
Methyl cyclohexane		10	U	10	U	10	U	10	U	10	U
Methyl Tertbutyl Ether		10	U	10	U	10	U	10	U	10	U
Methylene chloride		10	U	10	U	10	U	10	U	10	U
o-Xylene		10	U	10	U	10	U	10	U	10	U
Styrene		10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		10	U	10	U	10	UJ	10	UJ	10	U
Toluene		10	U	10	U	10	U	10	U	10	U
trans-1,2-Dichloroethene		10	U	10	U	10	U	10	U	10	U
trans-1,3-Dichloropropene		10	U	10	U	10	U	10	U	10	U
Trichloroethene		15		25		10		11		9.1	J
Trichlorofluoromethane		10	UJ	10	UJ	10	U	10	U	10	U
Vinyl chloride		10	U	10	U	5.5	J	0.97	J	10	U
Xylene, m/p		10	U	10	U	10	U	10	U	10	U

Notes:

Results in micrograms per liter (µg/L)

Samples analyzed for VOCs by EPA Method OLM04.2

QC Code:

FS = Field Sample

FD = Field Duplicate

TB = Trip Blank

Qualifiers:

U = Not detected at a concentration greater than the RL

J = Estimated Value

D = Analyte was reported from a diluted analytical run.

B = Analyte was detected in the method blank

DELIVERABLE REVIEW TRACKING FORM

Project Title:

Project No.:

Client: New York State Department of Environmental Conservation (NYSDEC)

Deliverable Title:

Author(s):

Date to be Shipped:

Due Date to Client:

ASPECTS REVIEWED	DRAFT REPORT	
	REVIEWED BY	DATE
Format/Organization (PM)		
Conforms to Scope (PM)		
Technical Approach (TR)		
Computations Checked (TR)		
Figures Checked (TR)		
Tables Checked (TR)		
Conclusions/Recommendations (TR)		
Two Signatures/Sealed (PM)		
Budget (if applicable) (PM)		
All Comments Addressed (PM/TL)		

FINAL REVIEW RELEASE SIGNATURES:

Project Manager:

Date:

Principal Reviewer:

Date:

NOTES:

1. Retain this form in Project File
2. All blocks are not applicable to all deliverables
3. TL = Technical Lead
TR = Technical Reviewer
PM = Project Manager

Figure 9.1

TABLES

TABLE 2.1
SUBCONTRACTOR CORRECTIVE ACTION STEPS
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

1.	MACTEC visits subcontractors' facilities prior to initiating subcontract relationship
2.	CS and procurement staff develop, negotiate, and issue clear and concise subcontract agreement protecting the NYSDEC's and MACTEC's interests
3.	CS and procurement staff communicate to the subcontractor assigned roles and responsibilities of the MACTEC project team
4.	CS and PM maintain regular contact regarding subcontractor's technical performance and any deviations from scope and schedule
5.	CS and PM review subcontractor invoices for conformance to contract terms and conditions
6.	CS and PM attempt to resolve any issues with subcontractor's authorized representative
7.	CS and PM require subcontractor progress reports describing scope, schedule, and budget conformance
8.	CS and PM solicit Program Manager and other senior MACTEC staff advice on non-routine issues
9.	CS and Program Manager involve subcontractors' senior management in unresolved issues
10.	CS and PM invoke applicable financial penalties
11.	CS and Program Manager consider subcontract termination if subcontract allows and performance problems are well-documented and unresolvable
12.	Refuse further subcontract associations

Notes:

CS = Contract Specialist
MACTEC = MACTEC Engineering and Consulting
NYSDEC = New York State Department of Environmental Conservation
PM = Project Manager

TABLE 4.1
SAMPLE CONTAINER, PRESERVATION AND HOLD TIME REQUIREMENTS

NYSDEC QUALITY ASSURANCE PROGRAM PLAN

PARAMETER	MEDIUM	CONTAINER	VOLUME REQUIREMENTS	PRESERVATION	HOLDING TIMES ¹
<u>Volatiles Organics</u>	M			P	
TCL VOCs	Low Soil/Sediment	VOA Vial*	Fill - no headspace*	Cool, 4°C*	14 days
	Low Soil/Sediment	VOA Vial - field preserved	5 g	Freeze within 48 hours	14 days
	Low Soil/Sediment	VOA Vial - field preserved	5 g	Cool, 4°C with sodium bisulfate	14 days
	High Soil/Sediment	VOA Vial - field preserved	10 g	Cool, 4°C with methanol	14 days
	Groundwater/Liquid	glass, Teflon® lined septa	(2) 40 mL	Cool, 4°C HCL to pH <2	14 days
<u>Extractable Organics</u>					
TCL SVOCs, TCL Pesticides/PCBs	Soil/Sediment Groundwater/Liquid	Glass, Teflon® lined lid Glass, Teflon® lined cap	100 g (2) 1-L	Cool, 4°C Cool, 4°C	14 days extract/40 days analyze 7 days extract/40 days analyze
<u>Inorganics</u>					
TAL Inorganics	<u>Soil/Sediment</u>	Glass	2g	Cool, 4°C	6 months
Mercury		Glass	1g	Cool, 4°C	28 days
Cyanide		Glass	10g	Cool, 4°C	14 days
Hexavalent Chromium		Glass	2g	Cool, 4°C	24 hrs.
TAL Inorganics	<u>Groundwater/Liquid</u>	Glass or Polyethylene	450 mL	HNO ₃ to pH<2, 4°C	6 months
Mercury		Glass or Polyethylene	200 mL	HNO ₃ to pH<2, 4°C	28 days
Cyanide		Glass or Polyethylene	1 L	NaOH to pH>12, 4°C	14 days
Hexavalent Chromium		Glass or Polyethylene	500 mL	Cool, 4°C	24 hrs.
<u>TCLP</u>					
VOCs	Soil/Sediment	Glass, Teflon® lined lid	3x100g	Cool, 4°C	7 days extraction/7 days analyze
SVOCs	Soil/Sediment	Glass, Teflon® lined lid	200g	Cool, 4°C	7 days extraction/7 days extraction/40 days analyze
Mercury	Soil/Sediment	Glass, Teflon® lined lid	200g	Cool, 4°C	7 days extraction/28 days analyze
Inorganics	Soil/Sediment	Glass, Teflon® lined lid	200g	Cool, 4°C	180 days extraction/180 days analyze
Pesticides	Soil/Sediment	Glass, Teflon® lined lid	200g	Cool, 4°C	7 days extraction/40 days analyze
Herbicides	Soil/Sediment	Glass, Teflon® lined lid	200g	Cool, 4°C	7 days extraction/40 days analyze
Ignitability	Soil/Sediment	Glass, Teflon® lined lid	25g	Cool, 4°C	28 days
Reactivity	Soil/Sediment	Glass, Teflon® lined lid	40g	Cool, 4°C	28 days

TABLE 4.1
SAMPLE CONTAINER, PRESERVATION AND HOLD TIME REQUIREMENTS

NYSDEC QUALITY ASSURANCE PROGRAM PLAN

PARAMETER	MEDIUM	CONTAINER	VOLUME REQUIREMENTS	PRESERVATION	HOLDING TIMES ¹
Corrosivity	Soil/Sediment	Glass, Teflon® lined lid	30g	Cool, 4°C	28 days

Notes:* Only if directed by NYSDEC PM

¹ All holding times are from date of sample collection.

°C = Celsius
 g = gram
 Hg = mercury
 HNO₃ = nitric acid
 L = liter

mL = milliliter
 NaOH = sodium hydroxide
 PCB = polychlorinated biphenyls
 SVOC = semivolatile organic compound
 TAL = Target Analyte List
 TCL = Target Compound List
 VOC = volatile organic compound

TABLE 4.2
APPROXIMATE ELECTROMAGNETIC PROPERTIES
OF VARIOUS MATERIALS

MATERIAL	RELATIVE DIELECTRIC PERMITIVITY	PULSE VELOCITY (ns/ft)
Air	1	1
Freshwater	81	9
Seawater	81	9
Sand (dry)	4 - 6	2.1 - 2.4
Sand (saturated)	30	5.5
Silt (saturated)	10	3.1
Clay (saturated)	8 - 12	2.8 - 3.3
Average "dirt"	16	4
Dry sandy coastal land	10	3.1
Marshy forested flat land	12	3.5
Rich agricultural land	15	3.9
Pastoral land, hilly, forested	13	3.6
Freshwater ice	4	2.0
Permafrost	4 - 8	2.0 - 2.9
Granite (dry)	5	2.2
Limestone	7 - 9	2.6
Concrete	6.4	2.5
Asphalt	3 - 5	1.7 - 2.5

Notes:

ns/ft = nanoseconds per foot

Table 6.1: Field Instrument Calibration

Instrument	Activity	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA
pH Probe	Calibrate probe with up to three temperature-equilibrated standards to bracket expected pH values on site.	Daily-before use Calibration check - at end of day, or if instrument gives erratic results	Stable readings ± 0.1 pH units within 3 minutes	If probe reading fails to stabilize, do not use. Check/replace membrane and recalibrate or service as necessary. Repeat analysis of affected samples or qualify data if analysis cannot be repeated.	Task Leader and Field Samplers
DO Probe	Calibrate with 2 standards – saturated DO standard and 0.0 mg/L DO standard	Daily-before use Calibration check - at end of day, or if instrument gives erratic results	± 0.2 mg/L before use. ± 0.5 mg/L for end of day calibration check.	If DO reading exceeds criterion, recalibrate or service as necessary. Repeat analysis of affected samples or qualify data if analysis cannot be repeated.	Task Leader and Field Samplers
Specific Conductance Electrode	Calibrate electrode with a standard solution close to expected sample values.	Daily-before use Calibration check - at end of day, or if instrument gives erratic results	$\pm 5\%$ of standard or ± 10 mS/cm of standard (whichever is greater)	If sp. conductance electrode reading exceeds criterion, then clean probe or service as necessary and recalibrate. Repeat analysis of affected samples or qualify data if analysis cannot be repeated.	Task Leader and Field Samplers
Thermistor-Temperature Sensor	Calibrate against NIST-certified thermometer annually.	Calibration check –prior to onset of program	± 0.2 °C of NIST certified thermometer.	If temperature sensor reading exceeds criterion, then clean probe, or service as necessary and recalibrate. Repeat analysis of affected samples or qualify data if analysis cannot be repeated.	Task Leader and Field Samplers

Table 6.1: Field Instrument Calibration

Instrument	Activity	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA
Turbidimeter	Hach-calibrate with <0.1, 20, 100, and 800 NTU standards.	Daily-before use Calibration check-at end of day, or if instrument gives erratic results	$\pm 5\%$ per scale.	If turbidity reading exceeds criterion, then calibrate or service as necessary. Repeat analysis of affected samples or qualify data if analysis cannot be repeated.	Task Leader and Field Samplers
ORP/ Eh Probe	Calibrate against a Hanna solution.	Daily-before use Calibration check -at end of day, or if instrument gives erratic results	± 10 mV of standard	If ORP/Eh reading exceeds criterion, then have manufacture recalibrate. Repeat analysis of affected samples or qualify data if analysis cannot be repeated.	Task Leader and Field Samplers
FID	Calibrate with 100 ppmV methane standard. Blank: zero air check	Daily-before use Calibration check – at end of day, or if instrument gives erratic results	$\pm 10\%$ of true value	Recalibrate or service; rerun affected sample.	Task Leader and Field Samplers
PID	Calibrate with 100 ppmV isobutylene standard. Blank: zero air check	Daily-before use Calibration check – at end of day, or if instrument gives erratic results	$\pm 10\%$ of true value	Recalibrate or service; rerun affected sample.	Task Leader and Field Samplers

TABLE 7.1
ELECTRONIC DATA DELIVERABLE REQUIREMENTS
NYSDEC QUALITY ASSURANCE PROJECT PLAN

Equis "EZEDD01" Field Name	data type	Required For "EDD"	Description	"TED" Table	"TED" Column
project_code	1 Text20	X	This field contains the internal project_code used by TED to identify a unique site. This will be provided to the lab on a per project basis.	Location	Site_id
sample_name	2 Text30	X	This field contains the sample number as written in the Analysis Request and Chain of Custody (AR/COC) form sent to the laboratory with the field samples for analysis. This is a unique number assigned to each sample by sampling personnel. For laboratory samples enter "LAB QC".	sample_collection	field_sample_id
sys_sample_code	3 Text20				
sample_date	4 Date	X	mm/dd/yyyy. Date sample was collected in the field. Date information must be identical with the date from the AR/COC form. Leave blank for lab samples. Year may be entered as yyyy.	sample_collection	field_sample_date
sample_time	5 Time				
analysis_location	6 Text2				
lab_name_code	7 Text10	X	Laboratory that performed the analysis.	sample_analysis	lab_id
lab_sample_id	8 Text20	X	Unique sample ID internally assigned by the laboratory.	sample_analysis	lab_sample_id
sample_type_code	9 Text10	X	Specifies sample type. For field samples, enter FS (regular environmental sample), otherwise, use values listed in the LOV. For example, normal field samples must be distinguished from laboratory method blank samples, etc.	sample_collection	qc_code
Lab_Del_Group	10 Text20	X	Tracking code used by the laboratory. Commonly called Sample Delivery Group (SDG).	sample_analysis	lab_sample_delivery_group
Lab_Batch_Number	11 Text20		Tracking number used by the laboratory to identify a group of samples analyzed in the same batch. This field, in conjunction with laboratory blank ID, is used to link the relationship between field samples and laboratory blank and other QC samples.		
lab_anl_method_name	12 Text35	X	Test method used in the analysis of the analyte.	sample_analysis	analysis_method

TABLE 7.1
ELECTRONIC DATA DELIVERABLE REQUIREMENTS
NYSDEC QUALITY ASSURANCE PROJECT PLAN

Equis "EZEDD01" Field Name	data type	Required For "EDD"	Description	"TED" Table	"TED" Column
cas_rn	13 Text15	X	Unique analyte identifier. Use assigned CAS number when one is identified for an analyte. Tentatively Identified Compounds (TICs) and a number of other analytes are not assigned a standard CAS number. The laboratory is required to assign a UNIQUE identifier for all chemical_names.	sample_analysis_results	casno
chemical_name	14 Text60	X	Name of analyte or parameter analyzed.		
result_value	15 Text20	X	Must only be a numeric value. It is stored as a string of characters so that significant digits can be retained. Must be identical with values presented in the hard copy. Analytical result is reported left justified. Reported as the reporting_detection_limit for non-detects.	sample_analysis_results	lab_result
lab_qualifiers	16 Text7	X	Qualifier flags assigned by the laboratory.	sample_analysis_results	lab_qualifier
result_unit	17 Text15	X	This format assumes that the result value and detect limit have the same units.	sample_analysis_results	result_uom
result_type_code	18 Text10	X	Type of result (TIC, target analyte, etc.)	sample_analysis_results	result_type
detect_flag	19 Text2	X	Enter "Y" for detected analytes or "N" for non-detected analytes.	sample_analysis_results	report_hit_flag
reporting_detection_limit	20 Text20	X	Must only be a numeric value. Use the value of the Reported Detection Limit (RDL), Practical Quantitation Limit (PQL), or Contract Required Quantitation Limit. Value is stored as a string to retain significant figures. Unit of measure must be identical with result_unit value.	sample_analysis_results	detection_limit
dilution_factor	21 Text6	X	Must be a numeric entry. The factor by which the sample was diluted as part of the preparation process. If no dilution was done, enter the value 1. Value is stored as a string to retain significant figures.	sample_analysis	dilution_factor
sample_matrix_code	22 Text10	X	Code which distinguishes between different type of sample matrix. For example, soil samples must be distinguished from ground water samples, etc. Valid codes for HESE are "G" (gas), "L" (liquid), "S" (solid), and "P" (free or raw liquid product).	sample_collection	matrix

TABLE 7.1
ELECTRONIC DATA DELIVERABLE REQUIREMENTS
NYSDEC QUALITY ASSURANCE PROJECT PLAN

Equis "EZEDD01" Field Name	data type	Required For "EDD"	Description	"TED" Table	"TED" Column
total_or_dissolved (or fraction)	23 Text1	X	Must be "T" for total metal concentration, "D" for dissolved or filtered metal concentration, or "N" for organic (or other) parameters for which neither "total" nor "dissolved" is applicable. Also, HESE requires "C" for TCLP and "S" for SPLP fractions.	sample_analysis	fraction
basis	24 Text10				
analysis_date	25 Date	X	mm/dd/yyyy. Date sample was analyzed.	sample_analysis	analysis_date
analysis_time	26 Time				
method_detection_limit	27 Text20				
lab_prep_method_name	28 Text35		Description of sample preparation or extraction method.	sample_analysis	prep_method_name
prep_date	29 Date	X	mm/dd/yyyy. This field is used to determine whether holding times for field samples have been exceeded.	sample_analysis	extraction_date
prep_time	30 Time				
test_batch_id	31 Text20				
result_error_delta	32 Text20				
TIC_retention_time	33 Text8				
qc_level	34 Text10		Laboratory QC level associated with the analysis	sample_analysis	qc_level
result_comment	35 Text255		Any comments related to the analysis.	sample_analysis_results	comments
sample_quantitation_limit (may be REQUIRED FIELD for certain projects)	36 Text20		Must only be a numeric value. Use the value of the Sample Quantitation Limit (SQL). Value is stored as a string to retain significant figures. Unit of measure must be identical with result_unit value.	sample_analysis_results	TBD

Note: All "X" marked fields are minimum data required to load data to "TED".

APPENDIX A

INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY FORM (FROM NYSDOH FINAL VAPOR INTRUSION GUIDANCE – OCTOBER 2006)

**NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH**

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No. _____

Purpose of Investigation _____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ____)

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential
Industrial

School
Church

Commercial/Multi-use
Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other: _____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors _____ Building age _____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

Airflow near source

Outdoor air infiltration

Infiltration into air ducts

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

- a. Above grade construction: wood frame concrete stone brick
- b. Basement type: full crawlspace slab other _____
- c. Basement floor: concrete dirt stone other _____
- d. Basement floor: uncovered covered covered with _____
- e. Concrete floor: unsealed sealed sealed with _____
- f. Foundation walls: poured block stone other _____
- g. Foundation walls: unsealed sealed sealed with _____
- h. The basement is: wet damp dry moldy
- i. The basement is: finished unfinished partially finished
- j. Sump present? Y / N
- k. Water in sump? Y / N / not applicable

Basement/Lowest level depth below grade: _____ (feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard
Space Heaters	Stream radiation	Radiant floor
Electric baseboard	Wood stove	Outdoor wood boiler
		Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in: Basement Outdoors Main Floor Other _____

Air conditioning: Central Air Window units Open Windows None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)

Basement	
1 st Floor	
2 nd Floor	
3 rd Floor	
4 th Floor	

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

- | | |
|--|------------------------------------|
| a. Is there an attached garage? | Y / N |
| b. Does the garage have a separate heating unit? | Y / N / NA |
| c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) | Y / N / NA
Please specify _____ |
| d. Has the building ever had a fire? | Y / N When? _____ |
| e. Is a kerosene or unvented gas space heater present? | Y / N Where? _____ |
| f. Is there a workshop or hobby/craft area? | Y / N Where & Type? _____ |
| g. Is there smoking in the building? | Y / N How frequently? _____ |
| h. Have cleaning products been used recently? | Y / N When & Type? _____ |
| i. Have cosmetic products been used recently? | Y / N When & Type? _____ |

- j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____
- k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____
- l. Have air fresheners been used recently? Y / N When & Type? _____
- m. Is there a kitchen exhaust fan? Y / N If yes, where vented? _____
- n. Is there a bathroom exhaust fan? Y / N If yes, where vented? _____
- o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N
- p. Has there been a pesticide application? Y / N When & Type? _____

Are there odors in the building? Y / N

If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N

(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist)

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly)

No

Yes, use dry-cleaning infrequently (monthly or less)

Unknown

Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____

Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply: Public Water Drilled Well Driven Well Dug Well Other: _____

Sewage Disposal: Public Sewer Septic Tank Leach Field Dry Well Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

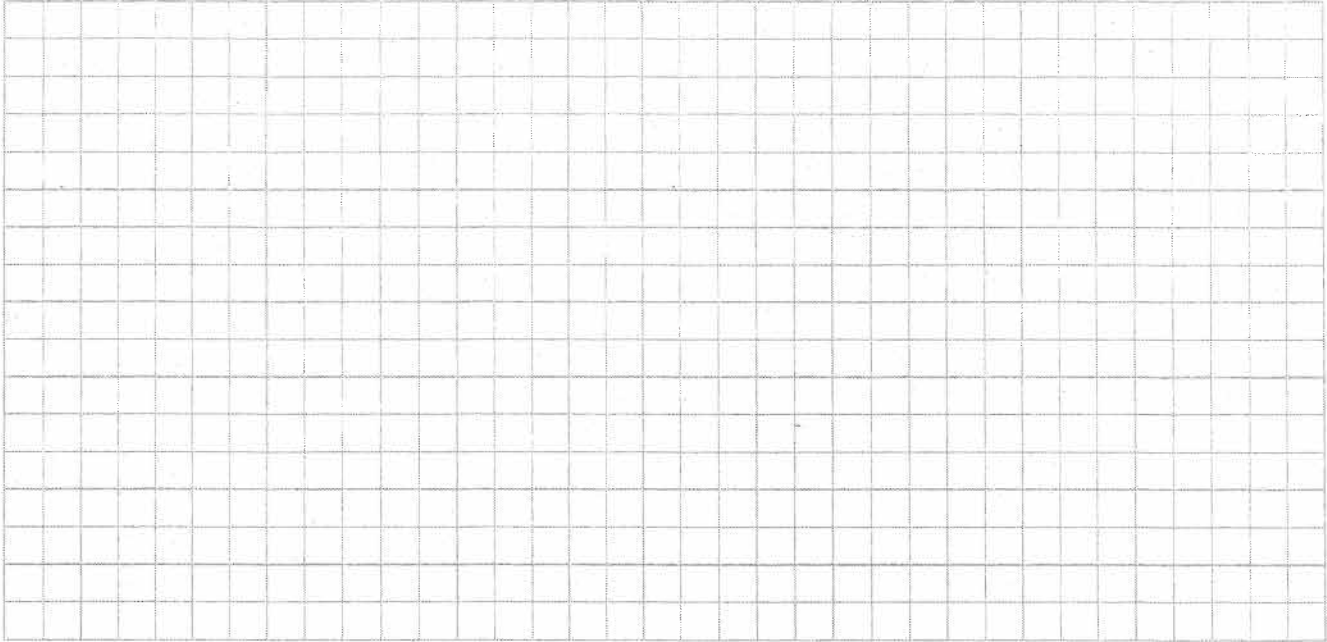
c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

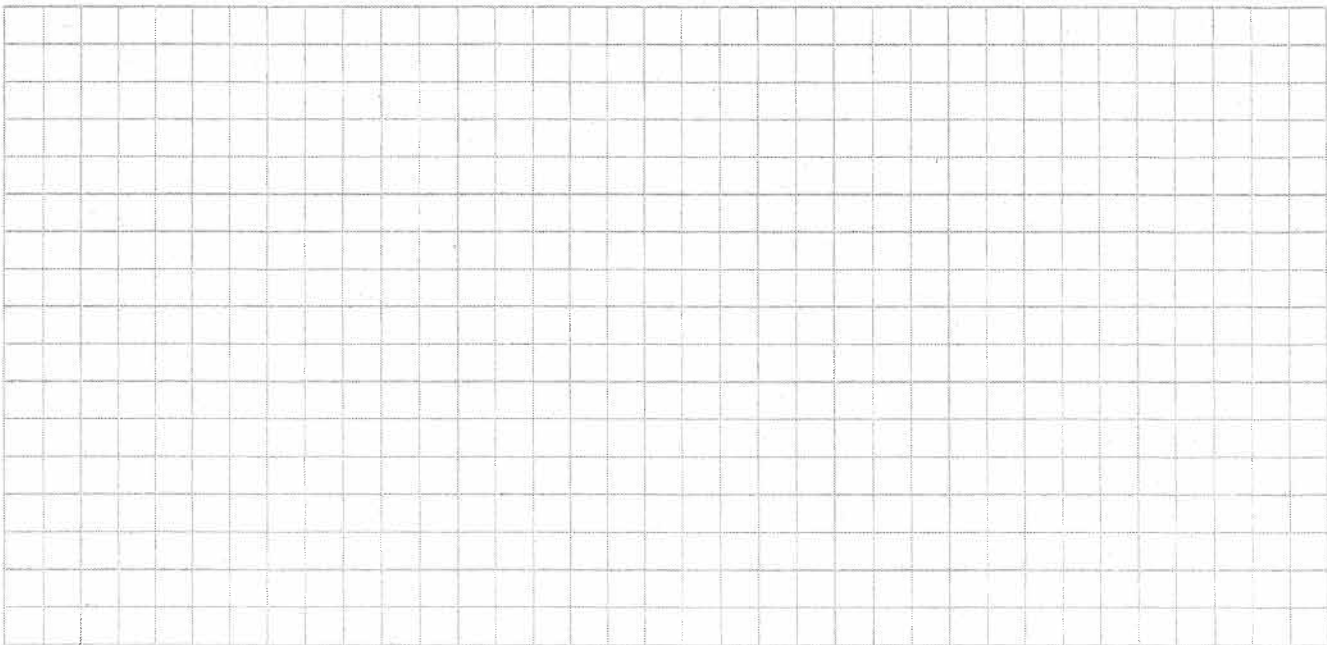
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



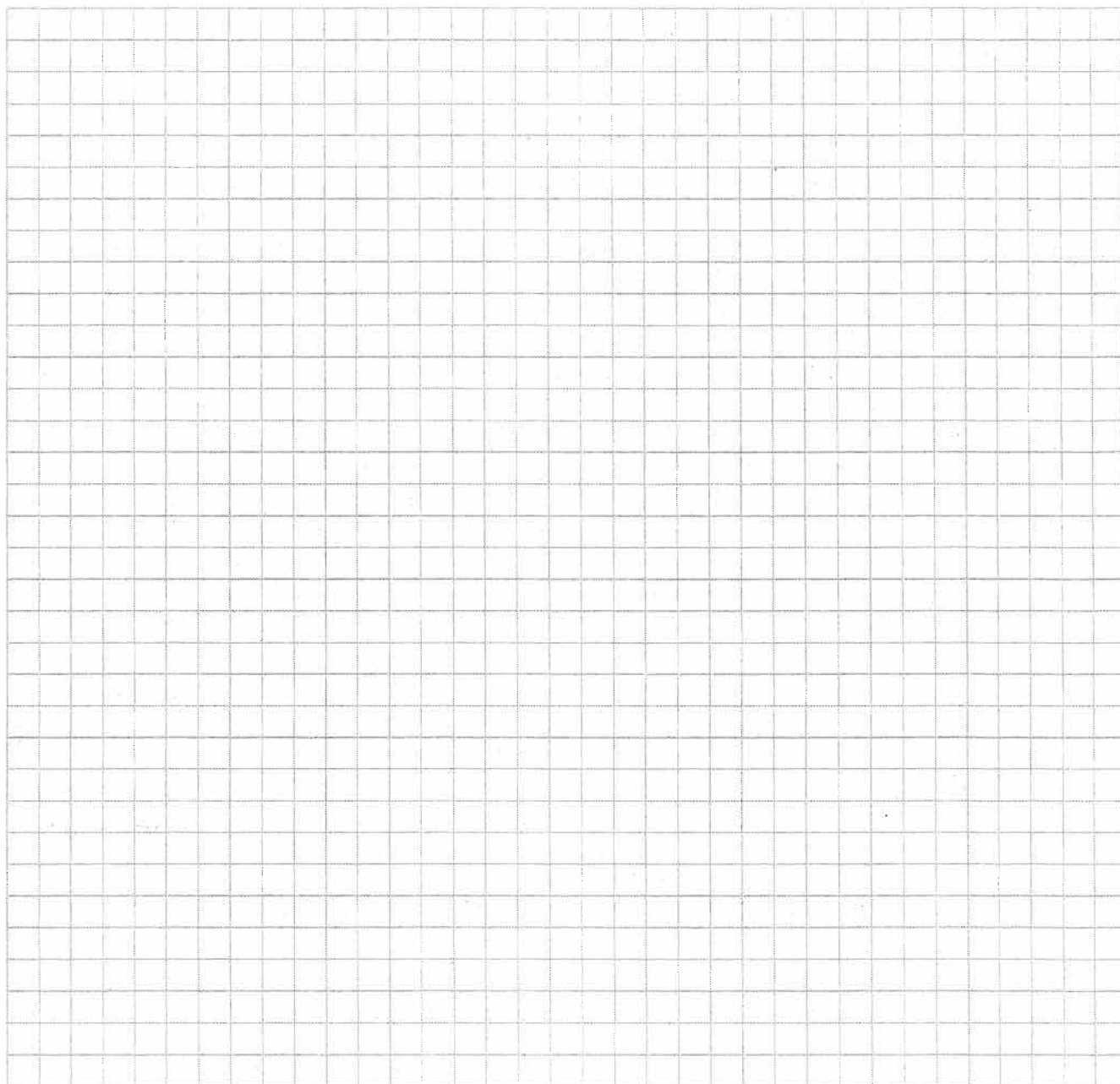
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition *	Chemical Ingredients	Field Instrument Reading (units)	Photo ** <u>Y / N</u>

* Describe the condition of the product containers as **Unopened (UO)**, **Used (U)**, or **Deteriorated (D)**

** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

APPENDIX G

FIELD SAMPLING PLAN AND SITE MANAGEMENT FORMS

APPENDIX G – FIELD SAMPLING PLAN

Monitoring and Sampling Plan

Monitoring

All site inspections will be performed by a qualified environmental professional. The attached Site Inspection Form shall be used during monitoring events.

Monitoring of Operable Unit 02, Brandy Brook (OU02), and Operable Unit 03, Pontiac Bay (OU03), institutional and engineering controls will occur during every regularly scheduled site inspection as per the site management plan (SMP). Monitoring of OU02 will include a visual inspection of Brandy Brook, specifically areas where reactive core mat (RCM) was placed and backfilled over. Monitoring of OU03 will include visual inspection of Pontiac Bay, specifically areas where Aquablok® was installed along the banks and backfilled over. Both OU02 and OU03 visual inspections will be performed from dry land, no boat will be required.

Inspection of OU02 and OU03 engineering controls will be performed to identify any disturbance or break in protective barrier layers and inspection of areas surrounding OU02 and OU03 be performed to identify failure of the land use restrictions. Additionally, monitoring points installed at the OU01 / OU02 interface will be monitored for the presence non-aqueous phased liquid (NAPL), and the approximate location of in-situ stabilization activities will be inspected to identify if there has been any suspected subsurface construction in the area.

Sampling

Sediment, surface water and groundwater sampling for the former Saranac Lake Gas Co. site will occur during all routine site inspections or at the request of the NYSDEC. During each site inspection, three surface water samples and three collocated sediment samples will be taken from OU02 and one surface water sample will be collected from OU03. Additionally, three groundwater samples, once from OU01 just upgradient of OU02 and two from OU02 will be collected. All sample will be submitted to Test America in Buffalo, NY for analysis of PAHs by method 8270. Field parameters will be taken at each surface water and groundwater sampling location using a

multimeter, and will include: temperature, pH, oxidation reduction potential (ORP), dissolved oxygen (DO), and specific conductance.

OU02

Three sediment samples and three collocated surface water samples will be taken from Brandy Brook at locations shown on Figure 2.4 of this ISMP. All samples will be taken from the center of the stream, with surface water samples drawn from a depth equal to 50% the water column and sediment samples taken from the top 0.5 feet of sediment. Surface water samples will be taken with a peristaltic pump and sediment samples will be taken with a ponar sampler or hand auger, depending on the depth of water.

One set of samples (SD/SW-402) will be collected from Brandy Brook Avenue just upstream (east) of the Brandy Brook discharge culvert that flows under Slater Avenue. A second set of samples (SD/SW-401) will be collected from Brandy Brook at the corner of Pine Street and River Street, just upstream (northeast) of the railroad culvert. The third and final set of samples (SD/SW-400) will be collected from Brandy Brook adjacent to and north of OU01, downstream of the RCM barrier and monitoring points. All samples will be submitted for analysis for polycyclic aromatic hydrocarbons (PAHs).

Additionally, groundwater samples will be collected from PZ-301, MW-104 and MW-106 using low-flow sampling methods and tested for PAHs.

OU03

One surface water sample (SW-403) will be taken from Pontiac Bay at the corner of River Street and Lake Flower Avenue, just south of the Brandy Brook discharge culvert. The surface water sample will be taken from one foot off the bottom of the bay and sampled with a peristaltic pump. The sample will be submitted for analysis for polycyclic aromatic hydrocarbons (PAHs). Estimated sample location can be seen on Figure 2.5 of the ISMP.

The network of on-site sediment, surface water and groundwater sampling locations has been designed based on the following criteria:

OU02

- Sediment samples within Brandy Brook are to be taken from the backfill placed on top of RCM, and shall be collected with a decontaminated ponar sampler. If contamination is to be reencountered within OU02, it is likely that remaining impacted soil pushed the RCM beyond the point of breakthrough and seeped into Brandy Brook, threatening both the brook and bay sediment.
- Collocated surface water samples are also collected to monitor potential surface water impacts.
- Groundwater samples are collected from MW-106 located at OU01 and upgradient of OU02 remedial activities for comparison to groundwater from MW-104 and PZ-301 located within OU02. It is anticipated that concentrations from MW-106 are greater than and remain greater than MW-104 and PZ-301. Changes to this field sampling plan are anticipated after remedial activities take place at OU01.

OU03

- The water sample within Pontiac Bay is to be taken close to the culvert where Brandy Brook discharges into the bay. In the unlikely event that surface water from Brandy Brook is impacted, this water sample would provide results of a mixed sample after the brook water meets the bay. Additionally, this location is adjacent to the area where Aquablok® was placed in the bay to provide a barrier between remaining impacted sediment and the Pontiac Bay surface water. Due to the depth of the bay, sediment samples are not proposed.

Figures 2.4 and 2.5 outlines estimated sampling locations; specific location of the sediment samples will be determined at the digression of the site inspector and based on visual and/or olfactory characteristics of each sampling point. Sampling location, description, and rationale will be recorded on the site inspection form and GPS coordinates of each location will be taken recorded. If no visual and/or olfactory characteristics are present, the inspector is to collect each sample as close to the pre-determined sampling location as possible, taking into consideration environmental factors and contaminant characteristics.

Appendix G

Saranac Lake Gas Co., OU02 & OU03

Site Inspection Form

A. General Information

Inspector Name: _____
 Inspection Date: _____
 Weather (AM/PM): _____
 Purpose for Inspection: _____

 Comments: _____

B. Brandy Brook (OU02)

OU02, Brandy Brook, extends from Pontiac Bay (culverted under Lake Flower Ave. and Slater Ave.) to OU01, or approximately 0.75 miles.

	No	Yes
1. Is there an increase in turbidity causing a visible contrast to natural conditions?	_____	_____
2. Is there residue from oil and/or floating substances, visible oil film, or globules or grease?	_____	_____
3. Are there any odors emanating from the brook?	_____	_____
4. Are culverts free of debris/blockages?	_____	_____
5. Are there bare, dead or damaged vegetated areas along bank?	_____	_____
6. Is there any erosional damage to the banks?	_____	_____
7. Has backfill (construction) sediment accumulated in any locations? If yes, photograph.	_____	_____
8. Is there any evidence of damage to the RCM?	_____	_____
9. Are monitoring points in the proper, upright position?	_____	_____
10. Insert the oil-water interface probe into each RCM monitoring stickup; is an interface observed? If yes, explain.	_____	_____
11. Is any wildlife (terrestrial or aquatic) observed?	_____	_____
12. Were any soil/sediment/water samples collected?	_____	_____
If so, what is the sample ID(s)? _____		

Comments: (Please comment for each question answered "yes")

C. Pontiac Bay (OU03)

Pontiac Bay is located in the northeastern portion of Lake Flower and encompasses the area east of the Lake Flower Boat Launch to the Brandy Brook culvert and south of the Lake Flower Boat Launch to the Fogarty's Lake Flower Marina.

	No	Yes
1. Is there an increase in turbidity causing a visible contrast to natural conditions?	_____	_____
2. Is there residue from oil and/or floating substances, visible oil film, or globules or grease?	_____	_____
3. Are there any odors emanating from the bay?	_____	_____
4. Are there bare, dead or damaged vegetated areas along bank?	_____	_____
5. Is there any erosional damage to the banks?	_____	_____
6. Is there any damage to structural retaining walls along banks?	_____	_____
7. Is there visible damage to the Aquablok® barrier layer?	_____	_____
8. Has any wildlife (terrestrial or aquatic) been observed?	_____	_____

Comments: (Please comment for each question answered "yes")

D. Site Management Activities

Upon completion of the inspection the following should be checked for compliance with the SMP.

	No	Yes
1. Was confirmation sampling conducted during this inspection?	_____	_____
2. Was a Health and Safety Inspection Conducted?	_____	_____
3. Are there any known missing site records?	_____	_____

Comments: (Please comment for each question answered "yes")

	No	Yes
4. Are Engineering controls performing as designed?	_____	_____
5. Do EC/ICs continue to be protective of human health and the environment?	_____	_____
6. Is the remedial performance criteria being achieved?	_____	_____
7. Is the site in compliance with the requirements of the SMP?	_____	_____

Comments: (Please comment for each question answered "no")

Notes from last inspection: (Please review and comment)

Inspector

Signature

Date

Reviewer

Date

APPENDIX H

ACOE PERMIT INFORMATION

ACOE Permit Application with Restoration Plan

Response to Comments Regarding ACOE Permit Application

ACOE Permit and Special Conditions

Restoration Inspection Forms



JOINT APPLICATION FORM

For Permits for activities affecting streams, waterways, waterbodies, wetlands, coastal areas, sources of water, and endangered and threatened species.

You must separately apply for and obtain Permits from each involved agency before starting work. Please read all instructions.

1. Applications To:

>NYS Department of Environmental Conservation



Check here to confirm you sent this form to NYSDEC.

Check all permits that apply:

☒ Stream Disturbance

☐ Dams and Impoundment Structures

☐ Tidal Wetlands

☐ Water Withdrawal

☒ Excavation and Fill in Navigable Waters

☐ 401 Water Quality Certification

☐ Wild, Scenic and Recreational Rivers

☐ Long Island Well

☐ Docks, Moorings or Platforms

☒ Freshwater Wetlands

☐ Coastal Erosion Management

☐ Incidental Take of Endangered / Threatened Species

>US Army Corps of Engineers



Check here to confirm you sent this form to USACE.

Check all permits that apply:

☒ Section 404 Clean Water Act

☐ Section 10 Rivers and Harbors Act

Is the project Federally funded? ☐ Yes ☒ No

If yes, name of Federal Agency:

General Permit Type(s), if known:

Preconstruction Notification: ☒ Yes ☐ No

>NYS Office of General Services



Check here to confirm you sent this form to NYSOGS.

Check all permits that apply:

☐ State Owned Lands Under Water

☐ Utility Easement (pipelines, conduits, cables, etc.)

☐ Docks, Moorings or Platforms

>NYS Department of State



Check here to confirm you sent this form to NYSDOS.

Check if this applies: ☐ Coastal Consistency Concurrence

2. Name of Applicant

Michael Mason (NYSDEC)

Taxpayer ID (if applicant is NOT an individual)

Mailing Address

New York Department of Environmental Conservation, 625
Broadway, 12th Floor

Post Office / City

Albany

State

NY

Zip

12233-7017

Telephone (518) 402-9814

Email michael.mason@dec.ny.gov

Applicant Must be (check all that apply): ☐ Owner ☐ Operator ☒ Lessee

3. Name of Property Owner (if different than Applicant)

See attached Table, multiple properties and owners

Mailing Address

Post Office / City

State

Zip

Telephone

Email

For Agency Use Only

Agency Application Number:

4. Name of Contact / Agent

Mark Stelmack, Amec Foster Wheeler

Mailing Address

511 Congress Street, Suite 200

Post Office / City

Portland

State

ME

Zip

04101

Telephone 207-828-3592

Email charles.lyman@amecfw.com

5. Project / Facility Name

Saranac Lake Gas Company

Property Tax Map Section / Block / Lot Number:

Map:32.OKC-1-11.00; Book/Page:141/92

Project Street Address, if applicable

Payeville Ln

Post Office / City

Saranac Lake/North Alba

State

NY

Zip

12983

Provide directions and distances to roads, intersections, bridges and bodies of water

See attached site location map; Rte 86 Saranac Lake; Right, Brandy Brook 0.11 mi; Right, Pine St (cross RR tracks) 0.30 mi; Payeville In.: site located on right 1st dirt driveway.

☐ Town ☐ Village ☐ City

County

North Elba/Saranac Lake

Essex

Stream/Waterbody Name

Brandy Brook/Lake Flower (Pontiac Bay)

Project Location Coordinates: Enter Latitude and Longitude in degrees, minutes, seconds:

Latitude: 44 ° 19 ' 14.95 " Longitude: 74 ° 07 ' 02.58 "

6. Project Description: Provide the following information about your project. Continue each response and provide any additional information on other pages. **Attach plans on separate pages.**

a. Purpose of the proposed project:

The purpose of the the proposed project is to remediate soil and sediment contaminated through operations at the Saranac Lake Gas Company, Inc. The site is a former manufactured gas plant, listed as a Class 2 Inactive Hazardous Waste Site in New York State. The remedy for the brook and lake are outlined in the Record of Decisions (RODs) for OU02 Brandy Brook and OU03 Pontiac Bay (NYSDEC, 2016 and NYSDEC, 2015).

b. Description of current site conditions:

The areas being remediated include a 1,360 foot reach of Brandy Brook (Operable Unit [OU] 2) and a portion of Pontiac Bay (OU 3) in Lake Flower. See attached Pre-Design Investigation Field Activities Report (MACTEC, 2017) and design drawings (attached to Restoration Plan - Attachment E) for a description and drawings showing the existing conditions.

c. Proposed site changes:

There are no proposed site changes. The site is being remediated and will be returned to existing conditions. See the attached Restoration Plan (MACTEC, 2017) .

d. Type of structures and fill materials to be installed, and quantity of materials to be used (e.g., square feet of coverage, cubic yards of fill material, structures below ordinary/mean high water, etc.):

The purpose of this work is to excavate contaminated sediment and soil to eliminate impacts to human health and the environment. There are no new structures proposed, the site will be restored to pre-existing conditions. The proposed work will impact several existing culverted crossing, which will be replaced with "open bottom" culverts. See Restoration Plan and design drawings (MACTEC, 2017) in Attachment E.

e. Area of excavation or dredging, volume of material to be removed, location of dredged material placement:

The brook excavation will result in 25,272 sf of wetland impact and 4,076 sf of upland impact and excavating approximately 5,800 cy of material. The area of bay excavation includes 76,000 sf and includes approximately 16,900 cy of contaminated sediment. Excavated contaminated sediment and soil will be trucked off site and disposed of at an approved disposal facility.

f. Is tree cutting or clearing proposed? ☒ Yes If Yes, explain below. ☐ No

Timing of the proposed cutting or clearing (month/year): Between November 1 and April 1

Number of trees to be cut: TBD Acreage of trees to be cleared: <0.5 acre

g. Work methods and type of equipment to be used:

Brandy brook will be diverted and excavation will be done in the dry. Earthwork will be accomplished by tracked excavator. Pontiac Bay will be dredged using mechanical dredging methods. See attached Pre-Design Investigation Field Activities Report for details (MACTEC, 2017).

h. Describe the planned sequence of activities:

The general sequence of remedial activities will include installation of erosion control measures, diversion of stream channel, excavation of contaminated sediment and soil, and site restoration. The bay will be dredged and backfilled to the approximate existing bathymetry. The remediation work along Brandy Brook will be done before the work in Pontiac Bay. See attached Pre-Design Investigation Field Activities Report (MACTEC, 2017)

i. Pollution control methods and other actions proposed to mitigate environmental impacts:

See attached Design Drawing Package for engineering drawings and specifications.

j. Erosion and silt control methods that will be used to prevent water quality impacts:

See attached Design Drawing Package for engineering drawings and specifications.

k. Alternatives considered to avoid regulated areas. If no feasible alternatives exist, explain how the project will minimize impacts:

An alternative analysis was completed as a part of the Record of Decision for OU02 and OU03 (NYSDEC, 2017 and NYSDEC, 2015). The selected alternative for both OU's is excavation of contaminated sediment and soil. The project will be executed utilizing the best management practices to minimize impacts. The remediation project includes a full restoration of impacted brook channel, bordering wetlands, bordering uplands and Pontiac Bay.

l. Proposed use: ☐ Private ☒ Public ☐ Commercial

m. Proposed Start Date: Estimated Completion Date:

n. Has work begun on project? ☐ Yes If Yes, explain below. ☒ No

o. Will project occupy Federal, State, or Municipal Land? ☒ Yes If Yes, explain below. ☐ No

The project will impact Brandy Brook and Pontiac Bay in Lake Flower both of these features are considered federal and state land. The impacts to this land will be temporary, no permanent structures are proposed.

p. List any previous DEC, USACE, OGS or DOS Permit / Application numbers for activities at this location:

None.

q. Will this project require additional Federal, State, or Local authorizations, including zoning changes?

☐ Yes If Yes, list below. ☒ No

7. Signatures.

Applicant and Owner (If different) must sign the application.

Append additional pages of this Signature section if there are multiple Applicants, Owners or Contact/Agents.

I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief.

Permission to Inspect - I hereby consent to Agency inspection of the project site and adjacent property areas. Agency staff may enter the property without notice between 7:00 am and 7:00 pm, Monday - Friday. Inspection may occur without the owner, applicant or agent present. If the property is posted with "keep out" signs or fenced with an unlocked gate, Agency staff may still enter the property. Agency staff may take measurements, analyze site physical characteristics, take soil and vegetation samples, sketch and photograph the site. I understand that failure to give this consent may result in denial of the permit(s) sought by this application.

False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the NYS Penal Law. Further, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project. In addition, Federal Law, 18 U.S.C., Section 1001 provides for a fine of not more than \$10,000 or imprisonment for not more than 5 years, or both where an applicant knowingly and willingly falsifies, conceals, or covers up a material fact; or knowingly makes or uses a false, fictitious or fraudulent statement.

Signature of Applicant

Michael Mason

Date

8/23/2017

Applicant Must be (check all that apply): ☒ Owner ☐ Operator ☐ Lessee

Printed Name

MICHAEL MASON

Title

PROJECT MANAGER (NYS&E)

Signature of Owner (if different than Applicant)

Date

Printed Name

Title

Signature of Contact / Agent

Mark Stelmack

Date

August 22, 2017

Printed Name

MARK STELMACK

Title

PROJECT MANAGER (ENGINEER)

For Agency Use Only

DETERMINATION OF NO PERMIT REQUIRED

Agency Application Number

(Agency Name) has determined that No Permit is

required from this Agency for the project described in this application.

Agency Representative:

Printed Name

Title

Signature

Date

JOINT APPLICATION REFERENCES AND ATTACHMENTS

SARANAC LAKE GAS COMPANY, INC.

NYSDEC SITE 516008

REFERENCES:

MACTEC, 2017. Pre-Design Investigation Field Activities Report, Operable Units OU02 and OU03, Saranac Lake Gas Company, Inc., NYSDEC Site No. 516008, MACTEC Engineering and Consulting, P.C. July 2017.

MACTEC, 2017. Restoration Plan, Brandy Brook (OU02) and Pontiac Bay on Lake Flower (OU03), Saranac Lake Gas Company, Inc., NYSDEC Site No. 516008, MACTEC Engineering and Consulting, P.C. August 2017.

New York State Department of Environmental Conservation (NYSDEC), 2016. Record of Decision, Saranac Lake Gas Company, Inc., Operable Unit Number 02: Brandy Brook. March 2016.

NYSDEC, 2015. Record of Decision, Saranac Lake Gas Company, Inc., Operable Unit Number 03: Pontiac Bay on Lake Flower. March 2015.

ATTACHMENTS:

A) Figure 1 – Site Location Map

B) Property Owners

- a. Property Owners Table.xls

C) Correspondence with Regulators (Attach a copy of each correspondence)

- a. New York Natural Heritage Program – Letter
- b. New York State Historic Preservation – Letter
- c. US Fish and Wildlife – Letter

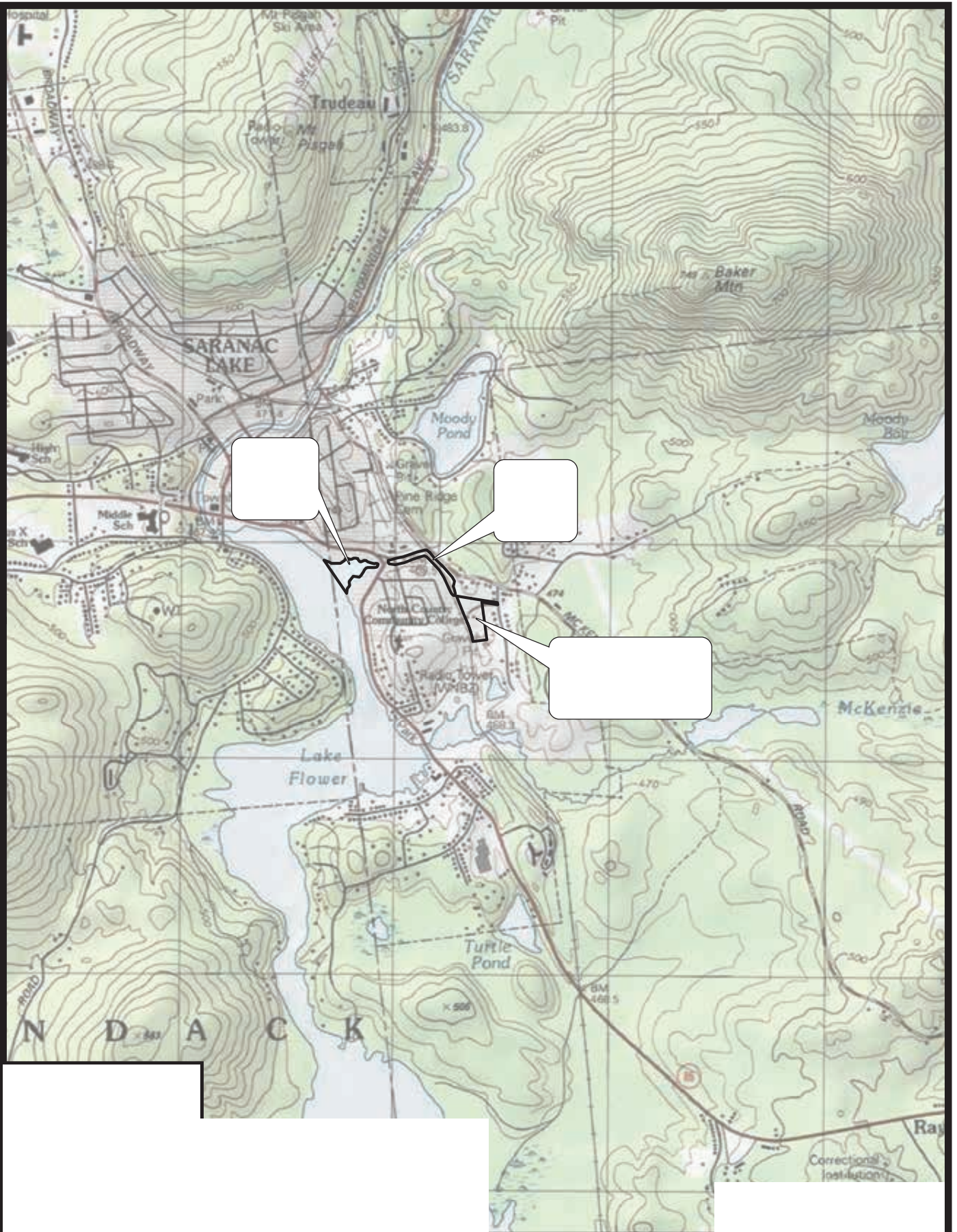
D) Army Corps of Engineers (ACOE) Jurisdictional Determination (JD)

- a. ACOE JD Appendix 1

E) Restoration Plan

F) Pre Design Investigation Field Activities Report

ATTACHMENT A
SITE LOCATION MAP



ATTACHMENT B
PROPERTY OWNERS

3. Name of Property Owner

TOWN	VILLAGE	OWNER	LOCATION	TAXMAP	BOOKPAGE	CLASS	ACRES	OWNER ADDRESS		
North Elba	Saranac Lake	Saranac Lake Gas Co Inc	Payeville Ln	32.0KC-1-11.000	141_392	441: Fuel Store&Dist	4.5	PO Box 798	Valley Forge PA	19482
North Elba	Saranac Lake	Dormitory Authority	Pontiac St	32.0KC-1-19.000	638_102	330: Vacant comm	11	515 Broadway	Albany NY	12207
North Elba	Saranac Lake	Carlene K Cloud	70 Slater Ave	32.0JC-4-1.000	1304_130	210: 1 Family Res	0.3	70 Slater Ave	Saranac Lake NY	12983
North Elba	Saranac Lake	David J Munn	20 Brandy Brook Ave	32.0JC-4-2.000	1199_35	210: 1 Family Res	0.3	20 Brandy Brook Ave	Saranac Lake NY	12983
North Elba	Saranac Lake	NYSARC Inc	26 Brandy Brook Ave	32.0JC-4-3.000	1276_224	230: 3 Family Res	0.63	12 Mohawk St	Tupper Lake NY	129861028
North Elba	Saranac Lake	Mary E Handley	34 Brandy Brook Ave	32.0JC-4-4.000	621_90	210: 1 Family Res	0.3	34 Brandy Brook Ave	Saranac Lake NY	12983
North Elba	Saranac Lake	Gary E Martin	38 Brandy Brook Ave	32.0JC-4-5.000	769_219	210: 1 Family Res	0.3	38 Brandy Brook Ave	Saranac Lake NY	12983
North Elba	Saranac Lake	Barbara A Kent	42 Brandy Brook Ave	32.0JC-4-6.000	1117_49	210: 1 Family Res	0.48	42 Brandy Brook Ave	Saranac Lake NY	12983
North Elba	Saranac Lake	Trustees Village Saranac Lake	Pine St	32.0JC-6-1.000	547_067	963: Municpl park	1	3 Main St	Saranac Lake NY	129832294
North Elba	Saranac Lake	Mark S Nason	1071 Pine St	32.0JC-6-5.000	884_333	210: 1 Family Res	0.4	1071 Pine St	Saranac Lake NY	12983

Note:
1] NYSDEC is in the process of obtaining access from the property owners.

ATTACHMENT C
CORRESPONDENCE WITH REGULATORS

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

June 13, 2017

Charles H. Lyman
Mactec
511 Congress Street
Portland, ME 04101

Re: Proposed remedial activity at Saranac Lake Gas Company, Site No. 516008
County: Essex Town/City: North Elba

Dear Mr. Lyman:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur within two miles of the project site (but all are more than one mile from the project site).

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

This response applies only to known occurrences of rare or state-listed animals and plants, and significant natural communities, maintained in the Natural Heritage database. For information regarding other regulated areas or resources (e.g., regulated wetlands; streams and lakes; and wild, scenic, and recreational rivers), please contact the NYS DEC Region 5 Office, Division of Environmental Permits, at dep.r5@dec.ny.gov, (518) 623-1286.

Sincerely,



Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program





The following rare animals and significant natural communities have been documented within two miles of the Saranac Lake Gas Company Site.

The following animals, while not listed by New York State as Endangered or Threatened, are of conservation concern to the state, and are considered rare by the New York Natural Heritage Program.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	HERITAGE CONSERVATION STATUS
Birds			
Common Loon Breeding Mckenzie Pond	<i>Gavia immer</i>	Special Concern	5835
Common Loon Breeding Lake Colby	<i>Gavia immer</i>	Special Concern	6458
Dragonflies and Damselflies			
Delicate Emerald Oseetah Lake Bog, 2012:	<i>Somatochlora franklini</i>	Unlisted	Critically Imperiled in NYS 14499
Ocellated Emerald Oseetah Lake Bog, 2013:	<i>Somatochlora minor</i>	Unlisted	Imperiled in NYS 14517
Ebony Boghaunter Oseetah Lake Shore, 2008: The dragonflies were observed in a sedge and grass dominated bog, a marsh with cattails and reeds, in an opening along a woods road, and near a lake.	<i>Williamsonia fletcheri</i>	Unlisted	Critically Imperiled in NYS 13431

The following significant natural communities are considered significant from a statewide perspective by the NY Natural Heritage Program. They are either occurrences of a community type that is rare in the state, or a high quality example of a more common community type. By meeting specific, documented criteria, the NY Natural Heritage Program considers these community occurrences to have high ecological and conservation value.

COMMON NAME	HERITAGE CONSERVATION STATUS
Wetland/Aquatic Communities	
Dwarf Shrub Bog	High Quality Occurrence of Uncommon Community Type
Lake Colby Bog: This large dwarf shrub bog that is in excellent condition within a large, moderate/high quality landscape.	15096

This report only includes records from the NY Natural Heritage database. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, from NatureServe Explorer at www.natureserve.org/explorer, and from USDA's Plants Database at <http://plants.usda.gov/index.html> (for plants).

Information about many of the natural community types in New York, including identification, dominant and characteristic vegetation, distribution, conservation, and management, is available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org. For descriptions of all community types, go to www.dec.ny.gov/animals/97703.html for Ecological Communities of New York State.

PLEASE NOTE

Requests for Information May Be Submitted Online or Via E-Mail

For future requests, we are pleased to invite you to use our new online Project Screening Request Form (www.nynhp.org/ProjectScreening), which allows online submission of information requests. Alternatively, you may submit requests via e-mail to our dedicated e-mailbox, NaturalHeritage@dec.ny.gov. Instructions for submitting requests can be found at <http://www.dec.ny.gov/animals/31181.html>. While we encourage submission of requests via e-mail, we will still accept mailed requests.

In order to receive responses to requests sooner, we recommend that before you submit a request for a project screening, you use the newly upgraded online Environmental Resources Mapper, <http://www.dec.ny.gov/animals/38801.html>.

****** If your project site does not fall within an area displayed in the Rare Plants and Rare Animals layer, then New York Natural Heritage has no records in the vicinity of your project site, and you will know that we have nothing to report. Therefore, you will not need to submit a request for a project screening. ******

For a record of your results, use the Identify Tool to click on your project location, and print or save the Identify Results window that opens.

(Information on Significant Natural Communities is provided in the Identify Results Window.)

If your project site does fall within an area displayed in the Rare Plants and Rare Animals layer, and you would like more information, then submit a request for a project screening via our new online Project Screening Request Form or our dedicated e-mailbox as described above.

Thank-you,
The New York Natural Heritage Information Services Team

00-00-30



New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233 -4757

RETURN SERVICE REQUESTED

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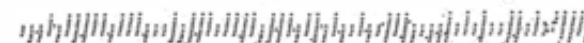
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ZIP 12207
041M12250658

Charles H. Lyman
Senior Project Scientist
MACTEC
511 Congress St.
Portland, ME 04101

0610150495 0015





ANDREW M. CUOMO
Governor

Parks, Recreation, and Historic Preservation

ROSE HARVEY
Commissioner

August 01, 2017

Mr. Charles Lyman
Senior Project Scientist
AmecFW working with NYSDEC
511 Congress Street
Portland, ME 04101

Re: USACE
Saranac Lake Gas Company, Inc. Remediation
Pontiac Bay and Brandy Brook, Saranac Lake, NY
17PR03069

Dear Mr. Lyman:

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based upon this review, the New York SHPO has determined that no historic properties will be affected by this undertaking.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Michael F. Lynch, P.E., AIA
Director, Division for Historic Preservation

Division for Historic Preservation

P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • www.nysparks.com



United States Department of the Interior

FISH AND WILDLIFE SERVICE

New York Field Office

3817 Luker Road

Cortland, NY 13045

Phone: (607) 753-9334 Fax: (607) 753-9699

<http://www.fws.gov/northeast/nyfo>



Document Control Number: 17TA2137

To: Mark Stelmack

Date: Jun 8, 2017

Regarding: Saranac Lake Gas Company Site

Town/County: Village of Saranac Lake / Essex County

We have received your request for information regarding occurrences of federally-listed threatened and endangered species within the vicinity of the above-referenced project/property. In an effort to streamline project reviews, species lists may now be obtained from our website at

<http://www.fws.gov/northeast/nyfo/es/section7.htm>. Please go to this site and follow the instructions to obtain: an official list request response; information about listed, proposed, and candidate species; and steps to complete initial assessments of whether a species may be present and impacted by a proposed action. Please note that this process involves two parts: (1) visiting the U.S. Fish and Wildlife Service's IPaC website to obtain an official species list; and (2) returning to the New York Field Office's website to complete the remaining steps in determining your project's potential impacts.

As a reminder, Section 9 of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) prohibits unauthorized taking* of listed species and applies to federal and non-federal activities. Additionally, threatened and endangered species and their habitats are protected by Section 7(a)(2) of the ESA, which requires federal agencies, in consultation with the Service, to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat. An assessment of the potential direct, indirect, and cumulative impacts is required for all federal actions that may affect listed species.

For projects not authorized, funded, or carried out by a federal agency, we provide technical assistance to individuals and other non-federal entities to assist with project planning to avoid the potential for "take," or when appropriate, to provide assistance with their application for an incidental take permit pursuant to Section 10(a)(1)(B) of the ESA.

Project construction or implementation should not commence until all requirements of the ESA have been fulfilled. If you have any questions or require further assistance regarding threatened or endangered species, please contact the Endangered Species Program at (607) 753-9334. Please refer to the above document control number in any future correspondence.

*Under the ESA and regulations, it is illegal for any person subject to the jurisdiction of the United States to *take* (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these), import or export, ship in interstate or foreign commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any endangered fish or wildlife species and most threatened fish and wildlife species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. "Harm" includes any act which actually kills or injures fish or wildlife, and case law has clarified that such acts may include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife.

ATTACHMENT D
ARMY CORPS OF ENGINEERS (ACOE)
JURISDICTIONAL DETERMINATION (JD)

Appendix 1 - REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

To: District Name Here

- I am requesting a JD on property located at: Saranac Lake Gas Co., Inc.

(Street Address)

City/Township/Parish: Saranac Lake County: Essex State: NY

Acreage of Parcel/Review Area for JD: _____

Section: NA Township: NA Range: NA

Latitude (decimal degrees): 44 19' 14.95" Longitude (decimal degrees): 74 07' 02.58"

(For linear projects, please include the center point of the proposed alignment.)

- Please attach a survey/plat map and vicinity map identifying location and review area for the JD.

- ☐ I currently own this property. ☐ I plan to purchase this property.

☐ I am an agent/consultant acting on behalf of the requestor.

☒ Other (please explain): State Regulatory addressing a hazardous waste site.

- Reason for request: (check as many as applicable)

☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.

☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under Corps authority.

☐ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.

☒ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.

☐ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.

☐ A Corps JD is required in order to obtain my local/state authorization.

☐ I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.

☐ I believe that the site may be comprised entirely of dry land.

☐ Other: _____

- Type of determination being requested:

☒ I am requesting an approved JD.

☐ I am requesting a preliminary JD.

☐ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.

☐ I am unclear as to which JD I would like to request and require additional information to inform my decision.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

*Signature: Michael Mason

Date: 0/23/2017

- Typed or printed name: Michael Mason

Company name: NYDEC, Division of Environmental Remediation

Address: 625 Broadway, 12th floor

Albany, New York 12233-7017

Daytime phone no.: (518) 402-9814

Email address: michael.mason@dec.ny.gov

***Authorities:** Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.

Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.

Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.

Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

ATTACHMENT E
RESTORATION PLAN

**RESTORATION PLAN
BRANDY BROOK (OU02) AND PONTIAC BAY ON LAKE
FLOWER (OU03)**

**SARANAC LAKE GAS COMPANY, INC
NYSDEC SITE No. 516008**

WORK ASSIGNMENT NO. D007619-39

Prepared for:

**New York State Department of Environmental Conservation
Albany, New York**

Prepared by:

**MACTEC Engineering and Consulting, P.C.
Portland, Maine**

MACTEC: 3611161193

AUGUST 2017

RESTORATION PLAN
BRANDY BROOK (OU02) AND PONTIAC BAY ON LAKE FLOWER (OU03)

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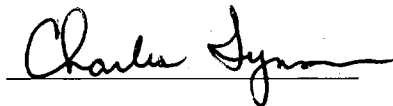
Prepared by:

MACTEC Engineering and Consulting, P.C.
Portland, Maine

MACTEC: 3611161193

August 2017

Submitted by:



Charles Lyman
Senior Project Scientist

Approved by:



Mark Stelmack, P.E.
Project Manager

TABLE OF CONTENTS

LIST OF TABLES.....	iii
GLOSSARY OF ACRONYMS AND ABBREVIATIONS.....	iv
1.0 INTRODUCTION	1-1
2.0 IMPACT AREAS.....	2-1
2.1 PROPOSED MITIGATION ACTIONS.....	2-3
3.0 HYDROLOGY	3-1
4.0 GRADING PLAN	4-1
5.0 PLANTING PLAN.....	5-1
5.1 TREES.....	5-1
5.2 SHRUBS.....	5-2
5.3 HERBACEOUS PLANTS	5-3
6.0 EROSION CONTROL	6-1
7.0 INVASIVE/NOXIOUS SPECIES.....	7-1
8.0 RESTORATION MONITORING.....	8-1
8.1 RESTORATION OBJECTIVE	8-1
8.2 MEASUREMENTS OF SUCCESS FOR WETLAND/UPLAND RESTORATION	8-1
8.3 PERFORMANCE STANDARDS FOR SUCCESS OF THE RESTORATION .	8-2
8.4 MONITORING	8-3
8.4.1 Monitoring Report Guidance.....	8-3
8.4.2 Monitoring Schedule	8-4
8.4.3 Monitoring Vegetation and Soils.....	8-4
8.4.4 Meander Surveys	8-5
8.4.5 Monitoring General Wildlife Use.....	8-5
8.4.6 Photographic Documentation	8-6
8.5 ANNUAL MONITORING REPORTS	8-6
8.6 CORRECTIVE ACTIONS FOR RESTORATION DEFICIENCIES.....	8-7
9.0 PROJECT SCHEDULE.....	9-1
10.0 ASSESSMENT PLAN	10-1
11.0 RESPONSIBLE PARTIES FOR RESTORATION ACTIONS	11-1
12.0 REFERENCES	12-1

TABLE OF CONTENTS (CONTINUED)

TABLES

APPENDICES

Appendix A: Design Drawings

LIST OF TABLES

Table

- 4.1 Brook Channel and Riparian Area Specifications
- 5.1 Replacement Tree and Shrub Species and Quantities Required
- 7.1 New York State Invasive Plant Species

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
C&D	construction and demolition
sf	square feet
MACTEC	MACTEC Engineering and Consulting, P.C.
MGP	manufactured gas plant
NYS	New York State
NYSDOT	New York State Department of Transportation
NYSDEC	New York State Department of Environmental Conservation
ROD	Record of Decision
sf	square feet
Site	Saranac Lake Gas Co, Inc.

1.0 INTRODUCTION

The Record of Decision (ROD) for OU02: Brandy Brook (New York State Department of Environmental Conservation [NYSDEC], 2016) and OU03: Pontiac Bay on Lake Flower (NYSDEC, 2015) present the selected remedies for the operable units OU02 and OU03 of the Saranac Lake Gas Co, Inc. Site (the Site), a Class 2 inactive hazardous waste disposal site.

The selected remedy for OU02 is the removal of manufactured gas plant (MGP)-related contamination within Brandy Brook and bordering wetlands which exceed guidance values for Class A sediments or restricted residential and protection of ecological resources soil cleanup objectives. Implementation of the OU02 remedy will require sediment and soil removal within an area approximately of 29,000 square feet (sf), excavated to an anticipated depth of 4.5 feet, impacting approximately 1,360 linear feet of Brandy Brook.

The selected remedy for OU03 is the removal of MGP-related contamination exceeding Class A sediment guidance values within Pontiac Bay on Lake Flower. Implementation of the remedy will require sediment removal within a bay area of approximately 76,000 sf to a depth of up to seven feet, and in-situ solidification of soil within an area of approximately 3,078 sf to a depth of approximately 15 feet along the upland bordering the bay.

The purpose of this restoration plan is to provide the details for the restoration of OU02 and OU03 following the remedial action. The Site is located in the Lake Champlain Basin within the Sumner Brook – Saranac River watersheds (#0415040602).

The Site has been thoroughly characterized through previous environmental site characterization efforts including the Remedial Investigation (MACTEC, 2015) and the Pre-Design Investigation (MACTEC, 2017).

Remedial design drawings prepared for the NYSDEC Division of Environmental Remediation for the remedial action at the Site are included in Appendix A. The design drawings depict existing conditions, proposed erosion and sediment control and site preparation plans, excavation plans, site restoration plans, brook excavation and restoration plans, and details.

Brandy Brook ranges from approximately three to five feet wide, and the wetlands bordering the brook range from five to 50 feet wide. The material below the stream and bordering wetlands will be excavated to a minimum depth of 4.5 feet below the ground surface. An estimated area of 25,272 sf of emergent and scrub-shrub wetland is expected to be impacted.

The proposed remedial action at of OU03 will require excavation of an area of 71,650 sf of Pontiac Bay bottom sediments to a depth of up to seven feet below the current lake bottom. In addition, the remediation of OU03 may result in impacts to approximately 175 linear feet of Pontiac Bay bank/shoreline. This restoration plan is based on the important ecological functions and values these areas provide.

2.0 IMPACT AREAS

OU02

The reach of Brandy Brook starting at the northwestern boundary of the property to the culvert at Slater Street is proposed for remediation. There are several culverted driveways crossing the brook that will be replaced. The box culvert under the railroad tracks and the portion of the brook that is culverted under Slater Street and Lake Flower Avenue to the head of Pontiac Bay will not be replaced. The remediation will impact approximately 1,360 linear feet of brook habitat and will impact an estimated 25,272 sf of scrub-shrub wetland bordering the brook including a small area of scrub-shrub wetland on the west side of the railroad tracks that parallels the brook. Approximately 4,076 sf of upland will also be impacted. The restored brook will mimic existing stream slope and sinuosity, as well as channel depth and width. Wetlands bordering the brook and on the west side of the railroad tracks will be restored as per the proposed grading plan.

The proposed remediation includes the riparian area along the brook, a mix of scrub/shrub wetland, upland forested habitat, and managed lawns. The riparian area along the brook that is currently scrub/shrub and forested bank habitat will be restored with the objective of recreating this type of habitat, thus replacing the functions and values the area is currently providing.

Approximately 430 linear feet of riparian area along the brook from the culvert below the railroad tracks to Slater Avenue is a mix of managed lawn and overgrown stream bank habitat. This portion of the brook will be restored to pre-construction contours and elevations, and the areas that are currently lawn will be restored as lawn in kind.

The final site grading plans are shown in design Drawings C-501 and C-502 provided in Appendix A. The restoration of the brook and bordering wetlands will include re-grading to match the existing grade to the extent practicable and planting scrub/shrub, as well as herbaceous cover vegetation. Drawings C-501 and C-502 show the areas on-site proposed for remediation. The brook and bordering riparian areas being impacted by the remediation of site contamination are summarized below:

- 1,360 linear feet of Brandy Brook channel,
- 25,272 sf of Brandy Brook bordering scrub-shrub wetland

- 4,076 sf of Brandy Brook bank and upland riparian area.

OU03

The remediation of Pontiac Bay will impact an area of 71,650 sf of lake bottom, which will be excavated to an anticipated depth of seven feet. In addition, approximately 175 linear feet of bank habitat bordering the bay will also be impacted and an area of approximately 16,530 sf of upland, exceeding the soil clean up goals will also be remediated. Remediation of the upland area will include in-situ stabilization and any bank habitat disturbed during this work will be restored.

The area of OU03 being remediated includes unconsolidated lake bottom sediment, bordering bank habitat, and upland managed lawn habitat. This contaminated sediment and soil excavated from the area will be restored to replicate existing conditions. The final site grading plans are shown on Drawing C-502 in Appendix A. Restoration of the lake bottom, bank, and bordering uplands will include re-grading to match the existing grade to the extent practicable and planting scrub/shrub and trees, as well as herbaceous cover vegetation. Drawing C-501 shows the areas on-site proposed for remediation. The lake and bordering upland areas being impacted by the remediation of site contamination are summarized below:

- 71,650 sf of Pontiac Bay sediment
- 175 linear feet of bank.

The area and volume being remediated are estimates as the extent of excavation of soil and sediment will ultimately be bounded by confirmation sample results compared to standards, criteria, and guidance values as defined in the ROD. Once it has been determined that the contamination has been removed to the levels outlined in the ROD, impacted areas (e.g., brook channel, riparian areas, and lake bottom) will be restored.

Investigations have determined that there are no freshwater wetlands that are regulated under Title 6 of the New York Codes, Rules, and Regulations Part 664 within two miles of the Site. The Saranac River is a designated wild, scenic, or recreational river. Information received from the New York Natural Heritage Program (NYSDEC, 2017) indicates no significant habitats (as defined by the New York State [NYS] Natural Heritage Program) or other significant natural communities or rare or state listed animals or plants are located on or in the immediate vicinity of the Site.

2.1 PROPOSED MITIGATION ACTIONS

To mitigate the temporal loss of in-stream habitat and bordering riparian habitat being remediated, the brook and bay will be restored as described in the Grading Plan and Planting Plan (Sections 4.0 and Section 5.0 of this document, respectively), and as shown on the Excavation Plan and Profile Plans (Drawing C-201 through C-203), Construction Baseline Cross Sections (Drawings C-401 through C-409, Brandy Brook Restoration/Landscaping-OU02 (Drawing C-501), Pontiac Bay Restoration/Landscaping-OU03 (Drawing C-502) and the Restoration Details (Drawings C-601 and C-602) in Appendix A. The primary goal of the restoration is to restore functions and values to be temporarily lost due to site remediation. As a part of site restoration, extensive shrub planting and seeding is planned in the upland and wetland areas to expedite the re-vegetation and stabilization of remediated areas.

3.0 HYDROLOGY

The hydrology in OU02 is derived from Brandy Brook, fed by a large wetland complex located to the east of the site and by shallow groundwater discharge. Brandy Brook is culverted under Payeville Lane and flows across the north side of the former MGP property (OU01). Where the brook turns to the north and flows along the existing railroad tracks, the surface water hydrology is augmented by shallow groundwater discharging to the brook. Below the railroad tracks, the brook appears to act as a surface water conduit, conveying surface water (i.e., Brandy Brook) to Pontiac Bay in Lake Flower.

OU03 is Pontiac Bay of Lake Flower, and the hydrology is derived from the lake, shallow groundwater discharging to the lake, and Brandy Brook which discharges to the bay. The lake also receives storm water runoff from the developed areas (i.e., uplands and roads) surrounding the bay. Remediation of contaminated sediment and soil is not expected to have a long-term impact on local hydrology. Surface water and groundwater will be temporarily collected and piped around work areas during the remediation of the operable units. The remedial action contractor will provide the means and methods for the diversion of the Brandy Brook during construction. After completion of construction, the overall site hydrology will be unchanged compared to current conditions.

4.0 GRADING PLAN

The impacted brook and bordering wetland will be re-graded to pre-existing conditions, following removal of contaminated soil and sediment. The impacted brook channel and bordering wetlands will be restored to replace existing functions and values. The restored brook will be reconstructed to pre-excavation elevations in its current location. The proposed final site grading subsequent to the remedial action is depicted in plan view on Drawings C-501 and C-502 in Appendix A. Representative cross section details for the brook and bordering wetland are shown on Drawings C-401 through C-409. The Excavation Plan and Profile drawings (Drawings C-201 through C-203) also show the finish grades for the brook and bay.

The existing conditions of Brandy Brook and bordering wetlands have been characterized through extensive field survey conducted in support of and reported in the “Wetland Delineation and Functional Assessment Report”, included as an attachment to the “Pre-Design Investigation Field Activities Report” (MACTEC, 2017). The following supplemental data was collected in the spring 2017:

- Stream Channel/Riparian Area Characterization (every 25 feet)
- Stream channel substrate grain size
- Channel width measurements
- Water depth measurements
- Floodplain widths
- Bordering vegetation
- Condition of stream bank
- Photo documentation of Brandy Brook.

Prior to conducting earthwork on-site, erosion and sediment controls will be installed as shown on Drawings C-106 and C-107 and described on drawing C-301 (Erosion and Sediment Control Notes) Erosion and sediment controls details are included in Drawing C-302. During restoration activities, a wetland scientist with experience in stream and wetland restoration will be onsite to oversee restoration activities. Restoration of the Brook and associated riparian buffer areas will be initiated as soon as results of confirmation samples have been received.

The restoration of Pontiac Bay will result in the replacement in-kind of lake bottom, bank, and uplands impacted during site remediation. The existing bathymetry, bank, and upland will be restored to pre-existing conditions and approximate elevation contours. Backfill material will be composed of clean fill with a grain size consistent with the material being excavated (i.e., fine to medium sand with trace silt).

Cleanup goals for soil and sediment are presented in the Record of Decisions for OU02 and OU03 and their application is shown on Figure 4.1 of the “Pre-Design Investigation Field Activity Report” (MACTEC, 2017).

Brandy Brook and Pontiac Bay Specifications

Wetlands bordering Brandy Brook channel will be restored using a mixture of clean gravelly sand mixed with organic material. Backfill in the brook and in Pontiac Bay will be comprised of a New York State Department of Transportation (NYSDOT) specified bedding material. The edges of the brook channel will be restored using coir logs (i.e., biodegradable fiber roll). In addition, timber logs and other vegetative material (e.g., branches and saplings) salvaged from the clearing and grubbing of the impacted areas will be used in restoring the brook channel and bordering wetland. The brook and bordering wetlands will be restored using various stream bank restoration techniques consistent with the biotechnical measures for erosion and sediment control, defined in Section 4 of the *New York State Standard and Specifications for Erosion and Sediment Control* (NYSDEC, 2005). Data collected during the stream characterization efforts including grain size/stream channel substrate, channel width, bank type, and riffle and pool locations, were used to select appropriate restoration techniques that mimic the existing conditions of the brook. A plan view of the brook shown on Drawing C-501 identifies the type and location of in-stream and bank features, structures, and treatments that have been selected to restore the brook. Cross section details shown on Drawings C-401 through C-406 include typical cross sections for the selected channel restoration treatments. Table 4.1 provides information on the proposed stream bottom substrate and bank treatments for a given reach of the brook. Restoration details of in-stream and bank features, structures, and treatments are shown on Drawings C-601 and C-602.

To restore pre-construction wetland functions and values, the following in-stream structures and techniques are incorporated in the design including placement of boulders in the stream channel,

keyed-in boulders along the bank, channel protection soft armoring (coir logs or equivalent), and log bank and cover logs. NYSDOT size designations are used to specify bottom substrate that is consistent with the existing stream bed material. To match the existing bottom substrates, mixing of different sized material (as shown in Table 4.1) will be required.

Grain size data collected during the initial characterization of the tributary was used to develop a suitable specification for material to restore the brook channel substrate and bordering wetlands. Table 4.1 presents the specifications for the brook and bay substrates as well as the specifications for the wetland substrate proposed for use in restoring the impacted areas. The brook channel and lake bottom, as well as uplands bordering the bay and brook, will be restored with a gravelly loamy sand. Upland restoration will include a six-inch layer of loam. The wetlands bordering the brook will be restored using a mix of mineral soil and organic matter. A histic epipedon (i.e., bordering wetland topsoil) approximately one foot thick will be created using a mixture of mineral soil and organic material, as noted in Table 4.1. This material will be used in areas where wetlands bordering the brook have been impacted.

Table 4.1: Restoration Material Specifications

Wetland Topsoil (Gravelly Sand mixed with Organic Material)		
	Percent Composition	Size
Sand	70 – 85%	#10 Sieve to #200 Sieve
Silt	0-30%	<#200 Sieve
Gravel	15-35%	2 mm to 75 mm
Organic Material	70% mineral/30% organic	Fibric to hemic organic matter
Brook Channel and Pontiac Bay Backfill (NYSDOT Bedding Material)		
Gradation (Sieve Size)	Percentage Passing	Size
4 inch	100	Cobble
1 inch	15 – 60	Gravel
¼ inch	0 – 25	Gravel
No. 40	0 - 10	Sand

After topsoil has been placed and final grading has been completed, elevations of the restored stream bed, banks, and wetlands will be verified with survey level by the remedial action contractor prior to

planting. Disturbed bordering riparian areas will be seeded and mulched after establishing the finished grade. These areas area will also be planted with shrubs. Erosion control blanket consisting only of natural fiber and biodegradable material will be used to stabilize newly restored areas. A detailed planting plan for impacted areas is presented in the Section 5.0 of this document.

5.0 PLANTING PLAN

All vegetation (i.e., shrubs, trees, and herbaceous plants) within the areas being excavated will be removed during remediation activities. Most of the shrubs and trees exist within the bordering riparian areas along the brook and Pontiac Bay. The wetland bordering the brook will be replanted with scrub shrub (i.e., alders) and herbaceous wetland plants (i.e., wetland grasses and sedges). The upland adjacent to the bay will be replanted with shrubs and trees and seeded with a conservation/erosion control grass seed mix. Trees and shrubs listed in Table 5.1 proposed in these areas are to be planted as shown on Drawing C-501 and C-502.

The scrub/shrub and emergent wetland habitat bordering the brook will be restored after confirmation samples have determined cleanup goals have been met, construction activities associated with removal of contamination has been completed, and the Site has been re-graded. Tree and shrub species proposed for restoration of the bordering riparian areas are described in the following subsections. Mature shrubs currently provide shade to the brook and soil stabilization as well. During the growing season, overhanging and bordering trees and shrubs help moderate the water temperature which affects fish and invertebrate species that inhabit the brook. Tree and shrub species proposed for the restoration of the riparian area will restore these functions and values by providing soil stabilization and erosion control as well as providing shade for the brook. Shrubs and herbaceous plants also provide nesting and forage opportunities for small mammals and birds that utilize the Site.

5.1 TREES

The following are proposed replacement tree species for the impacted riparian along Pontiac Bay:

- Red maple (*Acer rubrum*)
- Ash (*Fraxinus pennsylvanica*)
- Gray birch (*Betula populifolia*)
- Willow (*Salix babylonica*)
- Red spruce (*Picea rubens*)
- Red Cedar (*Juniperus virginiana*)

- Black cherry (*Prunus serotina*)
- White pine (*Pinus strobus*)
- Scotch pine (*Pinus sylvestris*)

The riparian area and proposed tree restoration is shown on Drawings C-501 and C-502. Tree plantings proposed in this area will replace those removed during the remedial action. Trees to be impacted by the remediation work will be flagged and identified in the field prior to commencing site work. Replacement trees to be used in restoring the Site will be four to six feet tall and have soil surrounding the root mass (e.g., potted or wrapped in burlap). Tree planting shall be completed by excavating an area twice the diameter of the root mass and associated soil. Topsoil will be used to backfill the voids along the edges of the planted species. Mulch will be applied to soil at the base of the planted trees. A general detail of the proposed tree planting method is shown on Drawing C-602.

5.2 SHRUBS

The following species are proposed for restoration of the wetland adjacent to Brandy Brook:

- Alder (*Alnus incana/rugosa*)
- Red-osier dogwood (*Cornus sericea*)
- Gray dogwood (*C. racemosa*)
- Common elderberry (*Sambucus canadensis*)

The wetland shrub planting areas are shown on Drawing C-501. The shrub planting density within the restored wetland is 500 shrubs per acre. The riparian area to be replanted with shrubs is approximately 0.58 acres, which will require a minimum of 290 shrubs. Based on the species composition observed in the existing wetland the following numbers of shrub species are proposed: 160 alders, 40 red-osier dogwoods, 40 gray dogwoods, and 60 common elderberries.

Each shrub planted shall be 1.5 to 2 feet tall and have soil surrounding the root mass (e.g., potted or wrapped in burlap). Planting shall be completed by excavating an area twice the diameter of the root mass and associated soil. Topsoil shall be used to backfill the voids along the edges of the planted species. Mulch shall be applied to soil at the base of the planted trees. A typical detail of the proposed shrub planting method is shown on Drawing C-602.

5.3 HERBACEOUS PLANTS

The impacted wetland along Brandy Brook will be seeded and mulched once the final site grading and restoration of the brook channel have been completed. The specification for the seed mix is included in Specification Section 020921-Seeding and Soil Supplements. Additional planting specifications are included in Specification Section 02930-Exterior Plants. If a seed mix other than the one described in the specifications is proposed by the contractor, the mix shall be approved in writing by a MACTEC natural resource scientist prior to use. The application rate for seed mix in the wetland area is 35 lbs/acre. The seeded areas shall be mulched in accordance with Specification Section 02930-Exterior Plants. The upland adjacent to Pontiac Bay will be restored, seeded, fertilized and mulched.

6.0 EROSION CONTROL

Prior to disturbance of earthwork during the remedial action, erosion and sediment controls will be put in place as shown on the Erosion and Sediment Control Plans (Drawing C-106 through C-108) and described in notes and details provided on Drawings C-301 (Notes) and C-302 (Details). Implementation of the erosion and sediment controls as specified therein is intended to minimize impacts from surface water runoff.

Temporary devices and structures to control erosion and sedimentation in and around remediation areas will be properly maintained at all times. The devices and structures will be disassembled and properly disposed of as soon as the Site is stable but no later than November 1 one full growing season after plantings. Soil and/or sediment collected by these devices will be removed and placed in the upland in a manner that prevents its erosion and transport to the Brook or Lake Flower.

7.0 INVASIVE/NOXIOUS SPECIES

Invasive plant species identified by the NYSDEC are listed on the Interim list of Invasive Plant Species in NYS (<http://www.dec.ny.gov/animals/65408.html>). Table 7.1 provides a summary of the listed species, which are categorized based on the habitat type in which they are typically found. None of the floating and submerged aquatic plants listed in the table have been observed in the Brook or Lake Flower. In addition, none of the common invasive emergent wetland and littoral species have been found on the Site. Several of the terrestrial herbaceous, vine, and shrub and tree species listed have been observed on the Site including, Japanese honeysuckle (*Lonicera japonica*), Japanese barberry (*Berberis thunbergii*), shrub honeysuckles (*L. morrowii/tatarica/x bella*), and multiflora rose (*Rosa multiflora*). These species are commonly found in fallow waste areas. It is likely that all of the invasive species within the proposed work area will be removed during the remedial action; however these species pose the highest risk in reestablishing once the remediation of the Site is completed. These species will not be used in the restoration of the riparian areas.

Future monitoring of the Site will focus on wetland and aquatic invasive species, as they appear to be the most likely to become established on the Site. The location of invasive species and measures employed to control invasive plants will be noted during monitoring events. If other invasive plants are identified colonizing the Site, corrective actions will be completed to control them.

8.0 RESTORATION MONITORING

Post-construction monitoring is necessary to determine whether the restoration efforts are (or will eventually be) successful in meeting the restoration objectives. The monitoring plan presented in this section contains: (1) project overview, (2) requirements and specific performance standards that will be used to evaluate whether the restoration objectives have been met, (3) a summary of data collected during the monitoring including corrective actions conducted, (4) maps of the restoration site, and (5) conclusions based on the data collected and the requirements of the mitigation. The NYSDEC will monitor the restored Site for one year, as per the ROD for the site.

8.1 RESTORATION OBJECTIVE

The primary objective of restoring the Brandy Brook and Pontiac Bay and associated riparian areas is to replace lost functions and values, due to the remediation of the Site. The primary functions and values these bordering habitats provide include sediment and shoreline stabilization, production export, and wildlife habitat. The vegetation (i.e., trees and shrubs) in this area are also providing shade which moderates the water temperature in the tributary and creek. The Brook and Pontiac Bay are known to provide habitat for juvenile and adult fish and macroinvertebrates.

8.2 MEASUREMENTS OF SUCCESS FOR WETLAND/UPLAND RESTORATION

This subsection outlines the standards or criteria that will be used to determine if the above objective has been, or will be, met. These standards have been developed to meet the requirements of the Corps as described in the guidance document “Revision of New England District Compensatory Mitigation Guidance” (USACE, 2010) and the goals outlined in this plan. The monitoring methods described in Subsection 8.4 are designed to evaluate whether each of the standards for success are being met. Though the monitoring efforts and reports will address each of the standards on an annual basis, and the time frames for the realization of individual standards do vary to some degree, the ultimate determination of success or failure of the restoration project will not be made before the fifth year of monitoring. This determination will be based in part on an updated function and value assessment that will be conducted in the fifth year, after soils, hydrology, vegetation, and functions and values have had sufficient time to become established.

The first year monitoring event will occur after the Site has been through a full growing season following completion of the construction and planting. For these special conditions, a growing season starts no later than May 31. However, if there are problems that need to be addressed and if the measures to correct them require prior approval from the Corps, the permittee shall contact the Corps by phone or letter as soon as the need for corrective action is discovered.

Remedial measures shall be implemented to attain the success standards described below within five growing seasons after completion of construction of the restoration site(s). Measures requiring earth movement or changes in hydrology shall not be implemented without written approval from the Corps.

8.3 PERFORMANCE STANDARDS FOR SUCCESS OF THE RESTORATION

Field conditions will be measured against the following criteria to determine whether the restoration is successful:

- 1) The proposed vegetation diversity and/or density goals for woody plants specified are as follows. At least 70% of the tree and shrub species planted in the riparian zone are healthy and vigorous and showing signs of growth. In the riparian area, at least the following number of non-exotic species including planted and volunteer species should be observed by Year 5.

To count species as a volunteer, it must be well represented on the Site (i.e., greater than 50 individuals per acre). Volunteer species should support functions consistent with the design goals.
- 2) Common reed (*Phragmites australis*), Purple loosestrife (*Lythrum salicaria*), Russian and Autumn olive (*Elaeagnus* spp.), Buckthorn (*Rhamnus* spp.), Japanese knotweed (*Polygonum cuspidatum*), and/or Multiflora rose (*Rosa multiflora*) plants at the restoration site are being controlled. For this standard, small patches must be eliminated during the entire monitoring period. Large patches must be aggressively treated and the treatment documented.
- 3) All slopes, soils, substrates, and constructed features within and adjacent to the restored Brook and Bay are stable.
- 4) The horizontal brook channel location and associated banks are exhibiting a change of less than 0.5 feet per year in restored locations as measured from known fixed points.

It is understood that some wetland functions and values (e.g., forested wildlife habitat) will not be completely replaced for many years due to the time it takes for trees to mature. Success for this type of function will be evaluated based on monitoring data regarding the likelihood that conditions will

remain favorable for the full replacement over time (e.g., trees will survive, mature, and remain vigorous over the long term to allow development of forested wetland habitat).

8.4 MONITORING

Within 60 days of completing the restoration of the tributary and riparian zones, the applicant will submit a signed letter to the Corps, Policy Analysis and Technical Support Branch, specifying the date of completion of the mitigation work and the Corps permit number.

If mitigation construction is initiated in, or continues throughout the year, but is not completed by December 31 of any given year, the permittee will provide the Corps, Policy Analysis and Technical Support Branch, a letter providing the date mitigation work began and the work completed as of December 31. The letter will be sent no later than January 31 of the next year. The letter will include the Corps permit number.

8.4.1 Monitoring Report Guidance

The Site will be monitored and monitoring reports submitted on an annual basis for five years after site restoration has been completed. If observations indicate a need for corrective actions during the five year monitoring period a written correspondence will be sent to the Corps and NYSDEC outlining any corrective action(s) needed, and proposed solution(s) by December 15th of that year.

Annual monitoring will be conducted during the growing season, consisting of a site visit in the summer/early fall. Each annual monitoring report, in the format provided in the “Revision to the New England District Compensatory Mitigation Guidance” (USACE, 2010), will be submitted to the Corps, Regulatory Division, Policy Analysis and Technical Support Branch, no later than December 15th of the year being monitored. Failure to perform the monitoring and submit monitoring reports constitutes permit non-compliance. A self-certification form will be completed and signed as the transmittal coversheet for each annual monitoring report and will indicate the permit number and the report number (Monitoring Report 1 of 5, for example).

The reports will address the performance standards in the summary data section, and will address the additional items noted in the monitoring report requirements in the appropriate section. The reports will also include the monitoring-report appendices.

Remedial measures will be implemented - at least two years prior to the completion of the monitoring period—to attain the success standards described below within 3 growing seasons after completion of construction of the mitigation site(s). Should measures be required within two years of the end of the original monitoring period, the monitoring period will be extended to ensure two years of monitoring after the remedial work is completed. Measures requiring earth movement or changes in hydrology will not be implemented without written approval from the Corps.

The overall objective of monitoring will be to determine how well the standards for restoration success are being met. Monitoring will primarily include annual assessments of wetland hydrology, soils, planted stock, vegetation density, general wildlife use, and detrimental erosion.

8.4.2 Monitoring Schedule

It is proposed that monitoring occur annually for five years after completion of the restoration. Monitoring site visits will occur once a year. The success of the restoration will be assessed at the end of the fifth year to determine if additional monitoring or corrective measures are necessary. Monitoring events will be conducted in summer/early fall to assess the general condition of the restoration areas and to collect detailed information on soils, hydrology, and vegetation, and general observations of wildlife use.

8.4.3 Monitoring Vegetation and Soils

Monitoring trees and shrubs planted in the riparian areas will focus on the overall health and growth of each individual tree or shrub planted within the restored areas. Tags will be placed on planted trees and shrubs in these areas for easy identification in subsequent monitoring events. Sample plots will be established to characterize and measure herbaceous vegetation in the restored areas.

Information collected in each restored area will include the following:

- Condition of planted stock (i.e., number alive versus number dead),

- Number of planted stock and naturally-colonized (i.e., volunteer) woody plants,
- Plant vigor,
- Shrub and tree height range, and
- The presence of invasive species within the area or plot.

Observations of the type, quality, and integrity of the soil will be made in each of the restored riparian areas during each year of monitoring.

8.4.4 Meander Surveys

Meander surveys will be conducted during site visits to assess the overall vegetative and hydrologic conditions in the restored brook and bordering wetland. The meander surveys will provide an opportunity to identify and implement needed corrective actions during the growing season. These surveys will involve walking random routes throughout the restoration areas to identify problems such as significant plant mortality, erosion, and insufficient hydrology.

Overall distribution and survivorship of planted stock will also be assessed during the meander survey by comparing on-site conditions with planned community type and success criteria (and reflecting any plants subsequently replaced due to mortality). Reasons for significant plant mortality or low vigor will be investigated and reported to NYSDEC so that remedial actions can be planned and implemented. Problems with erosion and insufficient hydrology will be addressed in the same manner.

During meander surveys, the location and distribution of any invasive species, listed in Standard of Success Item 3, shall be noted.

8.4.5 Monitoring General Wildlife Use

Data on general wildlife use will be collected during each site visit during meander surveys. Actual wildlife sightings and observed signs will be recorded by species and presented in a list for general year-to-year comparisons.

8.4.6 Photographic Documentation

Representative photographs of the restored areas will be taken from established points to allow yearly comparisons of vegetative cover and hydrologic conditions. Photos from established locations will be taken during mid-summer. Additional photos may be taken during the spring monitoring events if areas or conditions needing corrective action are observed.

8.5 ANNUAL MONITORING REPORTS

An Annual Monitoring Report shall be prepared following each year of monitoring. The purpose of this report will be to document the results of monitoring, document progress of the tributary and riparian area habitat development and identify any corrective actions that may be needed to obtain the performance standards.

The annual reports will provide evaluation of the standards for success outlined in Subsection 8.3.

Additional items to be discussed in the narrative will include:

- Description of the monitoring inspections and the dates, that occurred since the last report;
- Soils data, commensurate with the requirements of the soils portion of the 1987 Delineation Manual data form, should be collected after construction and every alternate year throughout the monitoring period;
- Any remedial actions done during the monitoring year to meet the success standards. Actions such as removing debris, replanting, controlling invasive plant species (with biological, herbicidal, or mechanical methods), re-grading the Site, applying additional topsoil or soil amendments, adjusting site hydrology, etc. will be reported;
- The status of all erosion control measures on the restoration sites. Included in this discussion will be a recommendation to remove or maintain in place;
- Estimates of percent vegetative cover for each restoration site and percent cover of the invasive species listed under Success Standard No. 2, (presented in Subsection 9.2 of this document, above);
- Observation of wildlife and aquatic organisms using the Site and type of use (e.g., nesting, feeding, shelter, etc.);
- Description of the health and vigor of the surviving plants, the prognosis for their future survival and a diagnosis of the cause(s) of morbidity or mortality;

- Recommended remedial measures to achieve or maintain achievement of the success standards and otherwise improve the extent to which the restoration sites replace the functions and values lost because of project impacts.

The monitoring reports shall include three appendices listed below:

Appendix A - An as-built planting plan showing one-foot contours, and the location and extent of the designed plant community types. Within each community type the plan shall show the species planted. This is only needed in the first monitoring report unless there are additional plantings of different species in subsequent years.

Appendix B - A vegetative species list of volunteer species in each plant community type. The volunteer species list should, at a minimum, include those that cover at least 5% of their vegetative layer.

Appendix C - Representative photos of the Site taken from the same locations for each monitoring event.

The format of the monitoring report will follow that outlined in the Revision to New England District Compensatory Mitigation Guidance (USACE, 2010).

8.6 CORRECTIVE ACTIONS FOR RESTORATION DEFICIENCIES

To ensure the success of the Brook, bordering wetland, and Pontiac Bay, problems identified during monitoring will be addressed in a timely manner. NYSDEC will be consulted on a case-by-case basis in regards to the need for major remedial measures.

Minor corrective action or remedial steps, such as replacing dead plantings, fertilizing plants to increase growth rate, or re-seeding small areas, may be done without notice to the regulatory agencies, however, they will be detailed in the annual reports. No changes in grading and hydrology will be completed without consultation and approval by the Corps.

9.0 PROJECT SCHEDULE

The current project schedule estimate is for commencement of pre-excavation activities in March 2018 with removal of contaminated materials completed at OU02 by December 2018. Remediation work on OU03 would begin in March 2019 and wrap up in December 2019. Restoration work will be performed as excavation activities and confirmation sampling activities are completed. This schedule should allow time for excavation and confirmatory sampling and analysis and restoration efforts to be completed, including establishment of the herbaceous layer, prior to the winter season.

10.0 ASSESSMENT PLAN

A post-construction assessment of the condition of the restored upland and wetlands shall be performed following the fifth growing season (Year 5) after completion of the project, or by the end of the monitoring period, whichever is later. "Growing season" in this context begins no later than May 31st. To ensure objectivity, the person(s) who prepared the annual monitoring reports shall not perform this assessment without written approval from the Corps. The assessment report shall be submitted to the Corps by December 15 of the year the assessment is conducted; this will coincide with the year of the final monitoring report, so it is acceptable to include both the final monitoring report and assessment in the same document

The post-construction assessment shall include the following:

- Summary of the original and/or modified restoration objectives and discussion of the level of attainment of these objectives in the restored uplands and wetlands.
- Description of significant problems and solutions during construction and monitoring of the restoration areas.
- Identification of agency procedures or policies that encumbered implementation of the restoration plan, specifically noting procedures or policies that contributed to less success or less effectiveness than anticipated in the restoration plan.
- Recommendations of measures to improve the efficiency, reduce the cost, or improve the effectiveness of similar projects in the future.

The following appendices shall also be included in the assessment report:

Appendix A - Summary of the results of a functions and values assessment of the restoration areas, using the same methodology used to determine the functions and values of the impacted wetlands.

Appendix B – A plan showing the restoration area along the Brook and Bay including major vegetation community types and notes on the condition of the stream channel and wetland restoration.

Appendix C - Photos of each restoration site taken from the same locations as the monitoring photos.

11.0 RESPONSIBLE PARTIES FOR RESTORATION ACTIONS

NYSDEC shall be responsible for constructing, monitoring, correcting deficiencies, and reporting (e.g., annual monitoring reports and the assessment report) associated with Brandy Brook and riparian area restoration.

12.0 REFERENCES

USACE, 2010. “Revision of New England District Compensatory Mitigation Guidance”, U.S. Corp of Engineers, New England District Regulatory Division, July, 2010.

MACTEC Engineering and Consulting, (MACTEC), 2015. Remedial Investigation Report– Saranac Lake Gas Company Site #516008. Prepared for New York State Department of Environmental Conservation, Albany, New York. January 2015.

MACTEC, 2017. Pre-Design Investigation Field Activities Report, OU02 and OU03 – Saranac Lake Gas Company, NYSDEC Site #516008. Prepared for New York State Department of Environmental Conservation, Albany, New York. August 2017.

New York State Department of Environmental Conservation (NYSDEC), 2016. Record of Decision, Saranac Lake Gas Co., Inc., Operable Unit Number: 02: Brandy Brook, State Superfund Project, Saranac Lake, Essex County, Site No. 516008. March.

NYSDEC, 2015. Record of Decision, Saranac Lake Gas Co., Inc., Operable Unit Number: 03: Pontiac Bay on Lake Flower, State Superfund Project, Saranac Lake, Essex County, Site No. 516008. March.

New York State Department of Environmental Conservation (NYSDEC), 2017. Response letter from the New York Natural Heritage Program, regarding Rare or State Listed animals or plants, or Significant Natural Communities in the vicinity of the site. June 13, 2017.

NYSDEC, 2005. “New York State Standards and Specifications for Erosion and Sediment Control”, New York State Department of Environmental Conservation, Division of Water, August, 2005.

TABLES

Table 5.1: Replacement Tree and Shrub Species and Quantities Required

<i>Trees (Upland restoration along Brandy Brook and area bordering Pontiac Bay)</i>		
Common Name	Scientific Name	Quantity
Red Maple	<i>Acer rubrum</i>	10
Ash	<i>Fraxinus pennsylvanica</i>	5
Gray Birch	<i>Betula populifolia</i>	10
Willow	<i>Salix babylonica</i>	5
Red Spruce	<i>Picea rubens</i>	10
Red Cedar	<i>Juniperus virginiana</i>	10
Black Cherry	<i>Prunus serotina</i>	5
White Pine	<i>Pinus strobus</i>	20
Scotch Pine	<i>Pinus sylvestris</i>	5
	Total	80
<i>Shrubs (Wetland restoration along Brandy Brook)</i>		
Common Name	Scientific Name	Quantity
Alder	<i>Alnus incana/rugosa</i>	160
Red-Osier Dogwood	<i>Cornus sericea</i>	40
Gray Dogwood	<i>C. racemosa</i>	40
Common Elderberry	<i>Sambucus Canadensis</i>	60
	Total	300

Table 7.1: New York State Invasive Plant Species

Floating & Submerged Aquatic	
Common Name	Scientific Name
Carolina Fanwort	<i>Cabomba caroliniana</i>
Rock Snot (diatom)	<i>Didymosphenia geminata</i>
Brazilian Elodea	<i>Egeria densa</i>
Water thyme	<i>Hydrilla verticillata</i>
European Frog's Bit	<i>Hydrocharis morus-ranae</i>
Floating Water Primrose	<i>Ludwigia peploides</i>
Parrot-feather	<i>Myriophyllum aquaticum</i>
Variable Watermilfoil	<i>Myriophyllum heterophyllum</i>
Eurasian Watermilfoil	<i>Myriophyllum spicatum</i>
Brittle Naiad	<i>Najas minor</i>
Starry Stonewort (green alga)	<i>Nitellopsis obtusa</i>
Yellow Floating Heart	<i>Nymphoides peltata</i>
Water-lettuce	<i>Pistia stratiotes</i>
Curly-leaf Pondweed	<i>Potamogeton crispus</i>
Water Chestnut	<i>Trapa natans</i>

Emergent Wetland & Littoral	
Common Name	Scientific Name
Flowering Rush	<i>Butomus umbellatus</i>
Japanese Knotweed	<i>Fallopia japonica</i>
Giant Knotweed	<i>Fallopia sachalinensis</i>
Yellow Iris	<i>Iris pseudacorus</i>
Purple Loosestrife	<i>Lythrum salicaria</i>
Reed Canarygrass	<i>Phalaris arundinacea</i>
Common Reed-nonnative variety	<i>Phragmites australis</i> var. <i>australis</i>

Terrestrial - Herbaceous	
Common Name	Scientific Name
Garlic Mustard	<i>Alliaria petiolata</i>
Mugwort	<i>Artemisia vulgaris</i>
Brown Knapweed	<i>Centaurea jacea</i>
Black Knapweed	<i>Centaurea nigra</i>
Spotted Knapweed	<i>Centaurea stoebe</i> ssp. <i>micranthos</i>
Canada Thistle	<i>Cirsium arvense</i>
Bull Thistle	<i>Cirsium vulgare</i>
Crown vetch	<i>Coronilla varia</i>
Black Swallow-wort	<i>Cynanchum louiseae</i> (nigrum)
European Swallow-wort	<i>Cynanchum rossicum</i>
Fuller's Teasel	<i>Dipsacus fullonum</i>
Cutleaf Teasel	<i>Dipsacus laciniatus</i>
Giant Hogweed	<i>Heracleum mantegazzianum</i>
Japanese Stilt Grass	<i>Microstegium vimineum</i>

Table 7.1: New York State Invasive Plant Species

Terrestrial - Vines	
Common Name	Scientific Name
Porcelain Berry	<i>Ampelopsis brevipedunculata</i>
Oriental Bittersweet	<i>Celastrus orbiculatus</i>
Japanese Honeysuckle	<i>Lonicera japonica</i>
Mile-a-minute Weed	<i>Persicaria perfoliata</i>
Kudzu	<i>Pueraria montana</i> var. <i>lobata</i>

Terrestrial - Shrubs & Trees	
Common Name	Scientific Name
Norway Maple	<i>Acer platanoides</i>
Tree of Heaven	<i>Ailanthus altissima</i>
Japanese Barberry	<i>Berberis thunbergii</i>
Russian Olive	<i>Elaeagnus angustifolia</i>
Autumn Olive	<i>Elaeagnus umbellata</i>
Glossy Buckthorn	<i>Frangula alnus</i>
Border Privet	<i>Ligustrum obtusifolium</i>
Amur Honeysuckle	<i>Lonicera maackii</i>
Shrub Honeysuckles	<i>Lonicera morrowii/tatarica/x bella</i>
Bradford Pear	<i>Pyrus calleryana</i>
Common Buckthorn	<i>Rhamnus cathartica</i>
Black Locust	<i>Robinia pseudoacacia</i>
Multiflora Rose	<i>Rosa multiflora</i>

APPENDIX A

DESIGN DRAWINGS

1

2

3

4

5

6

A

B

C

D

REMEDIAL ACTION
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SARANAC LAKE GAS CO., INC., SITE NO. 516008
OU02: BRANDY BROOK AND OU03 PONTIAC BAY ON LAKE FLOWER
SARANAC LAKE, NEW YORK
PERMITTING
AUGUST 2017

LOCUS MAP

KEY MAP

DRAWING INDEX

INCLUDED THIS SUBMITTAL	SHEET NUMBER	DRAWING TITLE	DISCIPLINE NUMBER
•	1	COVER SHEET	G-001
•	2	NOTES, LEGENDS, AND ABBREVIATIONS	G-002
•	3	EXISTING CONDITIONS PLAN – OVERVIEW	C-101
•	4	EXISTING CONDITIONS PLAN – OU01	C-102
•	5	EXISTING CONDITIONS PLAN – OU02	C-103
•	6	EXISTING CONDITIONS PLAN– OU03	C-104
•	7	CONSTRUCTION STAGING AND TRAFFIC PLAN	C-105
•	8	EROSION AND SEDIMENT CONTROL PLAN – OU02	C-106
•	9	EROSION AND SEDIMENT CONTROL PLAN – OU03	C-107
•	10	EXCAVATION PLAN AND PROFILE – OU02	C-201
•	11	EXCAVATION PLAN AND PROFILE – OU02	C-202
•	12	EXCAVATION PLAN AND PROFILE – OU03	C-203
•	13	EROSION AND SEDIMENT CONTROL NOTES	C-301
•	14	EROSION AND SEDIMENT CONTROL DETAILS	C-302
•	15	CIVIL DETAILS – 1	C-303
•	16	CIVIL DETAILS – 2	C-304
•	17	CONSTRUCTION BASELINE CROSS SECTIONS – OU02	C-401
•	18	CONSTRUCTION BASELINE CROSS SECTIONS – OU02	C-402
•	19	CONSTRUCTION BASELINE CROSS SECTIONS – OU02	C-403
•	20	CONSTRUCTION BASELINE CROSS SECTIONS – OU02	C-404
•	21	CONSTRUCTION BASELINE CROSS SECTIONS – OU02	C-405
•	22	CONSTRUCTION BASELINE CROSS SECTIONS – OU02	C-406
•	23	CONSTRUCTION BASELINE CROSS SECTIONS – OU03	C-407
•	24	CONSTRUCTION BASELINE CROSS SECTIONS – OU03	C-408
•	25	CONSTRUCTION BASELINE CROSS SECTIONS – OU03	C-409
•	26	BRANDY BROOK RESTORATION/LANDSCAPING – OU02	C-501
•	27	PONTIAC BAY RESTORATION/LANDSCAPING – OU03	C-502
•	28	RESTORATION DETAILS	C-601
•	29	RESTORATION DETAILS	C-602

Department of Environmental Conservation

REMEDIAL ACTION

SARANAC LAKE GAS CO., INC.

SARANAC LAKE, NEW YORK

NYSDEC SITE NUMBER - 516008

MACTEC

GENERAL

COVER

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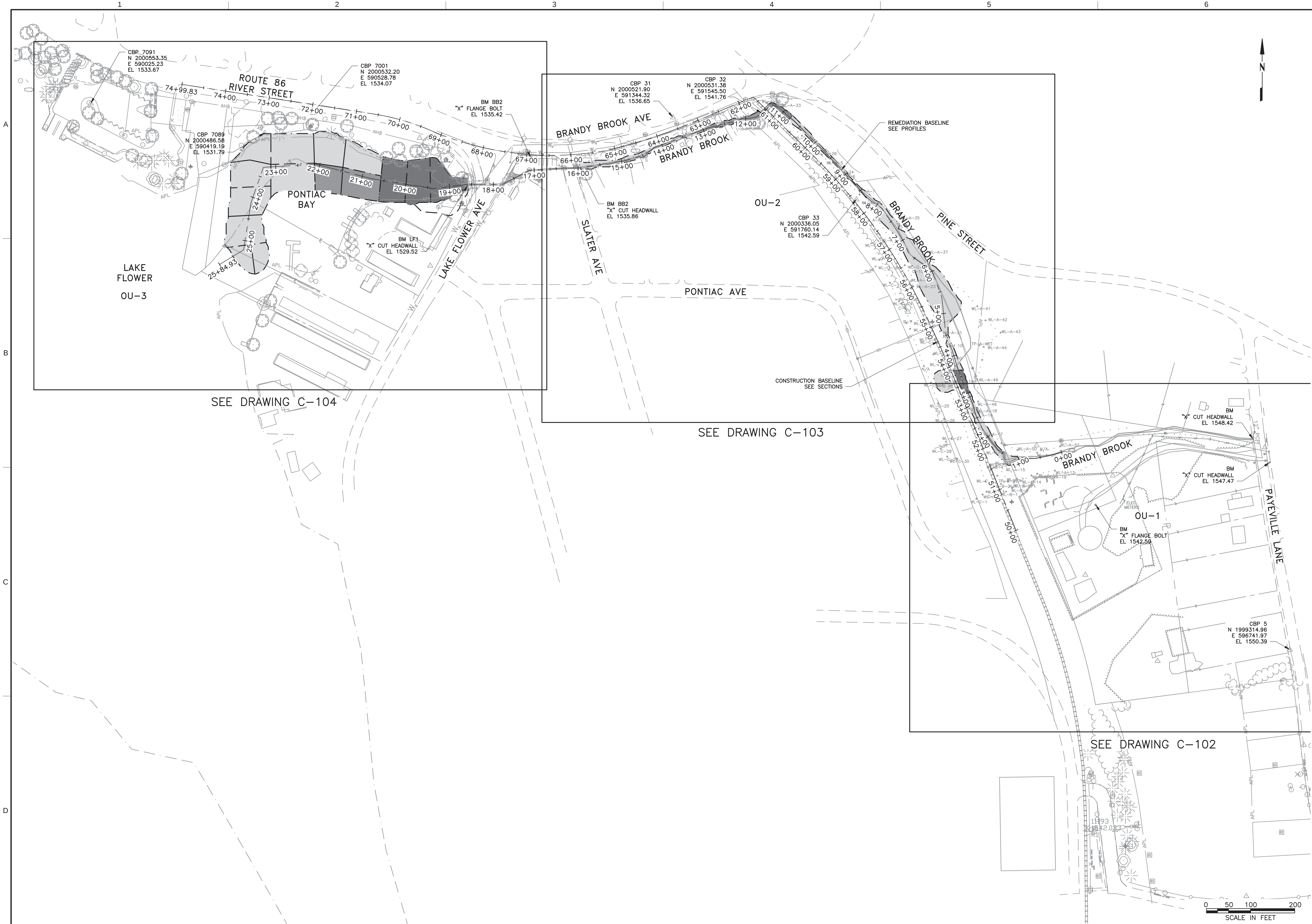
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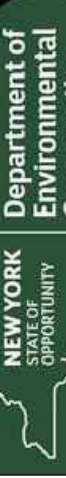


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		MACTEC Engineering and Consulting, P.C. P.O. Box 7050, 511 Congress Street Portland, Maine 04112-7050 (207) 775-5401	
CIVIL		REMEDIAL ACTION	
EXISTING CONDITIONS		SARANAC LAKE GAS CO., INC.	
OU01		SARANAC LAKE, NEW YORK	
		NYSDEC SITE NUMBER - 516008	
VERIFY SCALE			
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"			
DATE		FEB 2017	
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SHEET	5 OF 29	



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Department of
Environmental
Conservation
NEW YORK
Conservatory

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SARANAC LAKE GAS CO., INC.
SARANAC LAKE, NEW YORK
NYSDEC SITE NUMBER - 516008

DATE: FEB 2017

PROJ: 3611-16-1193

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VERIFY SCALE
BAR IS ONE INCH ON
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