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E910-02-002

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Gentlemen,

Subject: Saxton Nuclear Experimental Corporation (SNEC)
Operating License No., DPR-4
Docket No. 50-146
Phase 2 & 3 Characterization Data

As committed in GPU Nuclear letter E910-01-001, dated January 30, 2001, this document provides the remaining characterization information requested by the NRC in their letter dated January 17, 2001. To date two submittals have been sent to the NRC. These were:

- GPU Letter E910-01-013 dated July 2, 2001: Phase 1 characterization of the DSF, CV Pipe Tunnel subsurface soil and pavement and subpavement soil.
- GPU Letter E910-01-016 dated September 4, 2001: Phase 2 characterization of the Saxton Steam Generating Station (SSGS), SSGS Discharge Tunnel and Surrounding Environs. River sediment information was not available at the time of this submittal.

This submittal provides the remaining characterization information for river sediment from Phase 2 and Phase 3 characterization results for the SNEC Facility Yard Drains and Intake Tunnel. Because of the communication between the SSGS basement and Discharge Tunnel, the Intake Tunnel was included into Phase 3. Format changes and/or revisions to the applicable sections of the SNEC License Termination Plan (LTP), Chapters 2.0 & 5.0, will be made to incorporate this additional characterization data.

If you have any questions, please contact Mr. James Byrne at (717) 948-8461.

Sincerely,

G. A. Kuehn
Program Director, SNEC

cc: NRC Project Manager
NRC Project Scientist, Region 1

A001

Phase 2 – River Sediment Characterization

1.0 River Description

The Raystown Branch of the Juniata River meanders from its headwaters near Deeters Gap in Somerset County through rural Bedford County. From Deeters Gap, the river runs an easterly course through the Town of Bedford, Pennsylvania. After Bedford, the river takes a northeasterly course to Saxton, Pennsylvania where the river begins to form Raystown Lake. The river upstream of Raystown Lake is characterized by slow pools and interrupted by fast shallow riffles.

The Saxton Steam Generating Station (SSGS) Dam, located adjacent to the SSGS, was constructed to impound water for the SSGS. Although this dam was breached after shutdown of the SSGS in 1974, it was in place during the operational period of the Saxton Nuclear Experimental Corporation (SNEC) Facility. The SSGS Dam was a 780 feet long concrete gravity dam on the Raystown Branch, about 700 feet downstream from the mouth of Shoup's Run. The dam was constructed in three sections with crest elevations of 790.00 on the western end, 792.00 on the center section, and 794.00 on the eastern end. The western and center sections were provided with permanent steel flashboards that raised the crest to 793.83. Backwater from the SSGS Dam extended 1.5 miles upstream according to one historical report. However, based on a crest elevation of approximately of 794.00, it is possible that the backwater created by this dam extended to a point approximately 3.5 miles upstream. The pool created by the SSGS Dam received potentially contaminated runoff from the spray pond area and is therefore a depositional feature that was considered for sampling activities.

2.0 Sampling Activities

2.1 Sample Collection Methods

Sample collection methods were selected for each sample collection site based on site reconnaissance activities conducted prior to sampling. At each site one of the following methods was used to collect samples:

1. Core sampling
2. Ponar sampling
3. Suction sampling
4. Scoop sampling

2.1.1 Core Sampling

Core sampling was used at sites where sediment depth was expected to be significant. To conduct core sampling, the survey team utilized a slide hammer mounted to a 14-foot long modified sediment sampling vessel. The slide hammer was used to drive 3-inch diameter stainless steel sampling tubes with plastic liners (if appropriate) into river substratum and bottom sediments. Sampling tubes were driven to refusal in all cases (penetration < 6 inches per 50 hammer blows). The core sample was then recovered using a winch system.

2.1.2 Ponar Sampling

Ponar sampling was conducted at sites where core sampling was not expected to result in significant sediment recovery but sediment depth was sufficient to allow effective use of a Petit Ponar sampler. Ponar sampling was accomplished by slowly lowering a 6"Petit Ponar sampler on a rope to the substrate and closing the sampler with a sharp pull on the rope. The sampler was then raised and the sampler contents were emptied into one or more 10-gallon plastic tub(s). Multiple ponar grabs were obtained for each sample in an effort to collect a sufficient sample volume for analytical testing. The contents of the 10-gallon plastic tub(s) were allowed to settle and excess water was removed by decanting.

2.1.3 Suction Sampling

Suction sampling was conducted at submerged sites where neither core sampling nor ponar sampling was expected to be effective due to minimal sediment deposition. Suction sampling was conducted using a trash pump with a small nozzle that prevented the collection of large particles. To conduct suction sampling, a 30-inch diameter corrugated polyethylene pipe section that measured 22 inches long was placed on the streambed to isolate the sample location. The substrate was agitated by the sampling team to suspend fine-grained sediments, and sediment-laden river water was pumped to two 50-gallon plastic tubs. The contents of the 50-gallon plastic tub(s) were allowed to settle, and excess water was removed by decanting. The contents remaining in the two 50-gallon plastic tubs were then combined into one 10-gallon plastic tub.

2.1.4 Scoop Sampling

River levels during the sampling period were sufficiently low to allow collection of sediments from areas of the streambed that was not submerged. Sediment sampling in these exposed areas that are normally submerged areas was accomplished by scooping sediment into plastic bags. In some areas, cobbles and boulders were moved to expose sediment deposits and facilitate collection of finer-grained sediments.

2.2 Sample Collection Summary

The selection of the sediment sampling sites (Table 1) was based on areas of interest and field reconnaissance activities performed to identify likely depositional zones. Field reconnaissance typically consisted of visual observations of substrate and river flow conditions and physical probing of the substrate using steel rods or other implements. In addition, reconnaissance included use of a recording fathometer where appropriate to obtain information regarding the water depths.

The sampling locations included background river sites, near field river sites, river sites in the immediate vicinity of the SNEC Weir discharge, river sites in the immediate vicinity of the SNEC Discharge Tunnel, and standing water sites near the former Spray Pond. Two samples were collected at each site. Pertinent sample information was recorded on Sediment Sampling Data Forms, and field notes were recorded in an Environmental Field Book. Table A presents an overview of the sampling program and the following sections summarize sample collection activities.

Table A – Overview of Sampling Program

Area of Interest	Number of Sample Collection Sites	Number of Samples
Background	3	6
Near Field River Sites	10	20
SNEC Discharge Tunnel	5	10
SNEC Weir Line	6	12
Spray Pond	2	4
Total	**26**	**52**

2.2.1 Background Sites

Background sites were located in the river upstream of possible contamination from the SNEC Facility. These sites were identified as BKG-1, BKG-2, and BKG-3.

BKG-1 is located near the right bank(1) of the river in the large pooled area upstream of the bridge at Riddlesburg, PA. Site BKG-1 was selected after conducting site reconnaissance of the Riddlesburg Pool. Reconnaissance started at the Riddlesburg Bridge and proceeded upstream until a suitable sediment deposition area was discovered. By randomly probing with a steel rod from a boat, it was determined that the

(1) All references to right bank and left bank throughout this report are based on a descending river perspective.

Riddlesburg Pool substrate consisted primarily of cobbles and boulders. Soft sediment deposits were found in 4 feet of water at Site BKG-1. Core samples SXSD1537 and SXSD1538 were obtained at this location.

BKG-2 is located in Warriors Path State Park near the left bank just downstream from the end of Warriors Park Road. Access to the river was obtained from the gravel access road that runs along the river at the end of Warriors Park Road. Site BKG–2 was selected after conducting reconnaissance by boat in one pooled area (known locally as "Big Salmon Hole") and by wading in riffle and run areas which predominate in this area. Reconnaissance proceeded from "Big Salmon Hole" downstream to Site BKG-2. Substrate in the pool and riffle/run areas consisted primarily of cobbles and boulders. Soft sediment deposits were found in 2.5 feet of water at Site BKG-2. Ponar samples SXSD1539 and SXSD1540 were obtained at this location.

BKG-3 is located in Warriors Path State Park near the right bank just downstream of the Canoe/Raft Access Ramp. Site BKG–3 was selected after wading riffle and run areas near the access ramp. Substrate in the river near the access ramp area consisted primarily of cobbles and boulders. Soft sediment deposits were found at 0.5 feet of water at Site BKG-3. Ponar samples SXSD1543 and SXSD1544 were obtained at this location.

2.2.2 Near Field River Sites

Ten near field river sites referred to as Sites 1 through 4 and Sites 6 through 11 are located in depositional zones that are in close proximity to the SNEC Facility. Each of these sites is located in an area that could have been impacted by SNEC Facility discharges. Sites 1 through 3 are in the former pool area upstream of the SSGS Dam, and may have been impacted by spray pond discharges. Site 4 is located just downstream of the SSGS Dam and may have also been impacted by the spray pond discharges. In addition, Site 4 is downstream of the former Shoup's Run shunt line discharge which carried acid mine drainage (AMD) to the Raystown Branch during the SNEC Facility's operational period. Site 4 samples could provide an indication of whether radiological contaminants adsorbed to AMD precipitates and deposited in close proximity to the SNEC Facility. Site 5 was intended to be in close proximity to the SNEC facility in the vicinity of the Discharge Tunnel and Weir Line. However, Site 5 was abandoned because this same area was well represented by other sampling sites in close proximity to the Discharge Tunnel and Weir Line. Site 11 was added downstream to compensate for the removal of Site 5 from the sampling program. Sites 6 through 11 are downstream of all SNEC Facility point source discharges.

2.2.3 Weir Line Sites

Six weir sites were located in the outfall vicinity of the former Weir Line. These sites are identified as Weir 1 through Weir 6. Weir 6 location was added later as a confirmatory point to Weir 1, which indicated Cs-137 activity above background.

2.2.4 Discharge Tunnel Sites

Five Discharge Tunnel Sites were located in the immediate vicinity of the Discharge tunnel. These sites are identified as Discharge Tunnel 1 through Discharge Tunnel 5.

2.2.5 Spray Pond Sites

Two Spray Pond Sites were located in the immediate vicinity of the former Spray Pond. These sites are identified as Spray Pond Lagoon, and Spray Pond Bog

Spray Pond Lagoon

The Spray Pond Lagoon is a pool of standing water (approximately 10 feet deep) that has formed at the mouth of Shoup's Run. The Lagoon, which is fed by Shoup's Run, remains separate from the river except during high flow. The Spray Pond Lagoon site was included in the sampling program because it is adjacent to the former Spray Pond, and it was probably part of the former pool created by the SSGS Dam. Core samples SXSD1498 and SXSD1499 were obtained at this location.

Spray Pond Bog

The Spray Pond Bog is an area of shallow standing water (approximately 2 feet deep) that has formed along the north side of the Shoup's Run dike. The Shoup's Run Dike runs along the south side of Shoup's to its mouth. The Spray Pond Bog site was included in the sampling program because it is adjacent to the former Spray Pond and historic aerial photographs suggest that runoff from the Spray Pond accumulated in this area. Ponar samples SXSD1500 and SXSD1501 were obtained at this location.

3.0 Sample Results

Tables 2 & 3 provide the radiological results. With the exception of Weir 1 & 6 locations, all other sampling locations had results that were at or below environmental background detection levels and are thus classified as non-impacted. U-234, U-235 and U-238 activity was also found in samples. Results of these uranium nuclides are listed in Table 3. These results are indicative of natural background uranium.

Weir 1 & 6 samples averaged 1.7 pCi/g for Cs-137. These samples were obtained from a 25 m^2 (approximate) area surrounding the location where the mouth of the weir pipe used to be (i.e. 4 feet from weir head wall into the river). The contamination in this area is less than 25% of the site DCGL and will be classified as an impacted Class 2 area. This information will be updated in Chapter 5 (Figure 5-1 and Table 5-2) of the SNEC LTP.

Table 1
Sediment Sampling Locations

Site Identification	Sample Identification	Latitude	Longitude	Sample Date	Sample Time	Sample Type
Weir 1	SXSD1472	40° 13' 42.539"	78° 14' 33.429"	10/10/01	855	Scoop
Weir 1	SXSD1473	40° 13' 42.539"	78° 14' 33.429"	10/10/01	900	Scoop
Weir 2	SXSD1474	40° 13' 43.417"	78° 14' 30.996"	10/10/01	1205	Scoop
Weir 2	SXSD1475	40° 13' 43.417"	78° 14' 30.996"	10/10/01	1215	Scoop
Weir 3	SXSD1476	40° 13' 43.491"	78° 14' 31.384"	10/10/01	1226	Scoop
Weir 3	SXSD1477	40° 13' 43.491"	78° 14' 31.384"	10/10/01	1232	Scoop
Weir 4	SXSD1478	40° 13' 43.676"	78° 14' 32.104"	10/10/01	1240	Scoop
Weir 4	SXSD1479	40° 13' 43.676"	78° 14' 32.104"	10/10/01	1245	Scoop
Weir 5	SXSD1480	40° 13' 42.832"	78° 14' 32.382"	10/10/01	1415	Suction
Weir 5	SXSD1481	40° 13' 42.832"	78° 14' 32.382"	10/10/01	1420	Suction
Weir 6	SXSD1545	40° 13' 42.597"	78° 14' 33.435"	10/18/01	817	Suction
Weir 6	SXSD1546	40° 13' 42.597"	78° 14' 33.435"	10/18/01	823	Suction
Discharge Tunnel 1	SXSD1482	40° 13' 43.548"	78° 14' 34.806"	10/10/01	1502	Scoop
Discharge Tunnel 1	SXSD1483	40° 13' 43.548"	78° 14' 34.806"	10/10/01	1508	Scoop
Discharge Tunnel 2	SXSD1484	40° 13' 43.561"	78° 14' 35.097"	10/10/01	1525	Scoop
Discharge Tunnel 2	SXSD1485	40° 13' 43.561"	78° 14' 35.097"	10/10/01	1535	Scoop
Discharge Tunnel 3	SXSD1486	40° 13' 42.284"	78° 14' 34.657"	10/10/01	1515	Ponar
Discharge Tunnel 3	SXSD1487	40° 13' 42.284"	78° 14' 34.657"	10/10/01	1530	Ponar
Discharge Tunnel 4	SXSD1488	40° 13' 42.440"	78° 14' 36.302"	10/10/01	1555	Ponar
Discharge Tunnel 4	SXSD1489	40° 13' 42.440"	78° 14' 36.302"	10/10/01	1605	Ponar
Discharge Tunnel 5	SXSD1490	40° 13' 42.116"	78° 14' 36.419"	10/10/01	1612	Scoop
Discharge Tunnel 5	SXSD1491	40° 13' 42.116"	78° 14' 36.419"	10/10/01	1615	Scoop
Spray Pond Lagoon	SXSD1498	40° 13' 27.614"	78° 14' 40.116"	10/11/01	1130	Core
Spray Pond Lagoon	SXSD1499	40° 13' 27.614"	78° 14' 40.116"	10/11/01	1155	Core
Spray Pond Bog	SXSD1500	40° 13' 28.015"	78° 14' 39.220"	10/11/01	1240	Ponar
Spray Pond Bog	SXSD1501	40° 13' 28.015"	78° 14' 39.220"	10/11/01	1242	Ponar
Site 1	SXSD1502	40° 13' 20.197"	78° 14' 35.441"	10/11/01	1310	Scoop
Site 1	SXSD1503	40° 13' 20.197"	78° 14' 35.441"	10/11/01	1313	Scoop
Site 2	SXSD1496	40° 13' 30.559"	78° 14' 43.783"	10/11/01	1018	Scoop
Site 2	SXSD1497	40° 13' 30.559"	78° 14' 43.783"	10/11/01	1022	Scoop
Site 3	SXSD1494	40° 13' 32.130"	78° 14' 45.129"	10/11/01	1007	Ponar
Site 3	SXSX1495	40° 13' 32.130"	78° 14' 45.129"	10/11/01	1010	Ponar
Site 4	SXSD1492	40° 13' 36.644"	78° 14' 46.519"	10/11/01	947	Scoop
Site 4	SXSD1493	40° 13' 36.644"	78° 14' 46.519"	10/11/01	954	Scoop
Site 5	Deleted due to redundancy with discharge tunnel sampling.					
Site 6	SXSD1506	40° 13' 56.499"	78° 13' 53.996"	10/15/01	1415	Core
Site 6	SXSD1507	40° 13' 56.499"	78° 13' 53.996"	10/15/01	1430	Core
Site 7	SXSD1508	40° 13' 59.081"	78° 13' 48.768"	10/15/01	1510	Core
Site 7	SXSD1509	40° 13' 59.081"	78° 13' 48.768"	10/15/01	1532	Core
Site 8	SXSD1535	40° 14' 01.520"	78° 13' 39.818"	10/16/01	946	Core
Site 8	SXSD1536	40° 14' 01.520"	78° 13' 39.818"	10/16/01	1014	Core
Site 9	SXSD1504	40° 13' 57.580"	78° 13' 24.309"	10/16/01	1200	Core
Site 9	SXSD1505	40° 13' 57.580"	78° 13' 24.309"	10/16/01	1216	Core
Site 10	SXSD1470	40° 14' 16.367"	78° 13' 15.900"	10/9/01	1530	Core
Site 10	SXSD1471	40° 14' 16.367"	78° 13' 15.900"	10/9/01	1600	Core
Site 11	SXSD1547	40° 14' 54.757"	78° 13' 49.096"	10/18/01	1116	Core
Site 11	SXSD1548	40° 14' 54.757"	78° 13' 49.096"	10/18/01	1200	Core
BKG - 1	SXSD1537	40° 09' 25.063"	78° 15' 22.185"	10/17/01	940	Core
BKG - 1	SXSD1538	40° 09' 25.063"	78° 15' 22.185"	10/17/01	955	Core
BKG - 2	SXSD1539	40° 12' 12.494"	78° 15' 46.467"	10/17/01	1300	Ponar
BKG - 2	SXSD1540	40° 12' 12.494"	78° 15' 46.467"	10/17/01	1315	Ponar
BKG - 3	SXSD1543	40° 11' 47.708"	78° 15' 04.959"	10/17/01	1355	Ponar
BKG - 3	SXSD1544	40° 11' 47.708"	78° 15' 04.959"	10/17/01	1405	Ponar

Table 2
Juniata River Sediment Gamma Spec Results

SAMPLE ID	HpGe ID #	SAMPLE DATE	TIME	DESCRIPTION/LOCATION	Cs-137 (pCi/g)	Co-60 (pCi/g)
* 1472	3-9330	10/10/01	855	WEIR SITE #1	**2.55**	< 0.08
1473	2-9329	10/10/01	900	WEIR SITE #1	**1.07**	< 0.06
1474	3-9327	10/10/01	1205	WEIR SITE #2	< 0.07	< 0.07
1475	2-9326	10/10/01	1215	WEIR SITE #2	**0.05**	< 0.055
1476	1-9325	10/10/01	1226	WEIR SITE #3	< 0.039	< 0.05
1477	1-9338	10/10/01	1232	WEIR SITE #3	< 0.06	< 0.05
1478	2-9339	10/10/01	1337	WEIR SITE #4	< 0.06	< 0.05
1479	1-9328	10/10/01	1245	WEIR SITE #4	< 0.05	< 0.04
1480	1-9344	10/10/01	1415	WEIR SITE #5	**0.15**	< 0.04
1481	1-9345	10/10/01	1420	WEIR SITE #5	**0.08**	< 0.04
1545	1-9412	10/18/01	817	WEIR SITE #6	**1.8**	< 0.05
1546	2-9413	10/18/01	823	WEIR SITE #6	**1.2**	< 0.07
1482	2-9346	10/10/01	1502	DISCHARGE TUNNEL #1	**0.07**	< 0.06
1483	2-9354	10/10/01	1508	DISCHARGE TUNNEL #1	< 0.07	< 0.07
1484	3-9352	10/10/01	1525	DISCHARGE TUNNEL #2	< 0.09	< 0.07
1485	2-9366	10/10/01	1535	DISCHARGE TUNNEL #2	< 0.04	< 0.07
1486	3-9356	10/10/01	1515	DISCHARGE TUNNEL #3	< 0.05	< 0.06
1487	2-9348	10/10/01	1530	DISCHARGE TUNNEL #3	< 0.045	< 0.06
1488	1-9371	10/10/01	1555	DISCHARGE TUNNEL #4	< 0.05	< 0.04
1489	2-9372	10/10/01	1605	DISCHARGE TUNNEL #4	< 0.06	< 0.06
1490	3-9349	10/10/01	1612	DISCHARGE TUNNEL #5	< 0.06	< 0.06
1491	2-9351	10/10/01	1615	DISCHARGE TUNNEL #5	< 0.06	< 0.06
1498	1-9369	10/11/01	1130	SPRAY POND LAGOON	< 0.06	< 0.05
1499	2-9364	10/11/01	1155	SPRAY POND LAGOON	< 0.06	< 0.07
1500	1-9367	10/11/01	1240	SPRAY POND BOG	< 0.06	< 0.06
1501	1-9363	10/11/01	1242	SPRAY POND BOG	< 0.14	< 0.12
1502	1-9365	10/11/01	1310	RIVER SITE #1	< 0.04	< 0.05
1503	1-9361	10/11/01	1313	RIVER SITE #1	< 0.05	< 0.05
1496	3-9358	10/11/01	1018	RIVER SITE #2	< 0.05	< 0.08
1497	3-9362	10/11/01	1022	RIVER SITE #2	< 0.1	< 0.1
1494	3-9360	10/11/01	1007	RIVER SITE #3	< 0.1	< 0.09
1495	2-9357	10/11/01	1010	RIVER SITE #3	< 0.1	< 0.09
1492	2-9370	10/11/01	947	RIVER SITE #4	< 0.08	< 0.07
1493	1-9347	10/11/01	954	RIVER SITE #4	< 0.047	< 0.057
1506	1-9397	10/15/01	1415	RIVER SITE #6	**0.07**	< 0.04
1507	2-9399	10/15/01	1430	RIVER SITE #6	< 0.053	< 0.055
1508	1-9390	10/15/01	1510	RIVER SITE #7	< 0.05	< 0.04
1508-B	2-9403	10/15/01	1510	RIVER SITE #7	< 0.06	< 0.05
1509	2-9391	10/15/01	1532	RIVER SITE #7	< 0.06	< 0.06
1509-B	1-9402	10/15/01	1532	RIVER SITE #7	< 0.04	< 0.03
1535	2-9386	10/16/01	946	RIVER SITE #8	**0.09**	< 0.06
1536	1-9387	10/16/01	1014	RIVER SITE #8	**0.11**	< 0.05
* 1504	1-9392	10/15/01	1200	RIVER SITE #9	**0.16**	< 0.04
1505	2-9393	10/15/01	1216	RIVER SITE #9	< 0.06	< 0.06
1470	1-9333	10/9/01	1530	RIVER SITE #10	**0.13**	< 0.037
1471	2-9334	10/9/01	1600	RIVER SITE #10	< 0.044	< 0.04
1547	1-9420	10/18/01	1116	RIVER SITE #11	< 0.03	< 0.04
1548	2-9416	10/18/01	1200	RIVER SITE #11	< 0.049	< 0.063
* 1537	2-9419	10/17/01	940	BKG #1 RIDDLESBURG	**0.08**	< 0.07
1538	2-9421	10/17/01	955	BKG #1 RIDDLESBURG	< 0.07	< 0.07
1539	2-9423	10/17/01	1300	BKG #2 WARRIORS PATH	**0.07**	< 0.06
1540	1-9418	10/17/01	1315	BKG #2 WARRIORS PATH	**0.09**	< 0.05
1543	1-9422	10/17/01	1355	BKG #3 WARRIORS PATH	**0.01**	< 0.04
1544	1-9414	10/17/01	1405	BKG #3 WARRIORS PATH	< 0.04	< 0.05

Areas with a < symbol are less than MDA.
* TRU analyses performed on these samples (Ref. BWXT Report #0110089).

Table 3
Juniata River Sediment TRU/HTD Results

			Results (pCi/g)			
Isotope		Weir #1		River Site #9		Bkg #1 (Riddlesburg)
H-3	<	1.02E+01	<	1.01E+01	<	9.62E+00
C-14	<	4.58E+00	<	4.82E+00	<	4.94E+00
Fe-55	<	1.19E+00	<	3.21E-01	<	1.61E-01
Ni-59	<	5.20E+00	<	1.34E+01	<	5.74E+00
Ni-63	<	7.46E+00	<	6.94E+00	<	7.98E+00
Sr-90	<	1.40E-02	<	1.00E-02	<	1.00E-02
Tc-99	<	5.56E-01	<	2.05E+00	<	1.25E+00
I-129	<	1.35E+00	<	1.46E+00	<	1.27E+00
Np-237	<	3.41E-03	<	5.45E-03	<	1.03E-02
Pu-242	<	3.41E-03	<	4.35E-03	<	3.56E-03
Pu-239/240	<	3.41E-03	<	3.12E-03	<	3.56E-03
Pu-238	<	3.41E-03	<	3.48E-03	<	3.56E-03
Pu-241	<	9.60E-01	<	1.06E+00	<	1.15E+00
Am-243	<	5.13E-03	<	2.83E-03	<	3.50E-03
Am-241	<	4.89E-03	<	2.83E-03	<	3.50E-03
Cm-244	<	3.70E-03	<	3.16E-03	<	3.50E-03
Cm-242	<	5.72E-03	<	3.02E-03	<	3.72E-03
U-234		4.30E-01		5.29E-01		7.70E-01
U-235		2.30E-02		1.24E-02		1.81E-02
U-238		3.11E-01		4.12E-01		4.95E-01
Co-60		2.00E-02	<	2.74E-02	<	1.37E-02
Nb-94	<	1.08E-02	<	2.36E-02	<	1.13E-02
Sb-125	<	3.83E-02	<	5.90E-02	<	3.11E-02
Cs-134	<	1.57E-02	<	3.86E-02	<	2.04E-02
Cs-137		2.87E+00		1.54E-01		6.62E-02
Ce-144	<	8.78E-02	<	1.32E-01	<	8.73E-02
Eu-152	<	6.24E-02	<	1.39E-01	<	6.86E-02
Eu-154	<	4.20E-02	<	9.41E-02	<	4.66E-02
Eu-155	<	4.69E-02	<	6.98E-02	<	3.26E-02

Shaded areas denote positive results.
Areas with a < symbol are less than MDA.
Reference BWXT Report # 0110089, November 13, 2001

Phase 3 – Yard Drain Characterization

1.1 SNEC YARD DRAINAGE SYSTEM INVESTIGATION RESULTS

1.2 Remaining System Descriptions

The Saxton Steam Generating Station (SSGS) was demolished along with segments of its supporting yard drainage systems over twenty (20) years ago. However, several sections of underground drainage piping still exist in the South and West sides of the SSGS in-ground structure. These piping systems continue to channel rain water and site run-off away from the site.

Drainage systems surrounding the SNEC CV area have largely been removed as a result of the excavation of contaminated soils in the vicinity of the SNEC CV, including the Weir system piping to the Juniata River in its entirety. In addition, a septic system drain field has been excavated on the South side of the PENELEC Warehouse.

1.3 Initial Inspection Results

An inspection and sampling of remaining segments of SSGS Yard System Drainage piping has been performed in two (2) phases. The initial phase involved an effort to investigate and understand the various interconnections that exist between piping segments within the larger 100 acre PENELEC site area and the enclosed ~10 acre inner area that surrounds the former coal fired SSGS footprint and existing SNEC facility structures.

Robotics and video camera equipment was used to probe and examine existing piping segments and establish their interconnections. A diagram was then made up of their locations and placement with respect to other site landmarks. The investigation phase also located access points and established existing water flow patterns from these systems. Because water flows away from the site (toward the Juniata River), it was decided that a thorough investigation and sampling of remaining underground piping systems should be performed to rule out the possibility elevated levels of radionuclide contamination having been introduced into the environs through these systems.

1.4 Remaining Yard Drain Piping Sections Examined

The Shoup's Run Shunt Line is a 600 foot long 42 inch diameter line that was originally used to channel water from Shoup's Run to below the SSGS dam on the Juniata River thus bypassing the SSGS Intake Tunnel. All of the remaining SSGS area drainage lines on the south and west sides of the SSGS area connect at different points along the Shoup's Run Shunt Line.

At the South edge of the SSGS Boiler Pad, a pipe section was discovered and unearthed that appears to have been a storm drain line originating at the old SSGS facility. This line continues South toward the PENELEC Warehouse where it connects with the grated yard drain opening by this structure. This pipe section then continues further South past the Warehouse into the open field beyond the ~10 acre fenced in PENELEC property. It continues South toward Shoup's Run and passes into and out of two (2) access openings. At this point, the line is approximately 6 to 8 feet below the surface (grade level). At the second of the two access openings, the drain line turns toward the Southwest and terminates into the Shunt Line.

The small four (4) bay PENELEC Garage has four (4) sumps (1 per bay). Each of these sumps connect to a common header that passes below the garage floor toward the South and then connects to a ~12" diameter line that ties directly into the Shunt Line. This 12" line runs parallel with the South fence that surrounds the ~10 acre PENELEC property, and is assumed to connect at some point with the line running by the PENELEC Warehouse (unconfirmed).

About in the middle of the asphalt covered parking area between the Small Garage and the Warehouse, is a second grated drainage collection point that connects with the Shunt Line through a subsurface pipe traveling West toward and past the Small Garage. From robotics inspection efforts, it appears to travel very close to or beneath the Small Garage on its way to the Shunt Line.

Another connection with the Shunt Line (about 10 feet further northwest and beyond the previous connection) was discovered during a robotic inspection of the interior of the Shunt Line. This pipe serviced an unknown portion of the SSGS area but it is assumed to have been another yard drainage system tie-in that was destroyed during the initial SSGS demolition effort. All the Yard Drain piping sections are depicted in **Figure 1**.

1.5 Initial Sampling Results (Phase 1)

First phase sampling of Yard Drain piping access points was performed at the time of the initial exploration and mapping of these systems. These samples were grab samples of materials that had collected in these drainage system pipe sections since plant shutdown. GPU Nuclear personnel have assayed these materials and these analysis results are reported below.

Table 1, Phase 1 Sampling Results Summary (pCi/g)

(Sampling points are numbered in accordance with locations marked on **Figure 1** below)

Sampling Point	Sample No.	Description	Cs-137	Co-60	Combined TRU
1	SX11SD990131	Man-Hole Access With Ladder 1	< 0.19	< 0.04	No Analysis
2	SX11SD990132	Man-Hole Access With Ladder 2	**0.23**	< 0.08	No Analysis
3	SX11SD990130	First Man Hole Sample Outside Fence 1	< 0.17	< 0.18	No Analysis
4	SX11SD990129	First Man Hole Sample Outside Fence 2	**0.48**	< 0.04	No Analysis
5	SX11SD990133	Shunt Line Man-Hole Access	< 0.04	< 0.04	No Analysis
6	SX11SD990135	Garage - South of Fence - 12" Line	**0.072**	< 0.05	No Analysis
7	SX10SD99223	Garage Bay #4 - Floor Drain Rim	**6.4**	< 0.3	< MDA
8	SX10SD990137	Warehouse Storm Drain 12" Feed Pipe	**0.52**	< 0.04	No Analysis
9	SX10SD990024	Warehouse Storm Drain Line	0.16	< 0.06	No Analysis
10	SX10SD990136	Warehouse Storm Main	**0.26**	< 0.06	No Analysis
11	SX11SD990134	South - Old Parking Lot Storm Drain	**0.21**	< 0.03	No Analysis
12	SX12SD99287	Shoup's Run Shunt Line Outfall 1	< 0.12	< 0.11	No Analysis
13	SX12SD99279	Shoup's Run Shunt Line Outfall 2	< 0.06	< 0.07	No Analysis

NOTE: Positive results are in bold typeface.

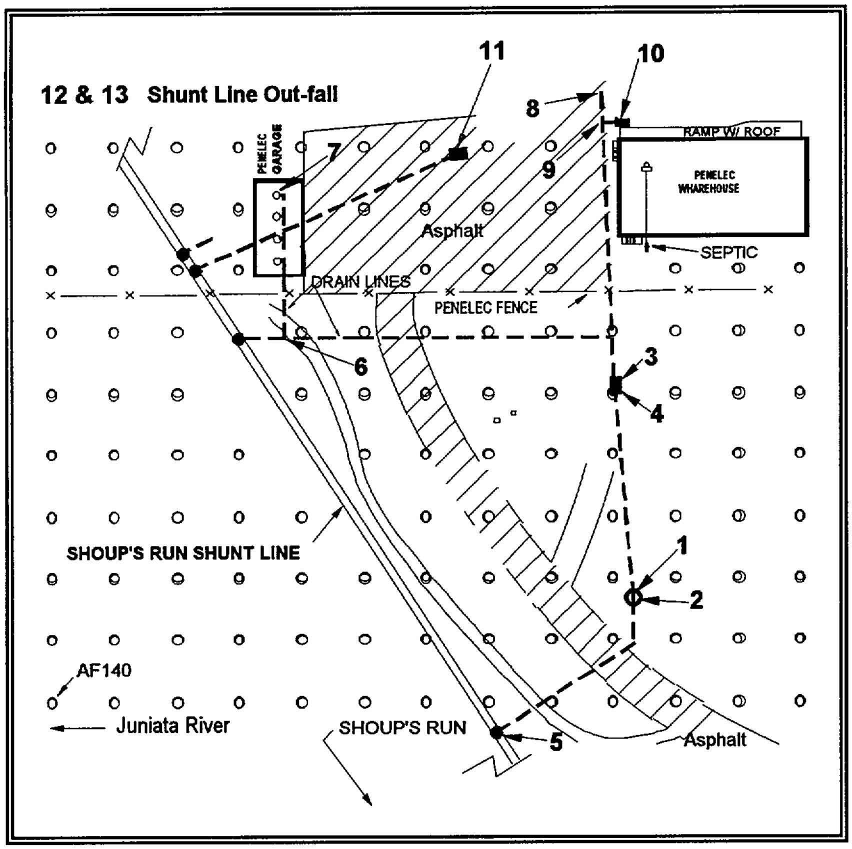

Figure 1, SNEC Site Grid Map Segment
---- Yard Drain Lines

1.6 Discussion of Initial Sampling and Inspection Results

First phase sampling results did not detect any significant or elevated levels of Cs-137 or Co-60 in any of the Yard Drain system piping that was accessed during this work effort. However, a sample taken from within sump number four (4) of the Small Garage did show a Cs-137 concentration of 6 pCi/g. This elevated level of Cs-137 may have be the result of radiological work performed in the Small Garage during previous site remediation efforts.

1.7 Second Phase Sampling and Measurement Effort

After reviewing the results from the phase one investigation effort, it was decided that a more rigorous investigation of these piping systems would be appropriate. The reasons for this are as follows:

- Grab samples from within an operational drainage system continually collect sediment and washout materials, i.e., materials that have washed into the systems since the time of facility demolition. Potentially contaminated materials from the time of site operation have most likely been lost by washing through the system and are no longer available for sampling.
- Grab samples alone, without internal measurements can easily miss encrusted or fixed contamination within a piping system.
- Some sections of drainage piping were not accessed during phase one activities.
- A more rigorous survey approach would be needed to meet Final Status Survey release criteria.

To satisfy these concerns, a second phase sampling and measurement effort was conducted. Measurements were made over accessible lengths of pipe and samples were taken from each piping system. The results were compared with previous sampling results. No further actions are planned for Final Status Survey since there were no significant findings in these systems.

1.8 Phase 2 Summary Results

Phase 2 results are summarized in the following Table.

Table 2, Phase 2 Summary (Cs-137)

	Measurement Results (range)		Sample Results (range)
Location	***dpm/100 cm^2***	***pCi/g***	***pCi/g***
Small Garage Sumps	< 664 to < 2134	< 2.1 to < 3.8	0.2 to 1.4
Central Grated Cover Yard Drain & Line to Shunt	< 330 to 910	< 1.0 to < 2	< 0.07 to 1.1
Grated Cover Yard Drain Near Warehouse	< 309 to < 1633	< 1.1 to < 1.8	0.7 (one sample)
12" Line South of Small Garage Outside Fence	< 336 to < 656	< 1.2 to < 2.3	< 0.1 (one sample)
Unknown 12" Drainage Line West of Small Garage	< 360 to < 565	< 1.3 to < 2	< 0.1 (one sample)
Drain Line from Warehouse South to Shunt Line	< 309 to < 522	< 1.1 to < 1.8	0.11 (one sample)
Shunt Line Access Points	< 409 to < 694	< 1.4 to < 2.4	0.04 to 0.34

1.9 Conclusions

During October 2001, in-situ gamma spectroscopy measurements and scale/sediment sampling was performed as part of a study of radioactive contamination in embedded piping found at the SNEC site. Spectra (127) were collected in approximately 10 pipes and drainage areas. Additionally, 39 QA/QC spectra were collected, and 29 scale/sediment samples were collected and analyzed in the on-site GPU laboratory. The results show that radioactivity levels are well within site release limits (DCGLs), even using conservative assumptions regarding calculations of in situ radionuclide concentrations. Sampling data compare favorably with measurement results.

Phase 2 measurements confirm that the Yard Drain piping system is below the DCGL's for releasing the site. In addition, measurements of significant sections of this system suggest that no major source of contamination was released to this system during past site operations. As such, this piping will not need to be resurveyed as part of the Final Site Survey. This piping is located under open land areas already classified as impacted Class 2 or 3 and these areas are documented in Figure 5-1 of the SNEC LTP.

Phase 3 – Intake Tunnel Characterization

1.0 Description

During operation of the SSGS, water was drawn from the Raystown Branch of the Juniata River. A dam was utilized to impound the river in the area of the intake structure, which included the Intake tunnel. The intake water system only provided intake of river water to the SSGS and no discharges to the river were made via this pathway. During freezing weather warm water from the SSGS Discharge Tunnel was diverted and allowed to flow into the SSGS Intake Tunnel via a pathway that utilized the Spray Pond supply piping. This configuration was established in order to prevent ice formation on the intake tunnel screen wash and filtration system components. This flow path, by use of discharge tunnel water, would have provided a mechanism for low level radioactivity to enter the SSGS intake tunnel.

2.0 Summary of Sampling Results

Table 1 lists the Intake Tunnel characterization results.

Sediment Sampling: A total of 174 sediment samples were taken throughout the Intake Tunnel. Of these, 142 samples showed positive Cs-137 above MDC. The average Cs-137 value is 0.46 pCi/g and the highest is 1.8 pCi/g (SSGS North Intake Tunnel North Wall / MID-SECTION @ 85'). All sediment samples were <MDC for Co-60 activity.

Core Bore Sampling: Fourteen (14) core bore samples were obtained throughout the tunnel. All core samples were found to be <MDC.

Concrete Samples – Material debris: Sample number SX-CF-2245 core disk crumbled when sliced and was counted as Concrete Debris. Results were <0.27 pCi/g Cs-137 and <0.4 pCi/g Co-60. No other debris samples were collected.

Water Sampling: Five (5) water samples were obtained throughout the intake tunnel. Sample results were <MDC for Cs-137, Co-60, and Tritium.

Loose Surface Contamination (Smear Surveys): At least 1 smear was obtained for every 100 square feet of concrete tunnel surface area. A total of 335 smears were obtained throughout the tunnel. All smears were <1000 dpm/100cm^2 beta-gamma and <MDC alpha.

Surface Scans Using an E-140N with a HP-210/260 Probe: Survey scan measurements were obtained every 10 feet of tunnel length. Approximately 1 square foot of surface area was surveyed. All Surface Scan survey results were <100 NCPM.

Static Measurements Using a Bicron Micro-Rem: Dose rates were obtained throughout the tunnel approximately every 10 feet at 3 feet from the floor. Dose rates were 2-4 uR/hr throughout the intake tunnel.

3.0 Summary of Survey Results

Based on the characterization results the Intake Tunnel can be classified as follows:

- Non-impacted from the Juniata River intake to the point where spray pump water was introduced.
- Class 3 from the point where spray pump water was introduced back to the SSGS.

These classifications will be updated in Chapter 5, (Figure 5-1 and Table 5-2) of the SNEC LTP.

Table 1 - Intake Tunnel Characterization Results

Sample Number			General Location Information	Sample Type	Isotopic Results		Other Results
					Cs-137	Co-60	
SX	SD	1622	SSGS South Intake Tunnel, SUCTION @ 60' / QC SAMPLE	Sediment	1.6 pCi/g	<.1 pCi/g	
SX	SD	1869	SSGS Intake CLEANOUT ACCESS	Sediment	0.22 pCi/g	<0.14 pCi/g	
SX	IW	1871	SSGS Intake @ CLEANOUT	Water	<1.5 E-8 uCi/ml	<1.5 E-8 uCi/ml	<289 pCi/L H-3
SX	SD	1914	SSGS North Intake Tunnel @ East WALL@ 0'	Sediment	0.56 pCi/g	<0.15 pCi/g	
SX	SD	1915	SSGS North Intake Tunnel @ 10'	Sediment	0.43 pCi/g	<0.09 pCi/g	
SX	SD	1916	SSGS North Intake Tunnel @ 20'	Sediment	0.51 pCi/g	<0.13 pCi/g	
SX	SD	1917	SSGS North Intake Tunnel @ 30'	Sediment	0.56 pCi/g	<0.1 pCi/g	
SX	SD	1918	SSGS North Intake Tunnel @ 40'	Sediment	0.38 pCi/g	<0.14 pCi/g	
SX	SD	1919	SSGS North Intake Tunnel @ 50'	Sediment	0.42 pCi/g	<0.1 pCi/g	
SX	SD	1920	SSGS North Intake Tunnel @ 60'	Sediment	0.85 pCi/g	<0.1 pCi/g	
SX	SD	1921	SSGS North Intake Tunnel @ 70'	Sediment	0.48 pCi/g	<0.09 pCi/g	
SX	SD	1922	SSGS North Intake Tunnel @ 80'	Sediment	0.6 pCi/g	<0.1 pCi/g	
SX	SD	1923	SSGS North Intake Tunnel @ 90'	Sediment	0.34 pCi/g	<0.07 pCi/g	
SX	SD	1924	SSGS North Intake Tunnel @ 100'	Sediment	0.74 pCi/g	<0.1 pCi/g	
SX	SD	1925	SSGS North Intake Tunnel @ 110'	Sediment	0.72 pCi/g	<0.09 pCi/g	
SX	SD	1926	SSGS North Intake Tunnel @ 120'	Sediment	0.74 pCi/g	<0.13 pCi/g	
SX	SD	1927	SSGS North Intake Tunnel @ 130'	Sediment	0.83 pCi/g	<0.08 pCi/g	
SX	SD	1928	SSGS North Intake Tunnel @ 140'	Sediment	0.82 pCi/g	<0.1 pCi/g	
SX	SD	1929	SSGS North Intake Tunnel @ 150'	Sediment	0.7 pCi/g	<0.1 pCi/g	
SX	SD	1930	SSGS North Intake Tunnel @ 160'	Sediment	0.88 pCi/g	<0.1 pCi/g	
SX	IW	1953	SSGS North Intake Tunnel/East END @ 30'	Water	<1.4 E-7 uCi/ml	<1.2 E-7 uCi/ml	<286 pCi/L H-3
SX	SD	1957	SSGS North Intake Tunnel @ 170'	Sediment	0.7 pCi/g	<0.14 pCi/g	
SX	SD	1997	SSGS North Intake Tunnel North Wall/ East END @ 25'	Sediment	0.8 pCi/g	<0.13 pCi/g	
SX	SD	1998	SSGS North Intake Tunnel North Wall / MID-SECTION @ 85'	Sediment	1.8 pCi/g	<0.09 pCi/g	
SX	SD	1999	SSGS North Intake Tunnel North Wall/ West END @ 160'	Sediment	0.7 pCi/g	<0.08 pCi/g	
SX	SD	2000	SSGS North Intake Tunnel South Wall / East END @ 25'	Sediment	1.4 pCi/g	<0.08 pCi/g	
SX	SD	2001	SSGS North Intake Tunnel South Wall/ MID-SECTION @ 95'	Sediment	0.85 pCi/g	<0.09 pCi/g	
SX	SD	2002	SSGS North Intake Tunnel South Wall/ West END @ 145'	Sediment	0.7 pCi/g	<0.1 pCi/g	
SX	SM	2033	SSGS North Intake Tunnel WALLS	Smear Composite	<9.6 E-6 uCi	<8.0 E-6 uCi	
SX	CF	2060	SSGS North Intake Tunnel FLOOR @ 25'	Core Bore	<0.14 pCi/g	<0.16 pCi/g	
SX	CF	2061	SSGS North Intake Tunnel FLOOR @ 65'	Core Bore	<0.12 pCi/g	<0.1 pCi/g	
SX	CF	2062	SSGS North Intake Tunnel FLOOR @ 100'	Core Bore	<0.14 pCi/g	<0.14 pCi/g	
SX	CF	2063	SSGS North Intake Tunnel FLOOR @ 135'	Core Bore	<0.14 pCi/g	<0.15 pCi/g	
SX	CF	2064	SSGS North Intake Tunnel FLOOR @ 165'	Core Bore	<0.18 pCi/g	<0.16 pCi/g	
SX	CF	2065	SSGS North Intake Tunnel FLOOR @ 110' QC SAMPLE	Core Bore	<0.2 pCi/g	<0.17 pCi/g	
SX	SD	2066	SSGS North Intake Tunnel PUMP SUCTION PIPE @ ~ 20'	Sediment	0.8 pCi/g	<0.1 pCi/g	
SX	SD	2067	SSGS North Intake Tunnel PUMP SUCTION PIPE @ ~ 55'	Sediment	0.22 pCi/g	<0.1 pCi/g	
SX	SD	2068	SSGS North Intake Tunnel PUMP SUCTION PIPE @ ~ 70'	Sediment	0.4 pCi/g	<0.1 pCi/g	
SX	SD	2069	SSGS North Intake Tunnel PUMP SUCTION PIPE @ ~ 100'	Sediment	0.55 pCi/g	<0.11 pCi/g	
SX	SD	2070	SSGS North Intake Tunnel PUMP SUCTION PIPE @ ~ 110'	Sediment	1.1 pCi/g	<0.1 pCi/g	
SX	SM	2071	SSGS North Intake Tunnel PUMP SUCTION PIPES INNER WALL COMPOSITE	Smear Composite	<1.8 E-5 uCi	<1.7 E-5 uCi	

SX	SD	2072	SSGS North Intake Tunnel @ North DOOR DEBRIS	Sediment	0.6 pCi/g	<0.09 pCi/g	
SX	SD	2073	SSGS North Intake Tunnel @ SOUTH DOOR DEBRIS	Sediment	0.72 pCi/g	<0.06 pCi/g	
SX	SM	2082	F.P. Intake Tunnel CEILING	Smear Composite	<1.4 E-5 uCi	<1.7 E-5 uCi	
SX	SM	2083	SSGS North Intake Tunnel CEILING & WALLS (QC SAMPLE)	Smear Composite	<1.7 E-5 uCi	<2.0 E-5 uCi	
SX	SD	2118	SSGS North Intake Tunnel QC SAMPLE @ ~ 30'	Sediment	0.5 pCi/g	<0.07 pCi/g	
SX	SD	2119	SSGS North Intake Tunnel QC SAMPLE @ ~ 70'	Sediment	0.5 pCi/g	<0.08 pCi/g	
SX	SD	2120	SSGS North Intake Tunnel QC SAMPLE /PUMP SUCTION PIPE INTERNALS @~20'	Sediment	0.52 pCi/g	<0.14 pCi/g	
SX	SD	2167	Intake Tunnel 20' West OF 2ND CLEANOUT	Sediment	0.7 pCi/g	<0.1 pCi/g	
SX	SD	2168	Intake Tunnel 20' E OF 2ND CLEANOUT	Sediment	0.55 pCi/g	<0.1 pCi/g	
SX	SM	2169	SSGS Intake Tunnel @ East/West 00' TO East 460'	Smear Composite	<8.9 E-6 uCi	<1.2 E-5 uCi	
SX	GW	2170	SSGS Intake Tunnel @ East 100'	Ground Water	<1.7 E-8 uCi/ml	<1.25 E-8 uCi/ml	<286 pCi/l H-3
SX	GW	2171	SSGS Intake Tunnel @ East 320'	Ground Water	<1.02 E-8 uCi/ml	<9.5 E-9 uCi/ml	<286 pCi/l H-3
SX	SD	2172	SSGS Intake Tunnel WALL/CEILING COMPOSITE East/West 00' TO East 220'	Sediment	0.09 pCi/g	<0.09 pCi/g	
SX	SD	2173	SSGS Intake Tunnel WALL/CEILING COMPOSITE East 230' TO East 460'	Sediment	0.6 pCi/g	<0.15 pCi/g	
SX	SM	2174	SMEARS Intake Tunnel 10' West 210' West (QC SAMPLE @ 235 E, 165 W, 425 E)	Smear Composite	<1.0 E-5 uCi	<1.3 E-5 uCi	
SX	SD	2175	COMPOSITE OF WALL & CEILING SCRAPINGS 10' West TO 210' West	Sediment	<0.16 pCi/g	<0.13 pCi/g	
SX	SD	2176	SSGS Intake Tunnel @ West 30'	Sediment	0.08 pCi/g	<0.1 pCi/g	
SX	SD	2177	SSGS Intake Tunnel @ West 40'	Sediment	0.17 pCi/g	<0.13 pCi/g	
SX	SD	2178	SSGS Intake Tunnel @ West 50'	Sediment	0.11 pCi/g	<0.15 pCi/g	
SX	SD	2179	SSGS Intake Tunnel @ West 60'	Sediment	0.17 pCi/g	<0.15 pCi/g	
SX	SD	2180	SSGS Intake Tunnel @ West 70'	Sediment	0.15 pCi/g	<0.11 pCi/g	
SX	SD	2181	SSGS Intake Tunnel @ West 80'	Sediment	0.11 pCi/g	<0.17 pCi/g	
SX	SD	2182	SSGS Intake Tunnel @ West 90'	Sediment	0.14 pCi/g	<0.16 pCi/g	
SX	SD	2183	SSGS Intake Tunnel @ West 100'	Sediment	0.15 pCi/g	<0.13 pCi/g	
SX	SD	2184	SSGS Intake Tunnel @ West 110'	Sediment	0.3 pCi/g	<0.08 pCi/g	
SX	SD	2185	SSGS Intake Tunnel @ West 120'	Sediment	0.23 pCi/g	<0.06 pCi/g	
SX	SD	2186	SSGS Intake Tunnel @ West 130'	Sediment	0.35 pCi/g	<0.08 pCi/g	
SX	SD	2187	SSGS Intake Tunnel @ West 140'	Sediment	0.16 pCi/g	<0.16 pCi/g	
SX	SD	2188	SSGS Intake Tunnel @ West 150'	Sediment	0.18 pCi/g	<0.1 pCi/g	
SX	SD	2189	SSGS Intake Tunnel @ West 160'	Sediment	0.26 pCi/g	<0.12 pCi/g	
SX	SD	2190	SSGS Intake Tunnel @ West 170'	Sediment	0.15 pCi/g	<0.17 pCi/g	
SX	SD	2191	SSGS Intake Tunnel @ West 180'	Sediment	0.15 pCi/g	<0.1 pCi/g	
SX	SD	2192	SSGS Intake Tunnel @ West 190'	Sediment	<0.19 pCi/g	<0.16 pCi/g	
SX	SD	2193	SSGS Intake Tunnel @ West 200'	Sediment	0.14 pCi/g	<0.12 pCi/g	
SX	SD	2194	SSGS Intake Tunnel @ West 210'	Sediment	0.16 pCi/g	<0.07 pCi/g	
SX	SD	2209	SSGS Intake Tunnel @ West 10'	Sediment	0.1 pCi/g	<0.12 pCi/g	
SX	SD	2210	SSGS Intake Tunnel @ East/West 00'	Sediment	0.2 pCi/g	<0.16 pCi/g	
SX	SD	2211	SSGS Intake Tunnel @ East 10'	Sediment	0.2 pCi/g	<0.15 pCi/g	
SX	SD	2212	SSGS Intake Tunnel @ East 20'	Sediment	0.19 pCi/g	<0.2 pCi/g	
SX	SD	2213	SSGS Intake Tunnel @ East 30'	Sediment	0.12 pCi/g	<0.18 pCi/g	
SX	SD	2214	SSGS Intake Tunnel @ East 40'	Sediment	0.09 pCi/g	< 0.15 pCi/g	
SX	SD	2215	SSGS Intake Tunnel @ East 50'	Sediment	0.16 pCi/g	<0.17 pCi/g	
SX	SD	2216	SSGS Intake Tunnel @ East 60'	Sediment	0.09 pCi/g	<0.17 pCi/g	
SX	SD	2217	SSGS Intake Tunnel @ East 70'	Sediment	0.2 pCi/g	<0.16 pCi/g	
SX	SD	2218	SSGS Intake Tunnel @ East 80'	Sediment	0.16 pCi/g	<0.12 pCi/g	
SX	SD	2219	SSGS Intake Tunnel @ East 90'	Sediment	<0.18 pCi/g	<0.18 pCi/g	
SX	SD	2220	SSGS Intake Tunnel @ East 100'	Sediment	0.18 pCi/g	<0.17 pCi/g	
SX	SD	2221	SSGS Intake Tunnel @ East 110'	Sediment	0.3 pCi/g	<0.17 pCi/g	
SX	SD	2222	SSGS Intake Tunnel @ East 120'	Sediment	0.23 pCi/g	<0.16 pCi/g	
SX	SD	2223	SSGS Intake Tunnel @ East 130'	Sediment	0.2 pCi/g	<0.16 pCi/g	

SX	SD	2224	SSGS Intake Tunnel @ East 140'	Sediment	0.18 pCi/g	<0.17 pCi/g	
SX	SD	2225	SSGS Intake Tunnel @ East 150'	Sediment	0.13 pCi/g	<0.14 pCi/g	
SX	SD	2226	SSGS Intake Tunnel @ East 160'	Sediment	0.25 pCi/g	<0.08 pCi/g	
SX	SD	2227	SSGS Intake Tunnel @ East 170'	Sediment	0.4 pCi/g	<0.05 pCi/g	
SX	SD	2228	SSGS Intake Tunnel @ East 180'	Sediment	0.3 pCi/g	<0.06 pCi/g	
SX	SD	2229	SSGS Intake Tunnel @ East 190'	Sediment	0.4 pCi/g	<0.06 pCi/g	
SX	SD	2230	SSGS Intake Tunnel @ East 200'	Sediment	0.6 pCi/g	<0.09 pCi/g	
SX	SD	2231	SSGS Intake Tunnel @ East 210'	Sediment	0.2 pCi/g	<0.06 pCi/g	
SX	SD	2232	SSGS Intake Tunnel @ East 220'	Sediment	0.24 pCi/g	<0.06 pCi/g	0.14 pCi/g U-235
SX	SD	2233	SSGS Intake Tunnel @ East 230'	Sediment	0.23 pCi/g	<0.06 pCi/g	
SX	SD	2234	SSGS Intake Tunnel @ West 20'	Sediment	0.2 pCi/g	<0.15 pCi/g	
SX	SD	2235	SSGS Intake Tunnel @ East 240'	Sediment	0.3 pCi/g	<0.09 pCi/g	
SX	SD	2236	SSGS Intake Tunnel @ East 250'	Sediment	0.6 pCi/g	<0.1 pCi/g	
SX	SD	2237	SSGS Intake Tunnel @ East 260'	Sediment	0.6 pCi/g	<0.08 pCi/g	
SX	SD	2238	SSGS Intake Tunnel @ East 270'	Sediment	0.73 pCi/g	<0.08 pCi/g	
SX	SD	2239	SSGS Intake Tunnel @ East 280'	Sediment	0.74 pCi/g	<0.08 pCi/g	
SX	SD	2240	SSGS Intake Tunnel @ East 290'	Sediment	0.76 pCi/g	<0.09 pCi/g	
SX	SD	2241	SSGS Intake Tunnel @ East 300'	Sediment	0.7 pCi/g	<0.12 pCi/g	
SX	SD	2242	SSGS Intake Tunnel @ East 310'	Sediment	0.76 pCi/g	<0.12 pCi/g	
SX	SD	2243	SSGS Intake Tunnel @ East 320'	Sediment	0.76 pCi/g	<0.13 pCi/g	
SX	SD	2244	SSGS Intake Tunnel @ East 330'	Sediment	0.76 pCi/g	<0.13 pCi/g	
SX	CF	2245	SSGS Intake Tunnel @ West 98'	Core Bore	<0.27 pCi/g	<0.4 pCi/g	
SX	CF	2246	SSGS Intake Tunnel @ East 120'	Core Bore	<0.18 pCi/g	<0.2 pCi/g	
SX	CF	2247	SSGS Intake Tunnel @ East 120'; QC SAMPLE.	Core Bore	<0.16 pCi/g	<0.17 pCi/g	
SX	CF	2248	SSGS Intake Tunnel @ East 355'	Core Bore	<0.2 pCi/g	<0.2 pCi/g	
SX	SD	2264	SSGS Intake Tunnel @East 340'	Sediment	0.56 pCi/g	<0.07 pCi/g	
SX	SD	2265	SSGS Intake Tunnel @ East 350'	Sediment	0.6 pCi/g	<0.11 pCi/g	
SX	SD	2266	SSGS Intake Tunnel @ East 360'	Sediment	0.7 pCi/g	<0.12 pCi/g	
SX	SD	2267	SSGS Intake Tunnel @ East 370'	Sediment	0.5 pCi/g	<0.17 pCi/g	
SX	SD	2268	SSGS Intake Tunnel @ East 380'	Sediment	0.52 pCi/g	<0.08 pCi/g	
SX	SD	2269	SSGS Intake Tunnel @ East 390'	Sediment	0.4 pCi/g	<0.07 pCi/g	
SX	SD	2270	SSGS Intake Tunnel @ East 400'	Sediment	0.44 pCi/g	<0.12 pCi/g	
SX	SD	2271	SSGS Intake Tunnel @ East 410'	Sediment	0.4 pCi/g	<0.13 pCi/g	
SX	SD	2272	SSGS Intake Tunnel @ East 420'	Sediment	0.5 pCi/g	<0.15 pCi/g	
SX	SD	2273	SSGS Intake Tunnel @ East 430'	Sediment	0.45 pCi/g	<0.12 pCi/g	
SX	SD	2274	SSGS Intake Tunnel @ East 440'	Sediment	0.4 pCi/g	<0.07 pCi/g	
SX	SD	2275	SSGS Intake Tunnel @ East 450'	Sediment	0.3 pCi/g	<0.08 pCi/g	
SX	SD	2276	SSGS Intake Tunnel @ East 460'	Sediment	0.17 pCi/g	<0.07 pCi/g	
SX	SD	2277	SSGS Intake Tunnel @ East 160' QC SAMPLE	Sediment	0.3 pCi/g	<0.10 pCi/g	
SX	SD	2278	SSGS Intake Tunnel @ East 90' QC SAMPLE	Sediment	0.11 pCi/g	<0.15 pCi/g	
SX	SD	2279	SSGS Intake Tunnel @ West 50'	Sediment	0.2 pCi/g	< 0.14 pCi/g	
SX	SD	2280	SSGS Intake Tunnel @ W 150' QC SAMPLE	Sediment	0.18 pCi/g	<0.09 pCi/g	
SX	SD	2281	SSGS Intake Tunnel @ East 290' QC SAMPLE	Sediment	0.8 pCi/g	<0.12 pCi/g	
SX	SD	2282	SSGS Intake Tunnel @ East 370' QC SAMPLE	Sediment	0.74 pCi/g	<0.08 pCi/g	
SX	SM	2310	SSGS Intake Tunnel @ West 20', West 90', East 50', East 250', East 350'	Smear Composite	<1.7 E-5 uCi	<1.7 E-5 uCi	
SX	SD	2330	SSGS South Intake Tunnel @ 0'	Sediment	0.6 pCi/g	<0.07pCi/g	
SX	SD	2331	SSGS South. Intake Tunnel @ 10'	Sediment	0.5 pCi/g	<0.06 pCi/g	
SX	SD	2332	SSGS South Intake Tunnel @ 20'	Sediment	0.5 pCi/g	<0.06 pCi/g	
SX	SD	2333	SSGS South Intake Tunnel @ 30'	Sediment	0.44 pCi/g	<0.10 pCi/g	
SX	SD	2334	SSGS South Intake Tunnel @ 40'	Sediment	0.5 pCi/g	<0.08 pCi/g	
SX	SD	2335	SSGS South Intake Tunnel @ 50'	Sediment	0.46 pCi/g	<0.07pCi/g	
SX	SD	2336	SSGS South Intake Tunnel @ 60'	Sediment	0.3 pCi/g	<0.08 pCi/g	
SX	SD	2337	SSGS South Intake Tunnel @ 70'	Sediment	0.4 pCi/g	< 0.07 pCi/g	
SX	SD	2338	SSGS South Intake Tunnel @ 80'	Sediment	0.2 pCi/g	<0.05 pCi/g	
SX	SD	2339	SSGS South Intake Tunnel @ 90'	Sediment	0.24 pCi/g	< 0.04 pCi/g	
SX	SD	2340	SSGS South Intake Tunnel @ 100'	Sediment	0.5 pCi/g	<0.08 pCi/g	
SX	SD	2341	SSGS South Intake Tunnel @ 110'	Sediment	0.4 pCi/g	<0.10 pCi/g	

SX	SD	2342	SSGS South Intake Tunnel @ 120'	Sediment	0.25 pCi/g	< 0.05 pCi/g	
SX	SD	2343	SSGS South Intake Tunnel @ 130'	Sediment	0.23 pCi/g	<0.05 pCi/g	
SX	SD	2344	SSGS South Intake Tunnel @ 140'	Sediment	0.3 pCi/g	< 0.06 pCi/g	
SX	SD	2345	SSGS South Intake Tunnel @ 150'	Sediment	0.4 pCi/g	<0.05 pCi/g	
SX	SD	2346	SSGS South Intake Tunnel @ 160'	Sediment	0.8 pCi/g	<0.11 pCi/g	
SX	SD	2347	SSGS South Intake Tunnel @ 170'	Sediment	0.2 pCi/g	< 0.11 pCi/g	
SX	SD	2348	SSGS South Intake Tunnel @ 180'	Sediment	0.33 pCi/g	<0.05 pCi/g	
SX	SD	2349	SSGS South Intake Tunnel @ 190'	Sediment	0.67 pCi/g	<0.08 pCi/g	
SX	SD	2350	SSGS South Intake Tunnel @ 45' 5% QC SAMPLE	Sediment	0.45 pCi/g	<0.08 pCi/g	
SX	SD	2351	SSGS South Intake Tunnel/WALL SEDIMENT COMPOSITE 0-100'	Sediment	1.8 pCi/g	<0.1 pCi/g	
SX	SD	2352	SSGS South Intake Tunnel/WALL SEDIMENT COMPOSITE 100-190'	Sediment	1.3 pCi/g	<0.14 pCi/g	
SX	GW	2353	SSGS South Intake Tunnel @ 30'	Ground Water	<1.3 E-8 uCi/ml	<1.4 E-8 uCi/ml	<306 pCi/l H-3
SX	GW	2354	SSGS South Intake Tunnel @ 160'	Ground Water	<1.2 E-8 uCi/ml	<2.8 E-8 uCi/ml	<306 pCi/l H-3
SX	CF	2355	SSGS South Intake Tunnel @ 180'	Core Bore	<0.15 pCi/g	<0.19 pCi/g	
SX	CF	2356	SSGS South Intake Tunnel @ 65'	Core Bore	<0.1 pCi/g	<0.12 pCi/g	
SX	CF	2357	SSGS South Intake Tunnel @ 65' QC SAMPLE	Core Bore	0.13 pCi/g	<0.1 pCi/g	
SX	CF	2358	SSGS South Intake Tunnel @ 20'	Core Bore	<0.17 pCi/g	<0.2 pCi/g	
SX	SD	2359	SSGS South Intake Tunnel @ 125' QC SAMPLE	Sediment	0.32 pCi/g	<0.09 pCi/g	
SX	SD	2360	SSGS South Intake Tunnel SUCTION @ ~30'	Sediment	0.67 pCi/g	<0.16 pCi/g	
SX	SD	2361	SSGS South Intake Tunnel SUCTION @ ~60'	Sediment	0.17 pCi/g	<0.05 pCi/g	
SX	SD	2362	SSGS South Intake Tunnel SUCTION @ ~80'	Sediment	0.85 pCi/g	<0.09 pCi/g	
SX	SD	2363	SSGS South Intake Tunnel SUCTION @ ~100'	Sediment	0.4 pCi/g	<0.15 pCi/g	
SX	SD	2364	SSGS South Intake Tunnel SUCTION @ ~120'	Sediment	0.3 pCi/g	<0.06 pCi/g	
SX	GW	2365	SSGS South Intake Tunnel @ 30' / QC SAMPLE	Ground Water	<1.5 E-8 uCi/ml	<1.4 E-8 uCi/ml	<305 pCi/l H-3
SX	SM	2366	South Intake Tunnel INCLUDING QC	Smear Composite	2.8 E-5 uCi	<1.7 E-5 uCi	
SX	SM	2367	West Intake Tunnel INCLUDING QC	Smear Composite	<1.8 E-5 uCi	<1.7 E-5 uCi	