Form A: HPSTID Cover Sheet

Health Physics Study / Technical Information Document

(HPSTID)

Cover Page

Number: HPSTID - **06-011**

Title: **Documentation for Initial Implementation of**

NEI Groundwater Initiatives

Comments:

Originator: _____ Date: 7/28/06

Independent Reviewer: _____ Date: 7/28/06

Approver: _____ Date: 7/28/06

HP Department Supervisor

B-4

OBJECTIVE

The purpose of this HPSTID is to provide documentation of actions taken for the initial implementation of the NEI Groundwater Initiatives. This Industry Initiative, which is being implemented by all U.S. nuclear utilities, contains requirements for documenting groundwater sample results and spills or leaks into groundwater and for making formal and informal communications to state and local officials and to the Nuclear Regulatory Commission (NRC). NEI is in the process of finalizing but has not yet finalized guidance on this aspect of the Industry Initiative.

The intent of this guidance applies to conditions or situations that are inadvertent, unexpected and unplanned/unmonitored. This guidance does not apply to conditions or situations that are expected, planned and monitored as authorized effluent releases in accordance with the Offsite Dose Calculation Manual (generically ODCM or ODAM). PWR secondary and auxiliary systems not impacted by/from active or residual primary-to-secondary leakage or other cross-connection to a radioactive source are generally not within the intent of the Industry Initiative for reporting.

DISCUSSION

The FPL Nuclear Fleet Ground Water Impact Assessment Plan is divided into three distinct segments. Phase I - Baseline Assessment, Phase II - Assessment, Phase III-Action Plan. See Appendix 1 for action plan. This HPSTID covers the actions for initial implementation, future actions may be developed based on industry/fleet recommendations.

1.0 Tritium Baseline Assessment

Action 1.1 - Locate/Catalog/Map existing wells and their availability/accessibility

Areva Engineering studies (EIR 51-5042838-01 and EIR 51-5047817-00) were performed to study groundwater behavior surrounding the plant. Recommendation were made for locations to drill groundwater monitoring wells.

15 groundwater monitoring wells were drilled in 2005 under Work Order #0420481, 04MSE128. See Appendix 2 for well numbering and locations. See Appendix 2 for details

Also included in Appendix 2 are maps of wells that have been drilled on-site which are not part of the tritium sampling program. These were wells drilled in support of petroleum monitoring and for support of plant auction in 2000. These wells are located outside of the protected area. These well locations will be reviewed in relation to the tritium sampling program under CR 06-03081.

Action 1.2 - Locate and map relevant surface water sample locations

Surface water (seawater) grab samples are required at two locations (control and indicator) monthly. The indicator (01) is over the vicinity of the plant discharge. The control location (51) is located in Ipswich Bay, MA. These samples are collected monthly and analyzed for gamma activity with a composite sample collected quarterly and analyzed for tritium.

A third sample point has been added which is located approximately 200 yards from the Protected Area fence, Southeast of the plant. A gamma and tritium analysis is performed on this sample.

Any sample collection and analysis deviations from the ODCM required program, or reportable concentrations, that may have occurred during the year are described in Section 4 of the Radiological Environmental Operating Report as part of the REMP Program.

Action 1.3 - Document current tritium sample results for existing wells and surface water locations

Sampling of Groundwater Monitoring wells is performed IAW Chemistry Department Instruction CDI-015. Sampling of Groundwater Monitoring Wells are completed quarterly, until a stable baseline has been established. Sampling frequency may be reduced in the future at locations where the baseline is stable. The definition of "stable" is TBD.

To date, two wells have shown detectable tritium levels, SW3 and SW1, both of which are surficial wells. A Key Performance Indicator was developed to track SW1 along with SD-1 and BD2 which are located closest to the site boundary.

- SD-1 Surficial Downgradient located South of PAB, near seawall
- BD-2 Bedrock Downgradient located South of PAB, near seawall
- SW-1 Surficial Well - Other located South of PAB/West of FSB

For the year 2005, 24-gamma analyses were performed on surface water samples. The only radionuclide detected in 2005 was naturally occurring K-40. No plant-related nuclides were detected. The present data for gamma emitters in seawater is consistent with that of the pre-operational program and previous years of operations. Therefore, no increasing or decreasing trends were observed.

Quarterly composites from the same gamma collection samples were analyzed for tritium. Eight samples were analyzed in 2005. The monthly composites showed no presence of tritium. The composites met the required LLD (3000 pCi/kg) for tritium in seawater. These results are consistent with pre-operational tritium data.

The calculated dose, as the result of plant effluents is not evaluated due to the fact that no plant related radionuclides were or have been detected. Therefore, no increasing or decreasing trends in dose were observed. This sampling program demonstrates that there is no impact to the public or environment, through this pathway, from plant operations.

Action 1.4 - Obtain new samples and submit for analysis

See Action 1.3 and Appendix 2 for sample data

Action 1.5 - Assess tritium results

See Action 1.3 and Appendix 2 for sample data

Action 1.6 - Prepare management report – tritium baseline results

In June of 1999 Tritium was discovered in the containment annulus through sampling. A project team was formed to investigate the source of this tritium. ACR #99-3948 was written to capture the root cause evaluation. Leakage from the fuel transfer canal and cask handling areas located in the Fuel Storage Building were determined to be the primary cause. Leakage at this time was estimated to be 10-30 gallons per day. Notifications to State and Local Officials was communicated through our "Good Neighbor" policy by the Communications Staff.

The information presented summarizes Seabrook Stations response and is organized as follows:

- Background Information
- Repair
- Mitigation and Control
- Monitoring
- Current State Efforts/Status
- KPI's
- Additional Information

In December of 1999 Non Destructive Examination (NDE) was performed to specific locations in the transfer canal and cask handling areas with no determinable results (CR 99-5194).

Leak Off Lines also known as Tell Tale Drains were hydrolased in October 2000 and blockage of calcium carbonate was removed from Zone 6 (cask loading pool). 01MSE0075 was issued in March of 2001 to provide a better method to collect the effluent from each individual leak off line and to segregate the leak-off effluent from the groundwater in the sump. See the Monitoring section for specifics on this MSE.

A repair was attempted through the application of BioDur561 to highly suspected areas in the cask loading pool and transfer canal areas in February 2003 which proved unsuccessful based on the continued leak rate of ~30 gpd. The areas were drained below the floor of the transfer canal ~ elev. -11' in April 2003 which stopped the leak.

The areas were left in this state until in an effort to locate the exact elevation of the leak was pursued. By raising and lowering the water levels it was thought that the suspect area could be limited by elevations. During this testing a ~350 gpd leak was discovered (CR 04-03660). The areas were again drained to below the floor of the transfer canal and the leak stopped. Visual inspection identified a crack approx. 108" in length in the cask loading pool. Additionally two other locations were identified for minor weld repairs. Upon completion of the weld repairs (WO#0420456) the areas were reflooded and the leak rate returned to approx 30 gpd. The areas were drained and in October 2004 a non-metalic liner, ML-2 was applied to the entire cask loading pool and transfer canal wall and floor surfaces per 04TMOD009(WO#0432401). The areas were reflooded and all indications show the leak has been stopped.

The non-metalic ML-2 liner will need protection from pre-outage and outage work in the transfer canal and cask loading pool. Engineering has been reviewing activities in these areas and have made recommendations for protection on a case by case basis. These include fabrication of "protective plates" used when placing equipment on the floor, etc. The Tritium Control Committee and engineering will be reviewing performance of the liner and making recommendations on replacement timeframe. When replacement is warranted it is believed that by systematically stripping the old coating the leak may be localized and a complete recoat may not be necessary.

The risk of the flow of Tritium away from the areas under plant buildings is reduced by aggressively dewatering the groundwater under plant buildings. Four dewatering locations are in service.

Tritium monitoring wells have been installed in order to detect the movement of Tritium containing water. Areva Engineering studies (EIR 51-5042838-01 and EIR 51-5047817-00) were performed to study groundwater behavior surrounding the plant. Recommendation were made for locations to drill groundwater monitoring wells.

The current state and efforts to control Tritium are being managed by The Tritium Control Committee. This multi-discipline group has been re-established to review Seabrook's current action plan and to recommend future actions to ensure mitigation and monitoring are completed in a timely manner.

Current State:

- The application of the non-metalic liner has stopped the leak from the Cask Loading Area.
- Tritium containing water is not migrating away from the plant.
- The Tritium Control Committee will be monitoring, performing and as needed, initiating additional actions for comprehensive tritium control.

2.0 Historical spills/leaks review

Action 2.1 - Review historical files and map locations for further assessment in Phase II

Historical Radiological Site Assessment is performed annually and documented in a Health Physics Study / Technical Information Document (HPSTID). HPSTID 06-006 is the most recent Historical Radiologically Site Assessment covering the period from January 1, 2005 to December 31, 2005.

Action 2.2 - Interview select employees for additional historical events to include in Phase II Assessment

Interviews are included as part of the Historical Radiological Site Assessment performed annually and documented in a Health Physics Study / Technical Information Document (HPSTID) per Seabrook Station Radiation Protection Manual, RP 17.2.

3.0 Review existing ground water performance data

Action 3.1 - Review ER, FSAR and other documentation pertaining to site ground water performance

Engineering Studies performed by Areva were foreign printed and are available in Eb. Foreign Print #25479-01 Areva Engineering studies Surficial Wells to Replace Cathodic Protection Standpipes at Seabrook Station and Foreign Print #25480-01 Recommendations for Siting of Ground Water Monitoring Wells at Seabrook Station were reviewed.

Action 3.2 - Prepare summary report with recommendations pertaining to additional studies needed, if any

Review hydrology based on findings of Engineering Assessment of Systems, Structures & Components (due 12/31/06). Additional hydrology assessment may be needed for the North side of the plant. This is being tracked under Condition Report 06-03081.

4.0 Implement NEI Industry Initiative

Action 4.1 - CR Issued

Condition Report 06-03081

Action 4.2 - Adopt/schedule company/site specific ground water assessment plans

See Appendix 3, Seabrook Station Site Specific Assessment Plan

Action 4.3 - Incorporate requirements in plant procedures to document all onsite ground water sample results in the Annual Radiological Environmental Monitoring Report

Incorporated into Chemistry Procedure CX0901.37 Rev. 04 Chg. 06, issued 7/25/06.

Action 4.4 - Incorporate requirement in plant procedures to document and describe any significant onsite leaks/spills into ground water for the previous calendar year in the annual Radiological Effluent Report. First report will incorporate information from calendar year 2006 in the report to be submitted in 2007

Incorporated into Chemistry Procedure CX0901.37 Rev. 04 Chg. 06, issued 7/25/06.

Action 4.5 - Define the term "Significant" for purposes of reporting spills/leaks

Fleet and industry have defined "Significant" as 100 gallons of contaminated water outside of buildings/structures.

Action 4.6 - Incorporate a requirement to submit a 30-day report to the NRC with a copy to the appropriate State Agency for any onsite ground water sample that may be used as a source of drinking water that exceeds the applicable column

Requirements currently exist in the Radiation Protection Manual, RP 17.1, Section 4.1.

Action 4.7 - Incorporate a requirement to make an informal notification to State/Local Officials, with follow-up notification to the NRC under 10 CFR 50.72 regarding significant onsite leaks/spills into ground water or onsite water sample results tat exceeds the applicable requirements in the ODCM-Reporting Levels for Radioactivity Concentrations in Environmental Samples

Operations Procedure ON1244-01 Spill Response and the NARC Manual contain requirements for notifications.

Action 4.8 - Determine which State and Local Agencies will receive the informal notifications and establish a reporting protocol

State and Local agencies have been identified in Health Physics Operational Guideline (HPOG) 25.

Action 4.9 - Establish internal management notification protocols

Internal management notifications is covered in Health Physics Operational Guideline (HPOG 25)

APPENDIX 1
FPL NUCLEAR FLEET
GROUND WATER IMPACT ASSESSMENT PLAN
SUMMARY

PHASE I Baseline	PHASE II Assessment	PHASE III Action Plan
Tritium Baseline **Wells/Surface Water** • Identify, locate & map existing wells and surface water locations to be sampled • Collect samples • Analyze • Baseline assessment • Summary Report	**Wells/Surface Water** • Evaluate need for additional sampling, sampling locations (new wells) based on results of tritium analyses, assessment of historical leaks/spills, hydrology/geology information or evaluation of SSC. • Develop Action Plans, as needed for o New wells o Long-term sampling program	**Wells/Surface Water** **Action Plan Implementation** • Install Wells per plan • Implement new sample schedule
Historical Leaks/Spills (50.75(g)) • Review and summarize data • Leaks/Spills/Legacy Disposal/Storage • Interviews • Map locations for further assessment	**Historical Leaks/Spills (50.75(g))** • Information Assessment o Leaks/Spills o Legacy Storage	**Historical Leaks/Spills (50.75(g))** • Update Records as necessary from well data, interviews, other credible sources, SSC reviews
Hydrology/Geology • Review existing data sources for understanding of ground water interaction	**Hydrology/Geology** • Evaluate for data gaps	**Hydrology/Geology** • Additional ground water assessments, as neeeded
	Systems, Structures, Components • Gather data, review, assessment • Develop Action Plans	**Systems Structures, Components** • Implement Action Plans o Monitor o Test o Modifications

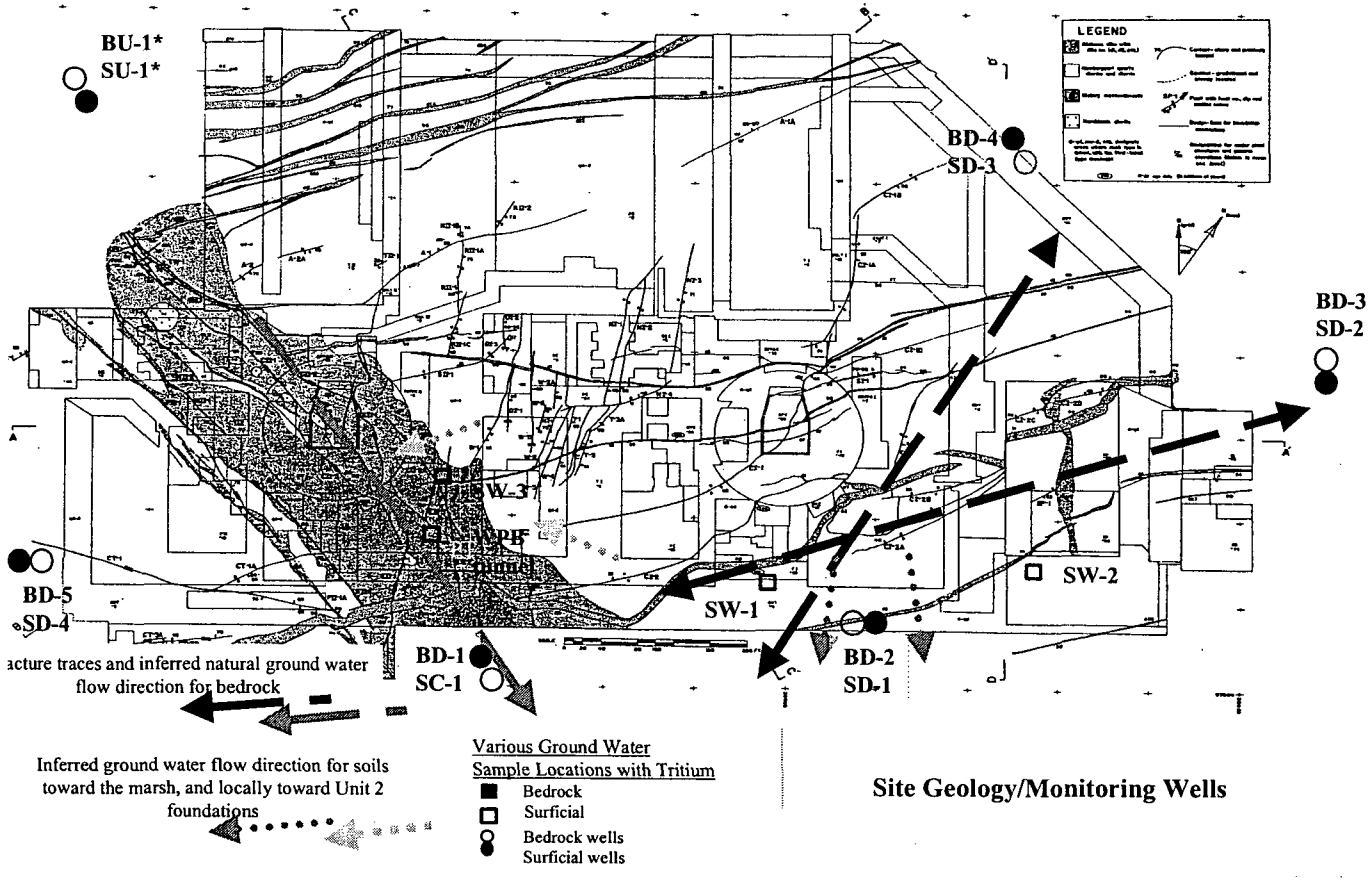
Ground Water Impact Assessment Plans
Project Planning Schedule - Phase I

Task	Sub Task
Corporate/Site Kick-Off Meetings	

	Meet w/ Site Teams
1.0 Tritium Baseline Assessment	
	1.1 Locate/Catalog/Map existing wells and their availability/accessability
	1.2 Locate and map relevant surface water sample locations
	1.3 Document current tritium sample results for existing wells and surface water locations
	1.4 Obtain new samples and submit for analysis
	1.5 Assess tritium results
	1.6 Prepare management report - tritium baseline results
2.0 Historical spills/leaks review	
	2.1 Review historical files and map locations for further assessent in Phase II
	2.2 Interview select employees for additional historical events to include in Phase II Assessment
3.0 Review existing ground water performance data	
	3.1 Review ER, FSAR and other documentation pertaining to site ground water performance
	3.2 Prepare summary report with recommendations pertaining to additional studies needed, if any

Implement NEI Industry Initiative	
	4.1 CR Issued
	4.2 Adopt/schedule company/site specific ground water assessment plans
	4.3 Incorporate requirements in plant procedures to document all onsite ground water sample results in the Annual Radiological Environmental Monitoring Report
	4.4 Incorporate requirement in plant procedures to document and describe any significant onsite leaks/spills into ground water for the previous calendar year in the Annual Radiological Effluent Report. First Report will incorporate information from calendar year 2006 in the report to be submitted in 2007.
	4.5 Define the term "Significant" for purposes of reporting spills/leaks
	4.6 Incorporate a requirement to submit a 30-day report to the NRC with a copy to the appropriate State Agency for any onsite ground water sample that may be used as a source of drinking water that exceeds the applicable column
	4.7 Incorporate a requirement to make an informal notification to State/Local Officials, with follow-up notification to the NRC under 10 CFR 50.72 regarding significant onsite leaks/spills into ground water or onsite water sample results that exceeds the applicable requirements in the ODCM-Reporting Levels for Radioactivity Concentrattions in Environmental Samples
	4.8 Determine which State and Local Agencies will receive the informal notifications and establish a reporting protocol
	4.9 Establish internal management notification protocols

APPENDIX 2
Site Geology with Recommendations for Monitoring Well Sites
Areva Engineering Report EIR 51-5042838-01 and EIR 51-5047817-00



APPENDIX 2
Key to Well Numbering System

Surficial Wells, Monitors groundwater in soils

- Flow direction follows surface contour
- SU – surficial upgradient
- SD – surficial downgradient
- SC – surficial cross-gradient
- SW - other

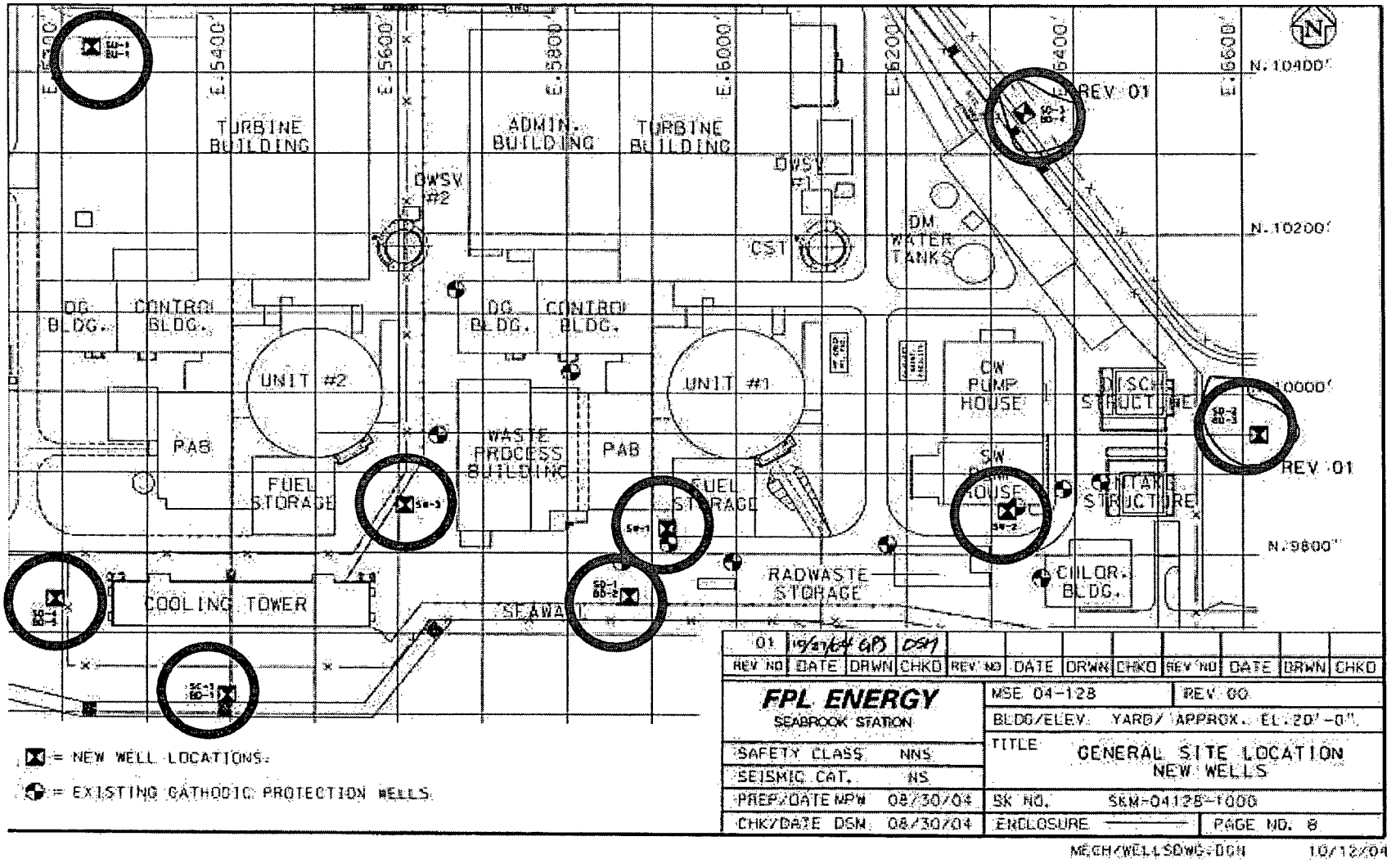
Bedrock Wells, Monitors groundwater in bedrock

- Flow direction follows the fracture contour
- BU – bedrock upgradient
- BD – bedrock downgradient
- BC – Bedrock cross-gradient

Well Numbers and Locations

• SD-1 / BD-2	South of PAB, near seawall
• SD-3 / BD-4	NE of Miller Bldg., outside Protected Area
• SD-2 / BD-3	East of Disch Structure, outside Protected Area
• SD-4 / BD-5	West of Cooling Tower, outside fence
• SC-1 / BD-1	South of Cooling Tower, outside fence
• SU-1 / BU-1	West of Unit 2 Turbine Building
• SW-1	South of PAB / West of Fuel Storage Bldg
• SW-2	South of Service Water Pump House
• SW-3	West of Waste Process Bldg. inside Protected Area

APPENDIX 2
Actual Monitoring Well Locations per 04MSE128



APPENDIX 2
Monitoring Well Biographical Information

WELL ID	SU-1	SD-1	SD-4	SC-1	SD-3	SD-2	SW-1	SW-2	SW-3
SHALLOW / DEEP	SHALLOW	SHALLOW	SHALLOW	SHALLOW	SHALLOW	SHALLOW	SHALLOW	SHALLOW	SHALLOW
NORTHING	10430.5	9746.92	9742.63	9623	10370	10000	9831.5	9854	9860
EASTING	5235.5	5873.17	5192	5395.33	6330	6579	5918	6319.5	5608
SURFACE ELEVATION	20.06'	20.09'	20.1'	19.89'	11'	12.6'	20.1'	20.47'	20.39'
BEDROCK ELEVATION	5.0'	1.6'	8.0'	5.4'	1'	1.6'	-2	4.0'	0.4'
DEPTH TO BEDROCK *	15'	18½ '	12'	14½ '	10'	11'	22'	16½ '	20'
WELL SCREENED *	4' to 15'	12' to 18½'	7' to 12'	9' to 14½'	5' to 10'	6' to 11'	12' to 22'	9' to 16½'	10' to 20'
FIRST WATER *	4'	12 ½'	9'	9'	5'	6'	12'	9'	12'
WELL DEPTH *	15'	18-½ '	12'	14½ '	10'	11'	22'	16½ '	20'
STAND / FLUSH CAP	STAND	FLUSH	FLUSH	STAND	STAND	STAND	FLUSH	FLUSH	FLUSH

WELL ID	BU-1	BD-2	BD-5	BD-1	BD-4	BD-3			
SHALLOW / DEEP	DEEP	DEEP	DEEP	DEEP	DEEP	DEEP			
NORTHING	10430.5	9746.92	9742.63	9623	10370	10000			
EASTING	5235.5	5873.17	5192	5395.33	6330	6579			
SURFACE ELEVATION	20.06'	20.09'	20.1'	19.89'	11'	12.6'			
BEDROCK ELEVATION	6.0'	-0.9	8.1'	4.9'	2.5'	1.6'			
DEPTH TO BEDROCK *	14'	21'	12'	15'	8½'	11'			
WELL SCREENED *	na	na	na	na	na	na			
FIRST WATER *	31'	26'	158'	39'	168'	151'			
WELL DEPTH *	46'	100'	167'	101'	174'	171'			
STAND / FLUSH CAP	STAND	FLUSH	FLUSH	STAND	STAND	STAND			

PUMP&PACKER TESTS:
BD-1: Water produced at 39-44 feet, 60-65 feet, and at 90-95 feet.
BD-2: Most water produced at 40-45 feet, adequate water at 60-65 feet, no water produced at 80-100 feet.
BD-3: Water produced at 92-97 feet, 111-116 feet, and most water at 160-165 feet.
* No test performed on BD-4, water produced only at 168 to 174 feet.
* No test performed on BD-5, water produced only at 158 to 167 feet.
* No test performed on BU-1, shallow bedrock well only to 46 feet.
NOTES:
All * depths are approximate (within inches), measured in "feet down from surface elevation" unless otherwise noted.
All deep wells are 4"dia, all shallow are 2" diameter
Plant coordinates are the locations of the Surveyors' pins. Wells are generally located within 10' of the pins.

APPENDIX 2
Monitoring Well Sampling Data

Date/Time	BD-1	BD-2	BD-3	BD-4	BD-5	BU-1	SC-1	SD-1	SD-2	SD-3	SD-4	SU-1	SW-1	SW-2	SW-3
	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)
09/07/04												< 554			
09/08/04						< 549									
09/14/04								< 546							
09/17/04												< 554			
09/22/04		< 550													
09/22/04		< 547													
09/23/04								< 607							
09/29/04													1930		< 553
10/29/04											< 547				
11/03/04					< 547										
11/05/04	584														
11/05/04	< 511														
11/05/04	< 513														
11/08/04							< 524							728	
11/18/04			880	< 560					1570	1140				< 557	
11/23/04			< 560												
11/23/04			< 559						< 560	< 560					
11/23/04			< 559												
11/08/04															
12/22/04													2930		
02/03/05			< 559					< 563							
02/05/05												< 564			
Spring / Summer 2005 Sampling															
06/09/05		< 548						620							
06/15/05													1160		691
06/22/05						< 538								< 534	
07/07/05						< 549						< 548			
07/08/05	< 553				< 548		< 545	< 545			< 546				
07/12/05			< 549	< 550					< 542	< 543					
Fall / Winter 2005 Sampling															
10/03/05						< 549									
11/02/05												< 546			
11/17/05		< 569						< 590					617		
11/18/05			< 569						< 565					< 586	617
11/19/05				< 574						< 565					
11/21/05	< 580				< 582		NW				< 574				
Winter / Spring 2006 Sampling															
03/11/06		< 577						< 579					1550	< 582	
03/16/06															610
03/18/06	< 592				< 587		< 588								
03/25/06			< 562			< 670			< 554		< 555	< 557			
03/27/06				< 592						< 586					
Spring / Summer 2006 Sampling															
05/05/06													2020		
06/14/06		< 589											1320		
06/24/06								< 590						< 585	< 589
06/25/06	< 598				< 590		< 590				< 590				

Definitions

B= Bedrock Well
S= Soil Well
C= Cross Gradient
D= Down Gradient
U = Up Gradient

Greater than MDC

NW= No Water Present

APPENDIX 2

Petroleum Monitoring Wells

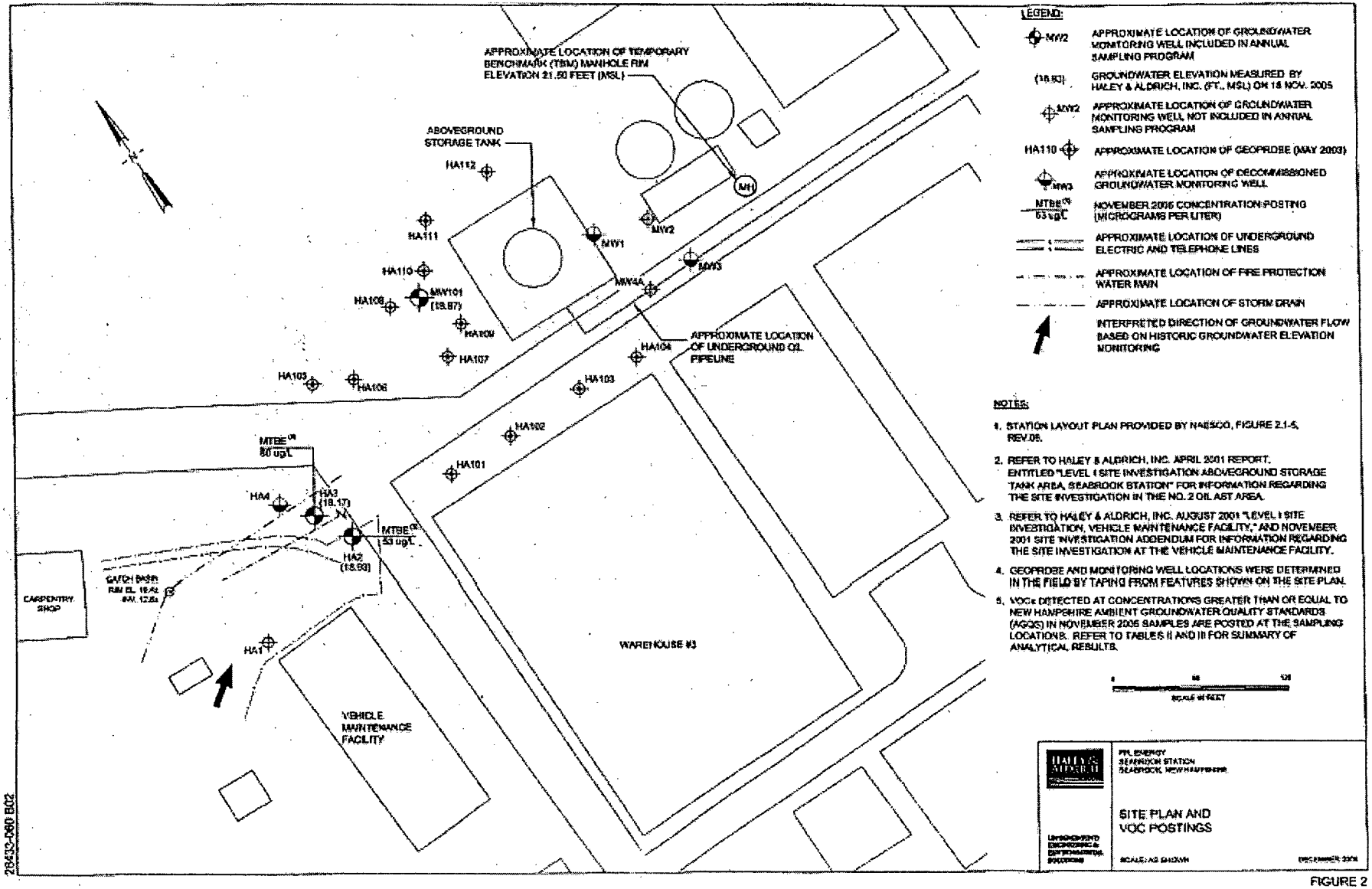
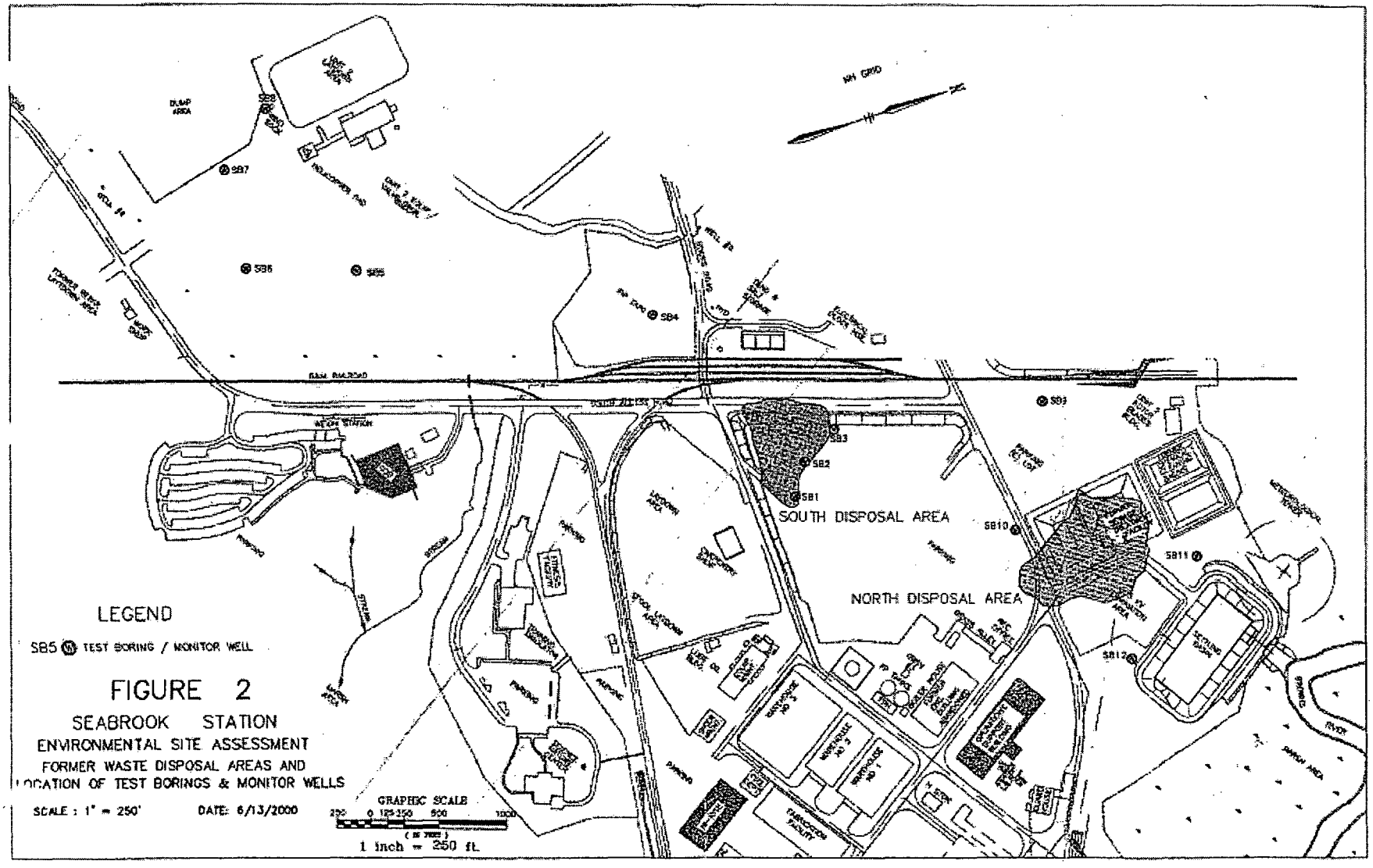


FIGURE 2

APPENDIX 2

APPENDIX 2

Wells Drilled to Support Plant Auction in 2000



APPENDIX 3

Seabrook Station Site Specific Assessment Plan

Action	Assignment	Due Date
Assess Sampling of Non-Radioactive Monitoring Wells	P. Harvey	9/15/06
Establish Pumping Policy in the SSRP	R. Thurlow	8/31/06
Complete High Risk Matrix List	R. Thurlow	10/31/06
Address/evaluate outage related High Risk Items on Matrix	R. Thurlow	9/15/06
Address Non-Outage Issues from High Risk Matrix List (depending on issues)	TBD	TBD
Perform System and Component Review	A. Kodal	12/31/06
Determine need for Storm Drain Inspections	A. Kodal	12/31/06
Establish Dewatering System Protection in the Work Control Program	T. Smith	8/31/06
Perform Periodic Ground Water Control Committee Meetings	R. Thurlow	Ongoing
Evaluate Spill Prevention (re-enforce station policy for groundwater protection)	M. Kiley	8/31/06
Evaluate earlier use of BTRS Demins	R. Thurlow	12/31/06
Provide PRB input for Ground water issues	Committee	Ongoing
Continue CNO Indicators	R. Thurlow	Ongoing
Establish Ground Water Protection Response Checklist	R. Thurlow	7/31/06
Establish Preventative Maintenance Program for WL Discharge Line	A. Chesno	8/31/06
Incorporate Ground water protection into Design Control Manual	R. Thurlow	Complete
Monitor Fleet & Industry Actions	R. Thurlow	Ongoing
Share Lessons Learned & Committee Minutes with fleet counter parts	P. Fields	Ongoing
Perform additional hydrology expand understanding of site hydrology	P. Mahan	12/31/06
Meet with Local / State Notification Personnel	R. Winn	9/15/06