



Pennsylvania Department of Environmental Protection

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July 25, 2001

Bureau of Radiation Protection

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Fax: 717-783-8965

Larry Harmon, Plant Manager
Safety Light Corporation
4150-A Old Berwick Road
Bloomsburg, PA 17815

Re: DEP Groundwater/Surface Water Assessment

Dear Mr. Harmon:

Enclosed with this letter is a copy of the Final End of Project Report for Groundwater and Surface Water Assessment of the Safety Light Corporation Site (Volume I of II). Volume II consists of sample data sheets and analytical procedures and is not included because of its large size. It can be provided at a later date at your request if you consider it important to have in your records.

Please be aware that the results for radium analysis contained in this report are not valid due to the analytical method used by the laboratory. The Department of Environmental Protection considers the results for the non-radiological analysis and all radiological analysis other than radium valid.

If you have any questions regarding the report provided with this letter or wish to have a copy of Volume II, please contact Robert Maiers of my office at 717-783-8979.

Sincerely,

David J. Allard, CHP

Director

Bureau of Radiation Protection

cc: R. Maiers, BRP w/o enclosure
M. Miller, NRC w/o enclosure

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**FINAL END OF PROJECT REPORT
FOR
GROUNDWATER AND SURFACE WATER ASSESSMENT
SAFETY LIGHT CORPORATION SITE**

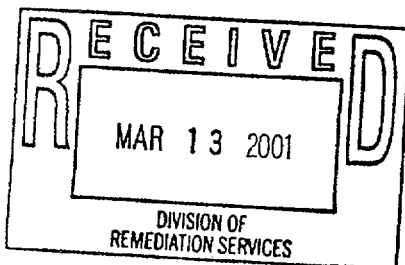
VOLUME I OF II

**SOUTH CENTRE TOWNSHIP
COLUMBIA COUNTY, PA**

**PADEP CONTRACT NO. ME-359186 (GTAC-3)
WORK REQUISITION NO. 34-030**

Prepared for:

Commonwealth of Pennsylvania
Department of Environmental Protection
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March 2001

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James N. DiClementi, P.E.
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NOTICE

The information in this document has been funded by the Pennsylvania Department of Environmental Protection (PADEP) under Contract No. ME-359186 to Foster Wheeler Environmental Corporation (FWENC). This document has been formally released by PADEP.

**SAFETY LIGHT CORPORATION SITE
END OF PROJECT REPORT**

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SAFETY LIGHT CORPORATION SITE END PROJECT REPORT

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1.0 INTRODUCTION

The Pennsylvania Department of Environmental Protection (PADEP) implemented a Hazardous Sites Cleanup Act (HSCA) funded assessment of the Safety Light Corporation (SLC) property located in South Centre Township, Columbia County. Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) was contracted to conduct the site assessment activities. As part of the activities, Foster Wheeler Environmental is submitting this End of Project Report to document the activities completed and to report the analytical findings of the water samples collected. The assessment included the collection and analysis of samples of the following:

- groundwater from monitoring wells located on the site;
- surface water obtained from the adjacent Susquehanna River; and
- nearby residential well water.

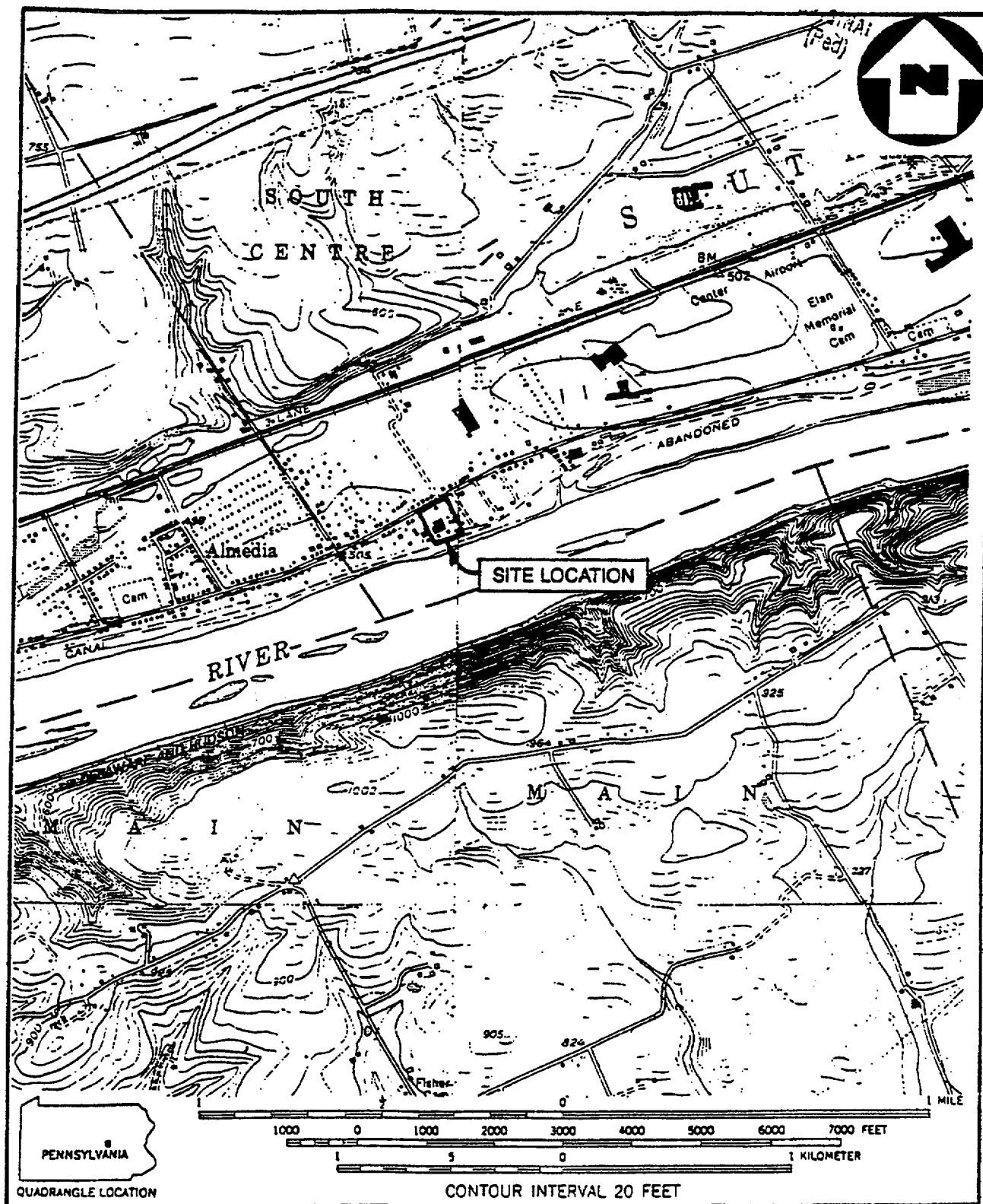
This report also contains the Contaminated Materials Handling Plan that details disposal recommendations to PADEP for the Investigation Derived Wastes (IDW). Details on budget and close-out expenditures, as well as final waste disposition documentation, were to be included in this report. This information will be submitted at the end of all project activities. The report is organized as follows:

- Introduction
- Project Background
- Summary of Field Activities
- Summary of Analytical Results
- Contaminated Materials Handling Plan
- Comparison of Previous Analytical Data to Current Data
- Conclusion

2.0 PROJECT BACKGROUND

The SLC Site encompasses an area of approximately 10 acres. The site location is shown in Figure 1. SLC utilizes a 1.5-acre area of the site for its current manufacturing operations. The site has been used since the 1940s to manufacture self-illuminated watches and instrument dials, and other articles containing radioactive materials. Most recently, the facility has been used to manufacture self-illuminating exit signs and other light sources (luminous paints, gas chromatograph foils, and accelerator targets). The facility has also been used for metal finishing and plating.

Radioactive wastes are currently being stored on site. In the past, radioactive wastes were stored and disposed in underground silos, injected into dry wells, spilled, discharged to the sanitary sewer system, and discharged to the Susquehanna River. Additional background and site history, along with other information, is contained in the July 1991, USEPA Preliminary Assessment. Past sampling data is included in a Health Consultation report, dated April 2000, by the Agency for Toxic Substances and Disease Control.



SITE LOCATION MAP
SAFETY LIGHT CORPORATION, BLOOMSBURG, PA

SCALE 1:24000
SOURCE: (7.5 MINUTE SERIES) U.S.G.S. BLOOMSBURG, MIFFLINVILLE,
CATAWISSA & SHUMANS, PA QUADS

FIGURE 1

FOSTER WHEELER
ENVIRONMENTAL CORPORATION

Past sampling events indicated that the site is impacted with radioactive materials, including Tritium, Strontium 90, Cesium 137, Radium 226, Nickel 63, and Americium 241. Other radionuclides, some metals, and to a lesser extent, organic contaminants also exist at the site.

3.0 SUMMARY OF FIELD ACTIVITIES

The primary objective of the scope of work was to perform sample collection and analysis to assess the surface water and groundwater in and around the site. Figure 2 illustrates the site layout and sample locations for groundwater, surface water, and residential well water. A Sampling and Analysis Plan (SAP) for the work was submitted by Foster Wheeler Environmental to PADEP, and approved prior to mobilization. Foster Wheeler Environmental personnel mobilized to the site on August 7, 2000, and completed the field activities on August 9, 2000. Additional field work was conducted on December 19 and 20, 2000, to prepare the IDW for disposal. As part of the field activities, the following types of samples were collected for analysis:

- static water level measurements and the groundwater from 21 monitoring wells located on and around the site;
- surface water (one up-gradient, three down-gradient) from the adjacent Susquehanna River;
- groundwater from two nearby residential wells;
- a composite for each of the waste types generated (solid and liquid) during the field activities; and
- a composite of the IDW for disposal facility acceptance requirements.

Field measurements for water quality parameters were collected to determine aquifer stabilization during purging and are included Appendix A. Air monitoring and radiological data were recorded in the field notes.

PADEP contracted Severn Trent Laboratory (STL) to perform chemical and radioactivity analyses on the water and waste characterization samples. Groundwater and surface water samples were analyzed for the following radioactive parameters:

- Gross Alpha radiation;
- Gross Beta radiation;
- Gamma Scan, which included Cesium 137 (CS 137), Cobalt 60 (Co 60); and
- the following radionuclides:
 - Tritium (H₃);
 - Strontium 90 (Sr 90);
 - Radium 226 (Ra 226);
 - Carbon 14 (C 14);
 - Nickel 63 (Ni 63);
 - Americium 241 (Am 241); and
 - Polonium 210 (Po 210).

Figure 2
 Foster Wheeler Environmental
 Corporation
 Safety Light Corporation Site
 Site Layout and Sample Location Map

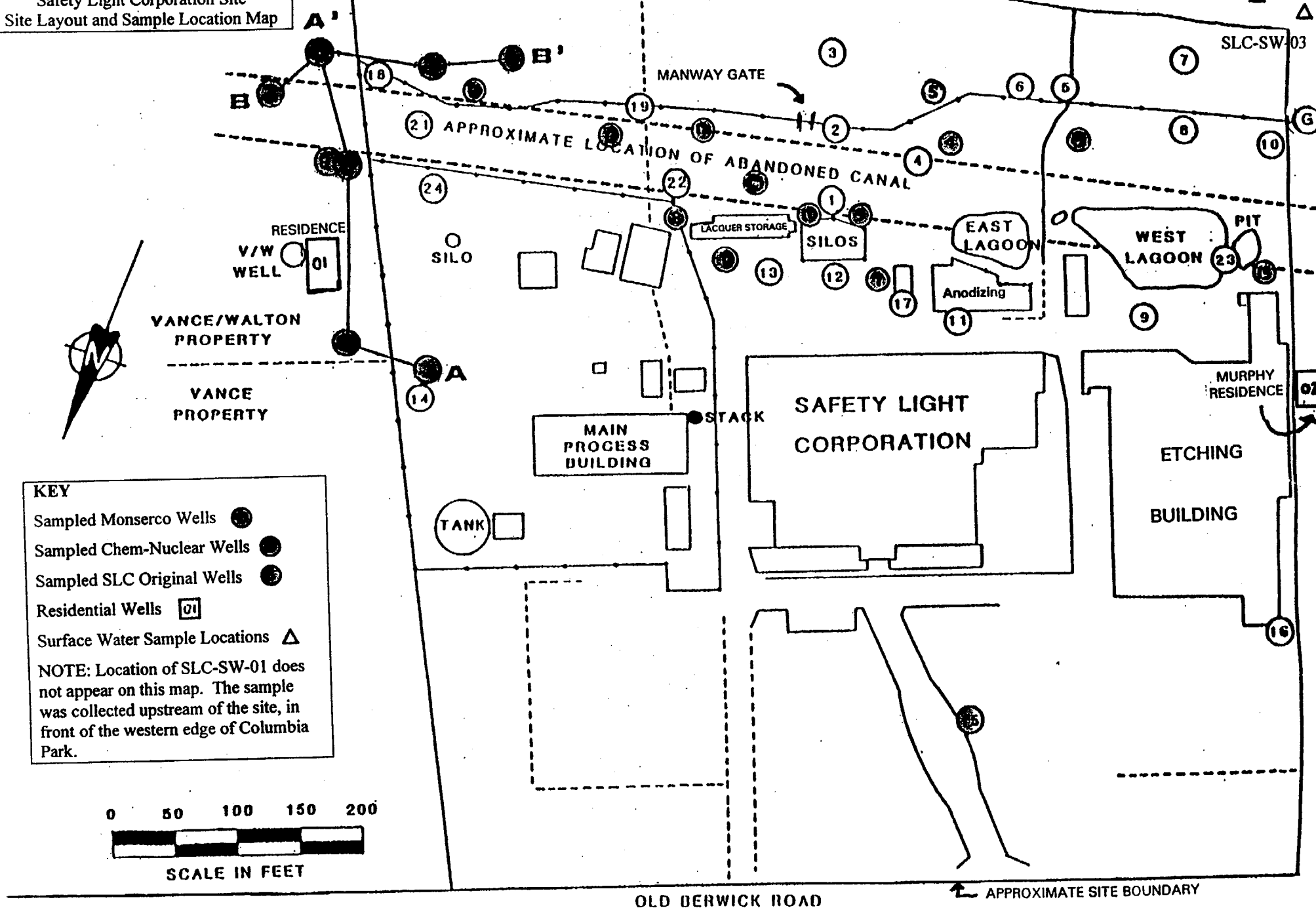


Figure 2 shows the locations all of the monitoring wells found on the site. A total of 23 monitoring wells were selected to be sampled during the field activities, including: thirteen wells installed by Monserco (MS-01 through MS-13), nine wells installed by Chem-Nuclear (CN-A through CN-I), and one Safety Light Corporation well (SL-15). The Monserco and Chem-Nuclear wells were selected because they were in good condition and they were at strategic locations throughout the site. The spatial distribution of the twenty-two wells was considered representative of the site. SL-15 was selected because it was relatively new, in good condition, and was in an up-gradient location of the site. This well was used to establish pre-site "background" conditions. Groundwater samples were collected from 21 of the 23 originally proposed wells. Monitoring wells CN-C and CN-E did not recharge adequately enough after purging to enable samples to be collected.

Whenever possible, at least three volumes of water were purged from the monitoring wells prior to sample collection. Many of the wells purged dry prior to achieving the required three volumes of water. Samples were collected from these wells after recharge without further purging. Water quality parameters were obtained with a Horiba model U-22 to establish that the aquifer groundwater was stabilized. The water quality parameters for each of the wells are located in Appendix A.

Approximately 0.14 feet free-phase product was measured in well MS-07. The product was a thick, black material with a strong petroleum odor. Analytical results of the groundwater sample collected from well MS-07 are discussed in Section 4.2 of this report. Free-phase product was not observed in any of the other wells.

3.2 Surface Water Sample Collection

Samples were collected at four locations along the banks of the Susquehanna River, as directed by PADEP. The approximate locations of the four samples are shown on Figure 2. Surface water sample SLC-SW-01 was collected approximately one mile upstream of the site on the Susquehanna River, within Columbia Park. This location was selected to represent "background", or pre-site conditions of the surface water. Surface water sample SLC-SW-02 was collected on the eastern edge of the site (southeast of the benchmark located near the Vance/Walton property). This sample represented the first location where potential impacts to the surface water would be expected. Surface water sample SLC-SW-03 was collected on the western edge of the site, in front of the Murphy residence property. This sample represented a location downstream of the site, where site impacts could potentially be the greatest on the surface waters. These three samples were collected at the shoreline of the river, approximately three to four feet from the bank. Surface water sample SLC-SW-04 was collected approximately 50 feet upstream from sample SLC-SW-03, further out from the bank, in the free flowing current to assess the impact of the site on water within the natural current.

Each sample was collected by submerging the laboratory-prepared bottles into the river. Care was taken to collect river water that was not impacted by disturbance of nearby sediments. For parameter aliquots requiring preservative, a clean, dedicated laboratory bottle was used to collect

the sample, and then the sample aliquot was transferred into the appropriate bottle. The sample was then labeled and placed into an iced cooler for shipment to the laboratory. River water samples were not filtered.

3.3 Residential Well Sample Collection

Foster Wheeler Environmental collected groundwater samples from two nearby residential wells. Samples were collected from either an outdoor spigot or from the whole house intake spigot directly into the laboratory bottles. An in-line filter device was used to obtain the filtered fraction for the TAL inorganics analysis. Sample bottles were labeled and placed into an iced cooler for shipment to the laboratory.

3.4 Waste Classification Sample Collection

Two samples were collected from IDW at the completion of the field activities. A composite sample was collected from the IDW liquids and from the IDW solids to gain representative samples for waste classification analysis of the IDW. The IDW included well purge water, equipment decontamination water, spent PPE, plastic sheeting and tubing which was stored in steel 55-gallon storage drums to await waste classification and disposal. The IDW consisted of one drum of solid waste and 5 partially full drums of liquid waste. Waste classification composite samples, SLC-WC-01 (solid) and SLC-WC-02 (liquid), were collected from the drums of IDW. Both composite samples were analyzed for the full Federal TCLP list, and RCRA Waste Characteristics, Gross Alpha, and Beta Radiation, and Tritium. The IDW was also scanned with a radiological survey meter to determine whether the waste was below the standard of 100 counts per minute (cpm) above established background. The results from the radiological scan were less than 100 cpm above background. Analytical data for IDW is summarized in Section 4 of this report.

Samples were also collected from the waste material for additional analysis required by the disposal facility, and are discussed in detail in Section 6 of this report.

3.5 Radiological Screen of Sampling Equipment, Samples and IDW

All decontaminated sampling equipment, samples leaving the site, and all containerized wastes were scanned with the Eberline ASP-1 survey meter with the HP-260 rod probe for radiological levels before being shipped off-site or stored to await transport and disposal. All screening indicated that the equipment and materials were below the 100 cpm limit.

3.6 QA/QC Sample Collection

QA/QC samples (blind field duplicates and rinsate blanks) were collected. Blind field duplicates were collected for 5% of the total samples collected, and were analyzed for the same parameters as the original sample. Rinsate blanks (if required) were collected from decontaminated sample collection equipment at a rate of 1 per day.

3.7 Decontamination Procedures

The majority of the sample collection equipment was dedicated to individual wells. Prior to use, between sample locations, and upon completion of sampling activities, sampling equipment (pumps, tubing, etc.) were decontaminated when required, as detailed in the SAP. The decontamination area was located away from expected sources of contamination to ensure that radiological screening was not impacted by nearby contamination sources. Materials used during sample collection were decontaminated and screened with a radiological survey meter after use to ensure that they were not contaminated with radioactive materials. All wastes generated during decontamination were collected in tubs and transferred to drums appropriately labeled for storage.

4.0 SUMMARY OF ANALYTICAL RESULTS

The laboratory analytical results are discussed below. Appendix B contains the summary tables for analytical data. Appendix C, (included as Volume 2 of this report), contains the laboratory data.

4.1 Analytical Protocols

PADEP contracted STL, in Pittsburgh PA, to perform the analysis, and provided laboratory bottles to Foster Wheeler Environmental. Analytical methods included US EPA SW-846 and 500 Series. PADEP selected the chemical and radiological analytical methods. Groundwater and residential well water sample results for VOCs, SVOCs, and TAL inorganics were compared to the PADEP Medium Specific Concentrations for Organic Regulated Substances in Groundwater, Used Aquifer, Total Dissolved Solids <2500 ug/L, Residential Criteria (PADEP Act 2 MSCs). As directed by PADEP, radiological analytical results for groundwater were compared to the Environmental Protection Agency (EPA) Drinking Water Standards, Maximum Contaminant Levels (MCL) for Radionuclides (EPA Drinking Water MCLs). Surface water organic and inorganic results were compared to Pennsylvania Title 25, Part 1, Subpart A, Chapter 16, Water Quality Toxics Management Strategy, Water Quality Criteria for Toxic Substances, Human Health Criteria. Radiological results for surface water samples are not compared to any criteria. Waste classification sample results were compared to the Federal TCLP and RCRA Characteristics Criteria for waste disposal. Waste classification radiological results have been compared to the disposal facility's criteria for the waste identity profile.

All aqueous samples were analyzed for the inorganic parameters (TAL inorganics), Gross Alpha radiation, Gross Beta radiation, Gamma radiation nuclides, and radionuclides including: tritium (H_3); Strontium 90 (Sr 90); Cesium 137 (Cs 137); Radium 226 (Ra 226); Carbon 14 (C 14); Cobalt 60 (Co 60); Nickel 63 (Ni 63); Americium 241 (Am 241); and Polonium 210 (Po 210). Radium 228 (Ra 228) was also run by the laboratory, and is required for comparison to the EPA Drinking Water MCLs. All samples collected for TAL inorganics analysis were analyzed for both filtered (dissolved) and the non-filtered (total) fractions, with the exception of the four river samples. During sample collection, a 0.45 micron in-line filter was used to filter the samples selected for dissolved TAL inorganics analysis.

Groundwater samples were analyzed for VOCs and SVOCs as selected by PADEP prior to field activities. Samples from the two residential wells and three monitoring wells, (MS-09, CN-B, and SL-15) were analyzed for VOCs and SVOCs. The sample from well MS-07 was found to contain free product, and at the direction of PADEP, the water sample collected from MS-07 was analyzed for VOCs and SVOCs. The product was a light non-aqueous phase liquid (LNAPL), and had a petroleum-like odor and a black, viscous, oily appearance. The groundwater sample was slightly turbid water containing small blobs of LNAPL.

Waste classification composite samples (one liquid, one solid) were analyzed for the full Federal TCLP list, and RCRA Waste Characteristics, Gross Alpha, and Beta Radiation, and Tritium.

QA/QC samples (blind field duplicates, rinsate blanks, etc) were to be analyzed as detailed in the Work Plan. Two rinsate blanks were collected; one to be analyzed for organics and TAL inorganics, and the other for TAL inorganics only. However, the blank was not analyzed for organics, as the laboratory failed to log in the organic analysis request for the blank.

4.2 Groundwater Analytical Results

Twenty-one wells were sampled and analyzed for various parameters. Tables 1, 2, 3, and 4, located in Appendix B, summarize the groundwater analytical results for VOCs, SVOCs, total and dissolved TAL inorganics, and radionuclides, respectively.

4.2.1 VOC and SVOC Results

Groundwater samples were collected from four wells for VOC and SVOC analysis. A blind duplicate was collected from well MS-09. VOC analytical results from samples SLC-GW-CN-B, SLC-GW-MS-7, and SLC-GW-SL-15 were below the PADEP Act 2 MSCs. Sample SLC-GW-MS-09 exceeded only the PADEP Act 2 MSC for vinyl chloride at 3.4 ug/L. The PADEP Act 2 MSC for vinyl chloride is 2 ug/L. The blind duplicate (SLC-GD-MS-09) of SLC-GW-MS-09 was below all PADEP Act 2 MSCs, including the MSC for vinyl chloride. SVOC analytical results for samples SLC-GW-CN-B, SLC-GW-MS-7, SLC-GW-SL-15, and SLC-GD-MS-09 were below the PADEP Act 2 MSCs. Sample SLC-GW-MS-09 exceeded the PADEP MSC for bis(2-ethylhexyl)phthalate of 6 ug/L with a result of 14 ug/L.

As discussed previously, LNAPL was observed in well MS-7 during sample collection. The sample was predominantly water and contained a very small amount of product. Although elevated organic concentrations may have been anticipated, VOC analytical results were non-detect for all VOCs except acetone, and extremely low levels of SVOCs were present in the sample. These low levels of organics may be due to the fact that the sample was predominantly water, and little or no product was in the aliquot that was analyzed by the laboratory.

4.2.2 Inorganic Analyte Results

Twenty-one groundwater samples and one blind duplicate were analyzed for total (unfiltered) and dissolved (filtered) TAL inorganics. Results from several groundwater samples exhibited exceedances of the PADEP Act 2 MSCs for inorganics. The range of concentrations and the number of samples in exceedance of the PADEP Act 2 MSCs are shown on Table 4-1, below. The majority of exceedances occurred in the unfiltered sample analyses. Analytical results of several filtered samples exhibited an exceedance of the PADEP Act 2 MSC for thallium. Analytical results of all other filtered samples were below the PADEP Act 2 MSCs. It should be noted that the majority of samples contained significant suspended solids or sediments. Based on the comparison of dissolved to total fraction results, the presence of inorganics may be attributed to the sediments rather than the groundwater. There may also have been some break-through during filtering due to the high sediment content of the groundwater. When break-through was noted, the fraction was re-filtered with a new in-line filter and placed into a clean bottle.

TABLE 4-1
INORGANIC ANALYTES IN EXCEEDANCE OF THE PADEP ACT 2 MSCs

ANALYTES IN EXCEEDANCE	NUMBER OF SAMPLES IN EXCEEDANCE	ANALYTE RANGE ug/L	PADEP ACT 2 MSC ug/L
ANTIMONY	1	7.8	6
ARSENIC	3	55-234	50
BARIUM	1	2470	2000
BERYLLIUM	4	4.6-16.2	4
CADMIUM	2	14.3-78.7	5
CHROMIUM	4	157-589	100
LEAD	13	9.7-689	5
NICKEL	6	129-559	100
SILVER	1	189	100
THALLIUM	20	4.2-43.6	2
VANADIUM	14	4.5-137	2.1
ZINC	1	21100	2000

4.2.3 Radiological Results

Twenty-one groundwater samples and one blind duplicate were analyzed for radiological nuclides. The Gross Alpha analysis had a range of results from non-detect to 3580 pCi/L. The Gross Beta results ranged from non-detect to 66,500 pCi/L. The H₃ results ranged from non-detect to 9050 pCi/L. The Gamma Scan indicated that Cs 137, Co 60, and Pb 214 were present in the groundwater samples. Cs 137 results ranged from non-detect to 1830 pCi/L. Co 60 results ranged from non-detect to 4.07 pCi/L. Lead 214 results ranged from non-detect to 197 pCi/L. Individual radiological scans indicated that Ra 226, C 14, Sr 90, Nil 63, Am 241, and Po210 were present in the groundwater samples. Results for Ra 226 ranged from non-detect to 95.5 pCi/L. C14 results ranged from non-detect to 16.6 pCi/L. Sr 90 results ranged from non-detect

to 29,500 pCi/L. Ni 63 results ranged from 3.02 to 83 pCi/L. Am 241 results ranged from non-detect to 1.46 pCi/L. Results for Po 210 ranged from non-detect to 110 pCi/L.

When compared to the EPA Drinking Water MCLs, numerous sample results were in exceedance of the standards. The following table details the exceedances for the groundwater samples. Note that the EPA Drinking Water MCLs have standards for gross alpha, gross beta, radium 226/radium 228, tritium, and strontium only. The laboratory report states that when strontium 90 is present, it usually causes elevated radium 228 results. The radium 228 result is used in a calculation to obtain the radium 226 result. This then causes an over-correction to the radium 226 results, hence the large negative values of radium 226. The majority of radium exceedances were in samples containing elevated strontium 90 concentrations, and according to the laboratory, the radium results may be erroneous.

**TABLE 4-2
RADIONUCLIDES IN EXCEEDANCE OF THE EPA DRINKING WATER MCLs**

Sample ID	Gross Alpha	Gross Beta	Tritium	Radium 226/ 228	Strontium
EPA Drinking Water MCL (pCi/L)	15	50	20,000	5*	8
SLC-GW-CN-A	301	3820	1980	16.9/13.3	21
SLC-GW-CN-D	64	200	5560	53.6/38.9	68.9
SLC-GW-CN-H	17.8	21.5	2720	1.02/0.867	0.205
SLC-GW-CN-I	26.6	47.7	1820	1.52/0.872	1.36
SLC-GW-MS-01	52.1	755	4290	-279/181	345
SLC-GW-MS-02	20	153	9050	-86.1/48.5	87.6
SLC-GW-MS-03	39.1	371	5790	-37.8/26.5	44.5
SLC-GW-MS-04	496	9650	3780	-979/615	6450
SLC-GW-MS-05	387	866	2860	56/95.5	159
SLC-GW-MS-06	264	2100	4210	-61.8/44.2	140
SLC-GW-MS-07	25.7	106	1600	-14.8/9.58	35.5
SLC-GW-MS-08	89.3	1490	5700	-360/237	696
SLC-GW-MS-09	413	34,200	3830	-7330/3950	10,000
SLC-GD-MS-09	1570	34,200	3600	-7580/4710	9410
SLC-GW-MS-10	3580	66,500	2940	-17,900/114,000	29,500
SLC-GW-MS-11	144	2190	1510	-676/439	1110
SLC-GW-MS-12	27.4	67.7	1830	-313/204	351
SLC-GW-MS-13	70.2	99.3	2960	-0.167/7.12	10.6
SLC-GW-SL-15	3.14	7.83	325	-12.1/8.33	1.03

* Radium 226 and Radium 228 results are summed and compared to a total standard of 5 pCi/L. Negative numbers were considered non-detects, and were zeroed when summed to gain a conservative estimate for the sum of the two isotopes.

Note: results do not include laboratory reported error result.

Bold results indicate exceedance.

4.3 Surface Water Analytical Results

Four surface water samples were collected from the Susquehanna River. No surface water samples were analyzed for VOCs and SVOCs as per the SAP. Tables 5 and 6, located in Appendix B, summarize the surface water analytical results for total TAL inorganics and radionuclides, respectively.

4.3.1 Inorganic Analyte Results

Four surface water samples were analyzed for total (unfiltered) TAL inorganics. Analysis of samples SLC-SW-01, SLC-SW-02, SLC-SW-03, and SLC-SW-04 indicated that the over half of the inorganics analyzed for were non-detect. Sample results for antimony, beryllium, cadmium, chromium, cobalt, lead, mercury, nickel, selenium, silver, thallium, vanadium, and cyanide were non-detect for all samples. The remaining analytes were present in levels above detection levels. However, when comparing the results to the Water Quality Criteria for Toxic Substances, no surface water sample results exceeded the criteria for inorganics.

4.3.2 Radiological Results

Four surface water samples were analyzed for radiological nuclides. The Gross Alpha analysis indicated non-detect levels. The Gross Beta results ranged from non-detect to 3.3 pCi/L. The H₃ results ranged from 260 to 390 pCi/L. The Gamma Scan indicated that Cs 137 and Co 60 were present in the surface water samples. Cs 137 results ranged from non-detect to 2.9 pCi/L. Co 60 results were non-detect. Individual radiological scans indicated that Ra 226, C 14, Sr 90, Ni 63, Am 241, and Po 210 were present in the surface water samples. Results for Ra 226 ranged from 0.325 to 0.553 pCi/L. C 14 results ranged from 0.442 to 3.08 pCi/L. Sr 90 results ranged from non-detect to 19.5 pCi/L. Ni 63 results ranged from 6.12 to 13.1 pCi/L. Am 241 results ranged from non-detect to 0.073 pCi/L. Results for Po 210 ranged from non-detect to 0.0417 pCi/L.

4.4 Residential Well Water Analytical Results

Two samples and one blind duplicate were collected from residential wells. All samples were analyzed for VOCS, SVOC, total and dissolved TAL inorganics, and radiological parameters. Tables 7, 8, 9, and 10, located in Appendix B, summarize the groundwater analytical results for VOCs, SVOCs, total and dissolved TAL inorganics, and radionuclides, respectively.

4.4.1 VOC and SVOC Results

VOC and SVOC analysis of the residential well water indicated that no results were in exceedance of the PADEP Act 2 MSCs.

4.4.2 Inorganic Analyte Results

The lead result from one of the unfiltered residential well samples was found to be in exceedance of the PADEP Act 2 MSC of 5 ug/L. The concentration of lead in SLC-RW-02, and its blind duplicate, SLC-RD-02, was 5.5 and 5 ug/L, respectively. Lead concentrations were non-detect in the filtered fraction of the same sample. Both the unfiltered and filtered sample results for copper in SLC-RW-02 and blind duplicate, SLC-RD-02, exceeded the PADEP Act 2 MSC of 1000 ug/L. Sample results for total copper in SLC-RW-02 and SLC-RD-02 were 1210 and 1220 ug/L, respectively. Sample results for dissolved copper in SLC-RW-02F and SLC-RD-02F were 1530 and 1580 ug/L, respectively. All other inorganic results were below the PADEP Act 2 MSCs for the residential well samples.

4.4.3 Radiological Results

The residential well water samples were analyzed for radiological nuclides. The Gross Alpha analysis indicated non-detect to 0.879 pCi/L. The Gross Beta results ranged from 2.3 to 2.58 pCi/L. The H₃ results ranged from 1170 to 2180 pCi/L. The Gamma Scan indicated that Cs 137 and Co 60 may be present in the groundwater samples. Cs 137 results ranged from non-detect to 6.24 pCi/L. Co 60 results were non-detect. Individual radiological scans indicated that Ra 226, C 14, Sr 90, Ni 63, Am 241, and Po 210 may be present in the groundwater samples. Results for Ra 226 ranged from non-detect to 0.209 pCi/L. C14 levels were non-detect. Sr 90 results ranged from 0.378 to 0.515 pCi/L. Ni 63 results ranged from non-detect to 4.32 pCi/L. Am 241 results ranged from 0.0216 to 0.0497. Results for Po 210 ranged from non-detect to 0.109 pCi/L.

No results from samples collected from the residential wells exceeded the EPA Drinking Water MCLs.

4.5 Waste Classification Analytical Results

Two waste classification samples were collected from the IDW generated during the sampling activities. Table 11, in Appendix B, summarizes the Waste Classification analytical results for the IDW. Sample SLC-WC-01 (solid IDW) results were below the TCLP and RCRA Characteristic criteria. Radiological results for Gross Alpha, Gross Beta, Tritium, as well as, the groundwater analytical results collected during this investigation, indicated that the solid material is not classified as a low-level radiological waste. Sample SLC-WC-02 (liquid IDW) results indicated that the waste is a RCRA Characteristically Hazardous Waste for Lead. The lead result of 15.5 mg/L exceeds the Federal TCLP criteria for lead of 5 mg/L. The analytical results for the liquid waste indicated that the waste will be handled and disposed of as a Hazardous Waste. Disposal requirements and additional details for the IDW are described in Section 5.0 of this report.

4.6 QA/QC Sample Collection Results

Results of blind duplicate samples and rinsate blanks are reported on the summary tables in Appendix B.

5.0 COMPARISON OF PREVIOUS ANALYTICAL DATA TO CURRENT DATA

Previous analytical data was provided to FWENC by PADEP in two documents, "Preliminary Assessment of Safety Light Corporation" prepared for the Hazardous Site Control Division, Environmental Protection Agency (EPA) by NUS Corporation, July 17, 1991, and "Characterization Survey of Safety Light Corporation Site at Bloomsburg, PA", prepared by Monserco Limited. The Monserco document was submitted to the Nuclear Regulatory Commission on September 5, 1996. The available and applicable data pertaining to groundwater sample analysis contained in these documents was tabulated for comparison to the current groundwater data detailed in this report. There was insufficient documentation pertaining to previous residential and surface water samples to make a comparison to current data (i.e., actual location of sample collection unclear). Table 12 in Appendix B contains the comparison data, and the discussion of the comparison follows below.

Results for radiological analyses of groundwater for ChemNuclear wells (Wells A, B, C, D, E, F, G, H, I, and Safety Light Well 15) were presented in the NUS Corporation document. Analysis was performed on groundwater samples for gross alpha, gross beta, tritium, Cs-137, and St-90 in 1990 by ChemNuclear and in 1991 by NUS Corporation. Comparison of past tritium results with current results shows a significant decrease in tritium concentrations in the groundwater. The sample data shows a decrease of at least an order of magnitude in tritium concentrations from the previous sampling events. The comparison of gross alpha and gross beta results indicates a moderate to significant increase of radionuclide concentrations in the majority of samples. Groundwater samples from wells CN-A and CN-D show the most significant increase in alpha and beta emitters. The majority of Cs-137 and St-90 results indicate little change from the past sampling events to the current event.

Incomplete data was provided in the Monserco Limited document. Groundwater samples were collected from Monserco Wells 1 through 13 for radionuclide, VOC, and metals analyses. A summary of analyses was provided in the document, however, actual concentrations for each compound or analyte were not detailed. More appropriate data may have been contained in the appendices of the document however, they were not provided to FWENC when it was determined that the appendices were not present in the document.

6.0 INVESTIGATION DERIVED WASTES

On December 19 and 20, 2000, waste handling activities were conducted on site to prepare the IDW for shipment and to meet the disposal facilities requirements (Envirocare, Utah). The facility requires that no free liquids be present in the wastes. The waste consists of purge water and decontamination water, PPE and plastic. The liquid waste was solidified, in the DOT-

approved shipping drums, with a solidification/stabilization agent that produced a low-temperature cure (Aquaset). The drums were placed onto drum spill pallets for secondary containment until shipment to the facility. The pallets and the drums were then tarped. The drums were stored in the temporary enclosed storage facility at the site. The drums were appropriately labeled as "hazardous waste", as required for storage and shipping. The federal Department of Transportation (DOT) does not require wastes with less than 2 nCi/g of radioactive nuclides to be labeled as a radioactive waste.

As discussed previously, the waste was sampled for waste characterization during the investigation activities. The presence of radionuclides in the waste required that the waste be disposed of at a low-level radioactive waste disposal facility, however, the waste is not classified as a low level radioactive or mixed waste based on analytical results. The solidified liquid and solid (PPE) waste will be considered one waste stream for the facility documentation. The wastewater is also considered characteristically hazardous for lead (D008), based on the TCLP analysis performed during the field investigation activities. Treatment of the material with the solidification/stabilization agent changed the physical state of the waste, from liquid to solid, however, the waste remains a characteristically hazardous waste.

On December 20, 2000, two composite samples of the waste were collected for analysis to ensure that the waste meets the facility's disposal requirements. In order to meet the facility disposal requirements, a free-liquids (Paint Filter Liquids Test) analysis was performed on one waste sample. The sample was sent (December 21, 2000) to STL Laboratory for analysis. Once the result was received, the waste profile application was submitted to the Envirocare facility for approval of the waste profile. The waste profile has been preliminarily approved, and the second composite sample of the waste was shipped to the Envirocare facility on March 5, 2001. The sample was submitted to Envirocare under chain-of-custody, with the Pre-sample Shipment Profile, to meet their testing requirements. Once the waste is tested and final waste shipment approval is completed by the facility, a contract for disposal will be completed with FWENC. The waste will then be transported by a permitted and approved transporter, and disposed of as a solid hazardous waste to the Envirocare facility.

All federal, state and local regulations will be followed during the material handling, shipping and disposal. The waste drums do not have to be screened by radiological survey meter prior to shipment for exposure dosage because the waste is below the DOT requirement of 2 nCi/g, and is not considered a radioactive waste. However, in order to meet Envirocare's acceptance requirements, the waste must be documented on a Radiological Waste Manifest. Since the waste is classified as a hazardous waste, the Pennsylvania Hazardous Waste Manifest will also accompany the waste shipment (Utah does not have a state hazardous manifest). Radiological and hazardous waste manifests will be completed by Foster Wheeler Environmental and signed by a PADEP representative (as generator) to accompany the waste to the disposal facility. Documentation regarding final disposition of the waste will be submitted to PADEP in an addendum letter, and will include all shipping documentation.

7.0 CONCLUSION

Sample collection and analysis generated results that indicate that the groundwater and, potentially, the surface water at the Safety Light Corporation site are impacted by previous site activities. The available data is limited, and the collection and evaluation of additional data may assist in better quantifying actual and potential future impacts to the environment from the contamination existing in the site media.

Analytical results indicate that the groundwater is impacted by radionuclides and some inorganic analytes. The majority of groundwater sample results confirm the presence of radionuclides above non-detect levels. Comparison of the groundwater analytical results indicated that many samples exceeded the EPA Drinking Water MCLs for gross alpha, gross beta, radium 226 and radium 228 (combined), and strontium 90. The highest concentrations of radionuclides were found in the groundwater collected from the monitoring wells closest to the location of the underground waste disposal silos, wells MS-09 and MS-10. None of the residential well sample results were found to exceed the EPA Drinking Water MCLs for radionuclides.

Analytical results of groundwater samples collected from the monitoring wells indicate that numerous inorganic analytes were detected at concentrations that exceed the PADEP Act 2 MSCs. Some of these exceedances may be attributed to the elevated level of suspended solids in the groundwater samples. The majority of the inorganic exceedances were detected in the unfiltered fraction of the groundwater samples. Thallium was the only inorganic analyte detected above the PADEP Act 2 MSCs in the filtered fraction of the monitoring well samples. Lead and copper were found to be in exceedance of the PADEP Act 2 MSCs in one of the residential well water samples. As copper was not detected in other groundwater samples, the elevated copper levels may be attributed to the residential plumbing system.

Low-level organic contaminants were detected in the groundwater samples collected from the site. Groundwater samples were collected from selected monitoring wells and analyzed for VOCs and SVOCs. Vinyl chloride and bis(2-ethylhexyl)phthalate were the only organic contaminants to exceed the PADEP Act 2 MSCs, and were detected in samples from only one monitoring well, MS-09. Bis(2-ethylhexyl)phthalate is a very common laboratory contaminant. However, in this case, it was not consistently present in the laboratory blanks, which would have identified it as a laboratory contaminant. None of the residential well water samples exceeded the PADEP Act 2 MSCs for VOCs or SVOCs. The majority of the residential well sample organic results were non-detect.

Analytical results from surface water samples collected from the Susquehanna River showed no obvious impact to the river water from site activities. Analyses for radionuclides showed that low concentrations of radionuclides are present in the surface waters of the Susquehanna River. Standards for radionuclide concentrations in surface water were not used for data comparison, as none were determined applicable for this event by PADEP. All surface water sample results were below the inorganics Water Quality Criteria for Toxic Substances. Surface water samples were not analyzed for VOCs and SVOCs.

APPENDIX A

FIELD WATER QUALITY PARAMETERS

Well I.D. CN-ADate 8/7/00Well Depth (from TOC) 26.38 ft.Well Diameter 3.94ⁱⁿ 2 in.Static Water Level 3.99 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

26.38 - 3.99 = 22.39 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²22.39 x .163 x 1² = 3.7 gal./volumeTotal Gallons Purged = 12 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	1748	6.6	0.267	6.5	12.34	19.0	0.0	0.17	261
1 volume	1753	6.0	0.271	34.5	0.00	13.3	0.0	0.18	242
2 volume	1758	6.0	0.272	10	0.00	13.2	0.0	0.18	244
3 volume	1803	6.0	0.273	10	0.00	13.2	0.0	0.18	244
4 volume									
5 volume									
6 volume									
7 volume									

Purge Method: Submersible pumpNotes/Observations: Water initially turbid, black fines becoming clear
after 2 volumes purged.Samplers: Jim Ruffing

Well I.D. CN-BDate 8/8/00Well Depth (from TOC) 31.74 ft.Well Diameter 2 in.Static Water Level 11.63 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

31.74 - 11.63 = 20.11 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²20.11 x .163 x 1² = 3.3 gal./volumeTotal Gallons Purged = 10 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	17:55	6.7	0.318	<10	7.56	13.3	0.0	0.21	183
1 volume	17:01	6.2	0.319	<10	4.60	13.0	0.0	0.21	204
2 volume	17:05	6.1	0.319	<10	4.52	13.0	0.0	0.21	210
3 volume	17:08	6.1	0.319	<10	4.50	13.0	0.0	0.21	211
4 volume									
5 volume									
6 volume									
7 volume									

Purge Method: submersible pumpNotes/Observations: Water clear, No odor.Samplers: J. M. Ruffing

Well I.D. CN-CDate 8/9/00Well Depth (from TOC) 23.17 ft.Well Diameter 2 in.Static Water Level 16.04 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

23.17 - 16.04 = 7.13 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²7.13 x .163 x 1² = 1.2 gal./vol.Total Gallons Purged = 1 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	—	6.4	270	244	—	—	—	—	—
1 volume									
2 volume									
3 volume									
4 volume									
5 volume									
6 volume									
7 volume									

Purge Method: submersible pumpNotes/Observations: Well purged dry before full volume collectedWell did not rechargeSamplers: none

Well I.D. CN - FDate 8/9/00Well Depth (from TOC) 28.09 ft.Well Diameter 2 in.Static Water Level 6.17 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

28.09 - 6.17 = 21.92 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²21.92 x .163 x 1² = 3.6 gal./volumeTotal Gallons Purged = 16 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	12:01	7.3	0.247	2-10	9.85	16.3	-	-	149
1 volume	12:07	7.2	0.281	2-10	11.41	16.1	-	-	157
2 volume	-	7.0	0.291	2-10	8.82	15.3	-	-	163
3 volume	-	7.1	0.284	2-10	8.16	15.2	-	-	171
4 volume	-	7.1	0.281	2-10	8.55	15.1	-	-	180
5 volume									
6 volume									
7 volume									

Purge Method: submersible pumpNotes/Observations: Water clear. No odor.Samplers: Jim Ruffing

Well I.D. CN-GDate 8/7/00Well Depth (from TOC) 19.96 ft.Well Diameter 2 in.Static Water Level 8.05 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

19.96 - 8.05 = 11.91 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²11.91 x .163 x 1² = 1.9 gal./volume

Total Gallons Purged = _____ gallons

Water Quality

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial									
1 volume									
2 volume									
3 volume									
4 volume									
5 volume									
6 volume									
7 volume									

Purge Method: Submers. pump

Notes/Observations: Pump clog after one volume 2/340
1400 - collect sample, no water quality parameters
recovered. water is cloudy

Samplers: Jason Rank

Well I.D. CN-14Date 8/8/00Well Depth (from TOC) 21.75 ft.Well Diameter 2 in.Static Water Level 11.50 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

21.75 - 11.50 = 10.25 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²10.25 x .163 x 1² = 1.7 gal./vol.Total Gallons Purged = 10 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	17.0	6.15	1200	<.1	10.50	14.1	-	-	297
1 volume	-	6.12	1220	>.999	8.7	13.7	-	-	270
2 volume	-	6.25	1245	>.999	6.32	13.6	-	-	281
3 volume	-	6.20	1315	999	5.65	13.5	-	-	261
4 volume	-	6.22	1322	932	5.98	13.2	-	-	263
5 volume	-	6.25	1320	527	5.50	12.5	-	-	266
6 volume									
7 volume									

Purge Method: submersible pumpNotes/Observations: Turbidity did not stabilize because pump was
moved inside the well during purgingSamplers: Jason Funk

Well I.D. CN - IDate 8/8/00Well Depth (from TOC) 26.57 ft.Well Diameter 2 in.Static Water Level 16.29 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

26.57 - 16.29 = 10.28 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²10.28 x .163 x 1² = 1.7 gal./volumeTotal Gallons Purged = 10 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	-	6.18	0.315	>999	9.27	17.8	-	-	212
1 volume	-	5.77	0.311	>999	6.05	13.5	-	-	236
2 volume	-	5.49	0.300	596	5.01	13.4	-	-	262
3 volume	-	5.42	0.300	413	4.81	13.2	-	-	285
4 volume	-	5.42	0.298	187	4.81	13.2	-	-	291
5 volume	-	5.42	0.288	179	4.79	13.2	-	-	296
6 volume									
7 volume									

Purge Method: _____

Notes/Observations: Water very turbid becoming less turbid.Samplers: Jagan Funk

Well I.D. MS-03Date 8/8/00Well Depth (from TOC) 10.00 ft.Well Diameter 2 in.Static Water Level 4.59 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

10.00 - 4.59 = 5.41 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²5.41 x .163 x 1² = 0.9 gal./volumeTotal Gallons Purged = 1.5 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	-	6.93	0.578	3.1	5.74	17.7			115
1 volume	-	6.58	0.463	96.5	7.45	16.6			80
2 volume									
3 volume									
4 volume									
5 volume									
6 volume									
7 volume									

Purge Method: _____

Notes/Observations: Well pumped dry after 1 volume. Water turbid.Samplers: Jason Fork

Well I.D. MS-04Date 8/8/00Well Depth (from TOC) 14.22 ft.Well Diameter 2 in.Static Water Level 7.42 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

14.22 - 7.42 = 6.80 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²6.80 x .163 x 1² = 1.1 gal./volumeTotal Gallons Purged = 1.5 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	1733	5.7	0.270	7989	3.0	16.1	0.0	0.18	107
1 volume									
2 volume									
3 volume									
4 volume									
5 volume									
6 volume									
7 volume									

Purge Method: submersible pumpNotes/Observations: Water turbid, tan. No odor. Purged dry after
1 volume.Samplers: Jim Roffing

Well I.D. MS-05Date 8/7/00Well Depth (from TOC) 13.22 ft.Well Diameter 2 in.Static Water Level 6.28 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

13.22 - 6.28 = 6.94 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²6.94 x .163 x 1² = 1.1 gal./volumeTotal Gallons Purged = 1.5 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	1415	6.3	2417	2999	5.55	18.0	0.0	0.27	-32
1 volume									
2 volume									
3 volume									
4 volume									
5 volume									
6 volume									
7 volume									

Purge Method: Submersible pumpNotes/Observations: Well purged dry after 1 volume.Grey, tan w. turbid. Sulfur odor.Samplers: Jim Rutling

Well I.D. MS-06Date 8/8/00Well Depth (from TOC) 12.97 ft.Well Diameter 2 in.Static Water Level 5.30 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

12.97 - 5.30 = 7.67 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²7.67 x .163 x 1² = 1.3 gal./volumeTotal Gallons Purged = 10³ 6 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	—	6.1	0.265	>999	7.79	14.0	—	—	248
1 volume	—	6.2	0.261	>999	4.53	13.9	—	—	275
2 volume	—	6.2	0.262	>999	3.78	13.8	—	—	278
3 volume	—	6.2	0.263	>999	3.48	13.9	—	—	301
4 volume	—	6.2	0.263	>999	3.20	13.9	—	—	317
5 volume	—	6.2	0.264	>999	3.10	13.8	—	—	327
6 volume									
7 volume									

Purge Method: _____

Notes/Observations: Water brown, turbid.Samplers: Jason Funk

Well I.D. MS-07Date 8/9/02Well Depth (from TOC) 21.94 ft.Well Diameter 2 in.Static Water Level 15.2 ft. (product)Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

$$\underline{21.94} - \underline{15.2} = \underline{6.74} \text{ ft.}$$

Gallons of Water per VolumeGallons = $T \times .163 \times \text{Radius}^2$

$$\underline{6.74} \times .163 \times \underline{1^2} = \underline{1.1} \text{ gal./volume}$$

Total Gallons Purged = 5 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial									
1 volume									
2 volume									
3 volume									
4 volume									
5 volume									
6 volume									
7 volume									

Purge Method: bailingNotes/Observations: Water has product (black, oily) on top of it.
No water quality readings collected to protect water quality meter.Samplers: Jim Rotting

Well I.D. MS-08Date 8/8/00Well Depth (from TOC) 16.62 ft.Well Diameter 2 in.Static Water Level 12.18 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

16.62 - 12.18 = 4.46 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²4.46 x .163 x 1² = 0.7 gal./volumeTotal Gallons Purged = 4 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	-	6.29	0.409	244	7.08	15.8	-	-	11
1 volume	-	5.85	0.455	510	0.93	15.2	-	-	-26
2 volume	-	5.89	0.456	289	0.00	15.1	-	-	-35
3 volume	-	5.90	0.458	258	0.00	15.1	-	-	-38
4 volume	-	5.91	0.457	238	0.00	15.1	-	-	-42
5 volume									
6 volume									
7 volume									

Purge Method: _____

Notes/Observations: Water very turbid.Samplers: Jason Funk

Well I.D. MS-09Date 8/8/00Well Depth (from TOC) 18.77 ft.Well Diameter 2 in.Static Water Level 12.51 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

18.77 - 12.51 = 6.26 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²6.26 x .163 x 1² = 1.0 gal./volumeTotal Gallons Purged = 4.5 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	-	6.4	0.392	466	5.36	15.4	0.0	0.29	-85
1 volume	-	6.4	0.466	113	1.31	14.9	0.0	0.31	-80
2 volume	-	6.4	0.477	10	0.22	14.8	0.0	0.31	-81
3 volume	-	6.5	0.489	10	0.22	14.8	0.0	0.32	-83
4 volume	-	6.5	0.493	10	0.22	14.8	0.0	0.32	-85
5 volume									
6 volume									
7 volume									

Purge Method: Submersible
Electric pumpNotes/Observations: Water brown, turbid becoming clear. Water in
purge bucket showing a sheen.Samplers: Jim Ritting

Well I.D. MS-10Date 8/9/00Well Depth (from TOC) 19.52 ft.Well Diameter 2 in.Static Water Level 7.01 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

19.52 - 7.01 = 12.51 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²12.51 x .163 x 1² = 2.0 gal./volumeTotal Gallons Purged = 8 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	0735	5.71	0.510	>999	2.0	14.1	-	-	61
1 volume	0737	5.75	0.528	>999	0.00	14.0	-	-	72
2 volume	-	5.82	0.547	>999	0.00	14.0	-	-	-4
3 volume	0741	5.88	0.553	>999	0.00	14.0	-	-	-15
4 volume	0743	5.94	0.562	624	0.00	14.0	-	-	-26
5 volume									
6 volume									
7 volume									

Purge Method: submersible pumpNotes/Observations: Water brown, turbid. Slight sulfur odor.Samplers: Jim Rutting

Well I.D. MS-11Date 8/8/00Well Depth (from TOC) 12.27 ft.Well Diameter 2 in.Static Water Level 8.18 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

12.27 - 8.18 = 4.09 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²4.09 x .163 x 1² = 0.7 gal./volumeTotal Gallons Purged = 4 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	1150	6.5	0.404	799	7.27	15.5	0.0	0.25	-3
1 volume	1152	6.4	0.376	799	7.08	14.9	0.0	0.24	-11
2 volume	1154	6.5	0.365	520	6.84	14.8	0.0	0.23	-4
3 volume	1156	6.5	0.359	274	6.00	14.8	0.0	0.23	1
4 volume	1158	6.4	0.357	208	0.00	14.8	0.0	0.23	1
5 volume									
6 volume									
7 volume									

Purge Method: submersible pumpNotes/Observations: Water initially black/brown very turbid becoming brown,
less turbid. Sulfur odor.Samplers: Jim Rottling

Well I.D. MS-12Date 8/8/00Well Depth (from TOC) ~~21.48~~⁵² 14.15 ft.Well Diameter 2 in.Static Water Level ~~15.17~~⁵² 6.82 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

~~21.48~~⁵² 14.15 - ~~15.17~~⁵² 6.82 = ~~6.24~~⁵² 7.33 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²~~6.24~~⁵² 7.33 x .163 x 1² = 1.2 gal./volume.Total Gallons Purged = 4 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	0:50	6.49	0.364	>999	2.44	14.1	-	-	11
1 volume	0:51	5.84	0.350	>999	0.42	13.7	-	-	78
2 volume	0:52	5.62	0.344	>999	0.16	13.6	-	-	101
3 volume	0:53	5.53	0.342	>999	0.04	13.6	-	-	121
4 volume									
5 volume									
6 volume									
7 volume									

Purge Method: submersible pumpNotes/Observations: Water turbid, brown/ten.Samplers: Jim Ruffing

Well I.D. MS-13Date 8/9/00Well Depth (from TOC) 21.48 ft.Well Diameter 2 in.Static Water Level 15.19 ft.Well Radius 1 in.**Height of Water in Well**

T = Well Depth - Static Water Level

21.48 - 15.19 = 6.29 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²6.29 x .163 x 1² = 1.0 gal./volumeTotal Gallons Purged = 4 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	10:21	6.35	0.463	418	6.75	13.7	-	-	-62
1 volume	-	6.30	0.404	2999	0.07	13.4	-	-	-67
2 volume	-	6.20	0.387	2999	0.00	13.3	-	-	-61
3 volume	-	6.09	0.382	613	0.00	13.2	-	-	-58
4 volume	10:25	6.06	0.383	477	0.00	13.2	-	-	-56
5 volume									
6 volume									
7 volume									

Purge Method: submersible pumpNotes/Observations: Water grey/brown turbid becoming less turbid.Samplers: Jim Ruttig

Well I.D. 5.2-15Date 8/9/00Well Depth (from TOC) 36.12 ft.Well Diameter 4 in.Static Water Level 25.29 ft.Well Radius 3 in.**Height of Water in Well**

T = Well Depth - Static Water Level

36.12 - 25.29 = 10.83 ft.**Gallons of Water per Volume**Gallons = T x .163 x Radius²10.83 x .163 x 3² = 15.9 gal/volumeTotal Gallons Purged = 16 gallons**Water Quality**

	Time	pH	Cond.	Turbidity	DO	Temp.	Sal.	TDS	ORP
Initial	-	6.4	0.362	0.47	2.13	14.8	-	-	100
1 volume									
2 volume									
3 volume									
4 volume									
5 volume									
6 volume									
7 volume									

Purge Method: submersible pumpNotes/Observations: well pumped dry prior to well volumeSamplers: Iron Fork

APPENDIX B

ANALYTICAL SUMMARY TABLES

TABLE 1
SAFETY LIGHT CORPORATION SITE, PADEP
VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS - GROUNDWATER

LAB ID		SLC-GW-CN-B	SLC-GW-MS-07	SLC-GW-MS-09	SLC-GD-MS-09	SLC-GW-SL-15
SAMPLE ID	PADEP Act 2	FOH100291008	FOH160319001	FOH100291011	FOH100291012	FOH160319002
DATE COLLECTED	MSCs	8/800	8/9/2000	8/8/2000	8/8/2000	8/9/2000
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS	ug/l	ug/l	ug/l	ug/l	ug/l	
COMMENTS						
1,1,1-Trichloroethane	200	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	na	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	27	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	7	5 U	5 U	2.4 J	2 J	5 U
1,2-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	70	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5	5 U	5 U	2.6 J	2.2 J	5 U
2-Butanone	2800	20 U	20 U	5 U	5 U	5 U
2-Hexanone	na	20 U	20 U	20 U	20 U	20 U
4-Methyl-2-pentanone	na	20 U	20 U	20 U	20 U	20 U
Acetone	3700	20 U	14 J	20 U	20 U	20 U
Benzene	5	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	100	5 U	5 U	5 U	5 U	5 U
Bromoform	100	5 U	5 U	5 U	5 U	5 U
Bromomethane	10	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	1900	5 U	5 U	1.6 J	5 U	5 U
Carbon tetrachloride	5	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	55	5 U	5 U	5 U	5 U	5 U
Chloroethane	28000	10 U	10 U	3.1 J	2.8 J	10 U
Chloroform	100	5 U	5 U	5 U	5 U	5 U
Chloromethane	na	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	na	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	na	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	700	5 U	5 U	5 U	5 U	5 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U
Styrene	100	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5	5 U	5 U	5 U	5 U	5 U
Toluene	1000	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	na	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	2	5 U	5 U	3.4 J	5 U	5 U
Xylenes (total)	10000	5 U	5 U	5 U	5 U	5 U

TABLE 2
SAFETY LIGHT CORPORATION SITE, PADEP
SEMI-VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS - GROUNDWATER

LAB ID	PADEP Act 2 MSCs	SLC-GW-CN-B	SLC-GW-MS-07	SLC-GW-MS-09	SLC-GD-MS-09	SLC-GW-SL-15
SAMPLE ID		FOH100291008	FOH160319001	FOH100291011	FOH100291012	FOH160319002
DATE COLLECTED						
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS						
1,2,4-Trichlorobenzene	70	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	600	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	600	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	75	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	na	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	3700	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	60	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	20	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	730	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	19	50 U	50 U	50 U	50 U	50 U
2,4-Dinitrotoluene	2.1	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	37	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	2900	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	40	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	1500	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	na	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	2.1	50 U	50 U	50 U	50 U	50 U
2-Nitrophenol	2300	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	1.5	50 U	50 U	50 U	50 U	50 U
3-Nitroaniline	2.1	50 U	50 U	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	na	50 U	50 U	50 U	50 U	50 U
4-Bromophenyl phenyl ether	na	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	na	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	150	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	na	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	na	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	2.1	50 U	50 U	50 U	50 U	50 U
4-Nitrophenol	60	50 U	50 U	50 U	50 U	50 U
Acenaphthene	2200	10 U	1.3 J	10 U	10 U	10 U
Acenaphthylene	2200	10 U	10 U	10 U	10 U	10 U
Anthracene	43	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	0.9	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	0.2	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.9	10 U	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	0.26	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.55	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	na	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl) ether	0.13	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl) phthalate	6	1.6 J	1.8 J	8.9 J	14	1.4 J
Butyl benzyl phthalate	2700	10 U	10 U	10 U	10 U	10 U
Carbazole	700	10 U	10 U	10 U	10 U	10 U
Chrysene	1.8	10 U	1.2 J	10 U	10 U	10 U
Di-n-butyl phthalate	3700	10 U	1.9 J	10 U	10 U	1.6 J
Di-n-octyl phthalate	730	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	0.09	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	na	10 U	10 U	10 U	10 U	10 U
Diethyl phthalate	500	10 U	10 U	1.9 J	10 U	10 U
Dimethyl phthalate	na	10 U	10 U	10 U	10 U	10 U
Fluoranthene	270	10 U	10 U	10 U	10 U	10 U
Fluorene	190	10 U	2 J	10 U	10 U	10 U
Hexachlorobenzene	1	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	1	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	50	50 U	50 U	50 U	50 U	50 U
Hexachloroethane	1	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.9	10 U	10 U	10 U	10 U	10 U
Isophorone	100	10 U	10 U	10 U	10 U	10 U
N-Nitrosodi-n-propylamine	0.094	10 U	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	130	10 U	10 U	10 U	10 U	10 U
Naphthalene	20	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	18	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	1	50 U	50 U	50 U	50 U	50 U
Phenanthrene	1200	10 U	1.9 J	10 U	10 U	10 U
Phenol	4000	10 U	10 U	10 U	10 U	10 U
Pyrene	13	10 U	1.7 J	10 U	10 U	10 U

MSCs-Medium Specific Concentrations for Organic Regulated Substances in Groundwater, Used Aquifer,
TDS <2500, Residential Criteria

TABLE 3
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID		SLC-RB-01	SLC-RB-01-F	SLC-RB-02	SLC-RB-02-F	SLC-GW-CN-A
LAB ID		F0H100153001	F0H100153007	F0H100153019	F0H100153020	F0H100153006
DATE COLLECTED		8/7/2000	8/7/2000	8/8/2000	8/8/2000	8/7/2000
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS		ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS	PADEP MSCs ¹					
Aluminum-Dissolved	NA		200 U		200 U	
Aluminum	NA	200 U		200 U		9660
Antimony-Dissolved	6		60 U		60 U	
Antimony	6	60 U		60 U		60 U
Arsenic-Dissolved	50		10 U		10 U	
Arsenic	50	10 U		2.3 B		7.2 B
Barium-Dissolved	2000		200 U		200 U	
Barium	2000	200 U		200 U		1930
Beryllium-Dissolved	4		5 U		5 U	
Beryllium	4	5 U		5 U		5 U
Cadmium-Dissolved	5		5000 U		5000 U	
Cadmium	5	5000 U		5000 U		3.1 B
Calcium-Dissolved	NA		5000 U		5000 U	
Calcium	NA	5000 U		5000 U		26500
Chromium-Dissolved	100		10 U		10 U	
Chromium	100	10 U		10 U		7.8 B
Cobalt-Dissolved	NA		50 U		50 U	
Cobalt	NA	50 U		50 U		157
Copper-Dissolved	1000		25 U		25 U	
Copper	1000	25 U		25 U		25.8
Iron-Dissolved	NA		100 U		100 U	
Iron	NA	100 U		100 U		13200
Lead-Dissolved	5		3 U		3 U	
Lead	5	3 U		3 U		9.7
Magnesium-Dissolved	NA		5000 U		5000 U	
Magnesium	NA	5000 U		5000 U		7670
Manganese-Dissolved	NA		15 U		15 U	
Manganese	NA	15 U		15 U		69600
Mercury-Dissolved	2		0.2 U		0.2 U	
Mercury	2	0.2 U		0.2 U		0.2 U
Nickel-Dissolved	100		13.5 B		40 U	
Nickel	100	40 U		40 U		28.2 B
Potassium-Dissolved	NA		5000 U		5000 U	
Potassium	NA	5000 U		5000 U		6370
Selenium-Dissolved	50		5 U		5 U	
Selenium	50	5 U		5 U		5 U
Silver-Dissolved	100		10 U		10 U	
Silver	100	10 U		10 U		11.7
Sodium-Dissolved	NA		5000 U		467 B	
Sodium	NA	5000 U		229 B		9210
Thallium-Dissolved	2		10 U		10 U	
Thallium	2	10 U		10 U		7 B
Vanadium-Dissolved	2.1		50 U		50 U	
Vanadium	2.1	50 U		50 U		9.9 B
Zinc-Dissolved	2000		20 U		7.5 B	
Zinc	2000	5 B		20 U		85.9
Cyanide-Dissolved	200		5 U			
Cyanide	200	5 U		16 U	5 U	5 U

MSCs-Medium Specific Concentrations for Inorganic Regulated Substances in Groundwater, Used Aquifer, Metals-GW
TDS <2500, Residential Criteria

SLC data.xls

TABLE 3
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	PADEP MSCs ¹	SLC-GW-CN-A-F	SLC-GW-CN-B	SLC-GW-CN-B-F	SLC-GW-CN-D	SLC-GW-CN-D-F
LAB ID		FOH100153012	FOH100291008	FOH100291017	FOH100153004	FOH100153010
DATE COLLECTED		8/7/2000	8/8/2000	8/8/2000	8/7/2000	8/7/2000
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS		ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS						
Aluminum-Dissolved	NA	200 U		200 U		200 U
Aluminum	NA		200 U		54000	
Antimony-Dissolved	6	60 U		60 U		60 U
Antimony	6		60 U		60 U	
Arsenic-Dissolved	50	10 U		10 U		1.6 B
Arsenic	50		10 U		24.8	
Barium-Dissolved	2000	54.2 B		40 B		55.2 B
Barium	2000		44.2 B		458	
Beryllium-Dissolved	4	5 U		5 U		5 U
Beryllium	4		5 U		2.4 B	
Cadmium-Dissolved	5	5000 U		5000 U		5000 U
Cadmium	5		5000 U		5000 U	
Calcium-Dissolved	NA	26500		33200		31900
Calcium	NA		32600		34200	
Chromium-Dissolved	100	10 U		10 U		10 U
Chromium	100		10 U		60.5	
Cobalt-Dissolved	NA	4.8 B		50 U		50 U
Cobalt	NA		50 U		37.7 B	
Copper-Dissolved	1000	25 U		25 U		25 U
Copper	1000		25 U		72.9	
Iron-Dissolved	NA	100 U		100 U		100 U
Iron	NA		176		75300	
Lead-Dissolved	5	3 U		3 U		3 U
Lead	5		3 U		44.9	
Magnesium-Dissolved	NA	6170		7430		7100
Magnesium	NA		7140		16800	
Manganese-Dissolved	NA	4400		15 U		215
Manganese	NA		83.7		2180	
Mercury-Dissolved	2	0.2 U		0.2 U		0.2 U
Mercury	2		0.2 U		0.2 U	
Nickel-Dissolved	100	40 U		40 U		19.8 B
Nickel	100		40 U		73.3	
Potassium-Dissolved	NA	3810 B		3190 B		2630 B
Potassium	NA		3710 B		11700	
Selenium-Dissolved	50	5 U		5 U		5 U
Selenium	50		5 U		5 U	
Silver-Dissolved	100	10 U		10 U		10 U
Silver	100		10 U		10 U	
Sodium-Dissolved	NA	9550		11800		11000
Sodium	NA		11700		10700	
Thallium-Dissolved	2	10 U		10 U		10 U
Thallium	2		10 U		8.8 B	
Vanadium-Dissolved	2.1	50 U		50 U		50 U
Vanadium	2.1		50 U		61.1	
Zinc-Dissolved	2000	7.8 B		20 U		10 B
Zinc	2000		4.6 B		238	
Cyanide-Dissolved	200	5 U		5 U		5 U
Cyanide	200		5 U		5 U	

MSCs-Medium Specific Concentrations for Inorganic Regulated Substances in Groundwater, Used Aquifer, Metals-GW
TDS <2500, Residential Criteria

SLC data.xls
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TABLE 3
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	PADEP MSCs ¹	SLC-GW-CN-F	SLC-GW-CN-F-F	SLC-GW-CN-G	SLC-GW-CN-G-F	SLC-GW-CN-H
LAB ID		FOH100291034	FOH100291035	FOH100153002	FOH100153008	FOH100291010
DATE COLLECTED		8/9/2000	8/9/2000	8/7/2000	8/7/2000	8/8/2000
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS		ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS						
Aluminum-Dissolved	NA		200 U		200 U	
Aluminum	NA	200 U		3650		13600
Antimony-Dissolved	6		60 U		60 U	
Antimony	6	60 U		60 U		60 U
Arsenic-Dissolved	50		10 U		10 U	
Arsenic	50	10 U		6.7 B		13.6
Barium-Dissolved	2000		43.6 B		79.3 B	
Barium	2000	44.9 B		117 B		237
Beryllium-Dissolved	4		5 U		5 U	
Beryllium	4	5 U		5 U		0.72 B
Cadmium-Dissolved	5		5000 U		3.9 B	
Cadmium	5	5000 U		5000 U		5000 U
Calcium-Dissolved	NA		30400		30400	
Calcium	NA	29100		28200		38600
Chromium-Dissolved	100		10 U		17.8	
Chromium	100	10 U		184		18
Cobalt-Dissolved	NA		50 U		50 U	
Cobalt	NA	50 U		6.6 B		18.8 B
Copper-Dissolved	1000		25 U		25 U	
Copper	1000	25 U		62.2		54.7
Iron-Dissolved	NA		100 U		89.3 B	
Iron	NA	149 N		7460		22100
Lead-Dissolved	5		3 U		3 U	
Lead	5	3 U		3.8		26.6
Magnesium-Dissolved	NA		7220		6870	
Magnesium	NA	6850		6600		7640
Manganese-Dissolved	NA		15 U		501	
Manganese	NA	26.1		2320		2580
Mercury-Dissolved	2		0.2 U		0.2 U	
Mercury	2	0.2 U		0.2 U		0.2 U
Nickel-Dissolved	100		40 U		40 U	
Nickel	100	19.7 B		40 U		29.4 B
Potassium-Dissolved	NA		3690 B		2240 B	
Potassium	NA	5000 U		3000 B		8730
Selenium-Dissolved	50		5 U		5 U	
Selenium	50	5 U		5 U		5 U
Silver-Dissolved	100		10 U		10 U	
Silver	100	10 U		10 U		10 U
Sodium-Dissolved	NA		11500 E		9040	
Sodium	NA	10700		9740		11100
Thallium-Dissolved	2		10 U		10 U	
Thallium	2	10 U		10 U		10 U
Vanadium-Dissolved	2.1		50 U		50 U	
Vanadium	2.1	50 U		50 U		8.9 B
Zinc-Dissolved	2000		20 U		11.3 B	
Zinc	2000	6.2 BE		29.5		73.8
Cyanide-Dissolved	200		5 U		5 U	
Cyanide	200	5 U		5 U		5 U

MSCs-Medium Specific Concentrations for Inorganic Regulated Substances in Groundwater, Used Aquifer, Metals-GW
TDS <2500, Residential Criteria

TABLE 3
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID		SLC-GW-CN-H-F	SLC-GW-CN-I	SLC-GW-CN-I-F	SLC-GW-MS-01	SLC-GW-MS-01-F
LAB ID		FOH100291015	FOH100291009	FOH100291016	FOH100291032	FOH100291037
DATE COLLECTED		8/8/2000	8/8/2000	8/8/2000	8/9/2000	8/9/2000
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS	PADEP MSCs ¹	ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS						
Aluminum-Dissolved	NA	200 U		200 U		200 U
Aluminum	NA		65900		9530 N	
Antimony-Dissolved	6	60 U		60 U		60 U
Antimony	6		60 U		60 U	
Arsenic-Dissolved	50	10 U		10 U		11.7
Arsenic	50		42.3		17.2	
Barium-Dissolved	2000	35.9 B		38.3 B		159 B
Barium	2000		986		239	
Beryllium-Dissolved	4	5 U		5 U		5 U
Beryllium	4		5.4		5 U	
Cadmium-Dissolved	5	3.4 B		4.4 B		5000 U
Cadmium	5		5000 U		5000 U	
Calcium-Dissolved	NA	33100		26600		36400
Calcium	NA		68100		37400	
Chromium-Dissolved	100	10 U		10 U		10 U
Chromium	100		73.9		13	
Cobalt-Dissolved	NA	50 U		50 U		50 U
Cobalt	NA		140		8.3 B	
Copper-Dissolved	1000	25 U		25 U		25 U
Copper	1000		252		38.9	
Iron-Dissolved	NA	100 U		100 U		21900 N
Iron	NA		95100		36600 N	
Lead-Dissolved	5	3 U		3 U		3 U
Lead	5		88.6		41.8	
Magnesium-Dissolved	NA	5560		6130		5990
Magnesium	NA		20900		7900	
Manganese-Dissolved	NA	4.4 B		2.9 B		8410 N
Manganese	NA		3420		8460	
Mercury-Dissolved	2	0.2 U		0.2 U		0.2 U
Mercury	2		0.18 B		0.2 U	
Nickel-Dissolved	100	40 U		40 U		40 U
Nickel	100		559		25.9 B	
Potassium-Dissolved	NA	5550		3210 B		6180
Potassium	NA		14000		8520	
Selenium-Dissolved	50	5 U		5 U		5 U
Selenium	50		3.5 B		5 U	
Silver-Dissolved	100	10 U		10 U		10 U
Silver	100		10 U		10 U	
Sodium-Dissolved	NA	11600		11500		9660 E
Sodium	NA		11600		9880	
Thallium-Dissolved	2	10 U		10 U		4.5 B
Thallium	2		8.8 B		10 U	
Vanadium-Dissolved	2.1	50 U		50 U		50 U
Vanadium	2.1		82.8		7.5 B	
Zinc-Dissolved	2000	5.8 B		5.9 B		5.6 B
Zinc	2000		305		65.4 E	
Cyanide-Dissolved	200	5 U		5 U		5 U
Cyanide	200		5 U		5 U	

MSCs-Medium Specific Concentrations for Inorganic Regulated Substances in Groundwater, Used Aquifer, Metals-GW
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TABLE 3
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID		SLC-GW-MS-02	SLC-GW-MS-02-F	SLC-GW-MS-03	SLC-GW-MS-03-F	SLC-GW-MS-04
LAB ID		F0H100291007	F0H100291018	F0H100291020	F0H100291029	F0H100291019
DATE COLLECTED		8/7/2000	8/7/2000	8/8/2000	8/8/2000	8/8/00
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS		ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS	PADEP MSCs ¹					
Aluminum-Dissolved	NA		200 U		200 U	
Aluminum	NA	2970		1010 N		18400
Antimony-Dissolved	6		60 U		60 U	
Antimony	6	60 U		60 U		60 U
Arsenic-Dissolved	50		10 U		10 U	
Arsenic	50	3.5 B		3.9 B		26.2
Barium-Dissolved	2000		70.8 B		75 B	
Barium	2000	96.6 B		96.1 B		331
Beryllium-Dissolved	4		5 U		5 U	
Beryllium	4	5 U		5 U		0.67 B
Cadmium-Dissolved	5		5000 U		2.9 B	
Cadmium	5	5000 U		5000 U		5000 U
Calcium-Dissolved	NA		28000		49900	
Calcium	NA	27200		46900		36400
Chromium-Dissolved	100		10 U		10 U	
Chromium	100	10 U		13.5		22.1
Cobalt-Dissolved	NA		50 U		6.7 B	
Cobalt	NA	50 U		50 U		13.9 B
Copper-Dissolved	1000		25 U		25 U	
Copper	1000	8 B		14 B		49.5
Iron-Dissolved	NA		61.5 B		4020	
Iron	NA	4250		10900 N		48900
Lead-Dissolved	5		3 U		3 U	
Lead	5	3.8		3.3		20.1
Magnesium-Dissolved	NA		6270		7130	
Magnesium	NA	6390		6780		8620
Manganese-Dissolved	NA		623		4730	
Manganese	NA	531		4430		6190
Mercury-Dissolved	2		0.2 U		0.2 U	
Mercury	2	0.2 U		0.2 U		0.2 U
Nickel-Dissolved	100		40 U		40 U	
Nickel	100	40 U		13.6 B		31.3 B
Potassium-Dissolved	NA		3910 B		6770	
Potassium	NA	4430 B		5770		9470
Selenium-Dissolved	50		5 U		5 U	
Selenium	50	5 U		5 U		5 U
Silver-Dissolved	100		10 U		10 U	
Silver	100	10 U		10 U		8.5 B
Sodium-Dissolved	NA		10600		14600	
Sodium	NA	11000		14000		9330
Thallium-Dissolved	2		10 U		10 U	
Thallium	2	10 U		10 U		4.8 B
Vanadium-Dissolved	2.1		50 U		50 U	
Vanadium	2.1	50 U		50 U		13.7 B
Zinc-Dissolved	2000		14.5 B		7.5 B	
Zinc	2000	22.7		26.5 E		118
Cyanide-Dissolved	200		5 U		5 U	
Cyanide	200	5.6 U		5 U		5 U

MSCs-Medium Specific Concentrations for Inorganic Regulated Substances in Groundwater, Used Aquifer, Metals-GW
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TABLE 3
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID		SLC-GW-MS-04-F	SLC-GW-MS-05	SLC-GW-MS-05-F	SLC-GW-MS-06	SLC-GW-MS-06-F
LAB ID		FOH100291030	FOH100153003	FOH100153009	FOH100291022	FOH100291027
DATE COLLECTED		8/8/2000	8/7/2000	8/7/2000	8/8/2000	8/8/2000
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS	PADEP MSCs ¹	ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS						
Aluminum-Dissolved	NA	200 U		200 U		200 U
Aluminum	NA		334000		65200 N	
Antimony-Dissolved	6	60 U		60 U		60 U
Antimony	6		7.8 B		60 U	
Arsenic-Dissolved	50	16.5		15.1		1.6 B
Arsenic	50		211		46.9	
Barium-Dissolved	2000	174 B		103 B		63.1 B
Barium	2000		2470		654	
Beryllium-Dissolved	4	5 U		5 U		5 U
Beryllium	4		16.2 B		4.8 B	
Cadmium-Dissolved	5	5000 U		5000 U		5000 U
Cadmium	5		14.3 B		5000 U	
Calcium-Dissolved	NA	37100		40300		26200
Calcium	NA		77400		37400	
Chromium-Dissolved	100	10 U		10 U		10 U
Chromium	100		589		73.8	
Cobalt-Dissolved	NA	50 U		50 U		50 U
Cobalt	NA		209 B		98	
Copper-Dissolved	1000	25 U		25 U		25 U
Copper	1000		614		181	
Iron-Dissolved	NA	19500		6450		100 U
Iron	NA		566000		118000 N	
Lead-Dissolved	5	3 U		3 U		3 U
Lead	5		689		111	
Magnesium-Dissolved	NA	5280		8420		5700
Magnesium	NA		82800		21000	
Manganese-Dissolved	NA	6010		7300		9.7 BN
Manganese	NA		18300		2550	
Mercury-Dissolved	2	0.2 U		0.2 U		0.2 U
Mercury	2		0.66		0.2 U	
Nickel-Dissolved	100	40 U		40 U		40 U
Nickel	100		494		129	
Potassium-Dissolved	NA	7580		3930 B		3440 B
Potassium	NA		43000		12400	
Selenium-Dissolved	50	5 U		5 U		5 U
Selenium	50		5 U		5 U	
Silver-Dissolved	100	10 U		10 U		10 U
Silver	100		189		10 U	
Sodium-Dissolved	NA	9420		12000		11300 E
Sodium	NA		16800		11800	
Thallium-Dissolved	2	10 U		10 U		10 U
Thallium	2		43.6		10.5	
Vanadium-Dissolved	2.1	50 U		50 U		50 U
Vanadium	2.1		410		99.3	
Zinc-Dissolved	2000	11.4 B		7.3 B		4.8 B
Zinc	2000		2060		311 E	
Cyanide-Dissolved	200	5 U		5 U		5 U
Cyanide	200		5 U		5 U	

MSCs-Medium Specific Concentrations for Inorganic Regulated Substances in Groundwater, Used Aquifer, Metals-GW
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TABLE 3
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID		SLC-GW-MS-07	SLC-GW-MS-07-F	SLC-GW-MS-08	SLC-GW-MS-08-F	SLC-GW-MS-09
LAB ID		F0H160319001	F0H160319004	F0H100291023	F0H100291026	F0H100291011
DATE COLLECTED		8/9/2000	8/9/2000			8/8/2000
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS	PADEP MSCs ¹	ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS						
Aluminum-Dissolved	NA		200 U		200 U	
Aluminum	NA	36100 N*		10900 N		361
Antimony-Dissolved	6		3.5 B		60 U	
Antimony	6	60 U		60 U		60 U
Arsenic-Dissolved	50		3.5 B		7.7 B	
Arsenic	50	26.7		234		3.1 B
Barium-Dissolved	2000		201		136 B	
Barium	2000	536		610		179 B
Beryllium-Dissolved	4		5 U		5 U	
Beryllium	4	2.6 B		0.96 B		5 U
Cadmium-Dissolved	5		5 U		5000 U	
Cadmium	5	0.79 B		5000 U		5000 U
Calcium-Dissolved	NA		45800		39300	
Calcium	NA	48900 N		44100		48800
Chromium-Dissolved	100		10 U		42	
Chromium	100	40.7		18.9		10 U
Cobalt-Dissolved	NA		50 U		50 U	
Cobalt	NA	25.8 B		50 U		50 U
Copper-Dissolved	1000		25 U		25 U	
Copper	1000	94.7		34.5		25 U
Iron-Dissolved	NA		11000		18000 N	
Iron	NA	71000 N		249000		30200
Lead-Dissolved	5		3 U		3 U	
Lead	5	54.8		26.6		3 U
Magnesium-Dissolved	NA		5050		5670	
Magnesium	NA	11700		8030		7170
Manganese-Dissolved	NA		7550		10100 N	
Manganese	NA	8960 N		13200		7900
Mercury-Dissolved	2		0.2 U		0.2 U	
Mercury	2	0.2 U		0.2 U		0.2 U
Nickel-Dissolved	100		4.4 B		40 U	
Nickel	100	55.7		26.3 B		40 U
Potassium-Dissolved	NA		4700 B		6460	
Potassium	NA	11700 *		8660		5740
Selenium-Dissolved	50		5 U		5 U	
Selenium	50	5 UN		5 U		5 U
Silver-Dissolved	100		10 U		10 U	
Silver	100	10 U		14.7		10 U
Sodium-Dissolved	NA		15600		9490 E	
Sodium	NA	15900		9680		12900
Thallium-Dissolved	2		5.5 B		5.4 B	
Thallium	2	7.7 B		27.4		5.8 B
Vanadium-Dissolved	2.1		50 U		50 U	
Vanadium	2.1	63		28.4 B		50 U
Zinc-Dissolved	2000		20 U		9.7 B	
Zinc	2000	192 N		100 E		56.5
Cyanide-Dissolved	200		5 U		5 U	
Cyanide	200	5 U		5 U		5 U

MSCs-Medium Specific Concentrations for Inorganic Regulated Substances in Groundwater, Used Aquifer, Metals-GW
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TABLE 3
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID		SLC-GW-MS-09-F	SLC-GD-MS-09	SLC-GD-MS-09-F	SLC-GW-MS-10	SLC-GW-MS-10-F
LAB ID		FOH100291014	FOH100291012	FOH100291013	FOH100291031	FOH100291038
DATE COLLECTED		8/8/2000	8/8/2000	8/8/2000	8/9/2000	8/9/2000
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS	PADEP MSCs ¹	ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS						
Aluminum-Dissolved	NA	200 U		200 U		200 U
Aluminum	NA		218		84900 N	
Antimony-Dissolved	6	60 U		60 U		60 U
Antimony	6		60 U		60 U	
Arsenic-Dissolved	50	2.3 B		2.5 B		3.9 B
Arsenic	50		1.8 B		55	
Barium-Dissolved	2000	176 B		175 B		136 B
Barium	2000		178 B		902	
Beryllium-Dissolved	4	5 U		5 U		5 U
Beryllium	4		5 U		5.7	
Cadmium-Dissolved	5	4.4 B		3.1 B		5000 U
Cadmium	5		5000 U		5000 U	
Calcium-Dissolved	NA	52200		51600		45200
Calcium	NA		48700		58400	
Chromium-Dissolved	100	10 U		10 U		10 U
Chromium	100		10 U		181	
Cobalt-Dissolved	NA	50 U		50 U		50 U
Cobalt	NA		50 U		78.9	
Copper-Dissolved	1000	25 U		25 U		25 U
Copper	1000		25 U		243	
Iron-Dissolved	NA	30700		30800		15000 N
Iron	NA		30000		191000 N	
Lead-Dissolved	5	3 U		3 U		3 U
Lead	5		3 U		182	
Magnesium-Dissolved	NA	7830		7750		8700
Magnesium	NA		7120		26200	
Manganese-Dissolved	NA	8310		8170		4200 N
Manganese	NA		7870		8440	
Mercury-Dissolved	2	0.2 U		0.2 U		0.2 U
Mercury	2		0.2 U		0.14 B	
Nickel-Dissolved	100	40 U		18.3 B		40 U
Nickel	100		40 U		304	
Potassium-Dissolved	NA	8120		7160		6470
Potassium	NA		6480		23500	
Selenium-Dissolved	50	5 U		5 U		5 U
Selenium	50		5 U		3.5 B	
Silver-Dissolved	100	10 U		10 U		10 U
Silver	100		10 U		10 U	
Sodium-Dissolved	NA	13900		13600		11800 E
Sodium	NA		12800		12600	
Thallium-Dissolved	2	5.7 B		5.7 B		4.5 B
Thallium	2		4.2 B		21.2	
Vanadium-Dissolved	2.1	50 U		50 U		50 U
Vanadium	2.1		50 U		137	
Zinc-Dissolved	2000	7.9 B		14.6 B		4.9 B
Zinc	2000		73		530 E	
Cyanide-Dissolved	200	5 U		5 U		5 U
Cyanide	200		5 U		5 U	

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TABLE 3
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID		SLC-GW-MS-11	SLC-GW-MS-11-F	SLC-GW-MS-12	SLC-GW-MS-12-F	SLC-GW-MS-13
LAB ID		F0H100291024	F0H100291025	F0H100291021	F0H100291028	F0H100291033
DATE COLLECTED		8/8/2000	8/8/2000	8/8/2000	8/8/2000	8/9/2000
MATRIX		WATER	WATER	WATER	WATER	WATER
UNITS	PADEP MSCs ¹	ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS						
Aluminum-Dissolved	NA		200 U		200 U	
Aluminum	NA	4700 N		60300 N		33500 N
Antimony-Dissolved	6		60 U		60 U	
Antimony	6	60 U		60 U		60 U
Arsenic-Dissolved	50		3.7 B		10 U	
Arsenic	50	9 B		37.6		30.4
Barium-Dissolved	2000		95.6 B		69 B	
Barium	2000	134 B		529		405
Beryllium-Dissolved	4		5 U		5 U	
Beryllium	4	5 U		3.9 B		1.2 B
Cadmium-Dissolved	5		5000 U		5000 U	
Cadmium	5	4.1 B		3.7 B		78.7 B
Calcium-Dissolved	NA		38400		33200	
Calcium	NA	38100		38100		32600
Chromium-Dissolved	100		10 U		10 U	
Chromium	100	14.2		157		2980
Cobalt-Dissolved	NA		50 U		50 U	
Cobalt	NA	9.8 B		66.9		20.2 B
Copper-Dissolved	1000		25 U		25 U	
Copper	1000	32.5		136		14500
Iron-Dissolved	NA		5300		1330	
Iron	NA	22300 N		170000 N		184000 N
Lead-Dissolved	5		3 U		3 U	
Lead	5	14.2		132		326
Magnesium-Dissolved	NA		7150		6830	
Magnesium	NA	7680		20500		12200
Manganese-Dissolved	NA		4300		137	
Manganese	NA	4430		1910		7880
Mercury-Dissolved	2		0.2 U		0.2 U	
Mercury	2	0.2 U		0.19 B		0.17 B
Nickel-Dissolved	100		18.9 B		15.3 B	
Nickel	100	24 B		203		373
Potassium-Dissolved	NA		3910 B		2740 B	
Potassium	NA	4980 B		13000		8760
Selenium-Dissolved	50		5 U		5 U	
Selenium	50	5 U		5 U		4.4 B
Silver-Dissolved	100		10 U		10 U	
Silver	100	10 U		10 U		77.4
Sodium-Dissolved	NA		10900		11200	
Sodium	NA	10800		11600		11700
Thallium-Dissolved	2		10 U		10 U	
Thallium	2	10 U		14.4		21.1
Vanadium-Dissolved	2.1		50 U		50 U	
Vanadium	2.1	50 U		91.8		60.3
Zinc-Dissolved	2000		8.5 B		6 B	
Zinc	2000	108 E		479 E		21100 E
Cyanide-Dissolved	200		5 U		5 U	
Cyanide	200	5 U		5 U		5 U

MSCs-Medium Specific Concentrations for Inorganic Regulated Substances in Groundwater, Used Aquifer, Metals-GW
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TABLE 3
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	PADEP MSCs ¹	SLC-GW-MS-13-F	SLC-GW-SL-15	SLC-GW-SL-15-F
LAB ID		F0H100291036	F0H160319002	F0H160319003
DATE COLLECTED		8/9/2000	8/9/2000	8/9/2000
MATRIX		WATER	WATER	WATER
UNITS		ug/l	ug/l	ug/l
COMMENTS				
Aluminum-Dissolved	NA	200 U		200 U
Aluminum	NA		324 N*	
Antimony-Dissolved	6	60 U		2.6 B
Antimony	6		60 U	
Arsenic-Dissolved	50	3.9 B		10 U
Arsenic	50		10 U	
Barium-Dissolved	2000	121 B		65.3 B
Barium	2000		158 B	
Beryllium-Dissolved	4	5 U		5 U
Beryllium	4		5 U	
Cadmium-Dissolved	5	5000 U		5 U
Cadmium	5		0.95 B	
Calcium-Dissolved	NA	29500		30700
Calcium	NA		29800 N	
Chromium-Dissolved	100	10 U		10 U
Chromium	100		1.3 B	
Cobalt-Dissolved	NA	50 U		50 U
Cobalt	NA		50 U	
Copper-Dissolved	1000	25 U		25 U
Copper	1000		18.8 B	
Iron-Dissolved	NA	19900 N		173
Iron	NA		92800 N	
Lead-Dissolved	5	3 U		3 U
Lead	5		3 U	
Magnesium-Dissolved	NA	5420		8000
Magnesium	NA		7660	
Manganese-Dissolved	NA	5460 N		236
Manganese	NA		1070 N	
Mercury-Dissolved	2	0.2 U		0.2 U
Mercury	2		0.2 U	
Nickel-Dissolved	100	40 U		40 U
Nickel	100		40 U	
Potassium-Dissolved	NA	2210 B		5000 U
Potassium	NA		5000 U	
Selenium-Dissolved	50	5 U		5 U
Selenium	50		5 U	
Silver-Dissolved	100	10 U		10 U
Silver	100		10 U	
Sodium-Dissolved	NA	11000 E		13400
Sodium	NA		12900	
Thallium-Dissolved	2	5.5 B		4.7 B
Thallium	2		9.9 B	
Vanadium-Dissolved	2.1	50 U		50 U
Vanadium	2.1		50 U	
Zinc-Dissolved	2000	371		6.7 B
Zinc	2000		18.9 BN	
Cyanide-Dissolved	200	5 U		5 U
Cyanide	200		5 U	

TABLE 4
SAFETY LIGHT CORPORATION SITE, PADEP
RADIOLOGICAL ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	SLC-RB-01	SLC-RB-02	SLC-GW-CN-A	SLC-GW-CN-B	SLC-GW-CN-D	
LAB ID	F0H100153001	F0H100153019	F0H100153006	F0H100291008	F0H100153004	
DATE COLLECTED	8/7/2000	8/8/2000	8/7/2000	8/7/2000	8/7/2000	
MATRIX	WATER	WATER	WATER	WATER	WATER	
COMMENTS	Rinse Blank	Rinse Blank	Monitoring Well	Monitoring Well	Monitoring Well	
UNITS	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	
	uncert.	uncert.	uncert.	uncert.	uncert.	
GROSS ALPHA	15	0.33 U 0.39	-0.07 U 0.34	301 47	0.846 0.999	64 14
GROSS BETA	50	1 U 1.1	0.6 U 1	3820 380	3.31 1.14	200 25
TRITIUM	20,000	-110 U 110	60 U 120	1980 260	2060 267	5560 600
GAMMA SCAN						
Cesium 137	na	4.1 U 6.9	2.1 U 6	-2.6 U 7.2	-4.36 U 8.56	7.8 U 8.1
Cobalt 60	na	-1.4 U 6.1	1.3 U 8.2	-3.5 U 9.1	-7.07 U 9.3	1.3 U 7.2
Lead 214	na	U	U	79 18	32.5 22	78 20
OTHERS						
Radium 226	5 ³	0.0825 0.193	0.0101 0.159	-16.9 U 3.4	0.251 0.129	-53.6 U 8.71
Radium228	{ ² }	0.897 0.89	0.589 0.839	13.3 1.84	0.944 0.456	38.9 4.19
Carbon 14	na	0.517 2.9	1.11 2.8	4.78 2.9	-3.33 U 4.8	3.93 2.9
Strontium 90	8	0.32 0.83	0.39 0.98	21 4.44	1.8 0.517	68.9 13.7
Nickel 63	na	3.02 11	4.03 9.7	9.01 11	5.78 12	8.45 11
Americium 241	na	0.057 0.21	-0.089 U 0.06	-0.042 U 0.098	-0.0439 U 0.0769	0.1 0.37
Polonium 210	{ ⁴ }	0 0.12	-0.0091 U 0.013	4.27 1.1	-0.0057 U 0.011	2.5 0.77

Notes:

U- Result is less than the sample detection limit.

na-not applicable

BOLD result-indicates exceedance of standard

¹ Source: Federal Register Volume 65, No. 236, December 7, 2000

² Standard excludes uranium and radon, but reported result does includes all alpha emitters.

³ Results of radium 226 and radium 228 are summed for each sample and compared to the standard of 5 pCi/L total. When St 90 is present it usually causes elevated Ra 228 results which cause an over-correction to the Ra 226 result. This leads to inaccuracy of the result and generally causes a very negative activity result for Ra 226.

⁴ Included in gross alpha

TABLE 4
SAFETY LIGHT CORPORATION SITE, PADEP
RADIOLOGICAL ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	LAB ID	EPA	SLC-GW-CN-F		SLC-GW-CN-G		SLC-GW-CN-H		SLC-GW-CN-I		SLC-GW-MS-01	
DATE COLLECTED	DRINKING		FOH100291034		FOH100153002		FOH100291010		FOH100291009		FOH100291032	
MATRIX	WATER		8/9/2000		8/7/2000		8/7/2000		8/7/2000		8/9/2000	
COMMENTS	STANDARDS ²		WATER		WATER		WATER		WATER		WATER	
UNITS	pCi/L		Monitoring Well		Monitoring Well		Monitoring Well		Monitoring Well		Monitoring Well	
			pCi/L	uncert.	pCi/L	uncert.	pCi/L	uncert.	pCi/L	uncert.	pCi/L	uncert.
GROSS ALPHA	15		0.506	0.843	9.3	2.4	17.8	3.53	26.6	6.87	52.1	8.88
GROSS BETA	50		3.91	1.26	23	3	21.5	3.08	47.7	7.8	755	75.5
TRITIUM	20,000		1920	254	1280	200	2720	327	1820	245	4290	475
GAMMA SCAN												
Cesium 137	na		-7.12 U	9.33	-12.2 U	7.5	-7.31 U	8.26	-5.7 U	6.17	-7.15 U	8.09
Cobalt 60	na		-11.2 U	9.86	-7.7 U	7.7	-7.13 U	7.83	2.61	9.11	-2.07 U	8.73
Lead 214	na		10.8	16.2	U		57.3	23.1	0.242	16.5	5.06	14.1
OTHERS												
Radium 226	5 ³		0.212	0.134	-4.8 U	3.75	1.02	0.17	1.52	0.337	-279 U	47
Radium228	{ ⁴ }		0.422	0.475	3.41	0.937	0.867	0.478	0.872	0.641	181	18.1
Carbon 14	na		0.989	2.8	3.12	4.7	-0.53 U	2.9	-1.35 U	2.9	-1.05 U	2.7
Strontium 90	8		0.67	0.426	5.98	1.62	0.205	0.403	1.36	0.472	345	68
Nickel 63	na		12.3	11	4.97	11	9.81	12	4.92	13	7.32	12
Americium 241	na		-0.0151 U	0.145	0.18	0.33	-0.00753 U	0.0151	0.043	0.101	0.0623	0.102
Polonium 210	{ ⁴ }		0.144	0.21	1.93	0.69	3.92	1.1	4.05	1.3	0.407	0.28

Notes:

U- Result is less than the sample detection limit.

na-not applicable

BOLD result-indicates exceedance of standard

¹ Source: Federal Register Volume 65, No. 236, December 7, 2000

² Standard excludes uranium and radon, but reported result does includes all alpha emitters.

³ Results of radium 226 and radium 228 are summed for each sample and compared to the standard of 5 pCi/L total. When St 90 is present it usually causes elevated Ra 228 results which cause an over-correction to the Ra 226 result. This leads to inaccuracy of the result and generally causes a very negative activity result for Ra 226.

⁴ Included in gross alpha

TABLE 4
SAFETY LIGHT CORPORATION SITE, PADEP
RADIOLOGICAL ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	LAB ID	SLC-GW-MS-02	SLC-GW-MS-03	SLC-GW-MS-04	SLC-GW-MS-05	SLC-GW-MS-06
DATE COLLECTED	EPA	F0H100291007	F0H100291020	F0H100291019	F0H100153003	F0H100291022
MATRIX	DRINKING	8/7/2000	8/8/2000	8/8/2000	8/7/2000	8/8/2000
COMMENTS	WATER	WATER	WATER	WATER	WATER	WATER
STANDARDS ²	Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well
UNITS	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L
GROSS ALPHA	15	20 3.17	39.1 6.45	496 94.2	387 52	264 58.4
GROSS BETA	50	153 15.5	371 37.2	9650 965	866 90	2100 223
TRITIUM	20,000	9050 936	5790 619	3780 426	2860 340	4210 467
GAMMA SCAN						
Cesium 137	na	34.5 12.5	0.785 8.6	-0.0684 U 9.04	1830 200	21.6 15.7
Cobalt 60	na	-0.0173 U 9.4	1.36 6.17	1.38 8.06	0.9 U 7.1	-2.17 U 8.21
Lead 214	na	55.4 18.7	-15.1 U 15.5	62.1 18.6	197 37	16 17.1
OTHERS						
Radium 226	5 ³	-86.1 U 13.6	-37.8 U 5.52	-979 U 210	56 5.6	-61.8 U 8.33
Radium 228	{ ⁴ }	48.5 4.97	26.5 2.83	615 61.5	95.5 9.72	44.2 4.65
Carbon 14	na	0.604 2.8	0.14 2.9	2.6 3	2.77 2.9	-2.14 U 2.9
Strontium 90	8	87.6 17.3	44.5 8.81	6450 1270	159 31.4	140 27.6
Nickel 63	na	2.46 12	1.41 13	36.3 13	16.7 12	9.09 11
Americium 241	na	0.174 0.167	0.00696 0.107	0.207 0.192	1.46 0.56	0.144 0.167
Polonium 210	{ ⁴ }	4.73 1.4	0.208 0.21	38.1 9	110 19	10.2 3.1

Notes:

U- Result is less than the sample detection limit.

na-not applicable

BOLD result-indicates exceedance of standard

¹ Source: Federal Register Volume 65, No. 236, December 7, 2000

² Standard excludes uranium and radon, but reported result does includes all alpha emitters.

³ Results of radium 226 and radium 228 are summed for each sample and compared to the standard of 5 pCi/L total. When St 90 is present it usually causes elevated Ra 228 results which cause an over-correction to the Ra 226 result. This leads to inaccuracy of the result and generally causes a very negative activity result for Ra 226.

⁴ Included in gross alpha

TABLE 4
SAFETY LIGHT CORPORATION SITE, PADEP
RADIOLOGICAL ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	LAB ID	EPA	SLC-GW-MS-07	SLC-GW-MS-08	SLC-GW-MS-09	SLC-GD-MS-09	SLC-GW-MS-10
DATE COLLECTED	DRINKING		FOH160319001	FOH100291023	FOH100291011	FOH100291012	FOH100291031
MATRIX	WATER		8/9/2000	8/8/2000	8/7/2000	8/7/2000	8/9/2000
COMMENTS	STANDARDS ²		WATER	WATER	WATER	WATER	WATER
UNITS	pCi/L		Monitoring Well	Monitoring Well	Monitoring Well	Monitoring Well Duplicate	Monitoring Well
			pCi/L	pCi/L	pCi/L	pCi/L	pCi/L
			uncert.	uncert.	uncert.	uncert.	uncert.
GROSS ALPHA	15		25.7	89.3	413	1570	3580
GROSS BETA	50		106	1490	34200	34200	66500
TRITIUM	20,000		1600	5700	3830	3600	2940
			255	610	431	409	348
GAMMA SCAN							
Cesium 137	na		-8.08 U	-6.76 U	-10.9 U	9.22	3.11
Cobalt 60	na		-11.2 U	-5.18 U	1.84	8.05	9.65
Lead 214	na		-10.8 U	-4.55 U	7.24	9.2	-5.56 U
OTHERS			14.9	14	17.2	27.1	7.85
							57.5
							34.1
Radium 226	5 ³		-14.8 U	-360 U	-7330 U	-7580 U	-17900 U
Radium 228	(⁴)		9.58	237	3950	4710	114000
			1.31	23.7	395	471	1140
Carbon 14	na		2.33	-3.01 U	12.6	10.5	11.4
Strontium 90	8		35.5	696	10000	3.3	3.1
Nickel 63	na		11.8	137	1970	9410	29500
Americium 241	na		0.454	5.98	34	13	83
Polonium 210	(⁴)		0.347	0.3	0.209	-0.019 U	0.103
			0.69	0.24	0.335	0.149	0.147
				2.28	0.78	0.39	11.6
				0.82	0.4		2.5

Notes:

U- Result is less than the sample detection limit.

na-not applicable

BOLD result-indicates exceedance of standard

¹ Source: Federal Register Volume 65, No. 236, December 7, 2000

² Standard excludes uranium and radon, but reported result does includes all alpha emitters.

³ Results of radium 226 and radium 228 are summed for each sample and compared to the standard of 5 pCi/L total. When St 90 is present it usually causes elevated Ra 228 results which cause an over-correction to the Ra 226 result. This leads to inaccuracy of the result and generally causes a very negative activity result for Ra 226.

⁴ Included in gross alpha

TABLE 4
SAFETY LIGHT CORPORATION SITE, PADEP
RADIOLOGICAL ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	LAB ID	EPA	SLC-GW-MS-11	SLC-GW-MS-12	SLC-GW-MS-13	SLC-GW-SL-15
DATE COLLECTED	DRINKING		F0H100291024	F0H100291021	F0H100291033	F0H160319002
MATRIX	WATER		8/8/2000	8/8/2000	8/9/2000	8/9/2000
COMMENTS	STANDARDS ²		WATER	WATER	WATER	WATER
UNITS	pCi/L		Monitoring Well	Monitoring Well	Monitoring Well	Background Well
			pCi/L uncert.	pCi/L uncert.	pCi/L uncert.	pCi/L uncert.
GROSS ALPHA	15		144 25.7	27.4 6.48	70.2 12.4	3.14 1.58
GROSS BETA	50		2190 219	67.7 8.78	99.3 12.2	7.83 2.32
TRITIUM	20,000		1510 218	1830 245	2960 349	325 159
GAMMA SCAN						
Cesium 137	na		5.94 9.7	15.8 12.8	-0.995 U 7.78	-15.5 U 8.57
Cobalt 60	na		4.07 6.09	-7.82 U 8.34	0.0416 9.76	-8.16 U 9.48
Lead 214	na		37.9 21.9	5.6 16.3	62.8 30.7	-11.2 U 14.6
OTHERS						
Radium 226	5 ³		-676 U 88.5	-313 U 49.5	-0.167 U 0.0193	-12.1 U 2.05
Radium 228	(⁴)		439 43.9	204 20.4	7.12 0.958	8.33 1.37
Carbon 14	na		-1.72 U 2.9	-2.64 U 2.8	0.522 2.8	1.47 2.8
Strontium 90	8		1110 220	351 69.1	10.6 2.23	1.03 0.826
Nickel 63	na		4.23 12	1.89 11	4.37 10	6.59 10
Americium 241	na		0.107 0.109	-0.0125 U 0.0987	0.0374 0.0976	0.131 0.229
Polonium 210	(⁴)		6.01 1.5	7.16 2	22.5 4.3	1.07 0.48

Notes:

U- Result is less than the sample detection limit.

na-not applicable

BOLD result-indicates exceedance of standard

¹ Source: Federal Register Volume 65, No. 236, December 7, 2000

² Standard excludes uranium and radon, but reported result does includes all alpha emitters.

³ Results of radium 226 and radium 228 are summed for each sample and compared to the standard of 5 pCi/L total. When St 90 is present it usually causes elevated Ra 228 results which cause an over-correction to the Ra 226 result. This leads to inaccuracy of the result and generally causes a very negative activity result for Ra 226.

⁴ Included in gross alpha

TABLE 5
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS - SURFACE WATER

SAMPLE ID	PADEP	SLC-SW-01	SLC-SW-02	SLC-SW-03	SLC-SW-04
LAB ID	Water Quality	FOH100153021	FOH100153014	FOH100153016	FOH100153017
DATE COLLECTED	for	8/8/2000	8/8/2000	8/8/2000	8/8/2000
MATRIX	Toxic	WATER	WATER	WATER	WATER
UNITS	Substances ¹	ug/l	ug/l	ug/l	ug/l
COMMENTS	ug/L				
Aluminum	NA	119 B	327	318	211
Antimony	10	60 U	60 U	60 U	60 U
Arsenic	50	2.7 B	1.5 B	2.6 B	10 U
Barium	NA	36 B	40.1 B	39.8 B	36.9 B
Beryllium	NA	5 U	5 U	5 U	5 U
Cadmium	10	5000 U	5000 U	5000 U	5000 U
Calcium	NA	31500	33400	33000	32000
Chromium	15	10 U	10 U	10 U	10 U
Cobalt	NA	50 U	50 U	50 U	50 U
Copper	1000	10.3 B	25 U	25 U	25 U
Iron	NA	540	849	1280	634
Lead	50	3 U	3 U	3 U	3 U
Magnesium	NA	7750	8410	8040	7890
Manganese	NA	138	102	172	75.6
Mercury	0.144	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	600	40 U	40 U	40 U	40 U
Potassium	NA	1920 B	3790 B	3380 B	4270 B
Selenium	NA	5 U	5 U	5 U	5 U
Silver	200	10 U	10 U	10 U	10 U
Sodium	NA	16000	19200	18400	18200
Thallium	2	10 U	10 U	10 U	10 U
Vanadium	NA	50 U	50 U	50 U	50 U
Zinc	5000	20 U	19.7 B	14.3 B	9 B
Cyanide	700	5 U	5 U	5 U	5 U

TABLE 6
SAFETY LIGHT CORPORATION SITE, PADEP
RADIOLOGICAL ANALYTICAL RESULTS - SURFACE WATER

SAMPLE ID	SLC-SW-01		SLC-SW-02		SLC-SW-03		SLC-SW-04	
LAB ID	FOH100153021		FOH100153014		FOH100153016		FOH100153017	
DATE COLLECTED	8/8/2000		8/8/2000		8/8/2000		8/8/2000	
MATRIX	WATER		WATER		WATER		WATER	
COMMENTS	Surface Water		Surface Water		Surface Water		Surface Water	
UNITS	pCi/L	uncert.	pCi/L	uncert.	pCi/L	uncert.	pCi/L	uncert.
GROSS ALPHA	0.73 U	0.71	0.3 U	0.53	0.7 U	0.78	0.22 U	0.58
GROSS BETA	1.8 U	1.2	3.2 J	1.3	2.9 J	1.2	3.3 J	1.2
TRITIUM	390 J	160	260 J	130	350 J	130	310 J	130
GAMMA SCAN								
Cesium 137	-1.6 U	7.4	-3.1 U	7.7	-3.2 U	8.5	2.9 U	6.9
Cobalt 60	1.4 U	8.2	-4.1 U	6.1	-2.9 U	8.4	1.1 U	9
OTHERS								
Radium 226	0.0814	0.21	0.0726	0.172	-0.016 U	0.134	0.634	0.263
Radium 228	0.325	0.756	0.472	0.885	0.553	0.813	0.353	0.825
Carbon 14	3.08	2.9	2.18	2.8	0.442	2.8	2.4	2.8
Strontium 90	19.5	4.15	-0.23 U	1.02	NA	NA	0.742	1.06
Nickel 63	9.59	11	6.12	11	13.1	12	10.4	11
Americium 241	-0.081 U	0.06	0.073	0.18	-0.1 U	0.18	-0.0084 U	0.13
Polonium 210	-0.00752 U	-0.011	0.0444	0.0972	0.0417	0.091	0 U	0.14

Notes:

U- Result is less than the sample detection limit.

na-not applicable

NA-not available

TABLE 7
SAFETY LIGHT CORPORATION SITE, PADEP
VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS - RESIDENTIAL WELL WATER

LAB ID	PADEP Act 2 MSCs ug/l	SLC-RW-01	SLC-RW-02	SLC-RD-02
SAMPLE ID		F0H100291001	F0H100291002	F0H100291003
DATE COLLECTED		8/8/2000	8/9/2000	8/9/2000
MATRIX		WATER	WATER	WATER
UNITS		ug/l	ug/l	ug/l
COMMENTS				
1,1,1-Trichloroethane	200	0.64 J	1 U	1 U
1,1,2,2-Tetrachloroethane	na	1 U	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	1 U
1,1-Dichloroethane	27	0.23 J	1 U	1 U
1,1-Dichloroethene	7	1 U	1 U	1 U
1,2-Dichloroethane	5	1 U	1 U	1 U
1,2-Dichloroethene (total)	70	1 U	1 U	1 U
1,2-Dichloropropane	5	1 U	1 U	1 U
2-Butanone	2800	5 U	5 U	5 U
2-Hexanone	na	5 U	5 U	5 U
4-Methyl-2-pentanone	na	5 U	5 U	5 U
Acetone	3700	10 U	10 U	10 U
Benzene	5	1 U	1 U	1 U
Bromodichloromethane	100	1 U	1 U	1 U
Bromoform	100	1 U	1 U	1 U
Bromomethane	10	2 U	2 U	2 U
Carbon disulfide	1900	1 U	1 U	1 U
Carbon tetrachloride	5	1 U	1 U	1 U
Chlorobenzene	55	1 U	1 U	1 U
Chloroethane	28000	2 U	2 U	2 U
Chloroform	100	1 U	1 U	1 U
Chloromethane	na	2 U	2 U	2 U
cis-1,3-Dichloropropene	na	1 U	1 U	1 U
Dibromochloromethane	na	1 U	1 U	1 U
Ethylbenzene	700	1 U	1 U	1 U
Methylene chloride	5	1 U	1 U	1 U
Styrene	100	1 U	1 U	1 U
Tetrachloroethene	5	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U
trans-1,3-Dichloropropene	na	1 U	1 U	1 U
Trichloroethene	5	1 U	1 U	1 U
Vinyl chloride	2	2 U	2 U	2 U
Xylenes (total)	10000	1 U	1 U	1 U

TABLE 8
SAFETY LIGHT CORPORATION SITE, PADEP
SEMI-VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS - RESIDENTIAL WELL WATER

LAB ID		SLC-RW-01	SLC-RW-02	SLC-RD-02
SAMPLE ID	PADEP Act 2	FOH100291001	FOH100291002	FOH100291003
DATE COLLECTED	MSCs	8/8/2000	8/9/2000	8/9/2000
MATRIX		WATER	WATER	WATER
UNITS	ug/l	ug/l	ug/l	ug/l
COMMENTS				
1,2,4-Trichlorobenzene	70	10 U	10 U	10 U
1,2-Dichlorobenzene	600	10 U	10 U	10 U
1,3-Dichlorobenzene	600	10 U	10 U	10 U
1,4-Dichlorobenzene	75	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	na	10 U	10 U	10 U
2,4,5-Trichlorophenol	3700	10 U	10 U	10 U
2,4,6-Trichlorophenol	60	10 U	10 U	10 U
2,4-Dichlorophenol	20	10 U	10 U	10 U
2,4-Dimethylphenol	730	10 U	10 U	10 U
2,4-Dinitrophenol	19	50 U	50 U	50 U
2,4-Dinitrotoluene	2.1	10 U	10 U	10 U
2,6-Dinitrotoluene	37	10 U	10 U	10 U
2-Chloronaphthalene	2900	10 U	10 U	10 U
2-Chlorophenol	40	10 U	10 U	10 U
2-Methylnaphthalene	1500	10 U	10 U	10 U
2-Methylphenol	na	10 U	10 U	10 U
2-Nitroaniline	2.1	50 U	50 U	50 U
2-Nitrophenol	2300	10 U	10 U	10 U
3,3'-Dichlorobenzidine	1.5	50 U	50 U	50 U
3-Nitroaniline	2.1	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	na	50 U	50 U	50 U
4-Bromophenyl phenyl ether	na	10 U	10 U	10 U
4-Chloro-3-methylphenol	na	10 U	10 U	10 U
4-Chloroaniline	150	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	na	10 U	10 U	10 U
4-Methylphenol	na	10 U	10 U	10 U
4-Nitroaniline	2.1	50 U	50 U	50 U
4-Nitrophenol	60	50 U	50 U	50 U
Acenaphthene	2200	10 U	10 U	10 U
Acenaphthylene	2200	10 U	10 U	10 U
Anthracene	43	10 U	10 U	10 U
Benzo(a)anthracene	0.9	10 U	10 U	10 U
Benzo(a)pyrene	0.2	10 U	10 U	10 U
Benzo(b)fluoranthene	0.9	10 U	10 U	10 U
Benzo(ghi)perylene	0.26	10 U	10 U	10 U
Benzo(k)fluoranthene	0.55	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	na	10 U	10 U	10 U
bis(2-Chloroethyl) ether	0.13	10 U	10 U	10 U
bis(2-Ethylhexyl) phthalate	6	4.7 J	3.9 J	10 U
Butyl benzyl phthalate	2700	10 U	10 U	10 U
Carbazole	700	10 U	10 U	10 U
Chrysene	1.8	10 U	10 U	10 U
Di-n-butyl phthalate	3700	10 U	10 U	10 U
Di-n-octyl phthalate	730	10 U	10 U	10 U
Dibenzo(a,h)anthracene	0.09	10 U	10 U	10 U
Dibenzofuran	na	10 U	10 U	10 U
Diethyl phthalate	5000	1.7 J	2.6 J	10 U
Dimethyl phthalate	na	10 U	10 U	10 U
Fluoranthene	270	10 U	10 U	10 U
Fluorene	190	10 U	10 U	10 U
Hexachlorobenzene	1	10 U	10 U	10 U
Hexachlorobutadiene	1	10 U	10 U	10 U
Hexachlorocyclopentadiene	50	50 U	50 U	50 U
Hexachloroethane	1	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.9	10 U	10 U	10 U
Isophorone	100	10 U	10 U	10 U
N-Nitrosodi-n-propylamine	0.094	10 U	10 U	10 U
N-Nitrosodiphenylamine	130	10 U	10 U	10 U
Naphthalene	20	10 U	10 U	10 U
Nitrobenzene	18	10 U	10 U	10 U
Pentachlorophenol	1	50 U	50 U	50 U
Phenanthrene	1200	10 U	10 U	10 U
Phenol	4000	10 U	10 U	10 U
Pyrene	13	10 U	10 U	10 U

MSCs-Medium Specific Concentrations for Organic Regulated Substances in Groundwater, Used Aquifer,
TDS <2500, Residential Criteria

TABLE 9
SAFETY LIGHT CORPORATION SITE, PADEP
TAL INORGANICS ANALYTICAL RESULTS
- RESIDENTIAL WELL WATER

SAMPLE ID		SLC-RW-01	SLC-RW-01-F	SLC-RW-02	SLC-RW-02-F	SLC-RD-02	SLC-RD-02-F
LAB ID		FOH100291001	FOH100291006	FOH100291002	FOH100291005	FOH100291003	FOH100291004
DATE COLLECTED		8/8/2000	8/8/2000	8/9/2000	8/9/2000	8/9/2000	8/9/2000
MATRIX		WATER	WATER	WATER	WATER	WATER	WATER
UNITS		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
COMMENTS	PADEP MSCs ¹						
Aluminum-Dissolved	NA		200 U		200 U		200 U
Aluminum	NA	200 U		200 U		200 U	
Antimony-Dissolved	6		60 U		60 U		60 U
Antimony	6	60 U		60 U		60 U	
Arsenic-Dissolved	50		10 U		10 U		10 U
Arsenic	50	10 U		10 U		10 U	
Barium-Dissolved	2000		43.8 B		39.4 B		39.1 B
Barium	2000	43.6 B		38.4 B		39.5 B	
Beryllium-Dissolved	4		5 U		5 U		5 U
Beryllium	4	5 U		5 U		5 U	
Cadmium-Dissolved	5		5000 U		4.4 B		4.2 B
Cadmium	5	5000 U		5000 U		5000 U	
Calcium-Dissolved	NA		33200		37300		37200
Calcium	NA	31700		36400		37300	
Chromium-Dissolved	100		10 U		10 U		10 U
Chromium	100	10 U		10 U		10 U	
Cobalt-Dissolved	NA		50 U		50 U		50 U
Cobalt	NA	50 U		50 U		50 U	
Copper-Dissolved	1000		17.9 B		1530		1580
Copper	1000	20.1 B		1210		1220	
Iron-Dissolved	NA		100 U		666		767
Iron	NA	100 U		1380		1340	
Lead-Dissolved	5		3 U		3 U		3 U
Lead	5	3 U		5.5		5	
Magnesium-Dissolved	NA		7940		8370		8350
Magnesium	NA	7440		7880		8110	
Manganese-Dissolved	NA		15 U		27.7		28.4
Manganese	NA	15 U		28.8		29.8	
Mercury-Dissolved	2		0.2 U		0.2 U		0.2 U
Mercury	2	0.2 U		0.2 U		0.2 U	
Nickel-Dissolved	100		40 U		40 U		13.9 B
Nickel	100	40 U		40 U		40 U	
Potassium-Dissolved	NA		4220 B		2990 B		2320 B
Potassium	NA	2010 B		2840 B		3000 B	
Selenium-Dissolved	50		5 U		5 U		5 U
Selenium	50	5 U		5 U		5 U	
Silver-Dissolved	100		10 U		10 U		10 U
Silver	100	10 U		10 U		10 U	
Sodium-Dissolved	NA		15600		11800		11700
Sodium	NA	14900		11400		11700	
Thallium-Dissolved	2		10 U		10 U		10 U
Thallium	2	10 U		10 U		10 U	
Vanadium-Dissolved	2.1		50 U		50 U		50 U
Vanadium	2.1	50 U		50 U		50 U	
Zinc-Dissolved	2000		74.7		57.1		700
Zinc	2000	71.2		62.8		64.6	
Cyanide-Dissolved	200		5 U		5 U		5 U
Cyanide	200	5 U		5 U		5 U	

MSCs-Medium Specific Concentrations for Inorganic Regulated Substances in Groundwater, Used Aquifer,
TDS <2500, Residential Criteria

SLC data.xls
Metals- RW
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TABLE 10
SAFETY LIGHT CORPORATION SITE, PADEP
RADIOLOGICAL ANALYTICAL RESULTS - RESIDENTIAL WELL WATER

SAMPLE ID		SLC-RW-01		SLC-RW-02		SLC-RD-02	
LAB ID	EPA	FOH100291001		FOH100291002		FOH100291003	
DATE COLLECTED	DRINKING	8/8/2000		8/9/2000		8/8/2000	
MATRIX	WATER	WATER		WATER		WATER	
COMMENTS	STANDARDS ²	Murphy Residence		Vance/Walton Residence		Vance/Walton Residence - duplicate	
UNITS	pCi/L	pCi/L	uncert.	pCi/L	uncert.	pCi/L	uncert.
GROSS ALPHA	15	-0.35 U	0.572	0.879	0.937	0.263	0.58
GROSS BETA	50	2.53	1.16	2.38	1.12	2.3	1.06
TRITIUM	20,000	1170	190	2180	279	2060	267
GAMMA SCAN							
Cesium 137	na	-0.0538 U	6.66	-5.12 U	8.99	6.24	8.4
Cobalt 60	na	-2.5 U	5.55	-8.42 U	5.89	-1.94 U	8.09
OTHERS							
Radium 226	5 ³	0.0728	0.162	-0.744 U	0.259	0.209	0.139
Radium 228	{ ⁴ }	0.511	0.417	0.637	0.376	0.196	0.423
Carbon 14	na	-3.77 U	2.8	-2.33 U	2.8	-0.803 U	2.9
Strontium 90	8	0.378	0.4	0.413	0.428	0.515	0.466
Nickel 63	na	-1.51 U	10	3.03	12	4.32	11
Americium 241	na	0.0497	0.234	0.0228	0.106	0.0216	0.134
Polonium 210	{ ⁵ }	0.109	0.17	0.0421	0.092	0 U	0.16

Notes:

U- Result is less than the sample detection limit.

BOLD result-indicates exceedance of standard

na-not applicable

¹ Source: Federal Register Volume 65, No. 236, December 7, 2000

² Standard excludes uranium and radon, but reported result does includes all alpha emitters.

³ Results of radium 226 and radium 228 are summed for each sample and compared to the standard of 5 pCi/L total.

⁴ Included in gross alpha

TABLE 11

SAFETY LIGHT CORPORATION, PADEP
WASTE DISPOSAL CRITERIA ANALYTICAL RESULTS - INVESTIGATION DERIVED WASTES

All quantities in ppm, except where noted.

Analyte ¹	RCRA Limits		
	Sample ID	SLC-WC-01	SLC-WC-02
	Lab ID	F0H160319005	F0H160319006
	Matrix	Solid	Water
	Date Collected	8/9/2000	8/9/2000
TCLP VOC			
Benzene	0.5	<0.05	<0.05
Carbon Tetrachloride	0.5	<0.05	<0.05
Chlorobenzene	100	<0.05	<0.05
Chloroform	6	<0.05	<0.05
1,2-Dichloroethane	0.5	<0.05	<0.05
1,1-Dichloroethylene (1,1-Dichloroethene)	0.7	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	200	<0.2	<0.2
Tetrachloroethene	0.7	<0.05	<0.05
Trichloroethene	0.5	<0.05	<0.05
Vinyl Chloride	0.2	<0.1	<0.1
TCLP SVOCs			
1,4-Dichlorobenzene	7.5	0.0059	<0.05
2,4-Dinitrotoluene	0.13	<0.05	<0.05
2,4,5-Trichlorophenol	400	<0.05	<0.05
2,4,6-Trichlorophenol	2.0	<0.05	<0.05
2-Methylphenol	200	<0.05	<0.05
4-Methylphenol	200	<0.05	<0.05
Pentachlorophenol	100	<0.25	<0.25
Hexachlorobenzene	0.13	<0.05	<0.05
Hexachlorobutadiene	0.5	<0.05	<0.05
Hexachloroethane	3.0	<0.05	<0.05
Nitrobenzene	2.0	<0.05	<0.05
Pyridine	5	<0.1	<0.1
TCLP METALS			
Arsenic	5	<0.0035	0.0113
Barium	100	0.096	0.236
Cadmium	1	<0.00075	0.0066
Chromium	5	0.003	0.037
Lead	5	0.0211	15.5
Mercury	0.2	<0.001	<0.001
Selenium	1	<0.006	<0.006
Silver	5	<0.0035	<0.0035

< Detected below the detection limits

- (1) VOC-Volatile Organic Compounds, SVOC-Semi-Volatile Organic Compounds
(2) Reported lab concentration is the sum of the three constituent SVOC.

TABLE 11

SAFETY LIGHT CORPORATION, PADEP
WASTE DISPOSAL CRITERIA ANALYTICAL RESULTS - INVESTIGATION DERIVED WASTES

All quantities in ppm, except where noted.

Analyte ¹	RCRA Limits		
	Sample ID	SLC-WC-01	SLC-WC-02
	Lab ID	FOH160319005	FOH160319006
	Matrix	Solid	Water
<u>TCLP PESTICIDES</u>			
Chlordane	0.03	<0.005	<0.005
Endrin	0.02	<0.0005	<0.0005
Heptachlor	0.008	<0.0005	<0.0005
Heptachlor Epoxide	0.008	<0.0005	<0.0005
Lindane	0.4	<0.0005	<0.0005
Methoxychlor	10	<0.001	<0.001
Toxaphene	0.5	<0.020	<0.020
<u>TCLP HERBICIDES</u>			
2,4-D	10	<0.01	<0.01
2,4,5 T (Silvex)	1	<0.04	<0.04
<u>WASTE CHARACTERISTICS</u>			
Corrosivity	>2 <12.5 pH	7	7.5
Flash Point	>60°C	>60	>60
Reactive Sulfide	500	<4.66	<4.44
Reactive Cyanide	100	<0.026	<0.025
Total Moisture %	-	3.1	not applicable

< Detected below the detection limits

- (1) VOC-Volatile Organic Compounds, SVOC-Semi-Volatile Organic Compounds
(2) Reported lab concentration is the sum of the three constituent SVOC.

SLC data.xls
IDW-TCLP-RCRA
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TABLE 11 (continued)

SAFETY LIGHT CORPORATION, PADEP
WASTE CLASSIFICATION RADIOLOGICAL ANALYTICAL RESULTS - INVESTIGATION DERIVED WASTES

SAMPLE ID		SLC-WC-01		SLC-WC-02	
LAB ID		F0H160319005		F0H160319006	
DATE COLLECTED		8/9/2000		8/9/2000	
MATRIX		SOLID		WATER	
COMMENTS		Waste composite		Water Composite	
UNITS		pCi/g	uncert.	pCi/L	uncert.
GROSS ALPHA		0.185	0.143	20.3	4.45
GROSS BETA		0.844	0.208	61.6	7.57
TRITIUM		0.117	0.572	2540	339

TABLE 12
SAFETY LIGHT CORPORATION SITE, PADEP
COMPARISON OF RADIOLOGICAL ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	EPA	SLC-GW-CN-A		WELL A		SLC-GW-CN-B		WELL B	
DATA SOURCE	DRINKING	FWENC 2000		PRELIMINARY ASSESSMENT		FWENC 2000		PRELIMINARY ASSESSMENT	
DATE COLLECTED	WATER	8/7/2000		1990	1991	8/7/2000		1990	1991
MATRIX	STANDARDS ²	WATER		WATER	WATER	WATER		WATER	WATER
COMMENTS		Monitoring Well		CNSI/SLC	NUS	Monitoring Well		CNSI/SLC	NUS
UNITS	pCi/L	pCi/L	uncert.	pCi/L	pCi/L	pCi/L	uncert.	pCi/L	pCi/L
GROSS ALPHA	15	301	47	-0.8 +/- 0.9	<1.14	0.846	0.999	-0.3 +/- 0.9	<1.39
GROSS BETA	50	3820	380	28 +/- 5	15.8	3.31	1.14	6 +/- 4	3.25
TRITIUM	20,000	1980	260	11,800 +/- 300	10,700	2060	267	12,200 +/- 400	11,300
GAMMA SCAN									
Cesium 137	na	-2.6 U	7.2	NA	<5.00	-4.38 U	8.56	NA	<4.34
Cobalt 60	na	-3.5 U	9.1	NA	NA	-7.07 U	9.3	NA	NA
Lead 214	na	79	18	NA	NA	32.5	22	NA	NA
OTHERS									
Radium 226	5 ³	-16.9 U	3.4	NA	NA	0.251	0.129	NA	NA
Radium 228	{ ⁴ }	13.3	1.84	NA	NA	0.944	0.456	NA	NA
Carbon 14	na	4.78	2.9	NA	NA	-3.33 U	4.8	NA	NA
Strontium 90	8	21	4.44	13 +/- 3	3.4	1.8	0.517	0 +/- 2	<2.0
Nickel 63	na	9.01	11	NA	NA	5.78	12	NA	NA
Americium 241	na	-0.042 U	0.098	NA	NA	-0.0439 U	0.0769	NA	NA
Polonium 210	{ ⁴ }	4.27	1.1	NA	NA	-0.0057 U	0.011	NA	NA

Notes:

NUS Preliminary Assessment of Safety Light Corp, Appendix E Data Tables, July 17, 1991

CNSI/SLC-ChemNuclear/Safety Light Corp, 8/90, NRC Samples Analyzed by DOE Sciences Laboratory

NUS-Safety Light Project Groundwater Sample Results Summary

U- Result is less than the sample detection limit.

na-not applicable

NA-NOT AVAILABLE

BOLD result-indicates exceedance of standard

¹ Source: Federal Register Volume 65, No. 236, December 7, 2000

² Standard excludes uranium and radon, but reported result does include all alpha emitters.

³ Results of radium 226 and radium 228 are summed for each sample and compared to the standard of 5 pCi/L total.

When Sr 90 is present it usually causes elevated Ra 228 results which cause an over-correction to the Ra 226 result.

This leads to inaccuracy of the result and generally causes a very negative activity result for Ra 226.

⁴ Included in gross alpha

TABLE 12
SAFETY LIGHT CORPORATION SITE, PADEP
COMPARISON OF RADIOLOGICAL ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	EPA	SLC-GW-CN-D		WELL D		SLC-GW-CN-F		WELL F	
DATA SOURCE	DRINKING	FWENC 2000		PRELIMINARY ASSESSMENT		FWENC 2000		PRELIMINARY ASSESSMENT	
DATE COLLECTED	WATER	8/7/2000		1990	1991	8/9/2000		1990	1991
MATRIX	STANDARDS ²	WATER		WATER	WATER	WATER		WATER	WATER
COMMENTS		Monitoring Well		CNSI/SLC	NUS	Monitoring Well		CNSI/SLC	NUS
UNITS	pCi/L	pCi/L	uncert.	pCi/L	pCi/L	pCi/L	uncert.	pCi/L	pCi/L
GROSS ALPHA	15	64	14	0 +/- 0.9	<1.25	0.506	0.843	4.6 +/- 1.5	<1.56
GROSS BETA	50	200	25	116 +/- 10	64.7	3.91	1.26	2 +/- 4	3.76
TRITIUM	20,000	5560	600	50,000 +/- 1000	46,500	1920	254	8,700 +/- 400	7640
GAMMA SCAN									
Cesium 137	na	7.8 U	8.1	NA	<4.63	-7.12 U	9.33	NA	<4.39
Cobalt 60	na	1.3 U	7.2	NA	NA	-11.2 U	9.86	NA	NA
Lead 214	na	78	20	NA	NA	10.8	16.2	NA	NA
OTHERS									
Radium 226	5 ³	-53.6 U	8.71	NA	NA	0.212	0.134	NA	NA
Radium 228	(³)	38.9	4.19	NA	NA	0.422	0.475	NA	NA
Carbon 14	na	3.93	2.9	NA	NA	0.989	2.8	NA	NA
Strontium 90	8	68.9	13.7	60 +/- 4	44	0.67	0.426	NA	1.9
Nickel 63	na	8.45	11	NA	NA	12.3	11	NA	NA
Americium 241	na	0.1	0.37	NA	NA	-0.0151 U	0.145	NA	NA
Polonium 210	(³)	2.5	0.77	NA	NA	0.144	0.21	NA	NA

Notes:

NUS Preliminary Assessment of Safety Light Corp. Appendix E Data Tables, July 17, 1991

CNSI/SLC-ChemNuclear/Safety Light Corp. 8/90, NRC Samples Analyzed by DOE Sciences Laboratory

NUS-Safety Light Project Groundwater Sample Results Summary

U- Result is less than the sample detection limit.

na-not applicable

NA-NOT AVAILABLE

BOLD result-indicates exceedance of standard

¹ Source: Federal Register Volume 65, No. 236, December 7, 2000

² Standard excludes uranium and radon, but reported result does includes all alpha emitters.

³ Results of radium 226 and radium 228 are summed for each sample and compared to the standard of 5 pCi/L total.

When St 90 is present it usually causes elevated Ra 228 results which cause an over-correction to the Ra 226 result.

This leads to inaccuracy of the result and generally causes a very negative activity result for Ra 226.

⁴ Included in gross alpha

TABLE 12
SAFETY LIGHT CORPORATION SITE, PADEP
COMPARISON OF RADIOLOGICAL ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	EPA	SLC-GW-CN-G		WELL G		SLC-GW-CN-H		WELL H	
DATA SOURCE	DRINKING	FWENC 2000		PRELIMINARY ASSESSMENT		FWENC 2000		PRELIMINARY ASSESSMENT	
DATE COLLECTED	WATER	8/7/2000		1990	1991	8/7/2000		1990	1991
MATRIX	STANDARDS ²	WATER		WATER	WATER	WATER		WATER	WATER
COMMENTS		Monitoring Well		CNSI/SLC	NUS	Monitoring Well		CNSI/SLC	NUS
UNITS	pCi/L	pCi/L	uncert.	pCi/L	pCi/L	pCi/L	uncert.	pCi/L	pCi/L
GROSS ALPHA	15	9.3	2.4	-1.1 +/- 0.9	<1.39	17.8	3.63	0.3 +/- 0.8	<1.81
GROSS BETA	50	23	3	9 +/- 4	7.62	21.5	3.08	10 +/- 4	5.59
TRITIUM	20,000	1280	200	6,200 +/- 300	5,790	2720	327	12,400 +/- 400	11,800
GAMMA SCAN									
Cesium 137	na	-12.2 U	7.5	NA	<2.52	-7.31 U	8.26	NA	<5.21
Cobalt 60	na	-7.7 U	7.7	NA	NA	-7.13 U	7.83	NA	NA
Lead 214	na	U		NA	NA	57.3	23.1	NA	NA
OTHERS									
Radium 226	5 ³	-4.8 U	3.75	NA	NA	1.02	0.17	NA	NA
Radium 228	{}	3.41	0.937	NA	NA	0.867	0.478	NA	NA
Carbon 14	na	3.12	4.7	NA	NA	-0.53 U	2.9	NA	NA
Strontium 90	8	5.98	1.62	5 +/- 2	3.9	0.205	0.403	1.7 +/- 2.1	<0.9
Nickel 63	na	4.97	11	NA	NA	9.81	12	NA	NA
Americium 241	na	0.18	0.33	NA	NA	-0.00753 U	0.0151	NA	NA
Polonium 210	{}	1.93	0.69	NA	NA	3.92	1.1	NA	NA

Notes:

NUS Preliminary Assessment of Safety Light Corp, Appendix E Data Tables, July 17, 1991

CNSI/SLC-ChemNuclear/Safety Light Corp, 8/90, NRC Samples Analyzed by DOE Sciences Laboratory

NUS-Safety Light Project Groundwater Sample Results Summary

U- Result is less than the sample detection limit.

na-not applicable

NA-NOT AVAILABLE

BOLD result-indicates exceedance of standard

¹ Source: Federal Register Volume 65, No. 236, December 7, 2000

² Standard excludes uranium and radon, but reported result does includes all alpha emitters.

³ Results of radium 226 and radium 228 are summed for each sample and compared to the standard of 5 pCi/L total.

When St 90 is present it usually causes elevated Ra 228 results which cause an over-correction to the Ra 226 result.

This leads to inaccuracy of the result and generally causes a very negative activity result for Ra 226.

⁴ Included in gross alpha

TABLE 12
SAFETY LIGHT CORPORATION SITE, PADEP
COMPARISON OF RADIOLOGICAL ANALYTICAL RESULTS - GROUNDWATER

SAMPLE ID	EPA	SLC-GW-CN-1		WELL 1		SLC-GW-SL-15		WELL 15-SLC	
DATA SOURCE	DRINKING	FWENC 2000		PRELIMINARY ASSESSMENT		FWENC 2000		PRELIMINARY ASSESSMENT	
DATE COLLECTED	8/7/2000	8/7/2000		1990	1991	8/9/2000		1990	1991
MATRIX	WATER	WATER		WATER	WATER	WATER		WATER	WATER
COMMENTS	STANDARDS ¹	Monitoring Well		CNSI/SLC	NUS	Background Well		CNSI/SLC	NUS
UNITS	pCi/L	pCi/L	uncert.	pCi/L	pCi/L	pCi/L	uncert.	pCi/L	pCi/L
GROSS ALPHA	15	26.6	6.87	0.8 +/- 0.9	<0.91	3.14	1.58	0 +/- 0.6	NA
GROSS BETA	50	47.7	7.8	0 +/- 14	<1.73	7.83	2.32	-3 +/- 8	NA
TRITIUM	20,000	1820	245	30,500 +/- 700	27,700	325	159	4,300 +/- 300	NA
GAMMA SCAN									
Cesium 137	na	-5.7 U	6.17	NA	<3.34	-15.5 U	8.57	NA	NA
Cobalt 60	na	2.61	9.11	NA	NA	-8.16 U	9.48	NA	NA
Lead 214	na	0.242	16.5	NA	NA	-11.2 U	14.6	NA	NA
OTHERS									
Radium 226	5 ³	1.52	0.337	NA	NA	-12.1 U	2.05	NA	NA
Radium 228	{ ⁴ }	0.872	0.841	NA	NA	8.33	1.37	NA	NA
Carbon 14	na	-1.35 U	2.9	NA	NA	1.47	2.8	NA	NA
Strontium 90	8	1.36	0.472	NA	<1.0	1.03	0.826	NA	NA
Nickel 63	na	4.92	13	NA	NA	6.59	10	NA	NA
Americium 241	na	0.043	0.101	NA	NA	0.131	0.229	NA	NA
Polonium 210	{ ⁵ }	4.05	1.3	NA	NA	1.07	0.48	NA	NA

NUS Preliminary Assessment of Safety Light Corp, Appendix E Data Tables, July 17, 1991

CNSI/SLC-ChemNuclear/Safety Light Corp, 8/90, NRC Samples Analyzed by DOE Sciences Laboratory

NUS-Safety Light Project Groundwater Sample Results Summary

U- Result is less than the sample detection limit.

na-not applicable

NA-NOT AVAILABLE

BOLD result-indicates exceedance of standard

¹ Source: Federal Register Volume 65, No. 236, December 7, 2000

² Standard excludes uranium and radon, but reported result does includes all alpha emitters.

³ Results of radium 226 and radium 228 are summed for each sample and compared to the standard of 5 pCi/L total.

When St 90 is present it usually causes elevated Ra 228 results which cause an over-correction to the Ra 226 result.

This leads to inaccuracy of the result and generally causes a very negative activity result for Ra 226.

⁴ Included in gross alpha