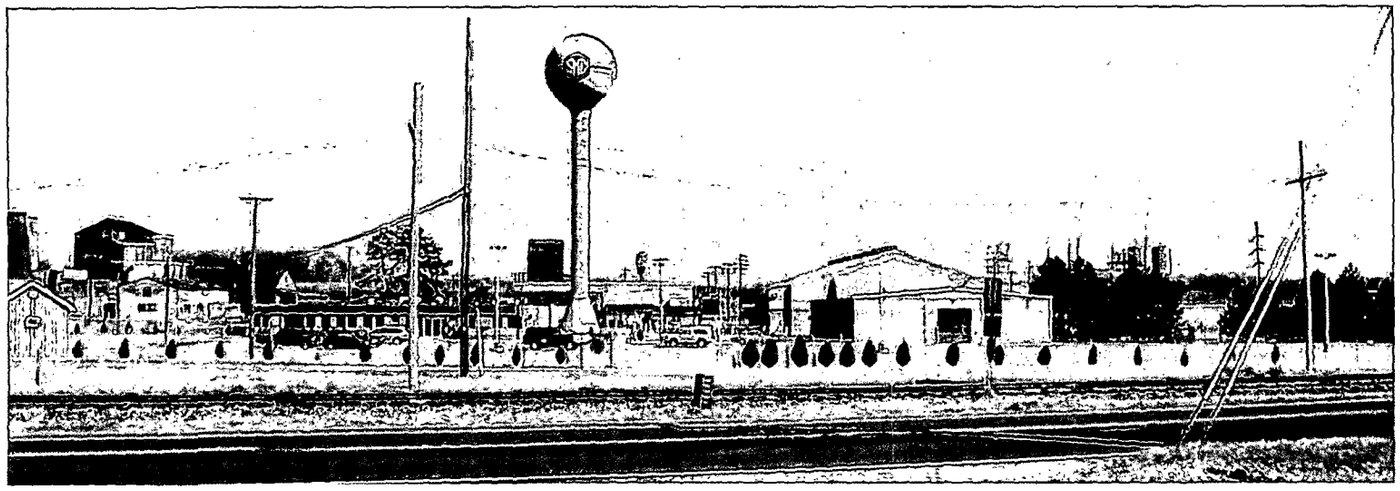


DECOMMISSIONING PLAN

SHIELDALLOY METALLURGICAL CORPORATION
NEWFIELD, NEW JERSEY

REVISION 1b: AUGUST 2009

APPENDIX 19.12 ALARA CALCULATION SPREADSHEETS
APPENDIX 19.13 LTC PLAN
APPENDIX 19.14 RADIONUCLIDE CONCENTRATIONS IN SOIL
APPENDIX 19.15 FINAL STATUS SURVEY PLAN
APPENDIX 19.16 SSAB MINUTES AND TRANSCRIPT
APPENDIX 19.17 COMPLETED SSAB INPUT FORMS
APPENDIX 19.18 ENGINEERED BARRIER DESIGN DRAWINGS

Prepared by

Integrated Environmental Management, Inc. *and* **TRC Environmental Corporation**

Appendix 19.12 - ALARA Calculations Spreadsheets

ALARA Analysis - Summary

Cost

Scenario	CostR and Cost WD	CostACC	CostTP	CostWDose	CostPDose	Total
LC	$ 9,237,500	$ 0	$ 0	$ 1,452	$ 264,253	$ 9,503,205
LTC	$ 14,716,265	$ 1,790	$ 5,038	$ 124	$ 657,357	$ 15,380,575
LT	$ 70,434,830	$ 2,117	$ 10,397,015	$ 351	$ 1,988,117	$ 82,822,429
LT/LTC(Slag only disposed)	$ 42,501,572	$ 1,984	$ 5,898,554	$ 393	$ 1,992,525	$ 50,395,028
LT/LTC(NonSlag only disposed)	$ 42,649,523	$ 1,986	$ 4,672,583	$ 392	$ 1,992,300	$ 49,316,784
LT(50% Slag disposed)/LTC	$ 28,608,918	$ 1,812	$ 2,916,024	$ 394	$ 1,993,578	$ 33,520,727

	Variable		Units	Comments
Population Density	P	0.0004	person/m2	
Land Area	A	47188	m2	Restricted Area
Fraction removed	F	1		Restricted release, thus F=1 for all scenarios
Release Criteria	DCGL(Th)	8.3	pCi/g	Value taken from DCGL Document (Appendix 19.10 of DP
Measured Concentration	Conc(Th)	277.62	pCi/g	Value taken from Source Term Document
Release Criteria	DCGL(U)	22.9	pCi/g	Value taken from DCGL Document (Appendix 19.10 of DP
Measured Concentration	Conc(U)	114.69	pCi/g	Value taken from Source Term Document
Monitary discount rate	3.00E-02		per year	
Half Life	1.41E+10		years	
Decay Constant	4.91E-11		per year	
Years of coll. dose	1000		years	
Discounting	33.3			Eq. N-2 of Appendix N
Cost of PR Averted	2000		dollars	

Results

Alternative	Conc/DCGL	Conclusion	
LC	335650	Greatest Cost-Benefit	Dose limit drives decision
LTC	543237		Dose limit drives decision
LT	2925264		Dose limit drives decision
LT/LTC(Slag only disposed)	1779938		Dose limit drives decision
LT/LTC(NonSlag only disposed)	1741855		Dose limit drives decision
LT(50% Slag disposed)/LTC	1183942		Dose limit drives decision

ALARA Analysis - On-site Worker Dose Estimate

Variables		Units
DAC (U)	8.41E-11	uCi/ml
DAC (Th)	1.91E-11	uCi/ml
DAC (Ra)	3E-10	uCi/ml
Direct (workers LC)	20	mrem TEDE
Direct (in SY)	30	mrem TEDE
Direct (workers LC)	9.62E-03	mrem/hr
Direct (in SY)	1.44E-02	mrem/hr
Rn (BHD bare)	8.20E-03	microR per hr
Concentration (Th)	277.62	pCi/g
Concentration (U)	114.69	pCi/g
Concentration (Ra)	103.12	pCi/g
Cost per person Rem	2000	dollars

Results

Decomm. Option	Air Conc. (ug/m3)	Air Conc. (Ra) (uCi/ml)	Air Conc. U (uCi/ml)	Air Conc. (Th) (uCi/ml)	Exp. Time (hr/yr)	Exp. duration (yr)	Dose (Ra) (rem)	Dose (U) (rem)	Dose (Th) (rem)	Dose (Direct) (rem)	Total Dose (rem)	LandArea (acre)	LandArea (m2)	Population Estimate	CollectiveDose (person-rem)
LC	0	0.00E+00	0.00E+00	0.00E+00	2000	2	0.00E+00	0.00E+00	0.00E+00	3.85E-02	3.85E-02	11.66	4.72E+04	1.89E+01	0.73
LTC	1.20E+01	1.24E-15	1.38E-15	3.33E-15	512	1	5.28E-06	2.10E-05	2.23E-04	4.92E-03	5.17E-03			1.20E+01	0.06
LT	2.01E+01	2.07E-15	2.31E-15	5.59E-15	840	2	2.90E-05	1.15E-04	1.23E-03	1.62E-02	1.75E-02			1.00E+01	0.18
LT/LTC(Slag only)	2.48E+01	2.56E-15	2.85E-15	6.89E-15	840	2	3.58E-05	1.42E-04	1.51E-03	1.62E-02	1.78E-02			1.10E+01	0.20
LT/LTC(NonSlag only)	2.46E+01	2.53E-15	2.82E-15	6.82E-15	840	2	3.55E-05	1.41E-04	1.50E-03	1.62E-02	1.78E-02			1.10E+01	0.20
LT(50% Slag)/LTC	2.59E+01	2.67E-15	2.97E-15	7.20E-15	840	2	3.74E-05	1.49E-04	1.58E-03	1.62E-02	1.79E-02			1.10E+01	0.20

ALARA Analysis - General Public Dose Estimate

Variables		Units
DAC (U)	8.41E-11	uCi/ml
DAC (Th)	1.91E-11	uCi/ml
DAC (Ra)	3E-10	uCi/ml
Direct (workers LC)	20	mrem TEDE
Direct (in SY)	30	mrem TEDE
Direct (workers LC)	9.62E-03	mrem/hr
Direct (in SY)	1.44E-02	mrem/hr
Risk Coeff	5E-04	per rem
Rn (BHD bare)	8.20E-03	microR per hr
Concentration (Th)	277.62	pCi/g
Concentration (U)	114.69	pCi/g
Concentration (Ra)	103.12	pCi/g
Cost per person Rem	2000	dollars

Results

Alternative	Air Conc. (ug/m3)	Air Conc. (Ra) (uCi/ml)	Air Conc. U (uCi/ml)	Air Conc. (Th) (uCi/ml)	Direct and Rn (mR/hr)	Direct (postclosure) (mR/hr)	T (construction) (hr/yr)	Years	T (post closure) (hr/yr)	Years	Dose (Ra) (rem)	Dose (U) (rem)	Dose (Th) (rem)	Dose (Direct&Rn) (rem)	Dose (Dir) (rem)	Total Dose (rem)	LandArea (acre)	LandArea (m2)	Population Estimate	Col. Dose (person-rem)
LC	0	0.00E+00	0.00E+00	0.00E+00	3.00E+01	1.14E-02	0	0	8760	70	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.00E+00	7.00E+00	11.66	47188.02	18.875208	132.13
LTC	1.20E+01	1.24E-15	1.38E-15	3.33E-15	3.00E+01	2.85E-03	512	1	8760	70	6.33E-03	2.51E-02	2.68E-01	1.54E+01	1.75E+00	1.74E+01	11.66	47188.02	18.875208	328.68
LT	2.01E+01	2.07E-15	2.31E-15	5.59E-15	3.00E+01	2.85E-03	840	2	8760	70	1.06E-02	4.21E-02	4.48E-01	5.04E+01	1.75E+00	5.27E+01	11.66	47188.02	18.875208	994.06
LT/LTC(Slag only)	2.48E+01	2.56E-15	2.85E-15	6.89E-15	3.00E+01	2.85E-03	840	2	8760	70	1.31E-02	5.19E-02	5.53E-01	5.04E+01	1.75E+00	5.28E+01	11.66	47188.02	18.875208	996.26
LT/LTC(NonSlag only)	2.46E+01	2.53E-15	2.82E-15	6.82E-15	3.00E+01	2.85E-03	840	2	8760	70	1.29E-02	5.14E-02	5.47E-01	5.04E+01	1.75E+00	5.28E+01	11.66	47188.02	18.875208	996.15
LT(50% Slag)/LTC	2.59E+01	2.67E-15	2.97E-15	7.20E-15	3.00E+01	2.85E-03	840	2	8760	70	1.37E-02	5.42E-02	5.78E-01	5.04E+01	1.75E+00	5.28E+01	11.66	47188.02	18.875208	996.79

ALARA Analysis - Remediation Costs (CostR and CostWD)

Assumptions	Value	Units	Reference	%total	Vol if 50% shipped	%
Slag Volume in Storage Yard	37560	yd3	Apprndix 19.2 DP	49.87%	18780	24.93%
Non-slag Volume in Storage yard	37760	yd3	Apprndix 19.2 DP	50.13%	56540	75.07%
Total Volume in Storage Yard	75320	yd3	Apprndix 19.2 DP			

Alternative	Cost ($)	Reference
LC	$ 9,237,500	Table 17.4 and Ch. 15 of DP (Surveillance and Monitoring)
LTC	$ 14,716,265	Table 17.2 and Ch. 15 of DP
LT	$ 70,434,830	Table 17.3 and Ch. 15 of DP
LT/LTC(Slag only)	$ 42,501,572	
LT/LTC(NonSlag only)	$ 42,649,523	
LT(50% Slag)/LTC	$ 28,608,918	

ALARA Analysis - Construction Accident Costs (CostACC)

Assumptions		Units			
Worklace Fatality rate	4.20E-08	per hour			
Transportaion fatality rate	3.80E-08	per km			
Transportaion fatality rate	6.60E-07	per km			
Shipment volume	13.6	m3/shipment			
Shipment volume	13.6	m3/shipment			
Monitary discount rate	3E-02	per year			
T (years of exposure)	1.00E+03	years			
Population Density	0.0004	persons/m2			
Soil Handling	1.62	person-hr/m3 of soil			
Cost per person Rem	2000	dollars			
Cost per fatality	3000000	dollars			
			%total	*50% Shipped*	*%*
Slag Volume in Storage Yard	37560	yd3	49.87%	18780	24.93%
Non-slag Volume in Storage yard	37760	yd3	50.13%	56540	75.07%
Total Volume in Storage Yard	75320	yd3	App. 19.2 DP		

Results

Alternative	Duration *(hr)*	No. of Workers	Worker Fatalities	Cost *$*	Comb. Cost *$*
LC	0	0	0.00E+00	$ 0	$ 0
LTC	1184	12	5.97E-04	$ 1,790	$ 1,790
LT	1680	10	7.06E-04	$ 2,117	$ 2,117
LT/LTC(Slag only) - Slag	838	11	3.87E-04	$ 1,161	
LT/LTC(Slag only) - Rest	594	11	2.74E-04	$ 823	$ 1,984
LT/LTC(NonSlag only) - NonSlag	842	11	3.89E-04	$ 1,167	
LT/LTC(NonSlag only) - Rest	590	11	2.73E-04	$ 818	$ 1,986
LT(50% Slag)/LTC - Slag	419	11	1.94E-04	$ 581	
LT(50% Slag)/LTC - Rest	889	11	4.11E-04	$ 1,232	$ 1,812

ALARA Analysis - Waste T&D Costs (CostTF)

Assumptions		Units	Notes			
Worklace Fatality rate	4.20E-08	per hour				
Transportaion fatality rate	3.80E-08	per km	Trucks			
Transportaion fatality rate	6.60E-07	per km	Trains			
Shipment volume	13.6	m3/shipment	Trucks			
Shipment volume	13.6	m3/shipment	Trains			
Monitary discount rate	3E-02	per year				
T (years of exposure)	1.00E+03	years				
Population Density	0.0004	persons/m2				
Soil Handling	1.62	person-hr/m3 of soil				
Cost per person Rem	2000	dollars				
Cost per fatality	3000000	dollars		*%total*	*50% Shipped*	*%*
Slag Volume in Storage Yard	37560	yd3	App. 19.2 DP	49.87%	18780	24.93%
Non-slag Volume in Storage yard	37760	yd3	App. 19.2 DP	50.13%	56540	75.07%
Total Volume in Storage Yard	75320	yd3	App. 19.2 DP			

Results

Alternative	No. of Trucks	No. of Train Cars	Truck Dist. *(mi)*	Truck Dist. *(km)*	Train Dist. *(mi)*	Train Dist. *(km)*	Truck Fatalities	Train Fatalities	Cost *$*
LC	0	0	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	$ 0
LTC	2746	0	10	1.61E+01	0	0.00E+00	1.68E-03	0.00E+00	$ 5,038
LT	575	1450	10	1.61E+01	2250	3.62E+03	3.52E-04	3.47E+00	$ 10,397,015
LT/LTC(Slag only)	2791	822	10	1.61E+01	2250	3.62E+03	1.71E-03	1.96E+00	$ 5,898,554
LT/LTC(NonSlag only)	2810	651	10	1.61E+01	2250	3.62E+03	1.72E-03	1.56E+00	$ 4,672,583
LT(50% Slag)/LTC	2810	406	10	1.61E+01	2250	3.62E+03	1.72E-03	9.70E-01	$ 2,916,024

ALARA Analysis - Cost of Remediation Worker Dose (CostWDose)

Alternative	Results Col. Dose *(person-rem)*	Dose Cost *($)*	Notes
LC	0.73	$ 1,452	$2,000/person-rem
LTC	0.06	$ 124	$2,000/person-rem
LT	0.18	$ 351	$2,000/person-rem
LT/LTC(Slag only)	0.20	$ 393	$2,000/person-rem
LT/LTC(NonSlag only)	0.20	$ 392	$2,000/person-rem
LT(50% Slag)/LTC	0.20	$ 394	$2,000/person-rem

ALARA Analysis - Cost of Population Dose (CostPDose)

Alternative	Col. Dose (person-rem)	Dose Cost ($)	Notes
LC	132	$ 264,253	$2,000/person-rem
LTC	329	$ 657,357	$2,000/person-rem
LT	994	$ 1,988,117	$2,000/person-rem
LT/LTC(Slag only)	996	$ 1,992,525	$2,000/person-rem
LT/LTC(NonSlag only)	996	$ 1,992,300	$2,000/person-rem
LT(50% Slag)/LTC	997	$ 1,993,578	$2,000/person-rem

ALARA Analysis - Regulatory Cost Estimate

Alternative	Regulatory ($/yr)	Duration (yr)	Reg Cost $
LC	$ 82,600	1000	$ 82,600,000
LTC	$ 16,150	1000	$ 16,150,000
LT	$ 0	1000	$ 0
LT/LTC(Slag only)	$ 16,150	1000	$ 16,150,000
LT/LTC(NonSlag only)	$ 16,150	1000	$ 16,150,000
LT(50% Slag)/LTC	$ 16,150	1000	$ 16,150,000

Appendix 19.13 - LTC Plan

TABLE OF CONTENTS

1 PURPOSE 2

2 SCOPE 2

3 REFERENCES 2

4 DEFINITIONS 3

5 PROCEDURES 3
- 5.1 Organization and Administration 3
- 5.2 Legal Description and Property Ownership 5
- 5.3 Facilities and Equipment 6
- 5.4 Training in Radiation Protection 6
- 5.5 Radiation Exposure Control 6
- 5.6 Control of Work 6
- 5.7 ALARA Program 7
- 5.8 Instrumentation 7
- 5.9 Radiological Surveillance 7
- 5.10 Visual Surveillance 9
- 5.11 Unscheduled Inspections 13
- 5.12 Photographic Documentation 14
- 5.13 Maintenance 14
- 5.14 Posting 14
- 5.15 Reports 15
- 5.16 Records 15
- 5.17 Documentation 15
- 5.18 Emergency Response and Notifications 16
- 5.19 Periodic Program Review 16

6 EXEMPTION PROVISIONS 16

7 DOCUMENTATION 16

8 ATTACHMENTS 17

CONTROLLED COPY NO. _____

1 PURPOSE

1.1 This Radiation Safety Procedure (RSP) shall be known as the Shieldalloy Metallurgical Corporation (SMC) Long Term Control Plan (LTCP).

1.2 SMC's policy on radiological protection is to minimize the risk of harm or injury to employees, contractors, or others from the radiologically-restricted area at the SMC facility, and to demonstrate compliance with applicable laws and the regulations on control of radioactive materials. The LTCP carries out those purposes and implements the commitments of the Decommissioning Plan (Rev. 1b) (DP) for the SMC facility that pertain to restricted release and long-term control of radioactive materials. It describes the long-term radiation protection, operation/maintenance, surveillance, and reporting activities that will be implemented pursuant to amended Materials License No. SMB-743 incorporating long term control (LTC) requirements.

2 SCOPE

This RSP applies to only to personnel, facilities, equipment and activities that involve the radiologically-restricted area at the SMC facility. Personnel, facilities, equipment and activities located or taking place elsewhere at the site are not subject to the radiation safety procedures contained herein.

3 REFERENCES

3.1 Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports for Workers; Inspection and Investigations"

3.2 Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation".

3.3 Title 10, Code of Federal Regulations, Part 40, "Domestic Licensing of Source Material".

3.4 Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material".

3.5 Title 10, Code of Federal Regulations, Part 110, "Export and Import of Nuclear Equipment and Material".

3.6 Title 29, Code of Federal Regulations, Part 1910, "Occupational Safety and Health Standards".

3.7 ANSI N323 - American National Standard Institute, "Radiation Protection Instrumentation Test and Calibration," N323A-1997.

3.8 U. S. Nuclear Regulatory Commission License Number SMB-743 (as amended).

3.9 DP - Shieldalloy Metallurgical Corporation, "Decommissioning Plan for the SMC Facility", Report No. 94005/G-28247 (Rev. 1b).

3.10 O&M Plan - Shieldalloy Metallurgical Corporation, "Operations and Maintenance Plan; Engineered Barrier", TRC Project No. 105106.000100.000000.

3.11 RSP-002 - Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-002, "Definitions".

4 DEFINITIONS

The terms used in this LTCP that are not defined herein and not commonly understood shall be found in RSP-002.

5 PROCEDURES

5.1 Organization and Administration

5.1.1 Senior Corporate Official

5.1.1.1 Overall control and authority for radiation protection and long-term control of the radiologically-restricted area at the SMC facility shall rest with the Senior Corporate Official.

5.1.1.2 The responsibilities of the Senior Corporate Official include, but are not limited to, the following:

5.1.1.2.1 Establish SMC policy with respect to the long term safe placement of radioactive materials at the SMC facility and revise/amend this LTCP to reflect such policy;

5.1.1.2.2 Assure that SMC radiation protection and compliance services are sufficient to meet the requirements of this LTCP and U. S. Nuclear Regulatory Commission (NRC) license requirements;

5.1.1.2.3 Take such other actions are necessary or appropriate to give effect to the purposes of the LTCP.

5.1.2 Radiation Safety Officer (RSO)

5.1.2.1 The Senior Corporate Official may delegate the authority for implementing the radiation protection program described herein to the RSO.

5.1.2.2 The RSO shall be responsible for recommending the type and quantity of staff and resources necessary for full implementation of the LTCP.

5.1.2.3 The RSO shall have the responsibility and authority to terminate via issuance of a stop-work order any work activities that do or may violate regulatory or SMC requirements for radiological protection.

5.1.2.3.1 Work activities that are ongoing when a stop-work order is issued shall be permitted to proceed to a safe condition.

5.1.2.3.2 The RSO shall terminate a stop-work order when the conditions requiring issuance of the order have been remedied.

5.1.2.4 The minimum qualifications of the RSO shall be:

5.1.2.4.1 An Associate's degree (or equivalent) in a science-related discipline:

5.1.2.4.2 Course work and/or five (5) years of work experience with the following:

5.1.2.4.2.1 Principles and practices of radiation protection;

5.1.2.4.2.2 Radioactivity measurements, monitoring techniques, and the use of instruments;

5.1.2.4.2.3 Mathematics and calculations basic to the use and measurement of radioactivity;

5.1.2.4.2.4 Conducting radiological surveys and evaluating results; and

5.1.2.4.2.5 Familiarity with applicable NRC, EPA, and OSHA regulations, as well as the terms and conditions of any licenses and permits issued to SMC by these or other agencies.

5.1.2.5 In the event the RSO resigns, becomes incapacitated or is absent for more than 60 consecutive calendar days, a new RSO shall be named and notification of such, including the name and qualifications of the new RSO, shall be submitted to the NRC.

5.1.2.6 The NRC should be notified in advance if a replacement RSO is to be named.

5.1.3 Inspection Team Members

5.1.3.1 Inspection team members shall be selected by the RSO or the Senior Corporate Official to implement the provisions of this LTCP.

5.1.3.2 Visual surveillance shall be performed by personnel who:

5.1.3.2.1 Are experienced engineers and/or scientists; and

5.1.3.2.2 Have been specifically trained to conduct site inspections.

5.1.3.3 Radiological surveillance shall be performed by the RSO or personnel designated by the RSO who are qualified in:

5.1.3.3.1 Radioactivity measurements;

5.1.3.3.2 Radiological monitoring techniques;

5.1.3.3.3 The use of radiation detection instrumentation; and

5.1.3.3.4 The performance of radiation surveys.

5.1.3.4 Visual and radiological surveillance may be performed by a single individual who meets the qualifications shown in Section 5.1.3.2 and 5.1.3.3, above.

5.1.4 Maintenance Providers

Maintenance shall be performed by personnel who have been specifically trained in the maintenance procedure to be implemented.

5.2 Legal Description and Property Ownership

5.2.1 The legal description of the restricted area shall be developed from a survey prepared by a licensed land surveyor and filed with Gloucester County.

5.2.2 A deed notice that includes the following restrictions shall be recorded with Gloucester County:

5.2.2.1 The owner of the property shall be the licensee;

5.2.2.2 Prohibitions on the performance of agricultural, residential and industrial activities within the restricted area;

5.2.2.3 Prohibitions on demolition, excavation, digging, drilling or any other activity that might result in the removal or breach of the engineered barrier;

5.2.2.4 Prohibitions on the disturbance of soil, ground or groundwater within the restricted area; and

5.2.2.5 Prohibitions on the use or removal of soil, ground or groundwater from the restricted area.

5.2.3 The deed notice shall require that future owners of the restricted area:

5.2.3.1 Agree that property ownership brings with it all of the obligations of License No. SMB-743;

5.2.3.2 Acknowledge, re-record and maintain the deed notice in form and content satisfactory to the NRC;

5.3 Facilities and Equipment

5.3.1 Licensed radioactive materials shall be stored in the restricted area described in Attachment 8.1.

5.3.2 In the restricted area, all applicable occupational safety and health regulations in 29 CFR 1910 shall apply.

5.4 Training in Radiation Protection

5.4.1 All personnel permitted unescorted access to the restricted area shall receive training in radiation protection.

5.4.2 Training may consist of Visitor Training, GET, Hazard Communication Training and/or special briefings, as determined by the RSO.

5.4.3 Training programs shall address the pertinent requirements of 10 CFR 19 and 29 CFR 1910, as applicable and shall include the following topics:

5.4.3.1 Identification of radiation postings and barriers.

5.4.3.2 How to contact the RSO.

5.5 Radiation Exposure Control

5.5.1 Radiation Dose Limits and Goals

5.5.1.1 Internal and external exposure limits for employees, visitors and contractors shall be those established by the NRC in 10 CFR 20.1402.

5.5.1.2 The Senior Corporate Official shall ensure that sufficient trained personnel are available to perform each operation such that 10% or more of the applicable regulatory dose limit is not incurred.

5.6 Control of Work

5.6.1 Working activities at the SMC facility that may subject an individual to exposures of less than 25 millirem TEDE per calendar year shall require no specific controls.

5.6.2 A RWP shall be prepared for construction, demolition, maintenance, and repair activities, and all non-routine operations in the restricted area if the dose potential to an individual exceeds 100 millirem TEDE.

5.7 ALARA Program

5.7.1 While occupational radiation exposures incurred by employees or visitors of the SMC facility have been historically low, all exposures incurred under the LTCP shall be as low as reasonably achievable (ALARA).

5.7.2 The Senior Corporate Official and the RSO shall adopt the following three principles to govern all work activities with the potential for exposure to radiation or radioactive materials:

5.7.2.1 Activities and operations shall be undertaken only if they produce a positive net benefit.

5.7.2.2 All radiation exposures shall be kept ALARA in light of economic and societal costs.

5.7.2.3 Radiation exposures received by individuals shall not exceed the radiation dose limits described in 10 CFR 20.1201.

5.7.3 If the dose potential for any on-site activity exceeds 25 millirem TEDE, ALARA considerations shall be addressed in applicable work plans.

5.8 Instrumentation

5.8.1 Instrumentation used for radiological surveillance purposes shall be:

5.8.1.1 Of sufficient sensitivity and accuracy to assess radiation exposure levels expected to be found within or near the restricted area.

Note: These instruments should provide a response in units of microR per hour, milliR per hour, microrem per hour, millirem per hour, or in other units of exposure rate.

5.8.1.2 Of sufficient quantity to support on-going or planned operations.

5.8.2 Instrumentation shall be purchased, tested and calibrated by methods that are consistent with ANSI N323 recommendations.

5.8.3 Instruments in the active inventory shall be calibrated at least once per year or more frequently if so recommended by the instrument vendor.

5.9 Radiological Surveillance

5.9.1 The ambient exposure rate and integrated exposure at the perimeter of the restricted area shall be determined.

5.9.2 The exposure rate shall be determined using hand-held instruments.

5.9.2.1 Surveys shall be performed with a portable radiation survey instrument that is sensitive to gamma radiation (e.g., sodium iodide detector, microR meter, microrem meter, ionization chamber).

5.9.2.1.1 The instrument shall be turned on and permitted to stabilize for a minimum of 30 seconds before proceeding further.

5.9.2.1.2 Pre-operational checks as described in RSP-008 shall be completed before proceeding further.

5.9.2.2 Surveys shall be conducted by walking slowly around the outside of the perimeter fence with the detector held at a height of approximately one meter above the ground (waist high).

5.9.2.2.1 An increase in the audible response or in the needle/indicator movement may indicate the presence of unusual conditions.

5.9.2.2.2 The instrument shall be held stationary in the locations where the increased response is noted, and results recorded.

5.9.2.2.3 Stationary measurements shall be made and recorded at the at each dosimeter mounting location (see Section 5.9.3, below).

5.9.2.3 Readings shall be recorded as read on a Radiological Survey Form (Attachment 8.2 or equivalent).

5.9.2.3.1 Actual readings, rather than "background" or "as read" shall be recorded.

5.9.2.3.2 The range selector switch position shall be carefully evaluated when recording readings.

5.9.2.4 Any comments and notations that may be necessary for interpretation of results should be recorded on the Radiological Survey Form.

5.9.2.5 The individual performing the survey shall sign and date the completed Radiological Survey Form.

5.9.2.6 The frequency of routine radiological surveys shall be once per calendar quarter.

5.9.3 Integrated exposure shall be monitored using thermoluminescent dosimeters (TLD) mounted on the perimeter fence.

5.9.3.1 Dosimeters shall be mounted at a height of approximately one (1) meter above the ground surface in eight (8) equally-spaced locations around the perimeter (see Attachment 8.3).

5.9.3.2 The routine dosimeter deployment period shall be once per calendar quarter.

5.9.3.3 The results of dosimeter processing shall be tracked/trended in a manner that permits ready identification of changed or changing radiological conditions.

5.9.4 The RSO shall alert the NRC at least 30 days in advance of each scheduled radiological surveillance.

5.10 Visual Surveillance

5.10.1 Visual inspection of the restricted area shall be performed in order to identify or evaluate the following conditions:

5.10.1.1 Erosion

5.10.1.2 Settlement

5.10.1.3 Slope stability

5.10.1.4 Development of vegetation

5.10.1.5 Burrowing animals

5.10.1.6 Manmade disruptions

5.10.2 Routine visual inspections shall be performed once per calendar quarter.

5.10.3 Routine visual inspection shall include observation of the following:

5.10.3.1 All four side slopes and the top surface of the engineered barrier;

5.10.3.2 Drainage swales and stormwater storage areas;

5.10.3.3 The integrity of the security fencing, posting and signage placement; and

5.10.3.4 Outlying areas (i.e., within 0.25 miles around the restricted area) for significant changes in land usage from those described in the DP.

5.10.4 Inspections for Erosion

5.10.4.1 The surficial stone shall be inspected for evidence of deterioration and weathering.

5.10.4.2 Should erosion in the form of rills or gullies be identified during an inspection, corrective actions shall be taken.

5.10.4.2.1 The surficial crushed stone shall be relocated as necessary over the area from which it has shifted, maintaining the minimal thickness specified in Attachment 8.4.

5.10.4.2.2 If underlying soils have been impacted by erosion, they shall be reworked to repair the eroded areas and covered with the required thickness of stone.

5.10.4.3 If deterioration or weathering of the surficial stone is observed, the area in which the deterioration/weathering is observed shall be re-inspected during subsequent scheduled inspections to confirm that the deterioration does not impact the performance of the stone as an erosion control material.

5.10.4.4 If the deterioration is found to be impacting the erosion control features of the engineered barrier, it shall be addressed as described in Section 5.10.4.2, above.

5.10.4.5 If an area requires maintenance or repair due to erosion, deterioration or weathering effects, the remediated area shall be specifically inspected and findings documented during the next four quarterly inspections after the repair to verify its effectiveness.

5.10.5 Inspection for Settlement

5.10.5.1 The engineered barrier, including the top surface and side slopes, shall be inspected visually for signs of settlement since uneven settlement could impact drainage or erosion control on the surface of the engineered barrier or the integrity of its clay layer.

5.10.5.2 Should settlement (a) of greater than six inches or (b) that results in pooling of drainage or erosion be identified:

5.10.5.2.1 The various layers of the engineered barrier in the impacted area shall be carefully removed down to the surface of the clay layer.

5.10.5.2.2 Additional clay shall be added as necessary to increase the thickness of the clay to its original elevation.

5.10.5.2.3 The source of the clay and its placement shall meet the original engineering specifications.

5.10.5.2.4 The overlying layers of the engineered barrier shall be replaced in a manner that meets the original engineering specifications.

5.10.5.2.5 If the source of settlement is one of the surficial layers overlying the clay, the layers of the engineered barrier shall be removed only to the surface of the layer that is below the source of the settlement and shall be replaced as described above.

5.10.5.3 If an area requires reconstruction due to the effects of settlement, that area shall be inspected and findings documented during the next four quarterly inspections following repair to verify continued effectiveness.

5.10.6 Inspection for Slope Stability

5.10.6.1 The top surface and side slopes of the engineered barrier shall be inspected for signs of impending or actual slope failure.

5.10.6.2 If identified, tension cracks shall be monitored to assess the slope's behavior and to determine whether the sliding rate is increasing or decreasing.

5.10.6.3 The crest of the engineered barrier (the point where the side slope and top slope meet) shall be inspected for the presence of cracks.

5.10.6.4 The ground next to the engineered barrier shall be inspected for indications of rising upward slowly, which may be indicative of slope movement or failure.

5.10.6.5 If signs of a potential slope stability failure are identified or if a failure occurs, a professional who specializes in geotechnical engineering shall be contacted and consulted for guidance on the proper means of repairing the slope.

5.10.7 Inspection for Freeze/Thaw and Desiccation Cracking

5.10.7.1 If cracks are identified, they shall be evaluated to determine if they could be associated with settlement (i.e., are the cracks around an area that has settled in relation to the remainder of the engineered barrier) or stability (see Section 5.10.6).

5.10.7.2 If settlement or stability are not the suspected sources of the cracks, the crushed stone cover in the area where cracking was observed shall be carefully removed, the underlying soils recompacted and the stone cover replaced in accordance with the original engineering specifications.

5.10.7.3 If an area requires repair due to the presence of cracking, that area shall be inspected and findings documented during the next four quarterly inspections following repair to verify that the area has been adequately repaired and to verify that the cracking is not due to other factors, such as settlement or stability.

5.10.7.4 Soil moisture sensor monitoring stations and lysimeters shall be used to monitor the soil moisture content of the clay barrier layer during the first ten years following construction to ensure desiccation cracking of the clay layer does not occur.

5.10.7.5 If monitoring indicates that the soil moisture content of the clay barrier layer is approaching that at which cracks may develop, the need for irrigation or other means of hydration of the engineered barrier shall be determined and action taken, as required.

5.10.8 Inspection for Vegetation Development

5.10.8.1 Inspections shall focus on identification of deeper-rooted plants, such as trees or other woody plants.

5.10.8.2 If deeper-rooted plants are identified, they shall be eradicated by herbicides or other means necessary to destroy the plant.

5.10.8.3 Hand removal of vegetation shall be prohibited.

5.10.9 Inspection for Burrowing Animals

5.10.9.1 Inspections shall include examinations for the presence of animal burrows.

5.10.9.2 If animal burrows are observed, steps shall be taken to eradicate the subject animals.

5.10.10 Inspection for Manmade Disruptions

5.10.10.1 The restricted area shall be secured with fencing designed to deter access to, and manmade disruptions of, the engineered barrier.

5.10.10.2 Inspections shall include observations related to the presence of any manmade disruptions in the engineered barrier or breaches in the fencing.

5.10.10.3 If such disruptions are identified, the response actions shall be specific to the type of disruption encountered.

5.10.10.4 Any disruption that compromises the integrity of the engineered barrier shall be repaired or reconstructed in a manner that complies with the original engineering specifications for the engineered barrier.

5.10.10.5 If manmade disruptions are observed, the means of gaining access to the area shall be evaluated, with repairs/adjustments made to site security measures to prevent future access.

5.10.11 Inspection of Drainage Swales and Stormwater Storage Areas

5.10.11.1 Drainage swales and stormwater storage areas shall be inspected for evidence of erosion, accumulation of debris and the growth of vegetation.

5.10.11.2 Eroded areas shall be repaired to conform to original specifications for the area.

5.10.11.3 Any debris or sediment that has accumulated within the drainage swales or stormwater storage areas that could reduce the free movement of water or other operations of these features shall be removed.

5.10.11.4 If deeper-rooted plants, such as trees or other woody plants, are identified, they shall be eradicated by herbicides or other means that will destroy the plant.

5.10.12 The findings of all visual surveillances shall be recorded on a Visual Surveillance Checklist (see Attachment 8.5).

5.10.13 The RSO shall alert the NRC at least 30 days in advance of each scheduled visual surveillance.

5.11 Unscheduled Inspections

5.11.1 Unscheduled visual inspections should be performed:

5.11.1.1 Any time there is reason to suspect that conditions may have or are expected to change;

5.11.1.2 When a condition is identified during a routine inspection or other site visit that requires personnel with specific expertise to return to the site to evaluate the condition;

5.11.1.3 When notified by a citizen or outside agency that conditions at the site have substantially changed; or

5.11.1.4 When an extreme natural event such as the following occurs:

5.11.1.4.1 A seismic event of 4.0 magnitude or greater within 50 miles and 6.0 or greater within 75 miles.

5.11.1.4.2 A rainfall event of six inches in a 24 hour period as recorded at the Millville station or other appropriate local reporting station if the Millville station should become unavailable.

Note: Precipitation data are available on-line (in inches/hour for the past 24 hours) for that station at http://climate.rutgers.edu/njwxnet/station.php?s=214.

5.11.2 Unscheduled visual inspections may be performed at the discretion of the RSO or at any time there is reason to suspect that physical or exposure conditions may have or are expected to change.

5.11.3 Unscheduled radiological surveillance may be performed at the discretion of the RSO or at any time there is reason to suspect that exposure conditions may have or are expected to change.

5.11.4 The RSO shall notify the NRC within 15 days after any unscheduled inspection.

5.12 Photographic Documentation

5.12.1 Photographs shall be collected during each scheduled and unscheduled inspection to document the physical status of the engineered barrier and restricted area at the time of the inspection.

5.12.2 A photo log (see Attachment 8.6) shall be created and included in each inspection report.

5.13 Maintenance

5.13.1 Maintenance decisions and the selection of maintenance personnel shall be made by the Senior Corporate Official or the RSO.

5.13.2 Degraded conditions shall be remedied prior to the next scheduled inspection.

5.13.3 The inspection frequency, as shown in Section 5.10.2 above, may be increased as appropriate to confirm the results and effectiveness of maintenance events.

5.14 Posting

5.14.1 Posting/labeling requirements shall be as described in 10 CFR 20, Subpart J and 10 CFR 19.11.

5.14.2 Posting of the restricted area shall be verified as part of each inspection.

5.15 Reports

5.15.1 An annual inspection report for each calendar year shall be prepared within 90 days of the end of the year.

5.15.2 The annual report shall include the following:

5.15.2.1 A description of visual surveillance activities, including findings;

5.15.2.2 A summary of radiological surveillance findings, including a population dose estimate;

5.15.2.3 A copy of all corrective action reports, including a description of adverse events, planned corrective actions, documentation of closure, and plans to prevent similar events from occurring.

5.15.2.4 A description of all maintenance activities.

5.16 Records

5.16.1 The RSO shall maintain records sufficient to document implementation of this LTCP and to demonstrate compliance with applicable regulations and license requirements.

5.16.2 Surveillance, monitoring and maintenance records shall be maintained for the duration of the LTC license, at which time they may be transferred to the NRC if requested by the agency.

5.16.3 Copies of regulatory inspection records shall be maintained for a minimum of 10 years.

5.16.4 Copies of annual reports shall be maintained for the duration of the LTC license.

5.16.5 Records shall be maintained in either hard-copy or electronic (i.e., scanned) format.

5.16.6 A back-up records custodian should be appointed by SMC.

5.17 Documentation

5.17.1 The preparation, distribution and use of this LTCP and other RSPs shall be controlled.

5.17.2 The master copy of this LTCP and all other RSPs shall be signed by the Senior Corporate Official and the RSO prior to implementation.

5.17.3 Approval signatures shall signify an RSP is adequate for its intended use, that it meets the requirements of this LTCP, and that all provisions of amended License No. SMB-743 are met.

5.17.4 RSPs should be reviewed by the RSO for continued applicability, effectiveness and compliance at least once per year.

5.18 Emergency Response and Notifications

5.18.1 For emergencies where radioactive materials may be involved, consideration shall be given to exposure to radioactive materials and ionizing radiation in addition to the other hazards present.

5.18.2 The RSO (or designee) shall notify the NRC of the occurrence of reportable events as required in 10 CFR 20 Subpart M and 10 CFR 40.60.

5.19 Periodic Program Review

5.19.1 All activities conducted during the implementation of this LTCP shall be subject to annual review as required in 10 CFR 20.1101.

5.19.2 Limited-scope audits/assessments should be conducted by the RSO (or designee) to determine compliance with applicable federal/state regulations, applicable license requirements, and this LTCP.

5.19.3 The following programmatic elements shall be audited for compliance and continued applicability at a frequency of at least once per year:

5.19.3.1 Radiation safety training

5.19.3.2 Qualifications of inspection personnel

5.19.3.3 Documentation and records

5.19.3.4 Instrumentation

5.19.3.5 Visual and radiological surveillance

5.19.3.6 Maintenance

6 EXEMPTION PROVISIONS

Variances and exceptions to the requirements in this LTCP shall be permitted pursuant to the written authorization of the RSO and the Senior Corporate Official, and after approval by the NRC. Minor changes that do not influence the safety provisions in this LTCP shall be permitted pursuant to the written authorization of the RSO.

7 DOCUMENTATION

None

8 ATTACHMENTS

8.1 Location Where Licensed Materials are Stored at the Newfield Facility.

8.2 Radiation Surveillance Form

8.3 Perimeter Dosimeter Monitoring Locations

8.4 Stone Thickness Specifications

8.5 Visual Surveillance Checklist

8.6 Photograph Log

ATTACHMENT 8.1
LOCATIONS WHERE LICENSED MATERIALS ARE
STORED AT THE SMC FACILITY

Licensed radioactivity at the SMC facility can be found beneath an engineered barrier that has been constructed in the former Storage Yard. The radioactivity consists of ferrocolumbium slag generated from former metallurgical operations, as well as baghouse dust, concrete and soil as described in the "Source Term Document for the Newfield Restricted Area" (Integrated Environmental Management, Inc. Report No. 94005/G-29359). Details about the engineered barrier can be found in the "Operation and Maintenance Plan for the Engineered Barrier" (TRC Corporation Report.). Other details on the decommissioned site are found in the "Decommissioning Plan for the Newfield Facility" (Shieldalloy Metallurgical Corporation Report No. 94005/G-28247, Rev. 1b) and in the "Decommissioning Report for the Newfield Facility" (Shieldalloy Metallurgical Corporation Report No. XXXX, date). The page that follows this one shows the location of the permanent restricted area.

[To be finalized prior to submission of application for amended License No. SMB-743.]

ATTACHMENT 8.2
RADIATION SURVEILLANCE FORM

[To be finalized prior to submission of application for amended License No. SMB-743.]

ATTACHMENT 8.3
PERIMETER DOSIMETER MONITORING LOCATIONS

[To be finalized prior to submission of application for amended License No. SMB-743.]

ATTACHMENT 8.4
STONE THICKNESS SPECIFICATIONS

[To be finalized prior to submission of application for amended License No. SMB-743.]

ATTACHMENT 8.5
VISUAL SURVEILLANCE CHECKLIST

[To be finalized prior to submission of application for amended License No. SMB-743.]

ATTACHMENT 8.6
PHOTOGRAPH LOG

Taken		Downloaded		Camera ID	Location	Description	Photographer
Date	Time	Date	Time				

Appendix 19.14 - Radionuclide Concentrations in Soil

APPENDIX K
Analytical Results For Soil, Sediment and Water Sampling

Grid Location	Sample Type Soil/Sediment or Water	U-238 (pCi/g)[a]	Th-232 (pCi/g)	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Pb-214 (pCi/g)	Bi-214 (pCi/g)	Th-228/A (pCi/g)	Pb-212 (pCi/g)	Tl-208 (pCi/g)	Gross Alpha (pCi/L)	Gross Beta (pCi/L)
-h0	S	5.79	4.3	24	31	26	24					
-h2	S	3.36	6.45	8.8	8.9	9.9	8.8					
-g1	S	11.2	1.31	28	28							
-b32	S	3.92	4.94	77	83							
-b60	S	1.80	2.35	2.2		0.93	0.79	1.7	1.8	1.5		
-b60 (DUP 1)	S	1.58	1.48	1.4		0.67	0.53	0.85	0.80	0.64		
-b60 (DUP 2)	S	1.58	2.00	1.6		0.69	0.74	1.1	0.99	0.97		
-a4	S	0.84	1.66	0.3	0.4	0.4	0.3					
-a6	S	1.17	2.58	6.4	9.7	4.0	<3.9					
-a6 (DUP)	S	0.94	2.55	0.3	<0.6	0.5	<0.3					
-a8	S	8.00	10.8	5.3	10	6.5	5.3					
-a9	S	10.4	1.74	37	47	40	37					
-a33	S	2.29	6.0	1.8	6.7	2.7	1.8					
A-33	W										4.2	6.0
A7	S	1.14	2.39	0.5	<0.7	1.0	<0.4					
A11	W	0.61	1.02	1.04	<3.6	<7	<7.3				15	15
A26	S	0.87	1.70	0.3	<1.0	0.6	< 0.4					
A33 (QC)	S	1.37	1.91	0.4	0.3	0.4	<0.3					
A39	S	1.19	1.6	0.7	0.7	0.6	<0.4					
A46	S	0.75	1.58	0.5	<0.6	0.5	0.5					
A51	S	0.87	1.45	0.7	0.6	0.8	<0.4					
A70	S	0.79	1.29	0.9	0.8	1.0	0.9					
B10	S	1.41	4.92	0.7	1.1	0.6	0.7					

APPENDIX K
(Continued)

Grid Location	Sample Type Soil/Sediment or Water	U-238 (pCi/g)[a]	Th-232 (pCi/g)	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Pb-214 (pCi/g)	Bi-214 (pCi/g)	Th-228/A (pCi/g)	Pb-212 (pCi/g)	Tl-208 (pCi/g)	Gross Alpha (pCi/L)	Gross Beta (pCi/L)
B61	S	0.79	0.81	0.4	0.3	0.4	0.4					
B64	S	1.71	.63	1.5	4.1	2.2	1.5					
B70	S	0.81	1.40	0.6	0.3	0.5	0.6					
C17	S	1.30	3.56	0.6	1.4	1.1	0.6					
C30	S	1.69	4.71	1.0	1.5	1.4	1.0					
C32	S	1.18	4.23	3.4	1.5	3.5	3.4					
C45	S	1.77	6.32	0.5	<0.5	0.7	0.5	1.8	1.7	1.7		
D11	S	1.20	3.00	0.5	1.0	0.7	<0.4					
D25	S	1.26	3.43	<0.3	<0.5	<0.2	<0.3					
D61	S	0.76	1.11	0.6	0.2	0.5	<0.3					
D66	S	0.82	1.57	0.6	0.3	0.5	<0.3					
E22	S	1.26	2.53	0.5	<0.5	0.4	0.5					
E30 (QC)	S	1.32	3.02	1.2	1.0	1.4	1.2					
E32	S	1.26	3.13	1.6	1.9	1.8	1.6					
E42	S	1.18	2.1	0.85			0.51	0.56	0.58	0.41		
E54	S	0.51	1.06	<0.6		0.43	0.38	0.60	0.47	0.42		
F43	S	1.15	1.80	0.74		0.44	0.40	0.56	0.46	.043		
F50	S	0.94	2.33	0.91		0.44	0.35	0.68	0.50	0.47		
F55	S	0.95	1.75	0.6	<0.8	1.0	0.6	0.47	0.50	0.32		
G14	S	3.31	8.61	1.6	2.9	1.4	<0.6					
G23	S	0.95	1.68	<0.3	<0.5	<0.2	<0.3					
G25	S	0.92	1.95	0.5	<0.5	0.4	0.5					

APPENDIX K
(Continued)

Grid Location	Sample Type: Soil/Sediment or Water	U-238 (pCi/g)*	Th-232 (pCi/g)	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Pb-214 (pCi/g)	Bi-214 (pCi/g)	Th-228/A (pCi/g)	Pb-212 (pCi/g)	Tl-208 (pCi/g)	Gross Alpha (pCi/L)	Gross Beta (pCi/L)
G30	S	3.49	10.16	3.5	9.0	3.3	3.5					
G38	S	1.12	1.81	1.1		0.81	0.66	0.52	0.55	0.47		
G38 (DUP)	S	1.52	2.43	1.4		0.72	0.59	0.60	0.53	0.67		
G39	W	0.48	1.71	1.38	<3.8	<8	<9.8				16	16
G39	S	1.77	1.85	2.3		1.5	1.3	0.93	0.97	0.10		
G48	S	0.81	2.15	1.6	<0.6	0.7	0.5	0.64	0.56	0.54		
G50	S			2.0		1.3	1.2	4.9	4.0	4.0		
G50	S	2.17	13.3	1.9	5.2	1.7	1.9					
G57	S	1.1	4.21	<0.2	<0.6	<0.3	<0.2	2.4	2.0	2.0		
G61	S	0.63	1.35	1.8		0.58	0.43	0.54	0.45	0.46		
H49	W	17.4	48.4	19.55	66	44	34				1220	888
H49 (QC)	W	8.1	15.6	10.07	21.1	15	14				488	353
H9	S	1.73	2.75	0.7	1.1	0.8	0.7					
I18	S	0.95	1.98	1.1	<1.7	0.9	1.1					
I31	S	0.83	3.06	0.6	<0.6	0.6	0.6					
I35 (QC)	S	1.02	2.99	0.4	0.7	0.6	0.4					
I35	S	1.02	2.99									
J76.5	S		1.38	<0.5		0.40	0.31	0.36	0.36	0.33		
J76.5 (DUP 1)	S			1.3		0.52	0.40	0.46	0.36	0.39		
J76.5 (DUP 2)	S			1.1		0.64	0.52	0.61	0.64	0.68		
L18	S	1.03	1.90	0.6	0.8	0.5	0.6					
N17	S	1.60	35.3	4.4	12	5.2	4.4					

APPENDIX K
(Continued)

Grid Location	Sample Type Soil/Sediment or Water	U-238 (pCi/g)*	Th-232 (pCi/g)	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Pb-214 (pCi/g)	Bi-214 (pCi/g)	Th-228/A (pCi/g)	Pb-212 (pCi/g)	Tl-208 (pCi/g)	Gross Alpha (pCi/L)	Gross Beta (pCi/L)
O15	S	2.36	4.43	0.7	1.5	1.0	0.7					
U67	S	1.43	2.53	1.1		0.61	0.48	0.74	0.77	0.54		
U73	S	1.21	1.47	0.5	0.6	0.4	0.5					
W60	S	1.23	2.42	<0.5		0.55	0.48	0.72	0.62	0.54		
X56	S	1.68	3.32	0.6	0.7	0.6	0.9					
X57	S	1.47	3.00	0.6	0.9	0.8	0.6					
X61	S	1.15	2.12	<.6		0.55	0.49	0.53	0.52	0.50		
Y50	S	1.66		0.7	1.0	0.6	0.7					
Y56	S	1.38	2.76	0.5	0.5	0.5	0.5					
Z53	S	1.78	2.15	1.1	0.9	1.0	0.9					
Z60	S	1.14	1.79	0.4	0.3	0.3	<0.2					
AA44	S	1.62	4.17	0.8	0.9	1.0	0.8					
AA45	S	1.44	4.17	0.7	1.4	1.0	0.7					
AA49	S	1.3	41.2	0.4	0.9	0.6	0.4					
BB53	S	1.03	1.47	0.70		0.46	0.46	0.53	0.43	0.39		
BB55	S	0.58	1.34	0.11		0.53	0.44	0.56	0.59	0.46		
BB60	S	0.93	1.31	0.3	0.3	0.3	0.3					
CC43	S	1.1	5.04	0.14		0.70	0.65	0.12	1.1	0.93		
DD39	S	1.28	3.50	<0.9		0.70	.064	1.1	.094	.093		
DD41	S											
DD45 (QC)	S	1.21	4.58	.090	3.6	0.90	<0.39					
DD45	S	1.43	7.54	1.1		0.73	0.63	2.6	2.1	2.2		

APPENDIX K
(Continued)

Grid Location	Sample Type Soil/Sediment or Water	U-238 (pCi/g)*	Th-232 (pCi/g)	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Pb-214 (pCi/g)	Bi-214 (pCi/g)	Th-228/A (pCi/g)	Pb-212 (pCi/g)	Tl-208 (pCi/g)	Gross Alpha (pCi/L)	Gross Beta (pCi/L)
DD47	S	1.01	1.84	<0.6		0.50	0.44	0.54	0.47	0.48		
DD50	S	1.00	2.43	0.84		0.49	0.47	0.50	0.44	0.54		
EE36	S	1.51	4.41	0.75		0.87	0.77	0.99	0.86	0.80		
EE38	S	1.38	2.11	0.6	0.3	0.6						
EE47	S	1.03	3.00	<0.6		0.69	0.62	1.0	0.99	0.81		
EE47 (DUP)	S					0.92	0.82	3.2	2.5	2.6		
EE54	S	0.86	1.24	0.2	0.2	0.2	0.2					
FF53	S	0.90	1.50	0.89		0.44	0.42	0.56	0.53	0.47		
FF56	S	1.14	1.31	0.94	0.5	0.5	0.5					
FF56 (QC)	S	1.11	1.47	0.5	0.4	0.5	0.4					
GG43	S	0.76	1.66	<0.7		0.54	0.45	0.46	0.47	0.45		
GG45	S	0.95	1.77	0.98		0.52	0.45	0.70	0.62	0.59		
HH50	S	1.13	1.58	<0.7		0.51	0.44	0.56		.04		
HH53	S	1.06	2.57	1.1		0.57	0.616	0.69	0.65	0.72		
Settling Pond, SE	S	1.26	2.19	1.3	0.7	1.1	1.3					
Settling Pond, E	S	2.77	2.59	4.4	4.0	4.9	4.4					
Settling Pond, SW	S	5.15	1.67	1.4	1.0	1.7	1.4					
Settling Pond, W	S	1.93	4.03	2.2	0.6	2.2	2.2					
Settling Pond, N	S	3.06	2.89	0.6	<0.6	0.5	0.6					
0+10, 10L	S	5.65	5.1	21	22	24	21					
-0+10, 10L	S	5.65		21	22	24	21					
-0+20	S	1.75	3.17	0.8	1	0.8	0.8					

APPENDIX K
(Continued)

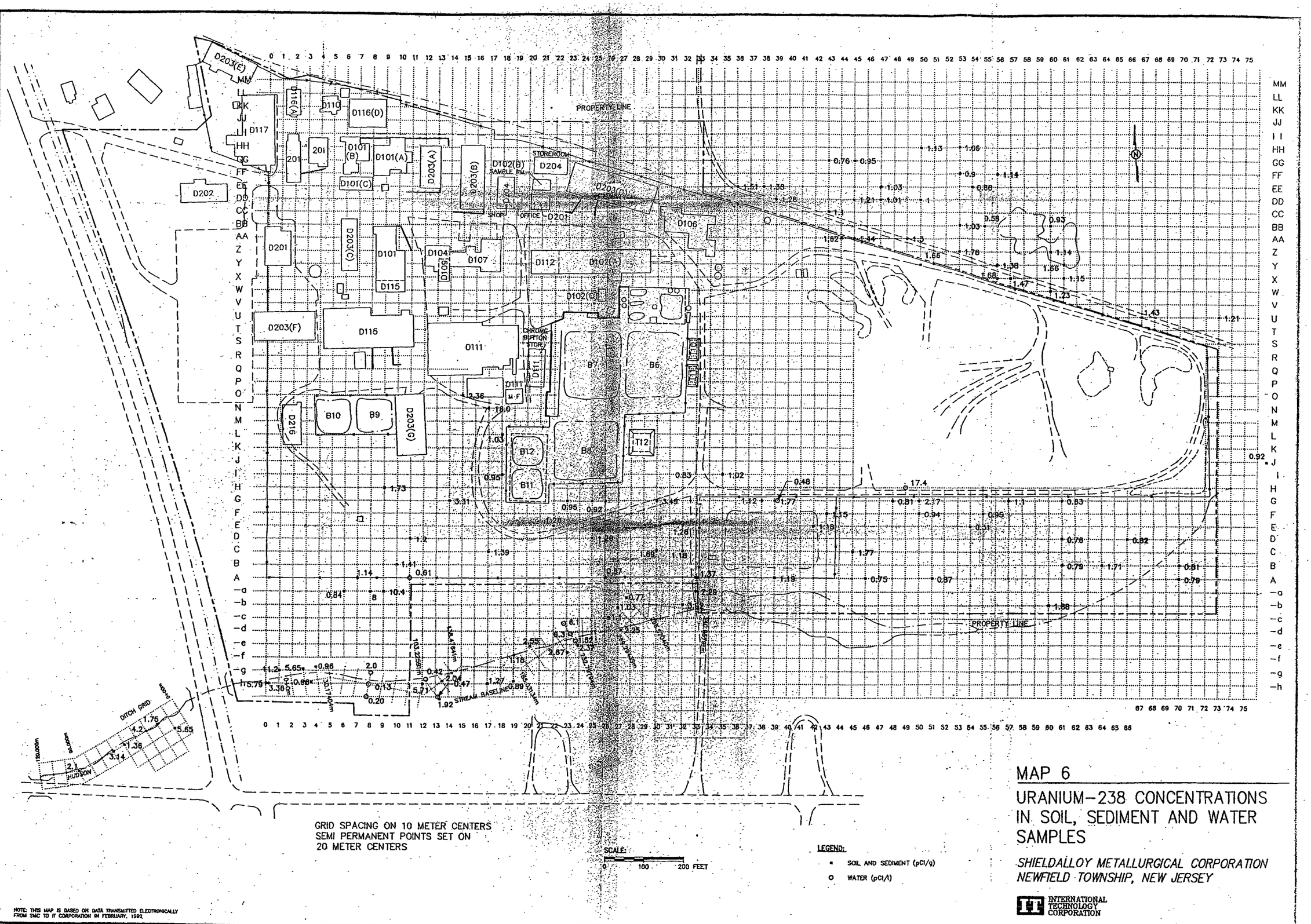
Grid Location	Sample Type Soil/Sediment or Water	U-238 (pCi/g)[a]	Th-232 (pCi/g)	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Pb-214 (pCi/g)	Bi-214 (pCi/g)	Th-228/A (pCi/g)	Pb-212 (pCi/g)	Tl-208 (pCi/g)	Gross Alpha (pCi/L)	Gross Beta (pCi/L)
-0+30	S	4.20		3.1	8.2	4.2	3.1					
-0+50	S	1.36	1.94	1.6	<1.1	1.3	1.6					
-0+50 (QC)	S	1.63	9.56	14	<11	14	<7.6					
-0+60	S	3.14	3.41	19	18	21	19					
-0+90	S	2.10	2.61	17	14	18	17					
-3+50 (QC)	S	1.63		14	<11	14	14					
0+20	S	2.57	1.38	2.4	1.6	2.6	2.4					
0+60, R	W	0.17	<0.079	0.71	<3.9	<9.2	<11				1.3	2.6
0+30, 10L	S	0.96	1.11	0.7	<0.7	0.8	<0.8					
0+60, L	W	1.98	1.48	15.2	9.9	10.4	9.0				86	65
0+100, 10L	S	5.71	8.86	34	30	36	34					
1+10	W	0.47	0.53	1.63	<3.9	9.0	10.0				9.9	10
1+10R	W										0	1.7
1+10L	W	0.42	<0.06	0.8	3.3	6.0	<5.6				1.5	1.8
1+10, 10R	S	1.92	2.34	4.7	.54	6.4	4.7					
1+20	S		2.63	7.0	4.2	7.4	7.0					
1+50, 10R	S	1.27	1.56	2.1	4.2	4.3	4.2					
1+60	W	0.18	0	0.69	0						7800	3600
1+80, 10R	S	0.89	1.62	1.9	2.8	4.4	3.8					
1+80, 10L	S	1.18	1.97	0.6	1.0	0.9	1.0					
1+100, 10L	S	2.55		12	8.1	13	12					
2+20	W	6.3	6.0	10.32	30.9	<2.1	<3.2				323	221

APPENDIX K
(Continued)

Grid Location	Sample Type: Soil/Sediment or Water	U-238 (pCi/g)*	Th-232 (pCi/g)	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Pb-214 (pCi/g)	Bi-214 (pCi/g)	Th-228/A (pCi/g)	Pb-212 (pCi/g)	TI-208 (pCi/g)	Gross Alpha (pCi/L)	Gross Beta (pCi/L)
2+20R	W	1.52	0.81	9.67	7.8	<8.8	<8.7				23	22
2+20L	W	6.1	5.72	33.11	36.3	59.9	46.0				247	239
2+20, 10R	S	2.67	2.93	<1.4	<1.0	<0.8	<1.0					
2+30, 10R	S	2.37	4.11	12	6.2	14	12					
2+60, 10L	S	1.10	1.31	0.5	0.3	20.7	0.5					
2+70	S	2.25	3.73	11	4.6	12	11					
2+80, 10L	S	1.03	1.11	0.4	0.3	0.5	<0.3					
2+90, 10L	S	0.77	1.68	0.6	0.8	0.8	0.6					
3+80, 10R,(QC)	S	1.38	1.51	8.1	3.8	8.2	8.1					
LOC-6	S			1.2		0.53	0.47	0.50	0.65	0.47		
BACKGROUND 1	S	0.83	1.48	^0.6	0.5	0.7	0.0					
BACKGROUND 2	S	1.38	0.28	1.0		0.51	0.47	0.55	0.47	0.44		
BACKGROUND 3	S	1.37	1.91	0.82		0.20	0.19	0.21	0.33	0.29		
BACKGROUND 4	S	0.92	1.68	<0.5		0.30	0.28	0.44	0.34	0.32		
BACKGROUND 5	S	1.04	1.19	0.85		0.32	0.31	0.43	0.42	0.27		
BACKGROUND 6	S	0.42	1.35	0.81		0.38	0.31	0.37	0.37	0.26		
J76.5 (BACKGROUND)	S	0.86	1.71									
J76.5 (BACKGROUND)	S	0.99	1.87									

* pCi/L for water samples

INITIATOR: H. PRICHARD | DRAWING NO.: 4644090-D-04
PROJECT MGR.: C. BERGER | PROJECT NO.: 4644090
STARTING DATE: 03/04/92 | DATE LAST REV.:
DRAWN BY: J. TABLER | DRAWN BY:



GRID SPACING ON 10 METER CENTERS
SEMI PERMANENT POINTS SET ON
20 METER CENTERS

SCALE:
0 100 200 FEET

LEGEND:
- SOIL AND SEDIMENT (pCi/g)
- WATER (pCi/l)

MAP 6

URANIUM-238 CONCENTRATIONS IN SOIL, SEDIMENT AND WATER SAMPLES

SHIELDALLOY METALLURGICAL CORPORATION
NEWFIELD TOWNSHIP, NEW JERSEY

INTERNATIONAL TECHNOLOGY CORPORATION

NOTE: THIS MAP IS BASED ON DATA TRANSMITTED ELECTRONICALLY FROM SMC TO IT CORPORATION IN FEBRUARY, 1992

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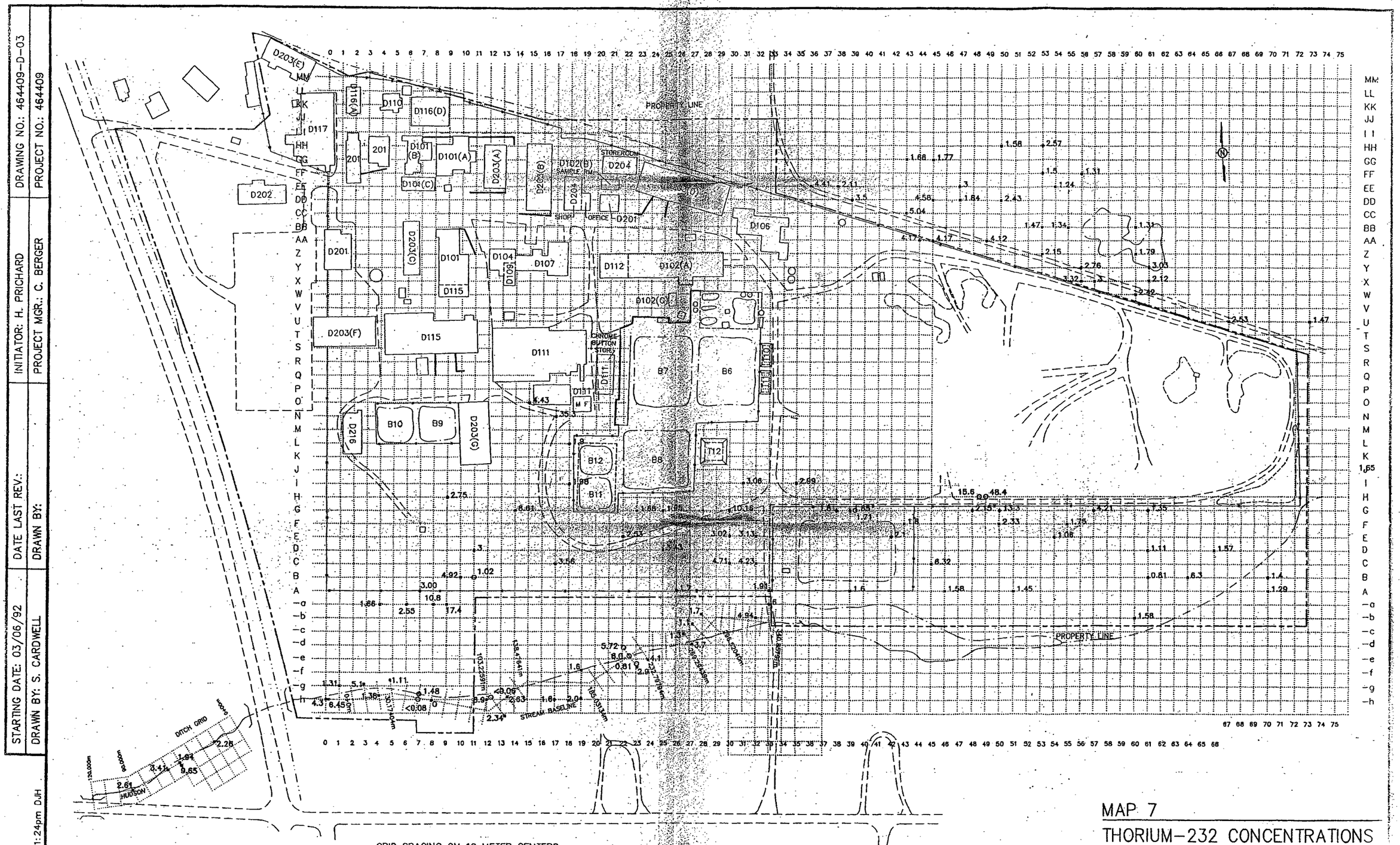


GRID SPACING ON 10 METER CENTERS
SEMI PERMANENT POINTS SET ON
20 METER CENTERS

(HUB, IRON PIN, RR SPIKE OR DRILL HOLE)

SCALE:
0 100 200 FEET

LEGEND:

- SOIL AND SEDIMENT (pCi/g)
- WATER (pCi/l)

NOTE: THIS MAP IS BASED ON DATA TRANSMITTED ELECTRONICALLY FROM SMC TO IT CORPORATION IN FEBRUARY, 1992

MAP 7

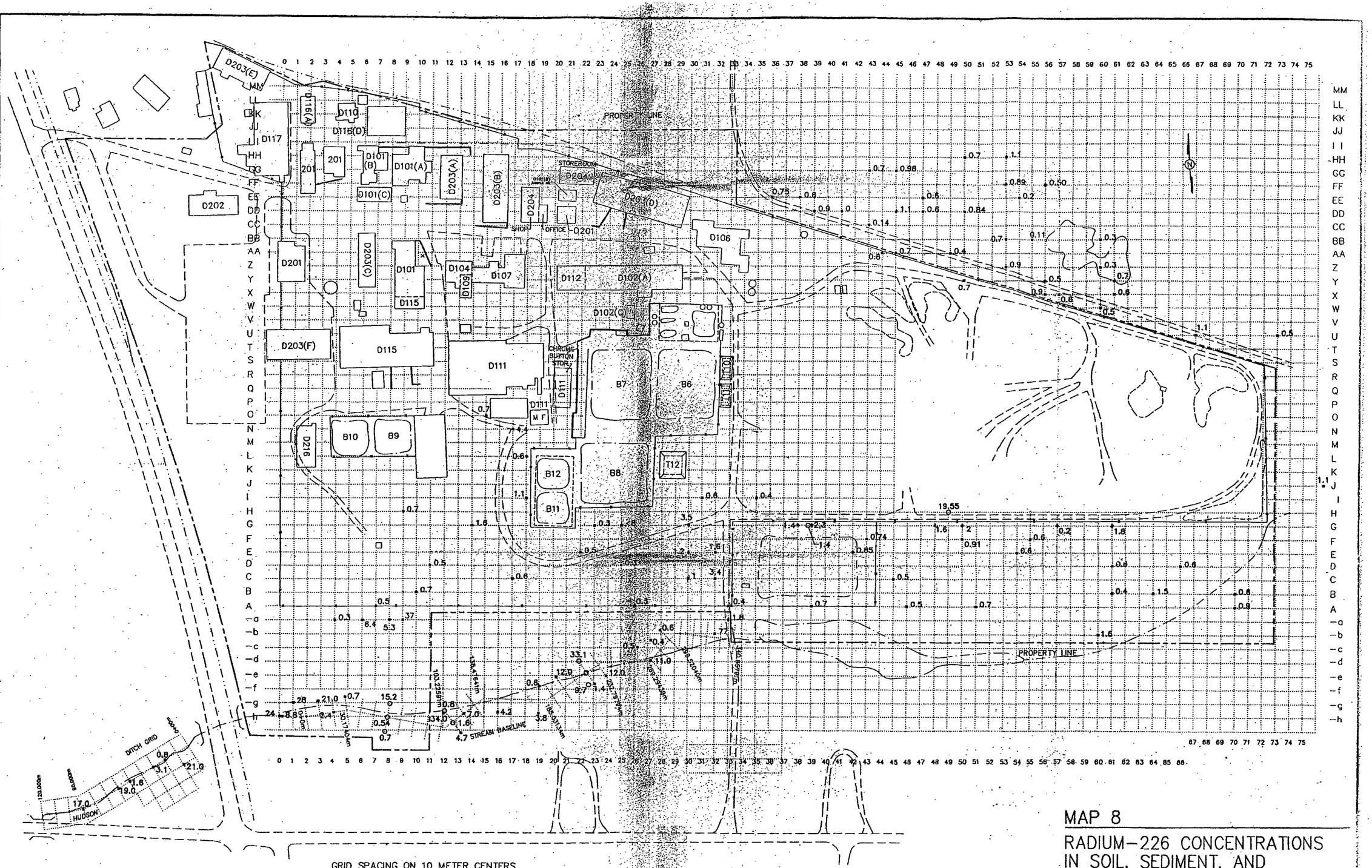
THORIUM-232 CONCENTRATIONS IN SOIL AND WATER SAMPLES

SHIELDALLOY METALLURGICAL CORPORATION
NEWFIELD TOWNSHIP, NEW JERSEY

INTERNATIONAL TECHNOLOGY CORPORATION

INITIATOR: H. PRICHARD	DRAWING NO.: 464409-D-03
PROJECT MGR.: C. BERGER	PROJECT NO.: 464409
STARTING DATE: 03/06/92	DATE LAST REV.:
DRAWN BY: S. CARDWELL	DRAWN BY:

46440903 03/28/92 1:24pm DJH



NOTE: THIS MAP IS BASED ON DATA TRANSMITTED ELECTRONICALLY FROM SMC TO IT CORPORATION IN FEBRUARY, 1992

MAP 8

RADIUM-226 CONCENTRATIONS IN SOIL, SEDIMENT, AND WATER SAMPLES

SHIELDALLOY METALLURGICAL CORPORATION
NEWFIELD TOWNSHIP, NEW JERSEY

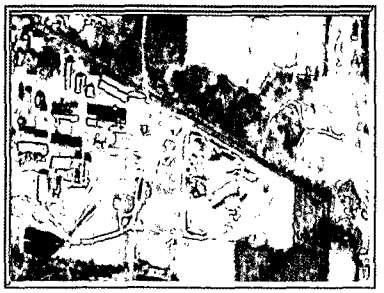
INTERNATIONAL TECHNOLOGY CORPORATION

INITIATOR: H. PRICHARD	DRAWING NO.: 464409-D-07
PROJECT MGR.: C. BERGER	PROJECT NO.: 464409
STARTING DATE: 03/17/92	DATE LAST REV.:
DRAWN BY: BILL SMITH	DRAWN BY:

46440907 03/26/92 1:53pm GWP

Appendix 19.15 - Final Status Survey Plan

Final Status Survey Plan for the SMC facility



Shieldalloy Metallurgical Corporation

Report No. 94005/G-29361

Final Status Survey Plan for the SMC Facility

Submitted to:

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Report No. 94005/G-29361
August 22, 2009

TABLE OF CONTENTS

1 INTRODUCTION 1

2 FACILITY STATUS 2
2.1 Background Information 2
2.2 Description of Facility 2
2.3 Contaminant Identification 4
2.4 Results of Previous Surveys 4
2.5 Area Classification 5
2.6 Unrestricted and Restricted Release 5

3 FINAL STATUS SURVEY PLAN 6
3.1 Objective 6
3.2 Approach 6

4 RELEASE CRITERIA 7
4.1 Unrestricted Release Provisions 7
4.2 Restricted Release Provisions 7
4.3 Dose Assessment Methodology 7

5 SURVEY DESIGN 9
5.1 Data Quality Objective 9
5.2 Non-Parametric Statistics 10
5.3 Decision Error 11
5.4 Relative Shift 11
5.5 Number of Measurements 12
5.5.1 Probability of Exceeding the DCGL 12
5.5.2 Determine the Decision Errors 12
5.5.3 Number of Data Points 12
5.6 Frequency of Measurements 12
5.7 Site Design 13
5.8 Elevated Measurement Criteria 14

6 SURVEY PROCEDURE 15
6.1 Survey Unit Classification 15
6.1.1 Class 1 Survey Units 16
6.1.2 Class 2 Survey Units 16
6.1.3 Class 3 Survey Units 16
6.2 Survey Package Development 17
6.3 Survey Requirements 17
6.3.1 Surface Scans 17
6.3.2 Direct Alpha/Beta Measurements 18
6.3.3 Removable Activity Measurements 18
6.3.4 Measurement Grid Spacing 18
6.3.5 Sample Collection 19
6.3.6 Sample Analysis 20
6.4 Investigation Levels 20
6.5 Survey Records 20

7 INSTRUMENTATION 22
7.1 Selection Criteria 22
7.2 Calibration Sources 23
7.3 Response Checks 23
7.4 Minimum Detectable Activity 23
7.4.1 Direct Alpha/Beta Measurements 24
7.4.2 Alpha/Beta Scans 24
7.4.3 In-situ Measurements 24
7.4.4 Analytical Instrument Description 24

8 DATA ANALYSIS 26
8.1 Data Assessment 26
8.2 Data Validation 26
8.3 Requirements for Release 26
8.4 Statistical Evaluation 27
8.5 Elevated Measurement Comparison 27

9 QUALITY CONTROL 28
9.1 Personnel 28
9.2 Training 28
9.3 Written Procedures 28
9.4 Selection of Instruments 28
9.5 Survey Documentation 28
9.6 Chain of Custody 29
9.7 Records Management 29
9.8 Duplicate Review of Survey Results 29
9.9 Survey Report 29

10 REPORTING 30

11 TABLES 32
Table 11.1 - Background Soil Concentrations 33
Table 11.2 - Soil DCGLs 34
Table 11.3 - Building Surface DCGLs 35
Table 11.4 - Area Factors for Outdoor Radiation Surveys 36
Table 11.5 - Instrumentation 37
Table 11.6 - Survey Requirements 38
Table 11.7 - Investigation Action 39
Table 11.8 - Survey and Sampling Summary 40

12 FIGURES 42
Figure 12.1 - Site Layout and Area Classifications 43

13 APPENDICES 45
Appendix 13.1 - Justification for Survey Design (VSP Output) 46

1 INTRODUCTION

This Final Status Survey Plan (FSSP) was prepared as part of the decommissioning planning at the Shieldalloy Metallurgical Corporation (SMC) facility in Newfield , New Jersey. The facilities and grounds subject to decommissioning activities were used in the past for a variety of manufacturing, waste handling and storage operations for more than 50 years. Some of these operations involved the use of raw materials that contained naturally-occurring radioactivity. Residual radioactivity from those operations is or may be present in buildings and land areas. The preponderance is in the form of slag from the manufacturing operation that contains licensable quantities of uranium and thorium.

SMC is pursuing a decommissioning approach to release most of the site for unrestricted use, while maintaining a portion of the property as a radiologically restricted area. The restricted area would be subject to the provisions of a Long Term Control (LTC) license, issued by the U. S. Nuclear Regulatory Commission (NRC). The NRC and SMC are in communication towards approval of the Decommissioning Plan (DP) for the site. This FSSP has been designed under the assumption that radiological conditions at the SMC facility will not change in any way as to affect the validity of the plan while awaiting the approval of the DP.

Following consolidation of all residual activity in the Storage Yard, located on the eastern portion of the property, an engineered barrier will be installed over this material. SMC will then conduct the Final Status Survey (FSS) of the impacted buildings and grounds in order to demonstrate that they may be released for unrestricted release. The area in which the engineered barrier is located, which will remain a restricted area, will be subject to a separate FSS to demonstrate compliance with NRC requirements for restricted release. Both of the surveys will follow protocols and methods established in the *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*.[1] The primary purpose of the FSSs will be to confirm that the former radiologically-controlled and/or impacted areas of the site, associated with former licensed operation, meet the dose criteria contained in Title 10, Code of Federal Regulations, Parts 20.1402 and 20.1403 (10 CFR 20.1402 and 20.1403).

This FSSP contains the work plan for the survey and release of the unrestricted and restricted portions of the property. Included in this plan is a description of the current radiological status of the buildings and grounds, the applicable dose criteria, the survey methodologies, instrumentation, quality control requirements, and the methods for data analysis and reporting.

[1] U.S. Nuclear Regulatory Commission, *Multi-Agency Radiation Survey and Site Investigation Manual*, NUREG 1575, Revision 1, August, 2000.

2 FACILITY STATUS

2.1 Background Information

At its Newfield, New Jersey facility, SMC manufactured specialty steel and super alloy additives primarily aluminum master alloys, ferroalloys, metal carbides, powdered metals, and optical surfacing products. Raw material used at the facility included ores which contained oxides of columbium (niobium), chromium, vanadium, aluminum metal, titanium metal, strontium metal, zirconium metal, and fluoride (titanium and boron) salts. Slag, dross and baghouse dust were generated as a result of the manufacturing processes.

One of the materials received, used and stored by SMC at Newfield contained radioactivity at a level that classified it as "source material" pursuant to 10 CFR 40. This material, called pyrochlore, was a concentrated ore containing columbium (niobium) and greater than 0.05% of natural uranium and natural thorium. Therefore, its possession and use are subject to licensing by the NRC.

SMC currently holds USRNC License No. SMB-743 which, at one time, allowed the possession, use, storage, transfer and disposal of source material at its Newfield, New Jersey site. At this time, manufacturing operations at Newfield have ceased and the license authorizes only the storage of licensed source material pending decommissioning.

A DP has been prepared for the site, wherein SMC proposes to consolidate all residual radioactive materials within the existing Storage Yard, located in the eastern portion of the plant. There it will be graded, covered with an engineered barrier and subject to long-term maintenance, monitoring and control under NRC supervision and control. Once the DP is approved, SMCs license will be amended to authorize decommissioning activities only as specified in the approved plan.

This FSSP and the provisions described herein, will be implemented as part of the DP. It is, in essence, a work plan for the survey and release of the facility and grounds under provisions for unrestricted release of the majority of the site, and under provisions of restricted release for the eastern portion of the property where residual radioactivity will be consolidated under the engineered barrier. When the decommissioning is complete and the NRC has confirmed that all provisions in the DP have been met, the site will be available for unrestricted use with the exception of the restricted area consisting of the engineered barrier. The radioactive materials license will then be amended to an LTC license and will be subject to the provisions of that license in perpetuity.

2.2 Description of Facility

The SMC facility is located at 35 South West Boulevard in Newfield, New Jersey. The primary portion of the site, consisting of the manufacturing facilities and their support areas, covers 67.7 acres.[2] The immediate area around the site is a mixture of industrial, agricultural and residential usage.

Most of the 68-acre SMC facility has never been impacted by licensed operations or has already been surveyed, remediated as applicable, and released for unrestricted use by the NRC. The visitor center, administrative offices, Department 107 (D107), Department 101 (D101), Department 115 (D115), Department 116 (D116), Department 118 (D118), Department 203 (C Warehouse, E/Fox

[2] An additional 19.8 acres of farmland, located approximately 2,000 feet southwest of the primary site are also owned by SMC but they are not subject to the provisions of the DP.

Warehouse, F Warehouse and H Warehouse), and Department 204 (D204) never housed radioactive materials. The following structures or facilities were, at one time, involved in licensed operations, but have since been released for unrestricted use by the NRC based upon the findings of FSSs:

- Department 203 (A Warehouse, B Warehouse, G Warehouse and D Warehouse);
- AAF Baghouse;[3] and
- Ferrovanadium slag sorting area in the Storage Yard (recently re-forested).[4,5,6,7]

The following buildings were impacted by licensed operations but have been demolished, with all materials either beneficially recycled, disposed of as industrial waste, stockpiled pending eventual disposal as non-radioactive waste or placed into the Storage Yard (Areas 2 and 5):

- The D111 ferrocolumbium production operations building; and
- The D102/112 aluminothermic reduction and materials crushing operations building.

Documentation of the radiological status of the footprint of the demolished buildings will be included as part of the site-wide FSS.

Over 20 buildings remain on the property. Small quantities of source material were occasionally stored in three of them, but they were not designated as restricted areas on License No. SMB-743. These are D117 (Cave), D202 (QA/QC Laboratory) and D Warehouse.[8]

The Storage Yard on the eastern portion of the property was used to store materials generated during manufacturing operations. Slag, baghouse dust and other materials generated during licensable ore processing were stored in this area, along with excavated soils and other similar materials. Other undeveloped plant property along the southern boundary includes all undeveloped and unused areas of the plant.

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[3] The concrete pad for the AAF Baghouse was excavated and moved to Area 5 of the Storage Yard.

[4] Shieldalloy Metallurgical Corporation, License Amendment Application to remove D203A (known as "A-Warehouse") from listing of permanent restricted areas, submitted on January 28, 1999. Amendment issued on July 20, 1999; Shieldalloy Metallurgical Corporation, "License Amendment Application to Remove Bldg. D203(G), also known as "G-Warehouse" from the listing of permanent restricted areas, submitted March 30, 2001; Shieldalloy Metallurgical Corporation, "License Amendment Application to Remove AAF Baghouse from the listing of permanent restricted areas, submitted January 30, 2000; Integrated Environmental Management, Inc., Report No. 94005/G-18198, "Soil Sampling/Survey of Storage Yard After Remediation", submitted to Shieldalloy Metallurgical Corporation, January 20, 2000.

[5] Shieldalloy Metallurgical Corporation, "License Amendment Application to Remove Bldg. D203(G), also known as "G-Warehouse" from the listing of permanent restricted areas, submitted March 30, 2001.

[6] Shieldalloy Metallurgical Corporation, "License Amendment Application to Remove AAF Baghouse from the listing of permanent restricted areas, submitted January 30, 2000.

[7] Integrated Environmental Management, Inc., Report No. 94005/G-18198, "Soil Sampling/Survey of Storage Yard After Remediation", submitted to Shieldalloy Metallurgical Corporation, January 20, 2000.

[8] In 2008, D202 was re-developed as office space.

Figure 12.1 shows the location and size of the impacted areas. As shown on the drawing, the area that is designated to be released for restricted use is located within the Storage Yard. All other areas at the SMC facility will be released for unrestricted use and will be designated as the unrestricted area.

2.3 Contaminant Identification

The NRC issued License No. SMB-743 to SMC, which authorized the company to ship, receive, possess, use, and store source material ancillary to metallurgical operations. The majority of the licensed radioactive material is in the form of slag generated during former D111 production department operations and dust from the former D111 baghouses.[9] The radionuclides of concern are natural thorium and uranium and their decay progeny that are in general equilibrium with their parents. More information about the radionuclides, quantities and locations within the Storage Yard can be found in the Source Term document.[10] The radionuclides of interest in the unrestricted area are identical to those in the Storage Yard (i.e., natural uranium and thorium and their decay progeny).

2.4 Results of Previous Surveys

A number of radiation surveys have been performed at the site for purposes of routine surveillance and for site-wide characterization. A summary of results is given in Chapter 4 of the DP. In general there is no evidence of residual radioactivity in any of the buildings and structures, and by far the majority of the activity is present in the Storage Yard.

Residual radioactivity does exist in the vicinity of the former D111 and D102 production buildings, with surface count rates in that area of up to five (5) times the soil background count rates. There is also evidence of residual radioactivity on the southwest fence line of the property, which is a runoff location from the D111 production area.

During a 1991 characterization effort, count rates above soil background levels were noted at a variety of other areas around the plant that were not influenced by licensed operations.[11] Resurvey of those areas in 2007 confirmed that residual radioactivity above the soil background level is present across the street from the former laboratory building (in an area west of the former Borough of Newfield well house), near the north fence line of the property, and in other small, discrete areas. The count rates in those areas range to about six (6) times the soil background count rates, with the depth of deposition of about one (1) foot or less. All are attributed to fluctuations in the natural background from industrial activities that have no relationship to the licensed operations that took place at the site.[12]

Also in 2007 and again in 2008, a series of survey and sampling campaigns took place in the location of the Hudson Branch watershed that runs along the southern border of SMC's property.

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[9] Integrated Environmental Management, Inc., *Source Term Document*, Newfield Facility, Report Number 94005/G-29358, January 15, 2008.

[10] Integrated Environmental Management, Inc., *Source Term Document*, Newfield Facility, Report Number 94005/G-29358, January 15, 2008.

[11] IT Corporation, "Assessment of Environmental Radiological Conditions at the Newfield Facility", Report No. IT/NS-92-106, April 2, 1992.

[12] Berger, C. D., Letter Report No. 94005/G-3205386, "Background Data Set for the Newfield Site", 2009.

These data, contained within a 2008 report, show the presence of radioactivity only marginally above the soil background.[13]

2.5 Area Classification

For the purpose of this FSSP, the Newfield property has been partitioned into impacted and non-impacted areas. The impacted areas have been designated as Class 1, 2, or 3, which indicate the level of survey effort required to meet FSS requirements under MARSSIM. These areas will be further divided into individual survey units. The mechanism for demonstrating compliance with release criteria is based on statistical and elevated measurements tests for each individual survey unit. Figure 12.1 shows the classification of all areas at the SMC facility.

2.6 Unrestricted and Restricted Release

For most of the site, survey units in impacted areas will be individually released for unrestricted use. These areas are assumed to have residual radioactivity, if any, in concentrations that are below the release criteria and thus require no further remediation. The remainder of the site inventory will be consolidated under the engineered barrier, which will be placed inside the borders of the restricted area. All areas, whether subject to unrestricted or restricted release provisions, will then undergo a FSS to demonstrate compliance with the 25 millirem per year NRC dose limit. Additionally, the restricted release provisions will require that a 100 millirem per year dose limit apply in the unlikely event that all controls and restrictions fail.

[13] Integrated Environmental Management, Inc., Report No. 94005/G-31360, "Focused Radiological Characterization of the Newfield Facility", October 24, 2008.

3 FINAL STATUS SURVEY PLAN

3.1 Objective

Once all remedial actions are complete, the FSS will be performed, the data acquired will be validated, and a FSS Report will be prepared and submitted with SMC's application to release the majority of the site from License No. SMB-743, and subject the remainder of the site to LTC provisions. The objective of the FSS is to collect sufficient information to demonstrate, to a reasonable degree of statistical certainty, that the residual radioactivity levels at the site do not exceed applicable Derived Concentration Guideline Levels (DCGLs), and that the license termination criteria for unrestricted and restricted release have been met. The assigned survey units represent the fundamental elements for compliance demonstration using statistical tests.

3.2 Approach

This FSSP has been prepared by SMC using guidance provided in NUREG-1575 (MARSSIM) and NUREG-1757.[14,15]. The FSS has been designed to ensure the final condition of the site satisfies the release criteria defined in Section 4.1 of this plan. These documents provide detailed guidance on the classification, selection, and size of the areas to be surveyed; survey instrumentation requirements; quantity and quality of data to be collected; unbiased sampling methods; and methods for evaluating survey results.

Methodologies for measuring residual radioactivity in soil and on building surfaces will satisfy the requirements of MARSSIM to the extent practical based on the nature and configuration of the radioactivity. SMC may use other guidance documents in conjunction with MARSSIM to design the survey so it meets the applicable data quality objectives (DQO). The DQOs are specifically defined in Section 5.1 of this FSSP.

FSSs in specific survey units may be performed as remedial tasks progress, as well as at the conclusion of work activities. Depending on the portion of the site undergoing remediation, areas in which the FSS has been completed will only be those that cannot be impacted by the remediation.

[14] U.S. Nuclear Regulatory Commission, *Multi-Agency Radiation Survey and Site Investigation Manual*, NUREG 1575, Revision 1, August, 2000.

[15] U.S. Nuclear Regulatory Commission, *Consolidated NMSS Decommissioning Guidance - Characterization, Survey, and Determination of Radiological Criteria*, NUREG 1757, Volume 2, September, 2003.

4 RELEASE CRITERIA

4.1 Unrestricted Release Provisions

SMC is currently licensed by the NRC to possess the radionuclides of concern at the SMC facility. The NRC has established criteria for ensuring that facilities and property that were used for licensed operations present negligible radiological risk to people and the environment once licensed operations cease. The radiation dose limit that the NRC has established as contributing a negligible risk to members of the public is 25 millirem, as published in 10 CFR 20.1402):

> *"Decommissioning with license termination shall be limited to sites considered acceptable for unrestricted release where the residual radioactivity that is distinguishable from background radiation results in a total effective dose equivalent to an average member of the critical group that does not exceed twenty-five millirem per year (25 mrem/yr), including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA)..."*

4.2 Restricted Release Provisions

This same 25 millirem dose limit will be applied to areas released for restricted use with the engineered barrier in place and other controls in place. However, in the unlikely event all of these controls should fail in a way that permits the engineered barrier to be breached, doses may not exceed 100 millirem per year as shown in 10 CFR 20.1403:

> *"A site will be considered acceptable for license termination under restricted conditions if: . . . (e) Residual activity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either- (e)(1) 100 mrem (1 mSv) per year-, . ."*

4.3 Dose Assessment Methodology

The level of residual radioactivity permissible for unrestricted and restricted release of building surfaces, demolished building footprints, soils and the engineered barrier must be demonstrated by compliance with the aforementioned radiation dose limits. Compliance with these limits are determined by means of exposure assessments where measured radioactivity levels are statistically shown to be below the DCGLs as described in MARSSIM.

The DCGLs were derived from NRC-approved dose modeling codes, using input parameters that are specific to the site and reasonably likely exposure scenarios. The derivation approach and basis are shown in the DCGL document and are summarized herein in Table 11.2 for land areas and in Table 11.3 for building surfaces.[16]

The residual radioactivity on the buildings inner surfaces are (e.g., walls, floors, ceilings) is assumed to be surficial and non-volumetric.[17] Furthermore, because of previous general cleaning efforts in the existing buildings, residual radioactivity on surfaces, if any, will be fixed (not loose), with the fraction of loose (removable) residual radioactivity no greater than 10 % of the total surface activity.

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[16] Integrated Environmental Management, Inc., Report No. 94005/G-29357, "Derived Concentration Guideline Levels for the Newfield Site", January 27, 2009.

[17] This was confirmed to be the case during the survey and release of other buildings at the site.

Therefore, the DCGLs established for building surfaces are applicable only to surface radiological conditions and not to buried structures (e.g., drainage or sewer pipes) or equipment.

To facilitate the performance of field measurements, in light of the presence of more than one radionuclide, gross activity DCGLs for each medium were determined, based on the unity rule, as follows:

$$\textit{Gross Activity DCGL} = \frac{1}{\frac{f_{Th-232}}{DCGL_{Th-232}} + \frac{f_{U-234}}{DCGL_{U-234}} + \frac{f_{U-235}}{DCGL_{U-235}} + \frac{f_{U-238}}{DCGL_{U-238}}}$$

where f = the relative fraction of the total activity contributed by the radionuclide. However, it is recognized that for the radionuclides of concern, namely naturally-occurring uranium and thorium and their progeny, the thorium series is more limiting than uranium, by as much as a factor of 100. Therefore, these considerations have been incorporated into the survey design.

5 SURVEY DESIGN

5.1 Data Quality Objective

The objective of this survey plan is to verify the proper release of SMC buildings and grounds in accordance with guidance established by the NRC and MARSSIM.[18] This objective is accomplished by setting the following requirements for data collection:

- Selecting appropriate instrumentation that can adequately detect the radionuclides of concern;
- Establishing proper count times and measurement methods to verify that the release criteria are met;
- Performing accurate surveys to demonstrate the radiological status of the facility;
- Appropriately assessing instrument detection levels;
- Appropriately identifying reference areas to establish relevant background levels;
- Utilizing acceptable methods for identifying small areas of elevated activity; and
- Implementing appropriate control over the quality of data produced.

The data collection effort will provide input into the following decisions:

- Verifying that exposure to members of the public from residual contamination will not exceed 25 mrem/year based on the future use of the facility; and
- Evaluating the data to ensure that sufficient information is collected to release the buildings and surrounding areas for unrestricted use and the Storage Yard with its engineered barrier for restricted use.

The minimum information required to accomplish the proper release of the buildings and grounds at the SMC facility are as follows:

- Impacted areas are classified by contamination potential as Class 1, Class 2 or Class 3 areas, as described in Section 7.1 of this plan. Survey unit boundaries are specified based on common history.
- Statistical testing is based on the null hypothesis, which states that the residual radioactivity in the survey unit exceeds the site dose criterion. This process is described in Section 5.3 of this report.

[18] U.S. Nuclear Regulatory Commission, *Multi-agency Radiation Survey and Site Investigation Manual*, NUREG-1575, Revision 1, August, 2000.

- The upper bound of the gray region is defined as the DCGL, and the lower bound of the gray region (LBGR) is 0.5 times the DCGL. This process is described in Section 5.4 of this report.

- The Type I decision error is defined as the probability of passing a survey unit that should fail. The Type II decision error is defined as the probability of failing a survey that should pass. Probability limits of 0.05 are assigned for the Type I (α) decision error and 0.25 for the Type II (β) decision error, as described in Section 5.3 of this report.

- The standard deviation is estimated as 0.2 x DCGL and is described in Section 5.4 of this report.

- The relative shift is calculated to be greater than 1.5, and normally ranges between 1.5 and 3. The derivation process is described in Section 5.4 of this report.

- The detection and sensitivity for all measurement techniques (scan, direct measurements and sample analysis) will be established at less than 70 percent of the DCGL. For this project, the methods and procedures to scan soil using gross gamma measurements should be able to detect radioactivity at less than 70 percent of the DCGL for all measurements other than gamma scanning. As described in the MARSSIM, additional samples must be taken to compensate for scanning limitations.

- The minimum number of measurements/samples collected in a Class 1 or 2 survey unit is nine (9) samples or measurements, along with nine (9) background measurements.[19] This number may be increased if required because of the potential for small areas of elevated residual radioactivity. Class 3 survey units will require a minimum of five (5) samples or measurements and five (5) background measurements. The approach to supplement the scanning data with discrete soil samples is described in Section 5.7 of this report. The selection of measurement locations depends on the classification of survey units, as shown in Section 7.1 of this FSSP.

- The documentation requirements for the survey, including the survey planning documentation, supports the decision whether or not the survey unit complies with the site release criteria. The survey records are described in Section 7.5, below.

5.2 Non-Parametric Statistics

Compliance with the DCGL for building surfaces, concrete pads, soil, and the engineered barrier is, with one exception, demonstrated by collecting direct measurements, scanning surfaces and collecting and analyzing samples. The one exception is the engineered barrier itself, where no soil samples will be collected.[20] However, the contaminants of concern at the SMC facility are present in the natural background. Therefore, if any data points above the applicable DCGLs are identified

[19] MARSSIM Table 5.3 using a relative shift value of 1.5 and Type I decision error of 0.05 and a Type II decision error of 0.25.

[20] The radiological status of all of the engineered barrier components will have been evaluated prior to installation (see Appendix 19.7 and 19.8 of the DP).

during data acquisition, the Wilcoxon Rank Sum (WRS) Test will be used to evaluate whether the entire data set reflects statistical compliance with the DCGLs.[21] The WRS test will be used to evaluate survey data from survey units in which the average of the direct alpha and beta measurements are expected to be less than the DCGL but may have individual measurement results, within the data set, in excess of the DCGL. Each survey unit evaluated in this manner will be compared to an appropriately-selected reference area.[22] If an individual measurement result exceeds the DCGL, the area from which the measurement was performed will then evaluated using the elevated measurement criteria. Data sets for which all measurement results are below the DCGL, or where the data are indistinguishable from background, will be evaluated by visual inspection of the data to confirm the release criteria have been met.

5.3 Decision Error

There are two types of decision errors applicable to the survey and analytical results. These are Type I (α) and Type II (β) errors. A Type I error, or false positive, refers to the probability that a survey result/measurement is above the release criteria when in fact it is not. On the other hand, a Type II error, or false negative, is the probability of determining that a result/measurement is below the release criteria when it is not.

The probability of making decision errors can be controlled by adopting an approach called hypothesis testing. In this case, the null hypothesis (H_0) will be treated like a baseline condition. As specified in MARSSIM, H_0 is that residual radioactivity in the survey which exceeds the applicable release criterion.[23] This means that the site or survey area will be assumed contaminated until proven otherwise. For testing of the surveys at the SMC facility, Type I (α) errors are set at 0.05 and Type II (β) errors are set at 0.25 or 25 percent. Type I errors have risk impacts that are more tightly managed. Type II errors have cost impacts.

5.4 Relative Shift

The relative shift is defined as "Δ/σ" where "Δ" is the DCGL minus the Lower Bound of the Gray Region (LBGR) and the"σ" is the standard deviation of the contaminant distribution. In order to calculate the relative shift, the DCGL must be determined and two assumptions made to estimate the LBGR and the standard deviation of the measurement distribution.[24] The standard deviation may be calculated from preliminary survey data, prior surveys of similar areas and materials, or from the standard deviation of a reference background area. However, it is important to note that the "σ" represents the standard deviation in data acquired *prior* to release and when all area decontamination is thought to be complete.[25] For Class 1 and Class 2 surveys, Δ/σ is set between 1 and 3 and typically set at 1.5. For Class 3 surveys, Δ/σ is expected to be greater than 3.

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[21] U.S. Nuclear Regulatory Commission, *Using Decision Methods for Dose Assessment to Comply with Radiological Crieria for License Termination*, NUREG 1549, Draft, July, 1998.

[22] Berger, C. D., Letter Report No. 94005/G-3205386, "Background Data Set for the Newfield Site", 2009.

[23] U.S. Nuclear Regulatory Commission, *Multi-agency Radiation Survey and Site Investigation Manual*, NUREG-1575, Revision 1, August, 2000.

[24] MARSSIM suggests that the LBGR be set at approximately 50% of the DCGL but that value can be adjusted later to provide a value for the relative shift between the range of 1 to 3.

[25] If no reference data are available to make a reasonable estimate, MARSSIM suggests using 30% of the mean survey unit background value.

5.5 Number of Measurements

The number of measurements to be made within each survey unit depends on the non-parametric statistics used to test the null hypothesis, acceptable decision errors, and the relative shift. Pursuant to MARSSIM guidance, the minimum number of measurements for a survey unit is nine (9) foreground and nine (9) background. Class 3 survey units require five (5) each of foreground and background measurements. In cases where scanning sensitivities are not adequate for detecting the DCGL, the number of measurements will be increased appropriately to provide spatial assessment of small areas of elevated activity.

Since non-radionuclide-specific direct measurements will be made for the building surfaces and grounds, the number of measurements will be determined using the WRS Test, which requires the evaluation of appropriately chosen reference areas as well as the survey unit itself. The number of measurements, N/2, represents the number of measurements to be collected from each survey unit. An equal number of measurements, N/2, will be collected from an appropriate reference area. Radionuclide-specific soil samples will also be subject to the WRS Test along with the appropriate background sample set.

5.5.1 Probability of Exceeding the DCGL

The probability that a random measurement from a survey unit will exceed a random measurement from the reference area by less than the $DCGL_{WRS}$ when the survey unit median is equal to the LBGR above background is defined as P_r. P_r is used to determine the number of measurements to be performed during the survey.

5.5.2 Determine the Decision Errors

The next step in the process is to determine the percentiles, $Z_{1-\alpha}$ and $Z_{1-\beta}$. These are represented by the selected decision errors, α and β, respectively.

5.5.3 Number of Data Points

The number of data points, N/2, to be obtained from each survey and background units (or survey unit pair) for the WRS Test will be determined as follows:

$$N/2 = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{3\,(P_r - 0.5)^2}$$

Where N/2 = number of samples; $Z_{1-\alpha}$ = Decision error level, α; $Z_{1-\beta}$ = Decision error level, β; and P_r = Probability of exceeding the $DCGL_{WRS}$. However, the number of samples is typically increased by 20% to obtain sufficient data points to obtain the desired power level and allow flexibility for lost or unusable data.

Once the relative shift, "Δ/σ", has been determined and the decision errors set, the calculation will be used to determine the number of samples required to evaluate a given survey unit. The interpolated value of N/2 gives the number of measurements required within a given survey unit. An equivalent number of background measurements will be included in the WRS test.

5.6 Frequency of Measurements

Once the number of measurements necessary for demonstrating compliance with the release criteria have been determined, it is important to demonstrate that the number identified is reasonable for the survey. It is possible, even if the MARSSIM guidance is strictly followed during the surveillance effort, that there will not be enough samples to produce the desired level of statistical comfort, or that the identified number appears excessive. This determination will be performed on a case-by-

case basis. If the number of measurements is not reasonable, then the data quality objectives or initial assumptions will be re-evaluated for applicability.

It is also important to determine whether the minimum detectable activity for scanning exceeds the DCGL calculated in accordance with Section 6.4 of this FSSP, or as established in NUREG-1507 for the detectors in use.[26] If the scanning MDAs exceed the $DCGL_{WRS}$, then the number of samples collected in each survey unit may need to be increased to ensure small areas of elevated activity are identified. When the scanning MDA exceeds the DCGL, an Area Factor, AF, is thus calculated as follows:

$$AF = \frac{MDA_{scanning}}{DCGL}$$

The size of the area of elevated activity that corresponds to the AF is then determined by decreasing the size of the assumed area of contamination and conducting the computer analysis used to calculate the DCGL elevated measurement criteria ($DCGL_{EMC}$). The ratio of the new run to the original run will be compared to the AF. When the ratio equals the AF, the size of the area of elevated activity that corresponds to the AF will have been determined (i.e. the size of the assumed area of contamination for the appropriate computer run).

The number of measurements required to account for the lack of scanning sensitivity, N_s, will be calculated as follows:

$$N_S = \frac{A}{A_S}$$

where A = Survey Unit area; and A_s = the size of the area of elevated activity that corresponds to the Area Factor. If value of N_s exceeds the number of measurements calculated as shown in Section 4.5 of this report, then N_s represents the minimum number of samples to be collected from each survey unit.

5.7 Site Design

As described in Section 2.5, above, each of the buildings and land areas at the SMC facility has been divided into "survey units" to meet MARSSIM spatial limits on areas and to facilitate a more manageable assessment of the various areas. The type and minimum number of direct surveys and samples was estimated using a combination of MARSSIM tables, calculations and the computer code Visual Sample Plan (VSP).[27] The scanning specifications for each survey unit were designed pursuant to MARSSIM guidance.

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[26] U.S. Nuclear Regulatory Commission, *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*, NUREG/CR-1507, December, 1997.

[27] Visual Sample Plan (Version 5.3.1), abbreviated VSP, was written and deployed by Pacific Northwest National Laboratory. It is a software tool for the development of sampling plans that are based on statistical sampling theory and the statistical analysis of sample results to support confident decision-making (i.e., release for unrestricted use). The software couples site, building, and sample location visualization capabilities with optimized sampling design and statistical analysis strategies. For this SSP, VSP was used to verify/confirm the calculated values.

The initial design of the surveys for each of building and land area is shown in Appendix 13.1, although the final design will be performed once decommissioning is complete and the area dimensions confirmed. Included is a conceptual map of the area, its dimensions, and VSP output information, as applicable. For land areas, the calculation summary is included. Table 11.8 is a summary of the number and type of measurements in each unit, along with related information/requirements.

5.8 Elevated Measurement Criteria

Measurements made in a Class 1 survey unit that exceed the DCGL will require that the area from which the result was obtained be evaluated using the elevated measurement criteria (EMC). The EMC provides assurance that unusually small areas of elevated activity receive proper attention and that any area having the potential for significant dose contribution is identified. It is intended to flag potential failures in the remediation process, but it will not be considered the primary means of identifying whether or not a survey unit meets the site dose release criterion.[28]

Area factors were established for survey results that may exceed the DCGL but consists of a relatively small area, less than 1,000 m^2. Once the size of the area associated with the elevated activity is determined, it will then be input, along with the elevated measurement result, into the computer code used to calculate the DCGL (e.g. $DCGL_{EMC}$). The resulting annual dose, divided by the criteria for release for unrestricted use (i.e., 25 millirem per year), consists of comparing each measurement from the survey unit with the DCGL. Any measurement from the survey unit that is equal or greater than the DCGL indicates an area of an elevated concentration that should be investigated, regardless of the outcome of the non parametric statistical tests. The DCGL for the EMC is thus derived as follows:

$$DCGL_{EMC} = A_m \times DCGL$$

where A_m = area factor for the area of the systematic grid area. The RESRAD computer code was used to establish area factors by changing the area of the contaminated zone. (The unrestricted area will be approximately 47,348 square meters or about 11.7 acres.)

Table 11.4 summarizes the area factors for the SMC facility. The largest area factor is set at 3.0 for an area less than or equal to seven (7) m^2. Additional measurements and sampling may be performed at locations and frequencies based on professional judgment.

[28] U.S. Nuclear Regulatory Commission, *Multi-agency Radiation Survey and Site Investigation Manual*, NUREG-1575, Revision 1, August, 2000.

6 SURVEY PROCEDURE

The purpose of the FSS is to collect sufficient data to demonstrate compliance with health and safety criteria so that the preponderance of the site may be released for unrestricted use. Additionally, sufficient data will be collected to demonstrate that the restricted portion of the site (Storage yard) meets the applicable dose criteria as well. Specifically, the following general approach will be used:

- Survey instrumentation will be set up and source checked to ensure proper operation. The Project Manger or the SMC Radiation Safety Officer (RSO) will perform preliminary inspections of the areas to identify additional specific survey requirements.
- The facility will be cleared of all loose equipment and materials to the maximum extent possible.
- The health physics technicians will develop survey packages for each of the survey areas.
- The survey team will grid the survey areas as specified by the survey protocols and mark or map the survey locations as applicable.
- The survey team will make survey measurements and analyze samples using appropriately-calibrated instruments and perform daily source and background checks before and after each day's work that are compared to instrument-specific control charts.
- Direct survey data collected during the project will be recorded on survey maps prepared for each survey area.

The Project Manager or the Project CHP will review the completed survey packages to verify all required surveys have been performed and to identify any areas exceeding the specific release criteria. This review will also confirm that the data have been recorded consistently and in a manner suitable for inclusion in the FSS report.

6.1 Survey Unit Classification

Each area at the SMC site has been divided into discrete survey units with a specific size and shape for which separate decisions about the data with respect to the DCGLs will be made. Impacted areas are those areas with a potential of being contaminated such as the footprint of the AAF Baghouse, the Storage Yard, etc. Nonimpacted areas are portions of the site that do not have a potential for being contaminated and are not required to be surveyed as part of the FSS. In order to design a conservative plan, it is assumed the entire SMC facility is potentially impacted (i.e., there are no non-impacted areas on site).

Survey units will be classified as Class l, 2, or 3. In general, a Class 1 survey unit is an impacted area where there are expected to be locations with concentrations of residual radioactivity that exceed the DCGL. Outdoor Class 1 survey units will be limited to an area of less than 2,000 m^2. Indoor class 1 survey units will be limited to 100 m^2.

A Class 2 survey unit is an impacted area where there are expected to be locations with concentrations of residual radioactivity detectable above background levels, but are not expected to exceed the DCGL.[29] Outdoor Class 2 survey units will be limited to an area of less than 10,000 m^2. Indoor class 2 survey units will be limited to an area of less than 1,000 m^2.

A Class 3 survey unit is an area where there are no expected locations with concentrations of residual radioactivity detectable above background. Outdoor and indoor Class 3 survey units will have no size limitations.[30]

6.1.1 Class 1 Survey Units

Class 1 areas at the SMC facility include building D116, the area that encompasses the Storage Yard, and extending outward a distance of 50 feet, the area that encompasses the footprints of buildings D102/112, D111, the AAF Baghouse and the Flex-Clean Baghouse, and the on-site haul roads connecting the former processing buildings to the Storage Yard. Figure 12.1 shows the location and spatial extent of the Class 1 areas.++

6.1.2 Class 2 Survey Units

Class 2 areas at the SMC facility include those that may be potentially contaminated as a result of excavation or other intrusive work during the construction of the engineered barrier and site preparation activities. Other Class 2 areas include areas that at one time held licensed materials, and those locations susceptible to fugitive dust during the decommissioning actions are also classified as Class 2 areas. While no Class 2 area is known to be impacted in excess of the DCGLs, these buildings will be surveyed pursuant to the requirements for a Class 2 survey unit. The walls in the rooms to a height of two (2) meters from the floor are included in Class 2.

6.1.3 Class 3 Survey Units

Class 3 areas at the SMC facility are those not classified as Class 1 or Class 2. In addition, the walls in rooms above two (2) meters from the floor, as well as all overhead areas, are designated as Class 3.

6.1.4 Background Reference Areas

Background soil samples have been collected and analyzed by a variety of methodologies over the years. In addition, an "industrial background" has been established for the working areas of the site, where the background differs from that of normal soil due to different construction activities, unrelated to licenced operations, that have gone on at the site over the years.[31] Table 11.1 contains the background data to which FSS data from land areas will be compared. In order to evaluate gross alpha or beta activity on surfaces, a surface of similar construction but not impacted by licensed operations will be used.

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[29] Typically Class 2 survey units are not remediated. If remediation is required, the survey unit is reclassified as Class 1.

[30] U.S. Nuclear Regulatory Commission, *Multi-agency Radiation Survey and Site Investigation Manual*, NUREG-1575, Revision 1, August, 2000.

[31] Activities that changed the natural background included leveling, excavating, importing rocks or gravel to stabilize road beds, etc.

6.2 Survey Package Development

For each survey unit, the health physics technician will develop a package, or portfolio, by performing a walk-down and preparing a worksheet/tracking sheet that outlines the general survey instructions, location, and any specific survey instructions for any abnormal conditions within the survey area. Each area will have been cleared of all loose equipment and materials to the maximum extent possible. During the survey, the surveyors will update the survey package(s) with the survey data and results of any special surveys or sample analyses to be performed.

6.3 Survey Requirements

The FSS of the buildings will consist of alpha/beta scans, fixed alpha/beta measurements, and smears for gross alpha/beta counting. The FSS of outdoor soil surfaces will consist of gamma walkover scans and soil samples and analysis. The FSSs of outdoor concrete pads and the engineered barrier will consist of gamma walkover scans, fixed alpha/beta measurements and smears for gross alpha/beta counting. These surveys will be performed as described in the following subsections.

6.3.1 Surface Scans

For Class 1 indoor survey units, beta scans will be performed over 100% of the accessible building surfaces using a scintillation detector, equivalent to a Ludlum Model 43-89, while listening to the audible output of the instrument. The scan survey is designed to detect small areas of elevated residual radioactivity that may not be detected by the static measurements, using a systematic pattern. The detector will be maintained within one (1) centimeter of the surface or less, if surface conditions permit. The scanning speed will be no greater than one detector width per second for alpha and beta scans.

For Class 1 outdoor survey units, exposed soil will have 100% scanning coverage of an area. Gamma Walkover for surface soil scans will be used to detect gamma-emitting radionuclides and will employ gamma scintillation survey instruments equipped with sodium iodide (NaI) scintillation crystal detectors. When scanning soil, the detector is held close to the ground, within 6 centimeters (<3 inches) and moved in a serpentine pattern. A scan rate of 0.5 meter per second is standard for scanning gamma emitters in surface soil.[32] The scan rate may be adjusted by the RSO according to the required scan MDC. In the scanning mode, the audio response should be used to help prevent failure to detect an elevated area due to meter response time

For Class 2 indoor survey units, alpha/beta scans will be performed over approximately 50% of the accessible building surfaces. Gamma scans will be performed over approximately 10 % of outdoor soil surface areas. All areas of elevated activity will be identified for further investigation and analysis. Scan MDAs will be set such that contamination at levels of approximately 50% of the DCGLWRS will be detected.

For Class 3 survey units, alpha/beta scans will be performed for less than 10 percent of the indoor surface area and gamma scans will be performed over less than 10 % of outdoor soil surface areas. Those areas with the highest potential for elevated residual radioactivity, based on professional judgment, will be selected for biased scanning.

[32] Adjustments to scan speed and distance may be made in accordance with approved procedures.

6.3.2 Direct Alpha/Beta Measurements

Direct alpha/beta measurement will be taken on the structural surfaces of each survey unit within buildings, remaining concrete pads, and the engineered barrier. Measurements will be conducted by integrating the total counts over a one (1) minute count time. Measurements will be made at the nodes of the grids, using a square grid pattern. The number of measurements and spacing will be determined in accordance with MARSSIM and the instructions in this FSSP.

6.3.3 Removable Activity Measurements

Smears for removable radioactivity will be taken at each direct measurement location within buildings, existing concrete pads, and the engineered barrier and analyzed for alpha and beta radiation by direct counting. The data will be reported in units of dpm/100cm^2.

6.3.4 Measurement Grid Spacing

Grids will be established for the purpose of referencing locations of measurements and sampling, relative to structure and/or site features. The grid spacing for the measurement and samples will be determined assuming a square grid pattern as follows:

$$L = \sqrt{\frac{A}{N}}$$

where L = grid spacing, A = Survey unit area (square meters), and N = the number of measurements.

Once the number of measurements and the grid spacing are determined, a starting point for the survey will be established for each survey unit by selecting a reference point for the survey unit such as the corner of the room. A random number generator will be used to provide a random number between 0 and 1 for an initial offset from the reference point in both the x and y coordinates. The random number pair will be multiplied by the calculated grid spacing providing the offset from the reference point for the first grid location.[33]

- Class 1 areas - Based on the maximum size of an outdoor Class 1 survey unit(2000 m^2), the outdoor areas will be gridded to approximately 225 m^2 (15m x 15m) grids. The size of any given survey unit may reduced by natural or man-made barriers (fences, buildings), thus reducing the grid size. 100% of the surfaces are scanned. No indoor areas have been classified as Class 1. Table 11.6 summarizes the requirements for establishing and surveying a grid, according to its MARSSIM classification.

- Class 2 areas - A grid will be established for any Class 2 outdoor areas using a grid of less than 1,100 m^2 grids. Ten percent (10%) of the outdoor soil area grids will be scanned as described in Section 7.3.1. Indoor survey units will utilize a grid that is less than 4 m^2 in area. Fifty percent (50%) of the grids on lower walls and the floors of buildings will be scanned. When grids to be surveyed are inaccessible because of electrical panels, etc., the technician will survey the accessible portion and contact the SMC RSO. The RSO may determine the potential for contamination behind the

[33] For small areas (e.g. structure surfaces less than 10m^2) survey grids may not be established. Rather, measurements will be performed at a frequency of one (1) measurement per four square meters. These measurements locations will be selected from the location of highest contamination potential on the basis of surveyor's professional judgment. Results will be compared to the $DCGL_{EMC}$ rather than the $DCGL_{WRS}$.

object by reviewing current area surveys and area history. The RSO will then determine whether the items should be moved, or if an alternate grid could be selected for survey. These decisions are documented on the survey form.

- Class 3 areas. These spaces are not gridded. Instead, at least thirty (30) locations in each survey unit will be randomly selected in a biased manner towards floor surfaces of buildings (20 points) and wall surfaces (10 points). Twenty (20) locations will be selected for each Class 3 survey area outside (soils and other surfaces). Surface scans are performed at 10% of the floor and/or lower wall locations. The scans are performed by creating a temporary grid unit (2 by 2 meters) around the point from which the smear and direct reading were taken. The location of the scan is documented on a scale drawing of the survey unit to ensure reproducibility. If obstacles preclude creating a four (4) m^2 space around the location, the shape of the area is changed, or an alternate location is selected, at the discretion of the HP. Any modifications are documented in the FSS package for the affected survey unit(s). The FSS package also documents any additional scans performed at locations of concern to the HP or RSO, e.g., high-traffic areas, or areas where discoloration or other indicators were present.

Upon establishing the first grid location, the aforementioned grid spacing will be used to establish a grid system throughout the survey unit. If the survey unit includes floor or walls, the grid is extended to all surfaces from the initial point.

Once gridded, the health physics technicians will verify that the number of grid locations satisfies the calculated number of measurements. If not, then a smaller grid spacing will be used to ensure the necessary number of measurements and samples are obtained.

6.3.5 Sample Collection

Surface soil samples will be collected with a clean, stainless steel scoop or spoon that is decontaminated between uses. Samples will be placed into appropriately-sized containers that have been provided or specified by the analytical laboratory. Each will be labeled with a unique sample number.

All sampling activities will be recorded on field logs and will include individual sample information such as date/time of sample, sample location, and sample number. Collected samples will remain in the custody of sampling personnel or locked in a controlled, limited access location until they are packaged for shipment to the commercial laboratory. A sample Chain of Custody/Request for Analysis form will be completed for all samples and will accompany the sample shipment to the analytical laboratory. Field screening of the samples will be performed to approximate the total radioactivity present and ensure the sample shipment conforms to applicable Department of Transportation shipping regulations.

Soil samples will be collected in accordance with written procedures. Sampling tools will be cleaned and monitored, as appropriate, after each use. Samples will be collected in clean/unused sealable containers. Smear samples will be collected in accordance with written procedures. Smear samples will be stored in clean containers.

Sample containers will be permanently labeled or marked in the field at the time of collection by the technician collecting the sample with the sample number and other identifying information. An

approved procedure will be used for strict chain of custody to ensure that the integrity of the sample is maintained throughout sampling, transportation, analysis, and archiving.

6.3.6 Sample Analysis

Sample collection and laboratory analysis will be performed in accordance with established SMC and site-specific procedures for solid and liquid media. Based on the radionuclides of concern, laboratory analyses may include on-site and outside laboratory gamma spectroscopy, on-site net gamma-activity counting, outside laboratory alpha spectroscopy (isotopic), and hazardous material profiling.

No less than 5% of final survey solid media surface and subsurface samples will be split and submitted for analysis to an independent laboratory for quality control purposes. The split sample results will be compared to on-site measurements according pursuant to project quality control provisions. Non-conformance will require investigation and resolution of the difference.

6.4 Investigation Levels

If an investigation is performed, or a survey unit is reclassified, a resurvey will be completed and documented. Table 11.7 summarizes the investigation action if the measurement indicates a result in excess of the DCGL. If a Class 2 survey unit exhibits contamination levels greater than the $DCGL_{WRS}$, it will be reclassified as a Class 1 unit and remediated. The FSS will be repeated following the required remedial tasks.

If the average value of the Class 2 direct measurements is less than the $DCGL_{WRS}$, the $Scan_{MDA}$ is sensitive enough to detect the $DCGL_{EMC}$ and there are no areas greater than the $DCGL_{EMC}$, the survey may be limited to performing a 100% surface scan without having to repeat the direct measurements. This condition assumes that the sample density meets the requirements for a Class 1 area (see Section 6.1). If the Class 2 area had contamination greater than the $DCGL_{WRS}$ but the $SCAN_{MDA}$ was not sensitive enough to detect the $DCGL_{EMC}$, the affected area must be reclassified and re-surveyed using the sample density determined from the EMC (see Section 4.7).

If an individual survey measurement in a Class 3 survey unit exceeds 0.5 times the DCGL, the survey unit will be re-evaluated. If necessary, it will be reclassified as a Class 2 and re-surveyed.

6.5 Survey Records

The Project Manager will maintain records of surveys in the survey packages for each area. The survey package may include the following records depending upon the survey design and protocols:

- Survey package worksheet giving the package identification, survey location information, general survey instructions and any specific survey instructions;
- Survey Unit Diagram of the area to be surveyed as available;
- Photographs of the survey area, as necessary, to show special or unique conditions;
- Printout of laboratory analysis results; and
- Data sheets to record the results of the surveys and analyses.

The health physics technicians will generate a report that presents all raw data, converted data, and information by survey location. The technician and Project Manager or SMC RSO will review them

for completeness, accuracy, suspect entries, and to compare results to the applicable DCGLs. Any changes to the data tables such as detector efficiency and background that could affect survey results will require Project Manager or SMC RSO approval. In addition, changes to data in primary tables will require a written explanation, to be attached to the survey report and maintained as a permanent project record.

Data and document control will include the maintenance of the raw data files, translated data files (i.e., spreadsheets), and documentation of all corrections made to the data. All electronic databases will be backed up on a regular basis.

7 INSTRUMENTATION

All instrumentation used for the FSS, including scanning measurements, will be appropriate for the type of radiation expected, of sufficient sensitivity and accuracy to detect the radioactive materials of interest, and of sufficient quantity to support planned activities. Table 11.5 lists the applications and detection capabilities of various types of instruments that may be used for the FSS. Instrument use, calibration and operational checks will be performed pursuant to SMC Radiation Safety Procedures, RSP-008.[34] The sensitivity for each medium and radionuclide will be determined prior to the start of the measurement campaign, with the results documented in the final status report. The following subsections provide additional project-specific instrumentation information.

7.1 Selection Criteria

The selection of appropriate radiation detectors will depend upon the type of survey, surface contour and survey area size. The following instruments (or equivalent substitutions) will be used to meet the necessary survey requirements:

- Bicron MicroRem tissue-equivalent meter (ambient gamma surveys);
- Ludlum Model 2241 scaler/ratemeter with Model 44-10 sodium iodine gamma scintillation detector (gamma walkover surveys);
- Ludlum Model 2224 scaler/ratemeter with Ludlum Model 43-89 dual alpha/beta (contamination surveys of surfaces);
- Ludlum Model 239-1F floor monitor with Ludlum Model 2221 scaler/ratemeter and Ludlum Model 43-37 gas proportional probe (contamination scanning of floors); and
- Ludlum Model 2929 dual alpha/beta scaler with a Ludlum Model 43-10-1 detector for analysis of removable activity

All portable instrumentation will be calibrated by a licensed commercial calibration service using National Institute of Standards and Technology (NIST) traceable sources and calibration equipment. Instrument calibration will include the following, as applicable to the instrument type:

- high voltage calibration;
- discriminator threshold calibration;
- window calibration;
- alarm operation, verification;
- scaler calibration verification.;
- operating voltage determination;

[34] Shieldalloy Metallurgical Corporation, *Instrumentation and Surveillance*, Radiation Safety Procedure No. RSP-008,.

- calibration constant determination; and
- dead time correction determination.

Calibration labels showing the instrument identification number, calibration date and calibration due date will be attached to all portable instruments. A full and complete copy of all relevant calibration certificates will be captured in the FSS report.

7.2 Calibration Sources

All sources used for on-site instrument calibration, daily checks or efficiency determinations will be representative of the instrument's response to the identified radionuclides and traceable to NIST. These sources will include ^{99}Tc, ^{230}Th, and ^{137}Cs sealed sources, as applicable.

The Project Manager and/or a designated health physics technician (or the SMC RSO if SMC sources are used) will control the use and storage of the radiation sources used for instrument response checks and efficiency determination. They will be stored securely and signed out when needed. A source sign-out log will show the location of all sources if they are removed from the designated source storage area.

7.3 Response Checks

Periodic instrument response checks will be conducted to assure constancy in instrument response, to verify the detector is operating properly, and to demonstrate that the measurement results are not the result of detector contamination or failure. Instrument response will be checked each day before the instrument is used. The check sources will be used to duplicate the same type of radiation that is being measured with the particular instrument using a specified source-detector alignment that can be easily repeated. If the instrument fails its response check, it is not used until the problem is resolved.

7.4 Minimum Detectable Activity

Minimum Detectable Activity (MDA) is defined as the smallest amount or concentration of radioactive material that will yield a net positive count with a 5% probability of falsely interpreting background responses as true activity. The MDA is dependent upon count times, geometry, sample size, detector efficiency background, and for scanning the scanning rate and the efficiency of the surveyor.[35] Nominal detection sensitivities were calculated using the guidance in NUREG-1507 and are summarized in Table 11.5. Instruments will be selected, if possible, to achieve detection sensitivities of less than the 70 percent of the DCGL for both scanning and direct, static measurements.

The MDAs for direct alpha/beta measurements, surface scanning and analyses for removable activity will be set at 50% or less of the DCGL. The MDAs for beta scans will be set equal to or less than 50% of the appropriate DCGL. Since the MDAs for alpha/beta scanning will be equal to or less that the appropriate DCGL, the scanning MDAs will not affect the number of measurements or samples required to evaluate a specific survey unit. If gamma scanning instrumentation MDA cannot detect

[35] U.S. Nuclear Regulatory Commission, *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*, NUREG/CR-1507, December, 1997.

the appropriate DCGL for soils, the number of samples will be increased according to guidance found in MARSSIM Chapter 5.[36]

7.4.1 Direct Alpha/Beta Measurements

The equation that will be used for calculating the MDA for direct alpha and beta measurements is:

$$MDA = \frac{\frac{2.71}{t_s} + 3.29\sqrt{\frac{R_b}{t_s} + \frac{R_b}{t_b}}}{E \times \frac{A}{100}}$$

where MDA = Minimum detectable activity (dpm/100 cm^2), R_b = Background count rate (cpm), t_b = Background count time (minutes), t_s = Sample count time (minutes), A = Detector area (cm^2), and E = Detector efficiency (counts/disintegration).

7.4.2 Alpha/Beta Scans

The equation that will be used for calculating the MDA for alpha and beta scans (MDA_{SCAN}) is:

$$MDA_{SCAN} = \frac{d' \times \sqrt{b_i} \times \frac{60}{i}}{E_I \times E_S \times \sqrt{p} \times \frac{A}{100}}$$

where MDA = Minimum detectable activity (dpm/100 cm^2), d' = Decision error taken from Attachment 2. (Assumed to be 3.28 for α =0.05 and β=0.75), I = Observation counting interval (scan speed divided by detector width), b_i = Background count per observation interval, E_I = Detector efficiency, E_s = Surface efficiency (assumed to be 25% for alpha and beta contamination on concrete), p = Surveyor efficiency (Assumed to be 50%), and A = Detector area (cm^2).[37,38]

7.4.3 In-situ Measurements

No in-situ measurements of radionuclide concentration in soils or other solid materials will be made during this FSS. Instead, discrete samples will be collected and analyzed by a qualified commercial analytical laboratory.

7.4.4 Analytical Instrument Description

Prior to submitting any samples to a commercial analytical laboratory, a letter of specification will be written. Included will be the necessary measurement result(s) and relevant detection sensitivity. At that time, the laboratory will be asked to declare the analytical method and the measurement devices they intend to use in order to meet SMC's specifications.

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[36] U.S. Nuclear Regulatory Commission, *Multi-agency Radiation Survey and Site Investigation Manual*, NUREG-1575, Revision 1, August, 2000.

[37] ISO-7503 recommends using a surface efficiency based on the type of radiation and radiation energy in the absence of experimentally derived values. A surface efficiency of 0.25 is recommended for alpha radiation and beta radiation with a maximum beta energy between 150 keV and 400 keV.

[38] International Organization for Standardization (ISO), *Evaluation of Surface Contamination*, ISO 7503, 1988.

Each commercial laboratory that provides analytical results as part of this FSS will be asked to provide a copy of their quality assurance documents, including quality assurance procedures designed to ensure the necessary calibrations and detection sensitivity requirements are met.

8 DATA ANALYSIS

8.1 Data Assessment

Once all surveys are complete, the data will be assessed and evaluated to ensure that the survey data are complete and collected in accordance with approved plans. The assessment will verify that residual radioactivity on building surfaces is less than the applicable $DCGL_{WRS}$. All areas exceeding the $DCGL_{WRS}$ will be reclassified, scanned and the data point re-surveyed before a statement of release can be made. The data set will be evaluated to ensure the proper number of measurements were taken and, if insufficient, the grid size may be reduced and the survey area re-surveyed with the approval of the Project Manager or the SMC RSO.

8.2 Data Validation

The survey data will be reviewed to verify that they are authentic, appropriately documented and technically defensible and that all assumptions about the data are correct. Assumptions will be verified by comparing the expected data parameters with the actual FSS data.

Before the resultant data are analyzed, criteria for data acceptability will include at a minimum the following items:

- The instruments used to collect the data are capable of detecting the radiation of interest at or below the DCGL and less than 0.5 times the DCGL for Class 3 areas. If not, acceptable compensatory measures have been collected;
- The calibration of the instruments used to collect the data is less than twelve months old;
- Instrument response was checked with satisfactory results before the instrument was used;
- The MDAs and assumptions to develop them are appropriate for the instruments and the survey methods used to collect the data;
- The final survey data set consists of qualified measurements that are representative of the current facility status and randomly collected as prescribed by the survey design; and
- The data have been properly recorded.

A discrepancy will exist if one or more of these criteria are not met. In that case, the discrepancy will be reviewed by the Project Manager or SMC RSO and the reasons for the acceptability of the data, or the corrective actions taken to restore data acceptability, will be documented.

8.3 Requirements for Release

A survey unit will meet the requirements for release for unrestricted and restricted use provided (1) an adequate number of measurements were taken; (2) no measurements exceed the $DCGL_{WRS}$ for the survey unit; and (3) no further statistical tests are required. If the statistical test or elevated measurement comparison test fail for a particular survey unit, the DQO process will be revisited and decisions regarding next steps will be made. If decontamination is required, the project team will

develop a plan for contaminant removal. Remediation and possible resurvey activities will then be considered as a potential path toward release of the survey unit.

8.4 Statistical Evaluation

The results of the statistical testing will allow one of two conclusions to be drawn:

The survey unit meets the dose-based release criteria.

This means the data do indeed provide statistically significant evidence that the level of residual radioactivity in the survey unit is less than the applicable criteria and that the decision to release this area can be made with confidence and without further analysis.

The survey unit fails to meet the dose-based release criteria.

In this case, the data do not provide sufficient statistically significant evidence that the level of residual radioactivity is acceptable, thus further analysis to determine why will be required. The DQO process must be revisited and the survey unit may require re-survey and/or collection of another set of discrete measurements for the statistical analysis. Alternatively, the survey unit may be remediated in order to reduce the level of residual radioactivity to the necessary levels. In this case, the survey unit will be re-classified a Class 1 survey unit and re-surveyed as required for that classification (see Table 11.6).

8.5 Elevated Measurement Comparison

If the EMC test fails, indicating that there remains small areas of elevated activity, then the DQO process must be revisited and the survey unit may be remediated in order to reduce the small areas of elevated activity. In this case, the survey unit will be re-classified a Class 1 survey unit and re-surveyed as required for that classification (see Table 11.6).

9 QUALITY CONTROL

Quality Assurance/Quality Control Programs are designed to ensure that all quality and regulatory requirements applicable to this survey effort are satisfied. All activities affecting quality will be controlled by the this FSSP and the associated Quality Control measures that are an integral part of the survey process.

9.1 Personnel

Project management and field supervisory personnel are required to have extensive experience with SMC's procedures and be familiar with the requirements of MARSSIM and this FSSP. Personnel participating in the performance of the FSS must also have prior experience with the radioactive materials and a working knowledge of the instruments used to detect the radionuclides on-site.

9.2 Training

Prior to the start of work and on a daily basis, all project personnel will receive site-specific training on the specific hazards present at the site in general and in the survey areas. Training will also include a review of this FSSP, applicable SMC procedures and license requirements. Included as well will be site orientation and training and site emergency procedures. In the event of an emergency, personnel will be instructed by the SMC RSO to act in accordance with all applicable SMC emergency procedures.

9.3 Written Procedures

All survey tasks, which are essential to survey data quality, will be controlled by existing and applicable SMC procedures and this FSSP. Changes to any of these provisions must be must be approved by the Project Manager and SMC, the Project CHP and the QA Manager, at which time they will be presented to all project personnel during the daily training sessions.

9.4 Selection of Instruments

SMC has selected instruments proven to reliably detect the radionuclides present at the facility. Qualified vendors will calibrate instruments under approved procedures using calibration sources traceable to the National Institute of Standards and Technology (NIST). In addition, all instruments and detectors will be inspected and source checked daily when in use to verify proper operation. Control charts and/or source check criteria will be established at the beginning of the project for reference. Procedures for calibration, maintenance, accountability , operation, and quality control of radiation detection instruments implement the guidelines established in American National Standard Institute (ANSI) standard ANSI N323A-1997 and ANSI N42.17A-1989.[39,40]

9.5 Survey Documentation

Survey packages will be the primary method of controlling and tracking the hard-copy records. Records of surveys will be documented and maintained in the survey package for each area (see Chapter 7.2). Each survey measurement will be identified by the date, collection technician, instrument type and serial number, detector type and serial number, location code, type of

[39] American National Standards Institute, *Radiation Protection Instrumentation and Calibration*, ANSI N323A-1997, April 3, 1997.

[40] American National Standards Institute, *Performance Specifications for Health Physics Instrumentation - Portable Instrumentation for Use in Normal Environmental Conditions*, ANSI N42.17A-1989, November, 1988.

measurement, mode of instrument operation, and Quality Control (QC) sample number, as applicable.

9.6 Chain of Custody

Procedures that establish responsibility for the custody of samples from the time of collection until results are received will be implemented. If samples are shipped to an off-site laboratory for analysis, they will be accompanied by a chain-of-custody record for sample tracking.

9.7 Records Management

Generation, handling and storage of survey data packages will be controlled by the Project Manager.

9.8 Duplicate Review of Survey Results

The survey package and survey data will be reviewed by three separate individuals in order to verify all documentation is complete and accurate. These reviewers will include the surveyor and either the Project Manager, SMC RSO or the Project CHP, and the QA Manager.

9.9 Survey Report

Following data acquisition, a FSS report will be prepared in accordance with NRC guidance on format and content. SMC may begin preparing the FSS report while surveys are on-going. General information may be compiled in advance in order to expedite report preparation when work is completed. The FSS report will contain, in part, a brief description of the site and the surveys performed, photographs of survey and sample locations, and survey results listed in tabular and graphical format.

10 REPORTING

Much of the information contained in the FSS report will be available from other decommissioning documents compiled by and retained by SMC. However, to the extent practicable, the FSS report will be a stand-alone document with the amount of information incorporated by reference kept to a minimum. The report will be approved by designated personnel capable of fully evaluating its content prior to its release. The following is a listing of required report elements:

- Site description;
- Site conditions at the time of the survey;
- Map or drawing of each survey unit showing the reference system and systematic sample locations for Class 1 and 2 survey units and random locations shown for Class 3 survey units and reference areas;
- Description of the remedial activities to remove excess radioactive materials;
- Survey objectives;
- Derived Concentration Guideline Levels;
- Classification of areas;
- Selection of instruments and survey objectives;
- Survey plan and procedures;
- Determination of background;
- Scanning and survey measurements;
- Discrete samples;
- Detection sensitivity;
- Sample collection and analysis;
- Data interpretation;

Additionally, the FSS report will contain the following:

- A discussion of any changes that were made in the FSS from what was proposed in the Plan or other prior submittals;
- A description of the method by which the number of samples was determined for each survey unit;

- A summary of the values used to determine the number of samples and a justification of these values

Furthermore, the survey results reported for each survey unit will include, as applicable:

- The measured sample concentrations;
- The statistical evaluation of the measured concentrations;
- Judgmental and miscellaneous sample data sets reported separately from the samples collected for performing the statistical evaluation;
- A discussion of anomalous data including any areas of elevated direct radiation detected during scanning that exceeded the investigation level or measurement;
- locations in excess of DCGL; and
- A statement that a given survey unit satisfied the DCGL and the elevated measurement comparison if any sample points exceeded the DCGL.

Finally, the FSS report will contain the following, as necessary:

- A description of any changes in initial survey unit assumptions relative to the extent of residual activity;
- If a survey unit fails, a description of the investigation conducted to ascertain the reason for the failure and a discussion of the impact that the failure has on the conclusion that the facility is ready for final radiological surveys; and
- If a survey units fails, a discussion of the impact that the reason for the failure has on other survey unit information

At the conclusion of decommissioning activities, SMC will submit to the NRC an FSS Report that is compliant with the content requirements specified above. Original data and backup information will be maintained by SMC as part of the permanent record keeping system.

11 TABLES

Table 11.1 - Background Soil Concentrations[41]

Type	Radionuclide Concentration (pCi/g)	
	Natural Thorium	Natural Uranium
Soil	0.7 ± 0.2	0.7 ± 0.2
Industrialized Areas	11.9 ± 10.4	2.5 ± 2.0

[41] Summarized from Berger, C. D., (Integrated Environmental Management, Inc.), letter report to D. R. Smith (Shieldalloy Metallurgical Corporation), "Background Data Set for the Newfield Site (Report No. 94005/G-3205386)", 2009.

Table 11.2 - Soil DCGLs[42]

Radionuclide	Dose Rate from 1 pCi/g (mrem/yr)	DCGLw equivalent to 25 mrem/yr (pCi/g)
Th-232+ progeny	2.843	8.8
U-234+progeny	2.027	12.3
U-235+progeny	0.7312	34
U-238+progeny	0.0299	836
U-natural (note 1)		24.6

(Note 1) The uranium isotope activity fractions of natural uranium are U-238 (48.6%), U-235 (2.2%), and U-234 (49.2%). The natural uranium DCGL was calculated using

$$Unat\ DCGL = \frac{1}{\frac{f_{U-234}}{DCGL_{U-234}} + \frac{f_{U-235}}{DCGL_{U-235}} + \frac{f_{U-238}}{DCGL_{U-238}}}$$

[42] Integrated Environmental Management, Inc., *Derived Concentration Guideline Levels (DCGLs) for the Decommissioning of the Newfield Facility*, Report No. 94005/G-29357, March, 2008.

Table 11.3 - Building Surface DCGLs[43]

Radionuclide	Activity Fraction f_i	DCGLw (dpm/100cm^2)
Th-232+ progeny	0.480	1,190
U-234+progeny	0.256	3,790
U-235+progeny	0.012	434
U-238+progeny	0.253	28,090
	Gross Activity DCGL	1,970 dpm/100cm^2

[43] Integrated Environmental Management, Inc., *Derived Concentration Guideline Levels (DCGLs) for the Decommissioning of the Newfield Facility*, Report No. 94005/G-29357, March, 2008.

Table 11.4 - Area Factors for Outdoor Radiation Surveys

Area (m^2)	Area Factor
1,000	1.1
500	1.2
100	1.3
50	1.5
10	2.5
7	3.0

Table 11.5 - Instrumentation

Instrument	Radiation Detected	Scale Range	Typical Background	Typical MDC[1]	Application
Bicron MicroRem tissue-equivalent plastic scintillation detector	Gamma	0-5,000 microrem/hr	8-10 microrem/hr	5 microrem/hr	ambient gamma surveys
Ludlum Model 2241 scaler/ratemeter with a Model 44-10 sodium iodide gamma scintillation detector	Gamma	0-1,000 microR/hr	8-10 microR/hr	5 microR/hr	gamma walkover surveys
Ludlum Model 2224 scaler/ratemeter with Ludlum Model 43-89 dual alpha/beta	Alpha, beta	0-500,000 cpm	<10 cpm alpha <200 cpm beta	<100 alpha <1,000 beta <3,200 beta scan	contaminatio n surveys of surfaces
Ludlum Model 239-1F floor monitor with Ludlum Model 2221 scaler/ratemeter and Ludlum Model 43-37 gas proportional probe	Alpha, beta	0-500,000	<10 cpm alpha <500 cpm beta	<100 alpha <3,000 beta scan	contaminatio n scanning of floors

[1]Minimum detectable concentration provided in dpm/100cm^2 at a 95% confidence interval.

Table 11.6 - Survey Requirements

Area Classification	Surface Scans		Activity Measurement	
	Indoor Surfaces	Outdoor surfaces	Indoor Surfaces	Outdoor surfaces
Class 1	100% using a grid, 4 m^2 in area	100% using a grid no larger than 225 m^2	One direct reading and one smear from the center of each grid unit	One discreet soil sample from the center of each grid unit
Class 2	50% of floor and lower wall surfaces using a 4 m^2 grid units.	10% using a grid no larger than 1,100 m^2	One direct reading and one smear from the center of each grid unit.	One discrete soil sample from the center of each grid unit
Class 3	10% of the locations as directed by the HP technician		One direct reading and one smear from 30 locations (20 from floors, 10 from walls) within each survey unit	30 discrete soil samples

Table 11.7 - Investigation Action

Action if Investigation Results Exceed:			
Class	**$DCGL_{EMC}$**	**DCGL**	**0.5 x DCGL**
1	Future remediation and resurvey	Verify the result is less than the $DCGL_{EMC}$	Acceptable
2	Future remediation and reclassify	Verify the result is less than the $DCGL_{EMC}$. Reclassify portions of the survey unit as necessary	Acceptable
3	Future remediation and reclassify	Increase scan coverage and reclassify	Increase scan coverage and reclassify

Table 11.8 - Survey and Sampling Summary

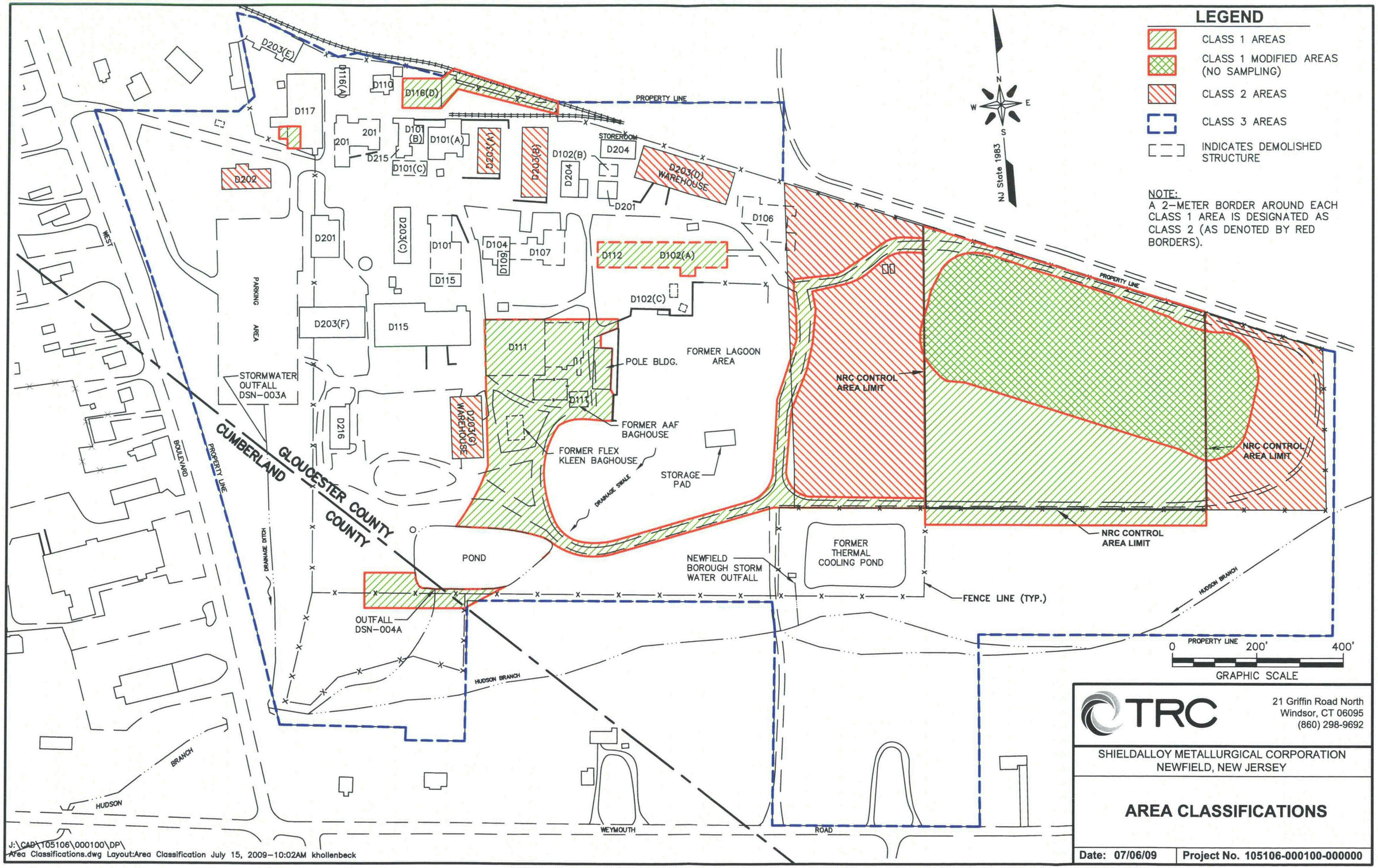
Building	Class	Survey Unit No.	Area (ft^2)[a]	No. Samples or Measurements	Size of Grid (ft)[b]	Grid Cell Area (ft^2)
D116(D)	1	1	1041.7	18	8.2	57.9
		2	954.3	18	7.8	53.0
		3	954.3	18	7.8	53.0
		4	954.3	18	7.8	53.0
		5	954.3	18	7.8	53.0
		6	954.3	18	7.8	53.0
		7	954.3	18	7.8	53.0
		8	954.3	18	7.8	53.0
		9	764.5	18	7.8	52.4
D117 (small room)	1	1	800	18	7.2	44.4
D117 (large room)	1	1	1063.7	18	8.3	59.1
		2	873.5	18	7.5	48.5
		3	1063.1	18	8.3	59.1
D202	2	Main Floor	8144	18/20	34.4	1023.7
		Second Floor	8144	18	37.4	1211.1
D203(A)	2	1	7580	18	29.0	726.7
D203(B)	2	1	6307.8	18	26.8	623.3
		2	6289.7	18	26.2	593.8
D203(D)	2	1	10572.3	18	35.7	1106.0
		2	105501.0	18	34.1	1009.4
D203(G)	2	1	6697.3	18	26.0	584.6
		2	6696.5	18	26.7	615.3
Storage Yard (East Side)	2	1	86,030	18		
Road Approaching Storage Yard	2	1	86,854	18		
		2	86,854	18		
Storage Yard (North Side)	1	1	18125	38		
Storage Yard (South Side)	1	1	19,820	42		
		2	19,820	42		

Building	Class	Survey Unit No.	Area (ft^2)[a]	No. Samples or Measurements	Size of Grid (ft)[b]	Grid Cell Area (ft^2)
		3	19,820	42		
		4	19,820	42		
		5	19,820	42		
		6	19,820	42		
		7	19,820	42		
		8	19,820	42		
		9	19,820	42		
D111 Footprint and Haul Roads	1	1	20,815	44		
		2	20,815	44		
		3	20,815	44		
		4	20,815	44		
		5	20,815	44		
		6	20,815	44		
		7	20,815	44		
		8	20,815	44		
Southwest Fenceline	1	1	17346	37		
D112/D102 Footprint	1	1	18,468	39		
Land Area (east of D116)	1	1	11,211	24		

a - To convert square feet into square meters, multiply value by 0.093.
b - To convert feet into meters, multiply value by 0.305.

12 FIGURES

Figure 12.1 - Site Layout and Area Classifications



TRC

21 Griffin Road North
Windsor, CT 06095
(860) 298-9692

SHIELDALLOY METALLURGICAL CORPORATION
NEWFIELD, NEW JERSEY

AREA CLASSIFICATIONS

Date: 07/06/09

Project No. 105106-000100-000000

13 APPENDICES

Appendix 13.1 - Justification for Survey Design (VSP Output)

D116(D) - Survey Unit 1

Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

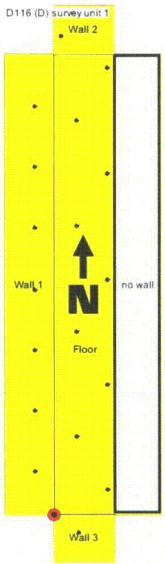
Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	1041.70 ft^2
Size of grid / Area of grid cell [d]	8.17465 feet / 57.872 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D116 (D) survey unit 1									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
7.1382	3.4425	0.0000		0	Systematic		Floor	7.1382	3.4425
3.0509	10.5219	0.0000		0	Systematic		Floor	3.0509	10.5219
7.1382	17.6014	0.0000		0	Systematic		Floor	7.1382	17.6014
3.0509	24.6808	0.0000		0	Systematic		Floor	3.0509	24.6808
7.1382	31.7603	0.0000		0	Systematic		Floor	7.1382	31.7603
3.0509	38.8397	0.0000		0	Systematic		Floor	3.0509	38.8397
7.1382	45.9192	0.0000		0	Systematic		Floor	7.1382	45.9192
3.0509	52.9986	0.0000		0	Systematic		Floor	3.0509	52.9986
7.1382	60.0781	0.0000		0	Systematic		Floor	7.1382	60.0781
3.3144	0.0000	2.3952		0	Systematic		Wall 3	4.6856	2.3952
1.1138	62.0000	2.3952		0	Systematic		Wall 2	1.1138	2.3952
0.0000	54.9392	2.3952		0	Systematic		Wall 1	54.9392	2.3952
0.0000	46.7645	2.3952		0	Systematic		Wall 1	46.7645	2.3952
0.0000	38.5899	2.3952		0	Systematic		Wall 1	38.5899	2.3952
0.0000	30.4152	2.3952		0	Systematic		Wall 1	30.4152	2.3952
0.0000	22.2406	2.3952		0	Systematic		Wall 1	22.2406	2.3952
0.0000	14.0659	2.3952		0	Systematic		Wall 1	14.0659	2.3952
0.0000	5.8913	2.3952		0	Systematic		Wall 1	5.8913	2.3952

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D116(D) - Survey Unit 2

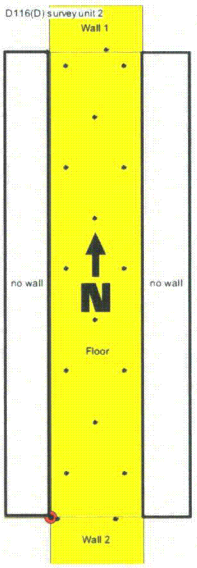
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	954.31 ft^2
Size of grid / Area of grid cell [d]	7.82428 feet / 53.0175 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D116(D) survey unit 2									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
2.2506	5.8883	0.0000		0	Systematic		Floor	2.2506	5.8883
10.0749	5.8883	0.0000		0	Systematic		Floor	10.0749	5.8883
6.1627	12.6643	0.0000		0	Systematic		Floor	6.1627	12.6643
2.2506	19.4403	0.0000		0	Systematic		Floor	2.2506	19.4403
10.0749	19.4403	0.0000		0	Systematic		Floor	10.0749	19.4403
6.1627	26.2164	0.0000		0	Systematic		Floor	6.1627	26.2164
2.2506	32.9924	0.0000		0	Systematic		Floor	2.2506	32.9924
10.0749	32.9924	0.0000		0	Systematic		Floor	10.0749	32.9924
6.1627	39.7684	0.0000		0	Systematic		Floor	6.1627	39.7684
2.2506	46.5444	0.0000		0	Systematic		Floor	2.2506	46.5444
10.0749	46.5444	0.0000		0	Systematic		Floor	10.0749	46.5444
6.1627	53.3205	0.0000		0	Systematic		Floor	6.1627	53.3205
2.2506	60.0965	0.0000		0	Systematic		Floor	2.2506	60.0965
10.0749	60.0965	0.0000		0	Systematic		Floor	10.0749	60.0965
0.9935	0.0000	0.3199		0	Systematic		Wall 2	11.5065	0.3199
8.8178	0.0000	0.3199		0	Systematic		Wall 2	3.6822	0.3199
7.7638	62.0000	0.3199		0	Systematic		Wall 1	7.7638	0.3199
0.0000	61.9395	0.3199		0	Systematic		no wall	61.9395	0.3199

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D116(D) - Survey Unit 3

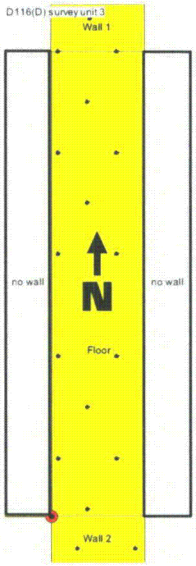
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	954.31 ft^2
Size of grid / Area of grid cell [d]	7.82428 feet / 53.0175 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D116(D) survey unit 3									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
2.2506	5.8883	0.0000		0	Systematic		Floor	2.2506	5.8883
10.0749	5.8883	0.0000		0	Systematic		Floor	10.0749	5.8883
6.1627	12.6643	0.0000		0	Systematic		Floor	6.1627	12.6643
2.2506	19.4403	0.0000		0	Systematic		Floor	2.2506	19.4403
10.0749	19.4403	0.0000		0	Systematic		Floor	10.0749	19.4403
6.1627	26.2164	0.0000		0	Systematic		Floor	6.1627	26.2164
2.2506	32.9924	0.0000		0	Systematic		Floor	2.2506	32.9924
10.0749	32.9924	0.0000		0	Systematic		Floor	10.0749	32.9924
6.1627	39.7684	0.0000		0	Systematic		Floor	6.1627	39.7684
2.2506	46.5444	0.0000		0	Systematic		Floor	2.2506	46.5444
10.0749	46.5444	0.0000		0	Systematic		Floor	10.0749	46.5444
6.1627	53.3205	0.0000		0	Systematic		Floor	6.1627	53.3205
2.2506	60.0965	0.0000		0	Systematic		Floor	2.2506	60.0965
10.0749	60.0965	0.0000		0	Systematic		Floor	10.0749	60.0965
0.9935	0.0000	0.3199		0	Systematic		Wall 2	11.5065	0.3199
8.8178	0.0000	0.3199		0	Systematic		Wall 2	3.6822	0.3199
7.7638	62.0000	0.3199		0	Systematic		Wall 1	7.7638	0.3199
0.0000	61.9395	0.3199		0	Systematic		no wall	61.9395	0.3199

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D116(D) - Survey Unit 4

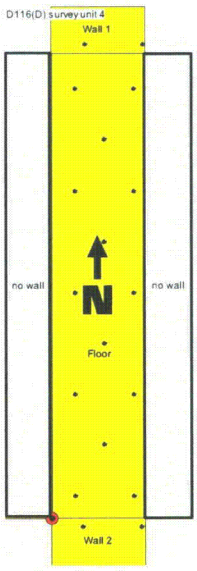
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	954.31 ft^2
Size of grid / Area of grid cell [d]	7.82428 feet / 53.0175 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.
[e] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Area: D116(D) survey unit 4									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
2.2506	5.8883	0.0000		0	Systematic		Floor	2.2506	5.8883
10.0749	5.8883	0.0000		0	Systematic		Floor	10.0749	5.8883
6.1627	12.6643	0.0000		0	Systematic		Floor	6.1627	12.6643
2.2506	19.4403	0.0000		0	Systematic		Floor	2.2506	19.4403
10.0749	19.4403	0.0000		0	Systematic		Floor	10.0749	19.4403
6.1627	26.2164	0.0000		0	Systematic		Floor	6.1627	26.2164
2.2506	32.9924	0.0000		0	Systematic		Floor	2.2506	32.9924
10.0749	32.9924	0.0000		0	Systematic		Floor	10.0749	32.9924
6.1627	39.7684	0.0000		0	Systematic		Floor	6.1627	39.7684
2.2506	46.5444	0.0000		0	Systematic		Floor	2.2506	46.5444
10.0749	46.5444	0.0000		0	Systematic		Floor	10.0749	46.5444
6.1627	53.3205	0.0000		0	Systematic		Floor	6.1627	53.3205
2.2506	60.0965	0.0000		0	Systematic		Floor	2.2506	60.0965
10.0749	60.0965	0.0000		0	Systematic		Floor	10.0749	60.0965
0.9935	0.0000	0.3199		0	Systematic		Wall 2	11.5065	0.3199
8.8178	0.0000	0.3199		0	Systematic		Wall 2	3.6822	0.3199
7.7638	62.0000	0.3199		0	Systematic		Wall 1	7.7638	0.3199
0.0000	61.9395	0.3199		0	Systematic		no wall	61.9395	0.3199

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D116(D) - Survey Unit 5

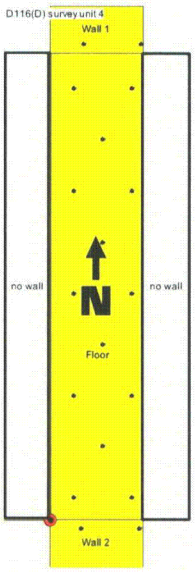
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	954.31 ft^2
Size of grid / Area of grid cell [d]	7.82428 feet / 53.0175 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.
[e] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Area: D116(D) survey unit 5									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
2.2506	5.8883	0.0000		0	Systematic		Floor	2.2506	5.8883
10.0749	5.8883	0.0000		0	Systematic		Floor	10.0749	5.8883
6.1627	12.6643	0.0000		0	Systematic		Floor	6.1627	12.6643
2.2506	19.4403	0.0000		0	Systematic		Floor	2.2506	19.4403
10.0749	19.4403	0.0000		0	Systematic		Floor	10.0749	19.4403
6.1627	26.2164	0.0000		0	Systematic		Floor	6.1627	26.2164
2.2506	32.9924	0.0000		0	Systematic		Floor	2.2506	32.9924
10.0749	32.9924	0.0000		0	Systematic		Floor	10.0749	32.9924
6.1627	39.7684	0.0000		0	Systematic		Floor	6.1627	39.7684
2.2506	46.5444	0.0000		0	Systematic		Floor	2.2506	46.5444
10.0749	46.5444	0.0000		0	Systematic		Floor	10.0749	46.5444
6.1627	53.3205	0.0000		0	Systematic		Floor	6.1627	53.3205
2.2506	60.0965	0.0000		0	Systematic		Floor	2.2506	60.0965
10.0749	60.0965	0.0000		0	Systematic		Floor	10.0749	60.0965
0.9935	0.0000	0.3199		0	Systematic		Wall 2	11.5065	0.3199
8.8178	0.0000	0.3199		0	Systematic		Wall 2	3.6822	0.3199
7.7638	62.0000	0.3199		0	Systematic		Wall 1	7.7638	0.3199
0.0000	61.9395	0.3199		0	Systematic		no wall	61.9395	0.3199

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D116(D) - Survey Unit 6

Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

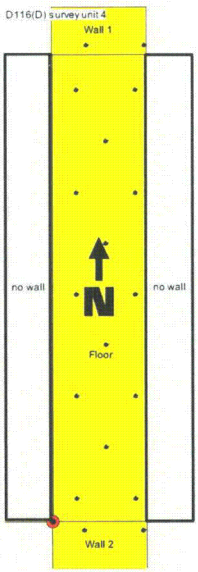
Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	954.31 ft^2
Size of grid / Area of grid cell [d]	7.82428 feet / 53.0175 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.
[e] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Area: D116(D) survey unit 6									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
2.2506	5.8883	0.0000		0	Systematic		Floor	2.2506	5.8883
10.0749	5.8883	0.0000		0	Systematic		Floor	10.0749	5.8883
6.1627	12.6643	0.0000		0	Systematic		Floor	6.1627	12.6643
2.2506	19.4403	0.0000		0	Systematic		Floor	2.2506	19.4403
10.0749	19.4403	0.0000		0	Systematic		Floor	10.0749	19.4403
6.1627	26.2164	0.0000		0	Systematic		Floor	6.1627	26.2164
2.2506	32.9924	0.0000		0	Systematic		Floor	2.2506	32.9924
10.0749	32.9924	0.0000		0	Systematic		Floor	10.0749	32.9924
6.1627	39.7684	0.0000		0	Systematic		Floor	6.1627	39.7684
2.2506	46.5444	0.0000		0	Systematic		Floor	2.2506	46.5444
10.0749	46.5444	0.0000		0	Systematic		Floor	10.0749	46.5444
6.1627	53.3205	0.0000		0	Systematic		Floor	6.1627	53.3205
2.2506	60.0965	0.0000		0	Systematic		Floor	2.2506	60.0965
10.0749	60.0965	0.0000		0	Systematic		Floor	10.0749	60.0965
0.9935	0.0000	0.3199		0	Systematic		Wall 2	11.5065	0.3199
8.8178	0.0000	0.3199		0	Systematic		Wall 2	3.6822	0.3199
7.7638	62.0000	0.3199		0	Systematic		Wall 1	7.7638	0.3199
0.0000	61.9395	0.3199		0	Systematic		no wall	61.9395	0.3199

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D116(D) - Survey Unit 7

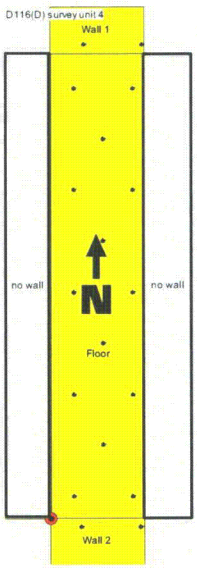
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	954.31 ft^2
Size of grid / Area of grid cell [d]	7.82428 feet / 53.0175 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.
[e] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Area: D116(D) survey unit 7									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
2.2506	5.8883	0.0000		0	Systematic		Floor	2.2506	5.8883
10.0749	5.8883	0.0000		0	Systematic		Floor	10.0749	5.8883
6.1627	12.6643	0.0000		0	Systematic		Floor	6.1627	12.6643
2.2506	19.4403	0.0000		0	Systematic		Floor	2.2506	19.4403
10.0749	19.4403	0.0000		0	Systematic		Floor	10.0749	19.4403
6.1627	26.2164	0.0000		0	Systematic		Floor	6.1627	26.2164
2.2506	32.9924	0.0000		0	Systematic		Floor	2.2506	32.9924
10.0749	32.9924	0.0000		0	Systematic		Floor	10.0749	32.9924
6.1627	39.7684	0.0000		0	Systematic		Floor	6.1627	39.7684
2.2506	46.5444	0.0000		0	Systematic		Floor	2.2506	46.5444
10.0749	46.5444	0.0000		0	Systematic		Floor	10.0749	46.5444
6.1627	53.3205	0.0000		0	Systematic		Floor	6.1627	53.3205
2.2506	60.0965	0.0000		0	Systematic		Floor	2.2506	60.0965
10.0749	60.0965	0.0000		0	Systematic		Floor	10.0749	60.0965
0.9935	0.0000	0.3199		0	Systematic		Wall 2	11.5065	0.3199
8.8178	0.0000	0.3199		0	Systematic		Wall 2	3.6822	0.3199
7.7638	62.0000	0.3199		0	Systematic		Wall 1	7.7638	0.3199
0.0000	61.9395	0.3199		0	Systematic		no wall	61.9395	0.3199

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D116(D) - Survey Unit 8

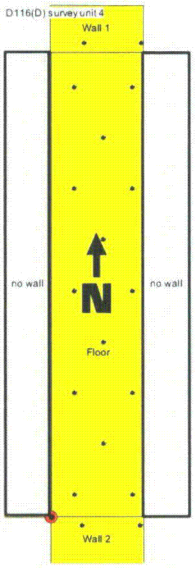
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	954.31 ft^2
Size of grid / Area of grid cell [d]	7.82428 feet / 53.0175 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.
[e] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Area: D116(D) survey unit 8									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
2.2506	5.8883	0.0000		0	Systematic		Floor	2.2506	5.8883
10.0749	5.8883	0.0000		0	Systematic		Floor	10.0749	5.8883
6.1627	12.6643	0.0000		0	Systematic		Floor	6.1627	12.6643
2.2506	19.4403	0.0000		0	Systematic		Floor	2.2506	19.4403
10.0749	19.4403	0.0000		0	Systematic		Floor	10.0749	19.4403
6.1627	26.2164	0.0000		0	Systematic		Floor	6.1627	26.2164
2.2506	32.9924	0.0000		0	Systematic		Floor	2.2506	32.9924
10.0749	32.9924	0.0000		0	Systematic		Floor	10.0749	32.9924
6.1627	39.7684	0.0000		0	Systematic		Floor	6.1627	39.7684
2.2506	46.5444	0.0000		0	Systematic		Floor	2.2506	46.5444
10.0749	46.5444	0.0000		0	Systematic		Floor	10.0749	46.5444
6.1627	53.3205	0.0000		0	Systematic		Floor	6.1627	53.3205
2.2506	60.0965	0.0000		0	Systematic		Floor	2.2506	60.0965
10.0749	60.0965	0.0000		0	Systematic		Floor	10.0749	60.0965
0.9935	0.0000	0.3199		0	Systematic		Wall 2	11.5065	0.3199
8.8178	0.0000	0.3199		0	Systematic		Wall 2	3.6822	0.3199
7.7638	62.0000	0.3199		0	Systematic		Wall 1	7.7638	0.3199
0.0000	61.9395	0.3199		0	Systematic		no wall	61.9395	0.3199

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D116(D) - Survey Unit 9

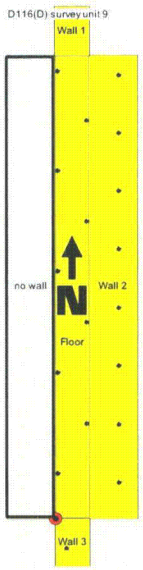
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	764.49 ft^2
Size of grid / Area of grid cell [d]	7.78113 feet / 52.4344 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D116(D) survey unit 9									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
0.3482	6.0088	0.0000		0	Systematic		Floor	0.3482	6.0088
4.2387	12.7474	0.0000		0	Systematic		Floor	4.2387	12.7474
0.3482	19.4861	0.0000		0	Systematic		Floor	0.3482	19.4861
4.2387	26.2248	0.0000		0	Systematic		Floor	4.2387	26.2248
0.3482	32.9634	0.0000		0	Systematic		Floor	0.3482	32.9634
4.2387	39.7021	0.0000		0	Systematic		Floor	4.2387	39.7021
0.3482	46.4407	0.0000		0	Systematic		Floor	0.3482	46.4407
4.2387	53.1794	0.0000		0	Systematic		Floor	4.2387	53.1794
0.3482	59.9181	0.0000		0	Systematic		Floor	0.3482	59.9181
1.5382	0.0000	4.0951		0	Systematic		Wall 3	2.9618	4.0951
4.5000	4.8194	4.0951		0	Systematic		Wall 2	57.1806	4.0951
4.5000	12.6005	4.0951		0	Systematic		Wall 2	49.3995	4.0951
4.5000	20.3816	4.0951		0	Systematic		Wall 2	41.6184	4.0951
4.5000	28.1628	4.0951		0	Systematic		Wall 2	33.8372	4.0951
4.5000	35.9439	4.0951		0	Systematic		Wall 2	26.0561	4.0951
4.5000	43.7250	4.0951		0	Systematic		Wall 2	18.2750	4.0951
4.5000	51.5062	4.0951		0	Systematic		Wall 2	10.4938	4.0951
4.5000	59.2873	4.0951		0	Systematic		Wall 2	2.7127	4.0951

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D117 - Small Room

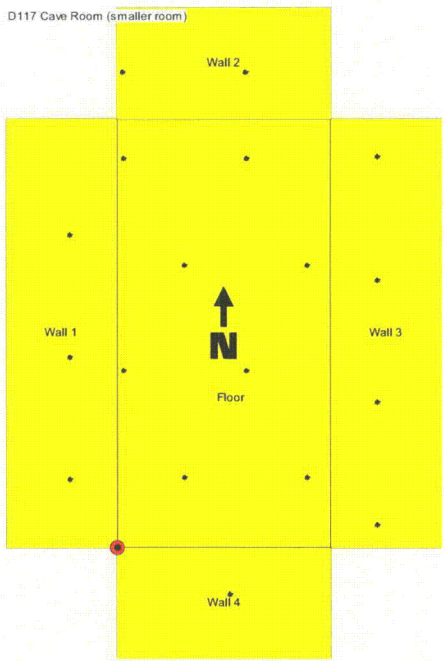
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	800.00 ft^2
Size of grid / Area of grid cell [d]	7.1638 feet / 44.4444 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D117 Cave Room (smaller room)									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
3.9969	4.0566	0.0000		0	Systematic		Floor	3.9969	4.0566
11.1607	4.0566	0.0000		0	Systematic		Floor	11.1607	4.0566
0.4150	10.2606	0.0000		0	Systematic		Floor	0.4150	10.2606
7.5788	10.2606	0.0000		0	Systematic		Floor	7.5788	10.2606
3.9969	16.4647	0.0000		0	Systematic		Floor	3.9969	16.4647
11.1607	16.4647	0.0000		0	Systematic		Floor	11.1607	16.4647
0.4150	22.6687	0.0000		0	Systematic		Floor	0.4150	22.6687
7.5788	22.6687	0.0000		0	Systematic		Floor	7.5788	22.6687
6.6256	0.0000	2.7437		0	Systematic		Wall 4	5.8744	2.7437
12.5000	1.2894	2.7437		0	Systematic		Wall 3	23.7106	2.7437
12.5000	8.4532	2.7437		0	Systematic		Wall 3	16.5468	2.7437
12.5000	15.6170	2.7437		0	Systematic		Wall 3	9.3830	2.7437
12.5000	22.7808	2.7437		0	Systematic		Wall 3	2.2192	2.7437
7.5554	25.0000	2.7437		0	Systematic		Wall 2	7.5554	2.7437
0.3916	25.0000	2.7437		0	Systematic		Wall 2	0.3916	2.7437
0.0000	18.2278	2.7437		0	Systematic		Wall 1	18.2278	2.7437
0.0000	11.0640	2.7437		0	Systematic		Wall 1	11.0640	2.7437
0.0000	3.9002	2.7437		0	Systematic		Wall 1	3.9002	2.7437

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D117 - Large Room, Survey Unit 1

Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

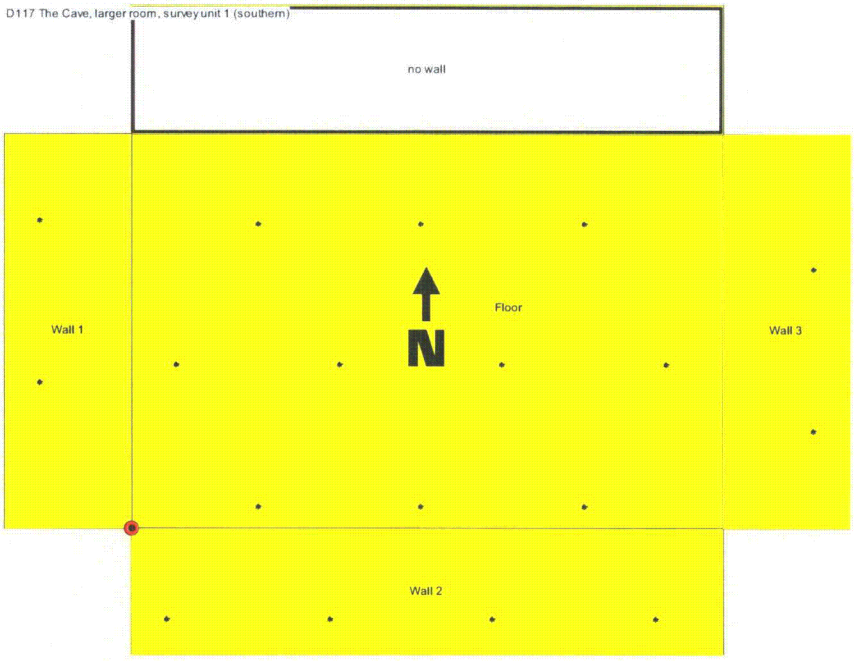
Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	1063.68 ft^2
Size of grid / Area of grid cell [d]	8.26047 feet / 59.0936 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D117 The Cave, larger room, survey unit 1 (southern)									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
6.4649	1.0889	0.0000		0	Systematic		Floor	6.4649	1.0889
14.7254	1.0889	0.0000		0	Systematic		Floor	14.7254	1.0889
22.9859	1.0889	0.0000		0	Systematic		Floor	22.9859	1.0889
2.3347	8.2427	0.0000		0	Systematic		Floor	2.3347	8.2427
10.5952	8.2427	0.0000		0	Systematic		Floor	10.5952	8.2427
18.8556	8.2427	0.0000		0	Systematic		Floor	18.8556	8.2427
27.1161	8.2427	0.0000		0	Systematic		Floor	27.1161	8.2427
6.4649	15.3965	0.0000		0	Systematic		Floor	6.4649	15.3965
14.7254	15.3965	0.0000		0	Systematic		Floor	14.7254	15.3965
22.9859	15.3965	0.0000		0	Systematic		Floor	22.9859	15.3965
1.8099	0.0000	4.6567		0	Systematic		Wall 2	28.1901	4.6567
10.0704	0.0000	4.6567		0	Systematic		Wall 2	19.9296	4.6567
18.3309	0.0000	4.6567		0	Systematic		Wall 2	11.6691	4.6567
26.5914	0.0000	4.6567		0	Systematic		Wall 2	3.4086	4.6567
30.0000	4.8518	4.6567		0	Systematic		Wall 3	15.1482	4.6567
30.0000	13.1123	4.6567		0	Systematic		Wall 3	6.8877	4.6567
0.0000	15.5854	4.6567		0	Systematic		Wall 1	15.5854	4.6567
0.0000	7.3249	4.6567		0	Systematic		Wall 1	7.3249	4.6567

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D117 - Large Room, Survey Unit 2

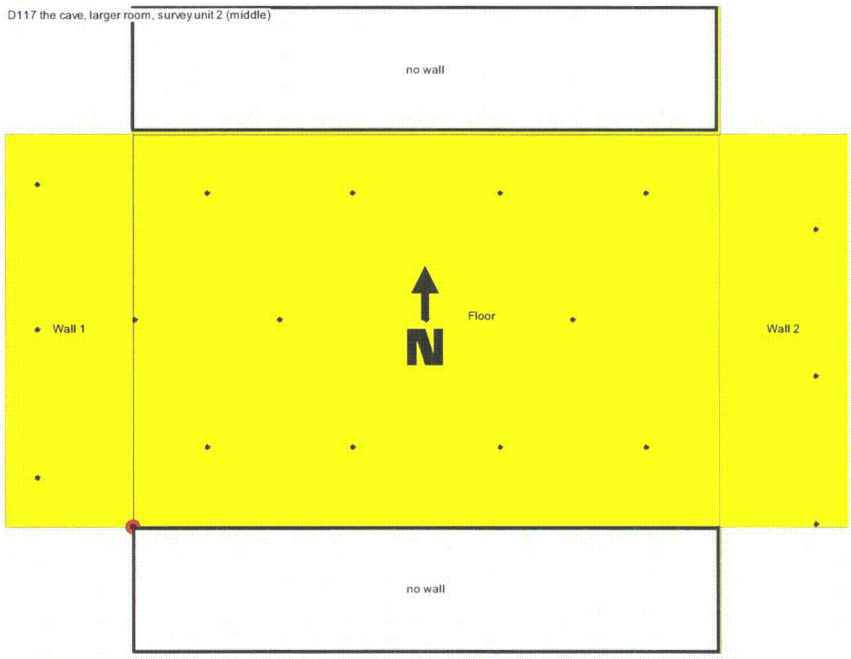
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	873.51 ft^2
Size of grid / Area of grid cell [d]	7.4857 feet / 48.5284 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D117 the cave, larger room, survey unit 2 (middle)									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
3.8451	4.0073	0.0000		0	Systematic		Floor	3.8451	4.0073
11.3309	4.0073	0.0000		0	Systematic		Floor	11.3309	4.0073
18.8166	4.0073	0.0000		0	Systematic		Floor	18.8166	4.0073
26.3023	4.0073	0.0000		0	Systematic		Floor	26.3023	4.0073
0.1023	10.4901	0.0000		0	Systematic		Floor	0.1023	10.4901
7.5880	10.4901	0.0000		0	Systematic		Floor	7.5880	10.4901
15.0737	10.4901	0.0000		0	Systematic		Floor	15.0737	10.4901
22.5594	10.4901	0.0000		0	Systematic		Floor	22.5594	10.4901
3.8451	16.9730	0.0000		0	Systematic		Floor	3.8451	16.9730
11.3309	16.9730	0.0000		0	Systematic		Floor	11.3309	16.9730
18.8166	16.9730	0.0000		0	Systematic		Floor	18.8166	16.9730
26.3023	16.9730	0.0000		0	Systematic		Floor	26.3023	16.9730
30.0000	0.1471	4.8872		0	Systematic		Wall 2	19.8529	4.8872
30.0000	7.6328	4.8872		0	Systematic		Wall 2	12.3672	4.8872
30.0000	15.1185	4.8872		0	Systematic		Wall 2	4.8815	4.8872
0.0000	17.4530	4.8872		0	Systematic		Wall 1	17.4530	4.8872
0.0000	9.9673	4.8872		0	Systematic		Wall 1	9.9673	4.8872
0.0000	2.4816	4.8872		0	Systematic		Wall 1	2.4816	4.8872

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D202 - Main Floor

Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

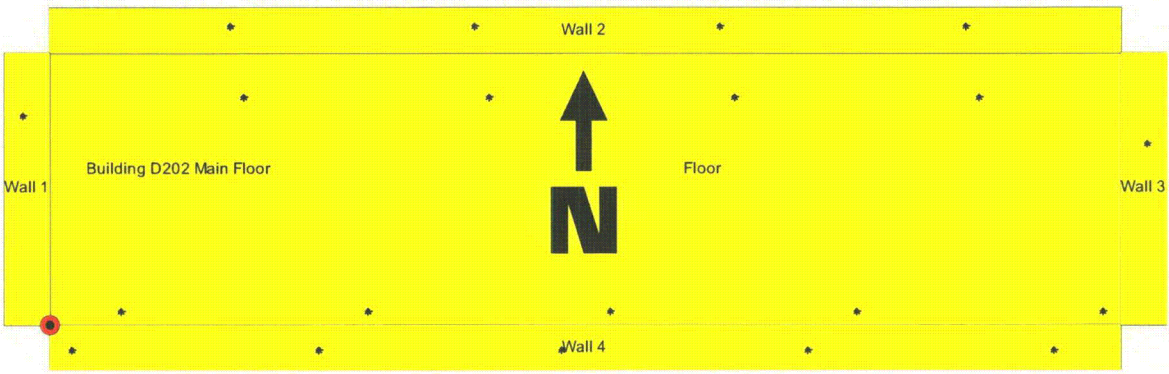
Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	20
Number of selected sample areas [b]	1
Specified sampling area [c]	8144.00 ft^2
Size of grid / Area of grid cell [d]	34.3806 feet / 1023.66 ft^2
Grid pattern	Triangular
Total cost of sampling [e]	$18.00

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.

Building 202 Main Floor



Area: Building 202 Main Floor									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
10.1108	1.8337	0.0000		0	Systematic		Floor	10.1108	1.8337
44.4914	1.8337	0.0000		0	Systematic		Floor	44.4914	1.8337
78.8720	1.8337	0.0000		0	Systematic		Floor	78.8720	1.8337
113.2526	1.8337	0.0000		0	Systematic		Floor	113.2526	1.8337
147.6332	1.8337	0.0000		0	Systematic		Floor	147.6332	1.8337
27.3011	31.6081	0.0000		0	Systematic		Floor	27.3011	31.6081
61.6817	31.6081	0.0000		0	Systematic		Floor	61.6817	31.6081
96.0623	31.6081	0.0000		0	Systematic		Floor	96.0623	31.6081
130.4429	31.6081	0.0000		0	Systematic		Floor	130.4429	31.6081
3.2568	0.0000	3.7219		0	Systematic		Wall 4	146.7432	3.7219
37.6374	0.0000	3.7219		0	Systematic		Wall 4	112.3626	3.7219
72.0180	0.0000	3.7219		0	Systematic		Wall 4	77.9820	3.7219
106.3986	0.0000	3.7219		0	Systematic		Wall 4	43.6014	3.7219
140.7792	0.0000	3.7219		0	Systematic		Wall 4	9.2208	3.7219
150.0000	25.1598	3.7219		0	Systematic		Wall 3	12.8402	3.7219
128.4596	38.0000	3.7219		0	Systematic		Wall 2	128.4596	3.7219
94.0791	38.0000	3.7219		0	Systematic		Wall 2	94.0791	3.7219
59.6985	38.0000	3.7219		0	Systematic		Wall 2	59.6985	3.7219
25.3179	38.0000	3.7219		0	Systematic		Wall 2	25.3179	3.7219
0.0000	28.9373	3.7219		0	Systematic		Wall 1	28.9373	3.7219

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D202 - Second Floor

Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

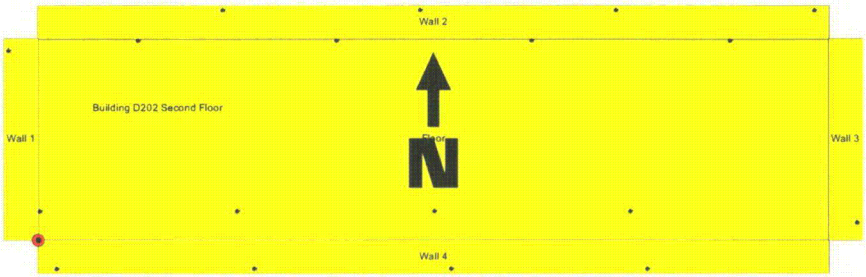
Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	8144.00 ft^2
Size of grid / Area of grid cell [d]	37.3964 feet / 1211.13 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.

Building D202 Second Floor



Area: Building D202 Second Floor									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
0.4445	5.2720	0.0000		0	Systematic		Floor	0.4445	5.2720
37.8409	5.2720	0.0000		0	Systematic		Floor	37.8409	5.2720
75.2374	5.2720	0.0000		0	Systematic		Floor	75.2374	5.2720
112.6338	5.2720	0.0000		0	Systematic		Floor	112.6338	5.2720
19.1427	37.6583	0.0000		0	Systematic		Floor	19.1427	37.6583
56.5391	37.6583	0.0000		0	Systematic		Floor	56.5391	37.6583
93.9356	37.6583	0.0000		0	Systematic		Floor	93.9356	37.6583
131.3320	37.6583	0.0000		0	Systematic		Floor	131.3320	37.6583
3.6761	0.0000	5.5460		0	Systematic		Wall 4	146.3239	5.5460
41.0725	0.0000	5.5460		0	Systematic		Wall 4	108.9275	5.5460
78.4690	0.0000	5.5460		0	Systematic		Wall 4	71.5310	5.5460
115.8654	0.0000	5.5460		0	Systematic		Wall 4	34.1346	5.5460
150.0000	3.2618	5.5460		0	Systematic		Wall 3	34.7382	5.5460
147.3418	38.0000	5.5460		0	Systematic		Wall 2	147.3418	5.5460
109.9453	38.0000	5.5460		0	Systematic		Wall 2	109.9453	5.5460
72.5489	38.0000	5.5460		0	Systematic		Wall 2	72.5489	5.5460
35.1525	38.0000	5.5460		0	Systematic		Wall 2	35.1525	5.5460
0.0000	35.7560	5.5460		0	Systematic		Wall 1	35.7560	5.5460

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D203(A)

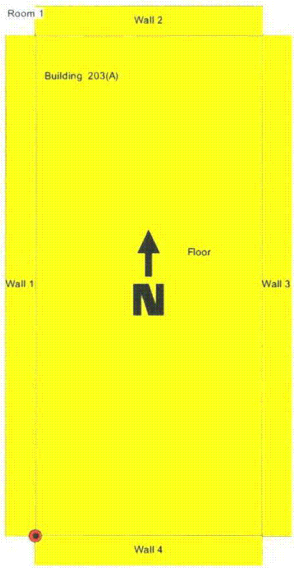
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field is also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	0
Number of selected sample areas [b]	1
Specified sampling area [c]	7580.00 ft^2
Size of grid / Area of grid cell [d]	28.9669 feet / 726.667 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



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D203(B) - Survey Unit 1

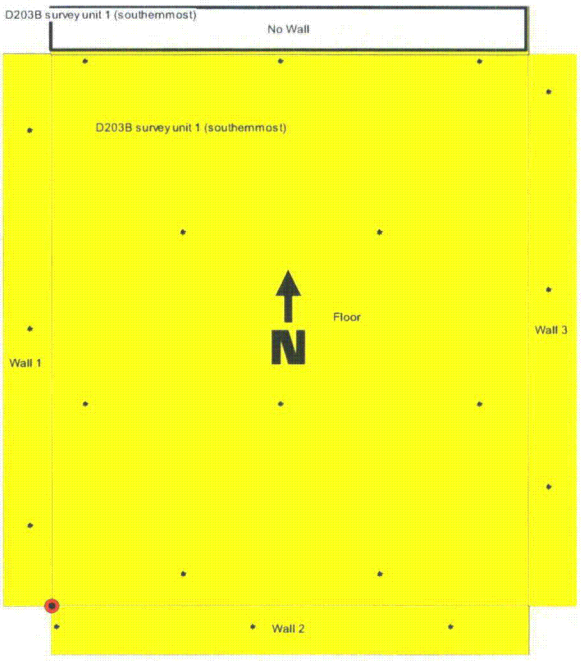
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	19
Number of selected sample areas [b]	1
Specified sampling area [c]	6307.81 ft^2
Size of grid / Area of grid cell [d]	26.8284 feet / 623.331 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D203B survey unit 1 (southernmost)									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
18.1348	4.3391	0.0000		0	Systematic		Floor	18.1348	4.3391
44.9631	4.3391	0.0000		0	Systematic		Floor	44.9631	4.3391
4.7206	27.5732	0.0000		0	Systematic		Floor	4.7206	27.5732
31.5490	27.5732	0.0000		0	Systematic		Floor	31.5490	27.5732
58.3773	27.5732	0.0000		0	Systematic		Floor	58.3773	27.5732
18.1348	50.8072	0.0000		0	Systematic		Floor	18.1348	50.8072
44.9631	50.8072	0.0000		0	Systematic		Floor	44.9631	50.8072
4.7206	74.0413	0.0000		0	Systematic		Floor	4.7206	74.0413
31.5490	74.0413	0.0000		0	Systematic		Floor	31.5490	74.0413
58.3773	74.0413	0.0000		0	Systematic		Floor	58.3773	74.0413
0.7728	0.0000	2.8764		0	Systematic		Wall 2	64.2272	2.8764
27.6011	0.0000	2.8764		0	Systematic		Wall 2	37.3989	2.8764
54.4295	0.0000	2.8764		0	Systematic		Wall 2	10.5705	2.8764
65.0000	16.2578	2.8764		0	Systematic		Wall 3	58.7422	2.8764
65.0000	43.0862	2.8764		0	Systematic		Wall 3	31.9138	2.8764
65.0000	69.9145	2.8764		0	Systematic		Wall 3	5.0855	2.8764
0.0000	64.6004	2.8764		0	Systematic		Wall 1	64.6004	2.8764
0.0000	37.7720	2.8764		0	Systematic		Wall 1	37.7720	2.8764
0.0000	10.9437	2.8764		0	Systematic		Wall 1	10.9437	2.8764

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D203(B) - Survey Unit 2

Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

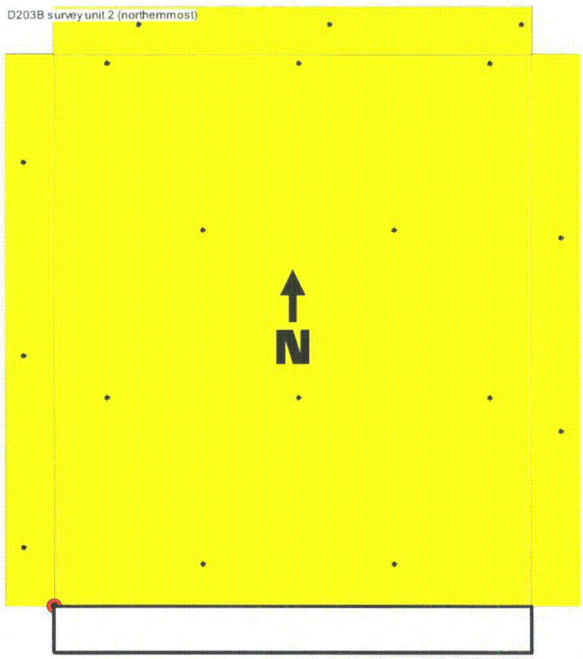
Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	6289.73 ft^2
Size of grid / Area of grid cell [d]	26.1856 feet / 593.821 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D203B survey unit 2 (northernmost)									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
20.2680	5.6458	0.0000		0	Systematic		Floor	20.2680	5.6458
46.4536	5.6458	0.0000		0	Systematic		Floor	46.4536	5.6458
7.1752	28.3231	0.0000		0	Systematic		Floor	7.1752	28.3231
33.3608	28.3231	0.0000		0	Systematic		Floor	33.3608	28.3231
59.5464	28.3231	0.0000		0	Systematic		Floor	59.5464	28.3231
20.2680	51.0005	0.0000		0	Systematic		Floor	20.2680	51.0005
46.4536	51.0005	0.0000		0	Systematic		Floor	46.4536	51.0005
7.1752	73.6779	0.0000		0	Systematic		Floor	7.1752	73.6779
33.3608	73.6779	0.0000		0	Systematic		Floor	33.3608	73.6779
59.5464	73.6779	0.0000		0	Systematic		Floor	59.5464	73.6779
65.0000	23.8368	4.0175		0	Systematic		Wall 3	51.1632	4.0175
65.0000	50.0224	4.0175		0	Systematic		Wall 3	24.9776	4.0175
63.7920	75.0000	4.0175		0	Systematic		Wall 2	63.7920	4.0175
37.6064	75.0000	4.0175		0	Systematic		Wall 2	37.6064	4.0175
11.4209	75.0000	4.0175		0	Systematic		Wall 2	11.4209	4.0175
0.0000	60.2353	4.0175		0	Systematic		Wall 1	60.2353	4.0175
0.0000	34.0497	4.0175		0	Systematic		Wall 1	34.0497	4.0175
0.0000	7.8641	4.0175		0	Systematic		Wall 1	7.8641	4.0175

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D203(D) - Survey Unit 1

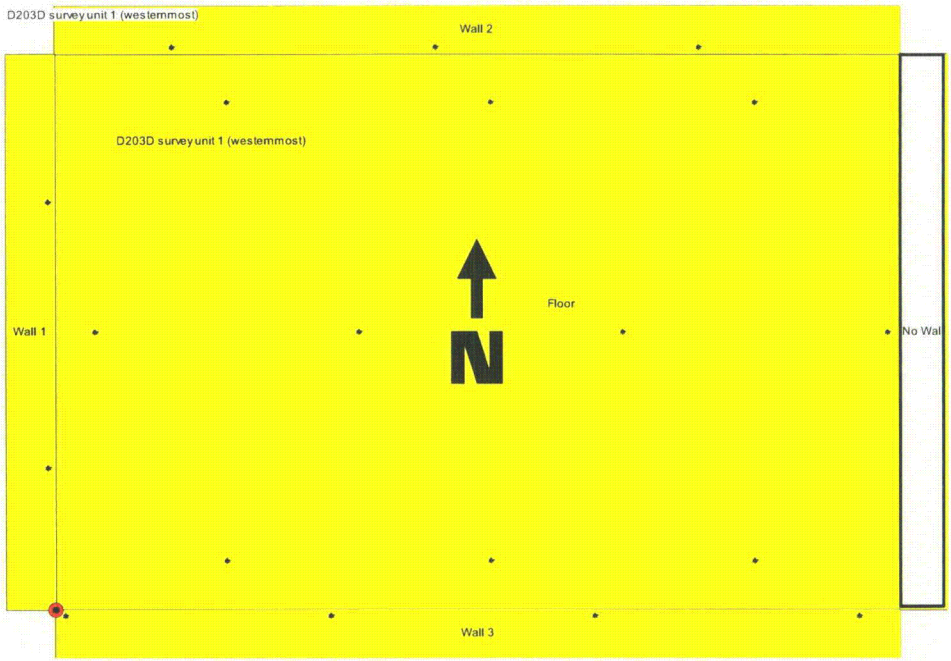
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	19
Number of selected sample areas [b]	1
Specified sampling area [c]	10572.32 ft^2
Size of grid / Area of grid cell [d]	35.7362 feet / 1105.98 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D203D survey unit 1 (westernmost)									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
23.1844	6.5177	0.0000		0	Systematic		Floor	23.1844	6.5177
58.9206	6.5177	0.0000		0	Systematic		Floor	58.9206	6.5177
94.6568	6.5177	0.0000		0	Systematic		Floor	94.6568	6.5177
5.3163	37.4661	0.0000		0	Systematic		Floor	5.3163	37.4661
41.0525	37.4661	0.0000		0	Systematic		Floor	41.0525	37.4661
76.7887	37.4661	0.0000		0	Systematic		Floor	76.7887	37.4661
112.5249	37.4661	0.0000		0	Systematic		Floor	112.5249	37.4661
23.1844	68.4146	0.0000		0	Systematic		Floor	23.1844	68.4146
58.9206	68.4146	0.0000		0	Systematic		Floor	58.9206	68.4146
94.6568	68.4146	0.0000		0	Systematic		Floor	94.6568	68.4146
1.4459	0.0000	0.9236		0	Systematic		Wall 3	112.5541	0.9236
37.1821	0.0000	0.9236		0	Systematic		Wall 3	76.8179	0.9236
72.9183	0.0000	0.9236		0	Systematic		Wall 3	41.0817	0.9236
108.6545	0.0000	0.9236		0	Systematic		Wall 3	5.3455	0.9236
87.1370	75.0000	0.9236		0	Systematic		Wall 2	87.1370	0.9236
51.4008	75.0000	0.9236		0	Systematic		Wall 2	51.4008	0.9236
15.6646	75.0000	0.9236		0	Systematic		Wall 2	15.6646	0.9236
0.0000	54.9285	0.9236		0	Systematic		Wall 1	54.9285	0.9236
0.0000	19.1923	0.9236		0	Systematic		Wall 1	19.1923	0.9236

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D203(D) - Survey Unit 2

Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

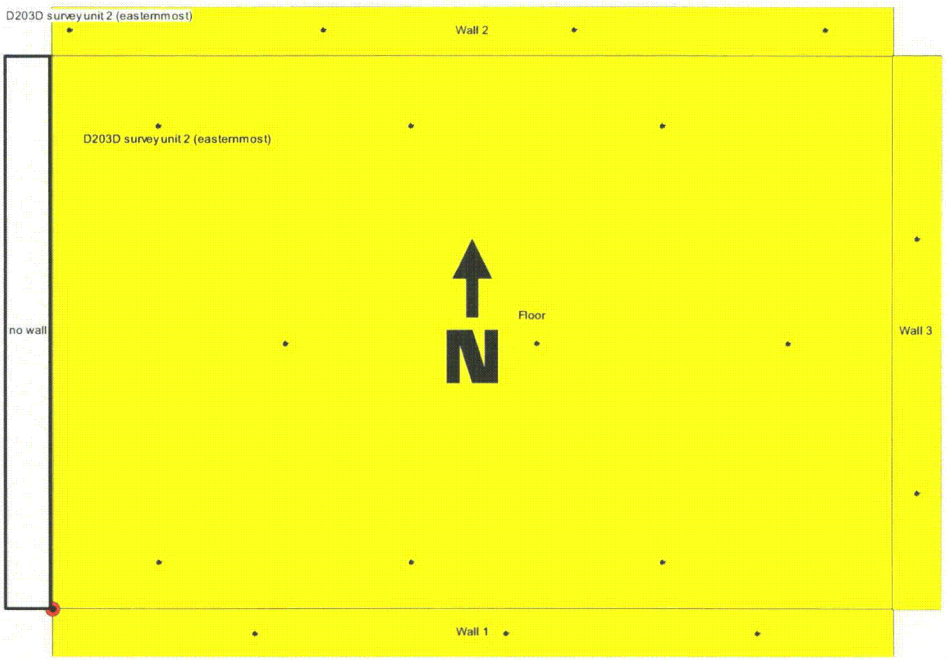
Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	10550.97 ft^2
Size of grid / Area of grid cell [d]	34.1401 feet / 1009.39 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D203D survey unit 2 (easternmost)									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
14.5092	6.2647	0.0000		0	Systematic		Floor	14.5092	6.2647
48.6493	6.2647	0.0000		0	Systematic		Floor	48.6493	6.2647
82.7894	6.2647	0.0000		0	Systematic		Floor	82.7894	6.2647
31.5792	35.8309	0.0000		0	Systematic		Floor	31.5792	35.8309
65.7193	35.8309	0.0000		0	Systematic		Floor	65.7193	35.8309
99.8594	35.8309	0.0000		0	Systematic		Floor	99.8594	35.8309
14.5092	65.3971	0.0000		0	Systematic		Floor	14.5092	65.3971
48.6493	65.3971	0.0000		0	Systematic		Floor	48.6493	65.3971
82.7894	65.3971	0.0000		0	Systematic		Floor	82.7894	65.3971
27.3618	0.0000	3.3378		0	Systematic		Wall 1	86.6382	3.3378
61.5019	0.0000	3.3378		0	Systematic		Wall 1	52.4981	3.3378
95.6420	0.0000	3.3378		0	Systematic		Wall 1	18.3580	3.3378
114.0000	15.7820	3.3378		0	Systematic		Wall 3	59.2180	3.3378
114.0000	49.9221	3.3378		0	Systematic		Wall 3	25.0779	3.3378
104.9378	75.0000	3.3378		0	Systematic		Wall 2	104.9378	3.3378
70.7977	75.0000	3.3378		0	Systematic		Wall 2	70.7977	3.3378
36.6576	75.0000	3.3378		0	Systematic		Wall 2	36.6576	3.3378
2.5176	75.0000	3.3378		0	Systematic		Wall 2	2.5176	3.3378

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D203(G) - Survey Unit 1

Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

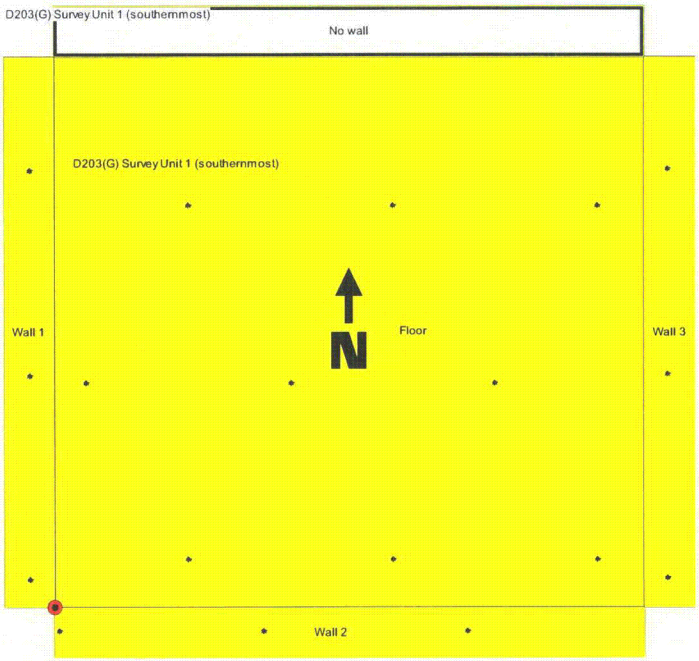
Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	6697.31 ft^2
Size of grid / Area of grid cell [d]	25.9815 feet / 584.598 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D203(G) Survey Unit 1 (southernmost)									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
17.2084	6.0541	0.0000		0	Systematic		Floor	17.2084	6.0541
43.1899	6.0541	0.0000		0	Systematic		Floor	43.1899	6.0541
69.1713	6.0541	0.0000		0	Systematic		Floor	69.1713	6.0541
4.2177	28.5547	0.0000		0	Systematic		Floor	4.2177	28.5547
30.1992	28.5547	0.0000		0	Systematic		Floor	30.1992	28.5547
56.1806	28.5547	0.0000		0	Systematic		Floor	56.1806	28.5547
17.2084	51.0553	0.0000		0	Systematic		Floor	17.2084	51.0553
43.1899	51.0553	0.0000		0	Systematic		Floor	43.1899	51.0553
69.1713	51.0553	0.0000		0	Systematic		Floor	69.1713	51.0553
0.7221	0.0000	3.0961		0	Systematic		Wall 2	74.2779	3.0961
26.7036	0.0000	3.0961		0	Systematic		Wall 2	48.2964	3.0961
52.6850	0.0000	3.0961		0	Systematic		Wall 2	22.3150	3.0961
75.0000	3.6665	3.0961		0	Systematic		Wall 3	66.3335	3.0961
75.0000	29.6479	3.0961		0	Systematic		Wall 3	40.3521	3.0961
75.0000	55.6294	3.0961		0	Systematic		Wall 3	14.3706	3.0961
0.0000	55.4448	3.0961		0	Systematic		Wall 1	55.4448	3.0961
0.0000	29.4634	3.0961		0	Systematic		Wall 1	29.4634	3.0961
0.0000	3.4819	3.0961		0	Systematic		Wall 1	3.4819	3.0961

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D203(G) - Survey Unit 2

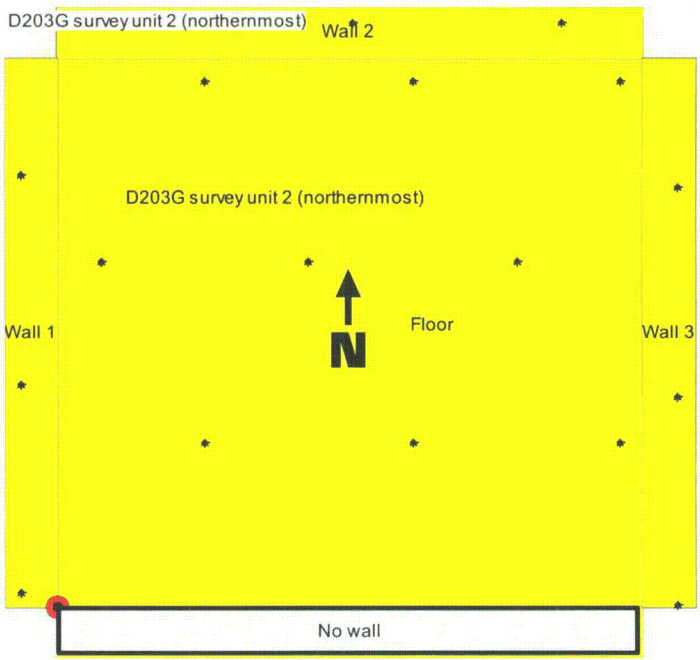
Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	18
Number of samples on map [a]	18
Number of selected sample areas [b]	1
Specified sampling area [c]	6696.46 ft^2
Size of grid / Area of grid cell [d]	26.6553 feet / 615.315 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: D203G survey unit 2 (northernmost)									
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY
19.1173	20.8434	0.0000		0	Systematic		Floor	19.1173	20.8434
45.7726	20.8434	0.0000		0	Systematic		Floor	45.7726	20.8434
72.4278	20.8434	0.0000		0	Systematic		Floor	72.4278	20.8434
5.7896	43.9275	0.0000		0	Systematic		Floor	5.7896	43.9275
32.4449	43.9275	0.0000		0	Systematic		Floor	32.4449	43.9275
59.1002	43.9275	0.0000		0	Systematic		Floor	59.1002	43.9275
19.1173	67.0117	0.0000		0	Systematic		Floor	19.1173	67.0117
45.7726	67.0117	0.0000		0	Systematic		Floor	45.7726	67.0117
72.4278	67.0117	0.0000		0	Systematic		Floor	72.4278	67.0117
75.0000	0.1353	4.4581		0	Systematic		Wall 3	69.8647	4.4581
75.0000	26.7905	4.4581		0	Systematic		Wall 3	43.2095	4.4581
75.0000	53.4458	4.4581		0	Systematic		Wall 3	16.5542	4.4581
64.8989	70.0000	4.4581		0	Systematic		Wall 2	64.8989	4.4581
38.2436	70.0000	4.4581		0	Systematic		Wall 2	38.2436	4.4581
11.5883	70.0000	4.4581		0	Systematic		Wall 2	11.5883	4.4581
0.0000	54.9331	4.4581		0	Systematic		Wall 1	54.9331	4.4581
0.0000	28.2778	4.4581		0	Systematic		Wall 1	28.2778	4.4581
0.0000	1.6225	4.4581		0	Systematic		Wall 1	1.6225	4.4581

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IEM
Integrated Environmental Management, Inc.

Project No: 94005.3206	Page 1 of 4
Subject: SURVEY AREA/SAMPLE DETERMINATION	
Performed by: Michael Kimbro	Date: 7/28/2009
Checked by:	Date:

NOTES: SMC - FINAL STATUS SURVEY - DETERMINE THE NUMBER OF SURVEY UNITS AND THE NUMBER OF SAMPLES REQUIRED PER SURVEY UNIT.

MARSSIM recommended survey unit sizes for outdoor areas:

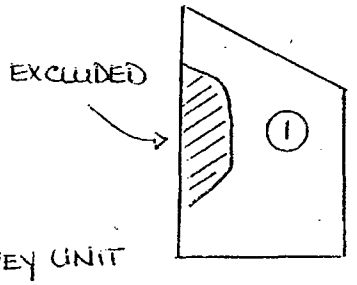
CLASS 1 - not to exceed 2,000 m^2 CLASS 2 - 2,000 m^2 - 10,000 m^2

USING: Type I error (α): 0.05 Relative shift Δ/σ: 1.5

Type II error (β): 0.05 WRS table shows requirement of 18 samples prior to applying elevated activity requirement calculations.

- compare area names (#) to attached area classification map.

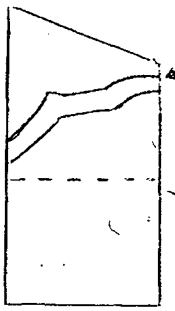
(1) CLASS 2 land area due east of the covered mound/modified area. Not to include the covered mound.
86,030 ft^2 = 7,992 m^2 one SURVEY UNIT WITH 18 SAMPLES TAKEN IN THE SURVEY UNIT.



NOT TO SCALE.

(2) CLASS 2 land area west of the covered mound/modified area.
193,707 ft^2 = 17,996 m^2

CREATE TWO SURVEY UNITS OF APPROX. 8,998 m^2. EACH OF THESE TWO SURVEY UNITS REQUIRE 18 SAMPLES. IF A SAMPLE LOCATION FALLS ON THE HAUL ROAD, IT MAY BE MOVED.



NOT TO SCALE
Haul road is not included in the survey unit.
SEPARATES 2 approximate SURVEY UNITS.

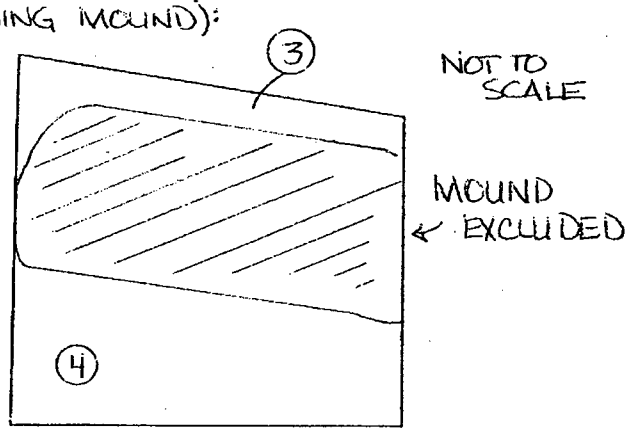
NOTE: CLASS 2 AREAS ARE NOT TESTED BY ELEVATED ACTIVITY CRITERIA.
MARSSIM P. 5-38 at BOTTOM: THESE CONSIDERATIONS GENERALLY APPLY ON TO CLASS 1 AREAS SINCE AREAS OF ELEVATED ACTIVITY SHOULD NOT EXIST IN CLASS 2 OR CLASS 3 AREAS.

THE ESTABLISHED DCGL FOR TH-232 + progeny = 8.3 pCi/g. NUREG-1507 TABLE 6.4 SHOW THE SCAN MDC FOR NaI 2" x 2" detector AS 18.3 pCi/g. SINCE THE SCAN MDC FOR THE CHOSEN INSTRUMENT IS UNABLE TO DETECT THE DCGL WHILE SCANNING, THE ELEVATED MEASUREMENT CRITERIA MUST BE APPLIED TO CLASS 1 AREAS TO DETERMINE IF ADDITIONAL SAMPLES MUST BE TAKEN.

CLASS 1.
AREA NORTH AND SOUTH OF THE COVERED MOUND/MODIFIED AREA.

(3)+(4) TOTAL SURFACE AREA (EXCLUDING MOUND):

196,503 ft²
est (3) area 18,125 ft² (north)
est (4) area 178,378 ft² (south)

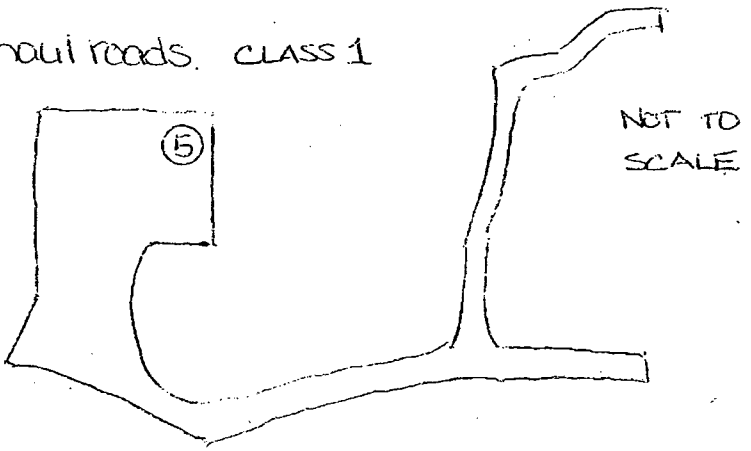


(3) 18,125 ft² = 1,684 m²
ONE SURVEY UNIT. REQUIRES 38 TOTAL SAMPLES.

(4) 178,378 ft² = 16,571 m². CREATE NINE SURVEY UNITS OF APPROXIMATELY 1,841 m² each. EACH SURVEY UNIT REQUIRES 42 SAMPLES.

(5) FORMER D111 area and haul roads. CLASS 1

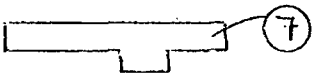
TOTAL SURFACE AREA =
166,523 ft² = 15,470 m²
CREATE EIGHT SURVEY UNITS OF APPROXIMATELY 1,934 m². EACH SURVEY UNIT REQUIRES 44 samples.



(6) CLASS 1 LAND AREA SOUTH OF POND
17,346 ft² = 1,611 m²
ONE SURVEY AREA WITH A REQUIRED 37 TOTAL SAMPLES.

NOT TO SCALE

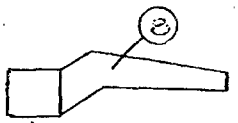
(7) CLASS 1 FORMER, D112 AREA
18,468 ft² = 1,715 m²



ONE SURVEY AREA WITH A REQUIRED 39 TOTAL SAMPLES.

(8) CLASS 1 FORMER, D116 AREA

Total surface area	17,411 ft²
est. building D116 Footprint.	6,200 ft²
land survey AREA	11,211 ft² = 1042 m²



↑ Building not included

ONE SURVEY UNIT WITH A REQUIRED 24 TOTAL SAMPLES.

ELEVATED ACTIVITY CALCULATIONS:

STEP 1 · DETERMINE the area, a', bounded by 18 systematic SAMPLES.

(3) 1,684 m²/18 = 102 m²
(4) 1,841 m²/18 = 94 m²
(5) 1,934 m²/18 = 107 m²
(6) 1,611 m²/18 = 90 m²
(7) 1,715 m²/18 = 96 m²
(8) ~~11,211 m²~~ 1,042 m²/18 = 58 m²

STEP 2 USING MARSSIM TABLE 5.6 FOR Th-232, CALULATE THE AREA FACTORS (A.F.) ASSOCIATED WITH a'.

X area	Y area factor
10 m²	3.2
30 m²	2.3
100 m²	1.8
300 m²	1.5
1000 m²	1.1

USING interpolation formula:

$$Y_2 = \frac{(X_2 - X_1)(Y_3 - Y_1)}{(X_3 - X_1)} + Y_1$$

	AF
(3)	1.8
(4)	1.8
(5)	1.8
(6)	1.9
(7)	1.8
(8)	2.2

STEP 3 - DETERMINE "REQUIRED" SCAN MDC (DCGL X AF)

③ 8.3 × 1.8 = 14.9
④ 8.3 × 1.8 = 14.9
⑤ 8.3 × 1.8 = 14.9
⑥ 8.3 × 1.~~8~~ 9 = 15.8 INK
⑦ 8.3 × 1.8 = 14.9
⑧ 8.3 × 2.2 = 18.3

• IF "ACTUAL SCAN MDC > REQUIRED SCAN MDC, THEN ADDITIONAL SAMPLES MUST BE TAKEN.

DETERMINE HOW MANY TOTAL SAMPLES ARE REQUIRED PER SURVEY UNIT.

STEP 4 - CREATE NEW A.F. (ACTUAL SCAN MDC / DCGL): AF $\frac{18.3 \text{ pCi/g}}{8.3 \text{ pCi/g}} = 2.2$

STEP 5 - INTERPOLATE TO GET AREA, α', that corresponds WITH THE NEW A.F

~~Y~~ AREA	X A.F.
30 m²	2.3
Y²	2.2
100 m²	1.8

$$Y_2 = \frac{(X_2 - X_1)(Y_3 - Y_1)}{(X_3 - X_1)} + Y_1$$

$$44 = \frac{(2.2 - 2.3)(100 - 30)}{(1.8 - 2.3)} + 30$$

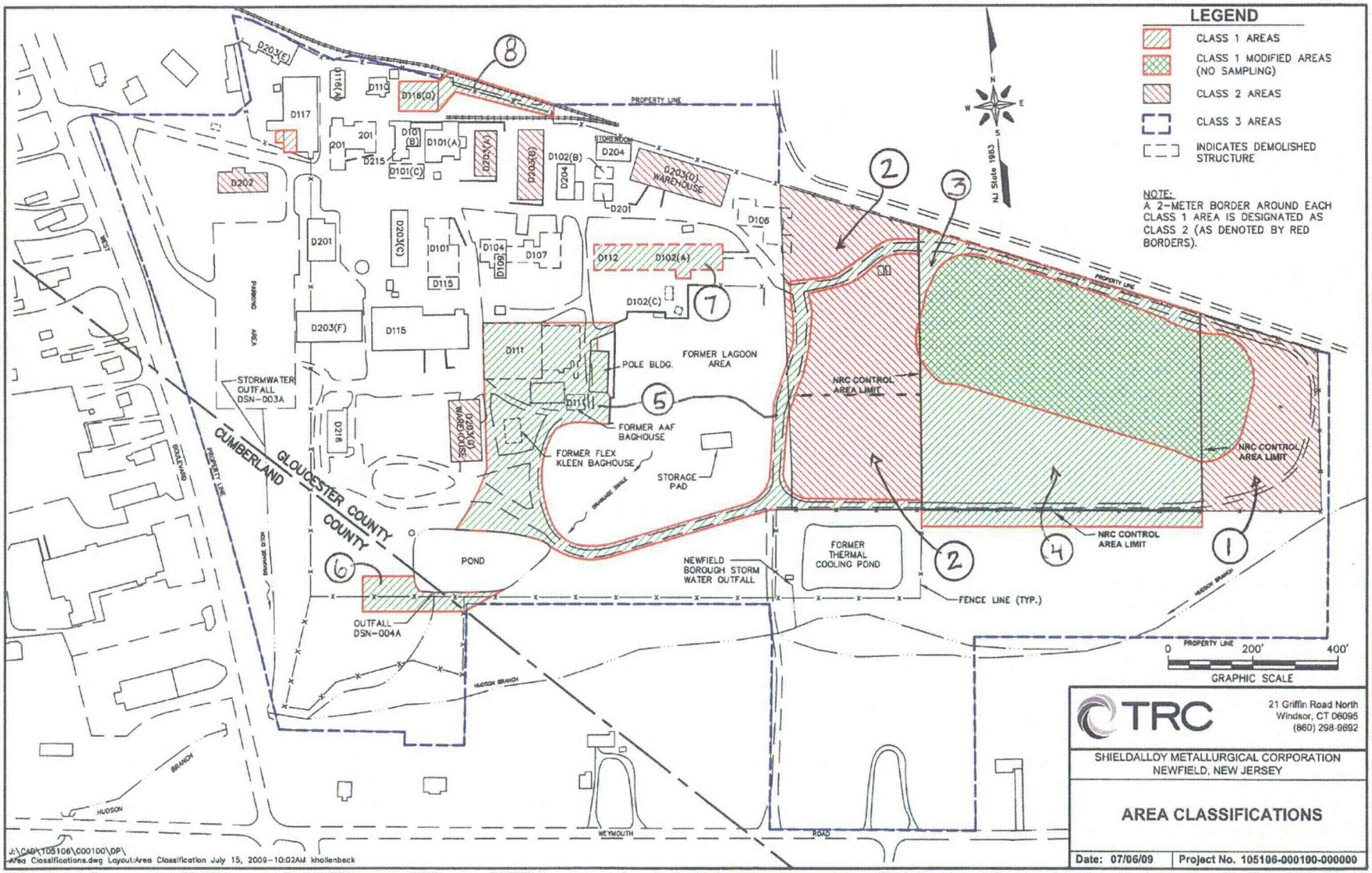
α' = 44 m²

STEP 6 DETERMINE THE NUMBER OF SAMPLES PER SURVEY UNIT:
SURVEY UNIT AREA / α'

③ 1,684 m²/44 m² = 38 samples
④ 1,841 m²/44 m² = 42 samples
⑤ 1,934 m²/44 m² = 44 samples
⑥ 1,611 m²/44 m² = 37 samples
⑦ 1,715 m²/44 m² = 39 samples
⑧ 1,042 m²/44 m² = 24 samples

Total OUTDOOR SAMPLES:

①	1 UNIT(S) × 18 SAMPLES =		18
②	2	18	INK ~~18~~ 36
③	1	38	38
④	9	42	378
⑤	8	44	352
⑥	1	37	37
⑦	1	39	39
⑧	1	24	24
Ⓡ	1 REFENCE UNIT (bkg) × 18		18
Class 3 Remainder of Site	18		18
			968 Total Samples


LEGEND
CLASS 1 AREAS
CLASS 1 MODIFIED AREAS (NO SAMPLING)
CLASS 2 AREAS
CLASS 3 AREAS
INDICATES DEMOLISHED STRUCTURE
NOTE:
A 2-METER BORDER AROUND EACH CLASS 1 AREA IS DESIGNATED AS CLASS 2 (AS DENOTED BY RED BORDERS).
NJ State 1983
PROPERTY LINE
STOREROOM
D204
D203(G) WAREHOUSE
D203(E)
D116(A)
D110
D116(D)
D117
201
D215
D101(B)
D101(A)
D101(C)
D205(A)
D203(B)
D102(B)
D202
D201
D106
D203(C)
D104
D109
D107
D112
D102(A)
D102(C)
D115
D203(F)
D111
POLE BLDG.
FORMER LAGOON AREA
STORMWATER OUTFALL DSN-003A
D113
FORMER AAF BAGHOUSE
D216
D203(D) WAREHOUSE
FORMER FLEX KLEEN BAGHOUSE
STORAGE PAD
DRAINAGE SWALE
NRC CONTROL AREA LIMIT
PARKING AREA
WEST
BOULEVARD
CUMBERLAND
GLOUCESTER COUNTY
COUNTY
POND
NEWFIELD BOROUGH STORM WATER OUTFALL
FORMER THERMAL COOLING POND
FENCE LINE (TYP.)
OUTFALL DSN-004A
HUDSON BRANCH
WEYMOUTH
ROAD
0 200' 400'
GRAPHIC SCALE
TRC
21 Griffin Road North
Windsor, CT 06095
(860) 298-9692
SHIELDALLOY METALLURGICAL CORPORATION
NEWFIELD, NEW JERSEY
AREA CLASSIFICATIONS
Date: 07/06/09
Project No. 105106-000100-000000
J:\CAD\105106\000100\DP\
Area Classifications.dwg Layout:Area Classification July 15, 2009-10:02AM khollenbeck

IEM
Integrated Environmental Management, Inc.

Project No. 94005.3210	Page 1 of 3
Subject: Calculate # Samples (Closing)	
Performed By: Michael Kimbro	Date: 6/25/2009
Checked By:	Date:

SHIELDALLOY SAMPLES (LAND AREAS) → CLASS 1 and 2 ONLY

STEP ONE - DETERMINE SIZE OF AREA and # of SURVEY UNITS:

USING AREA CLASSIFICATIONS MAP:

1. CLASS 2 AREA EAST OF BERM - 157,500 ft^2 = 14,632 m^2
2. CLASS 2 AREA WEST OF BERM - 247,500 ft^2 = 22,993 m^2
3. CLASS 1 AREA SOUTH OF BERM - 180,000 ft^2 = 16,722 m^2
4. CLASS 1 AREA NORTH OF BERM - 54,000 ft^2 = 5,017 m^2
5. CLASS 1 AREA LARGE CENTER OF SITE - 326,625 ft^2 = 30,344 m^2
6. CLASS 1 AREA FORMER D112 - 21,000 ft^2 = 1951 m^2
7. CLASS 1 AREA SURROUNDING D116 - 21,747 ft^2 = 2020 m^2
8. CLASS 1 AREA SMALL NW CORNER - ~~FOX WAREHOUSE IS A BUILDING~~ ESTIMATED 1,000 ft^2 = 93 m^2

MARSSIM p. 4-15 survey unit size: CLASS 1 - up to 2,000 m^2 CLASS 2 - 2,000 - 10,000 m^2

1. 14,632 m^2/2 = 2 units (7,316 m^2)
2. 22,993 m^2/3 - 3 units (7,664 m^2)
3. 16,722 m^2/9 = 9 units (1,858 m^2)
4. 5,017 m^2/3 = 3 units (1,672 m^2)
5. 30,344 m^2/16 - 16 units (1,897 m^2)
6. 1951 m^2 - 1 survey unit (1,951 m^2)
7. 2020 m^2/2 - 2 units (1,010 m^2)
8. 93 m^2 - 1 survey unit

THE SCAN MDC FOR A NaI 2" x 2" Detector is 18.3 pCi/g for Th-232 decay series AS FOUND IN NUREG-1507 TABLE 6.4. THE DCGL for Th-232 + progeny = 8.3 pCi/g AS FOUND IN THE DOCUMENT "DERIVED CONCENTRATION GUIDELINE LEVELS for the Newhall Site" TABLE 6.6. Th-232 + progeny was selected by B. Berger AS the MOST CONSERVATIVE.

- The SCAN MDC is GREATER THAN THE DCGL. Do we need to take additional samples (if so, how many?) or can we use the # samples indicated by TABLE 5.3 of MARSSIM (WRS Sum Test)

- USING Type I error (α) 0.05 Type II error (β) (0.05) Relative shift Δ/σ = 1.5 (WRS) = 18 samples

- calculate area, a', bounded by systematic samples

3. 1858/18 = 103 m^2
4. 1672 m^2/18 = 93 m^2
5. 1897 m^2/18 = 105 m^2
6. 1951 m^2/18 = 108 m^2
7. 1366 m^2/18 = 73 m^2
8. 93 m^2/18 = 5 m^2

* NOTE: MARSSIM p. 5-38 at bottom: These considerations generally apply only to Class 1 survey units, since areas of elevated activity should not exist in Class 2 or Class 3 areas.

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Project No. 94005.3210	Page 2 of 3
Subject: Calculate # samples (cosing)	
Performed By: Michael Kendre MK	Date: 6/25/2009
Checked By:	Date:

- Calculate area factors (AF) associated with a' USING MARSSIM TABLE 5.6 for TH-232

area	area factor
30 m²	2.3
100 m²	1.8
300 m²	1.5
1,000 m²	1.1

USING interpolation formula:

$$Y_2 = \frac{(X_2 - X_1)(Y_3 - Y_1)}{(X_3 - X_1)} + Y_1$$

(http://www.qyasdgner.com/php interpolation/linear_interpolation equation.php)

AF = ③ 1.79 ④ 1.85 ⑤ 1.79 ⑥ 1.79 ⑦ 1.94 ⑧ 5.3

- Determine "required scan MDC" (DCGL × A.F.)

③ 8.3 × 1.79 = 14.9
④ 8.3 × 1.85 = 15.4
⑤ 8.3 × 1.79 = 14.9
⑥ 8.3 × 1.79 = 14.9
⑦ 8.3 × 1.94 = 16.5
⑧ 8.3 × 5.3 = 44

3 m²	6.2 ⑧ (use for)
10 m²	3.2

- ACTUAL SCAN MDC (18.6 pCi/g) > REQUIRED SCAN MDCs. MORE SAMPLES ARE needed. (additional)
  ↳ except for ⑧

- CREATE NEW A.F. (ACTUAL SCAN MDC / DCGL)

$$\frac{18.3 \text{ pCi/g}}{8.3 \text{ pCi/g}} = 2.2$$

(a')

- INTERPOLATE TO GET AREA THAT CORRESPONDS WITH THIS AF.

area	area factor
30 m²	2.3
× Y2	2.2
100 m²	1.8

$$Y_2 = \frac{(X_2 - X_1)(Y_3 - Y_1)}{(X_3 - X_1)} + Y_1$$

$$44 = \frac{(2.2 - 2.3)(100 - 30)}{(1.8 - 2.3)} + 30 \qquad a' = 44 \text{ m}^2$$

new sample size: survey unit area / a'

③ 1850 m²/44 m² = 42 per unit
④ 1672 m²/44 m² = 38 per unit
⑤ 1897 m²/44 m² = 43 per unit
⑥ 1951 m²/44 m² = 44 per unit
⑦ 2613 m²/44 m² = 59 per unit
⑧ NA

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Integrated Environmental Management, Inc.

Project No. 94005.3210	Page 3 of 3
Subject: Calculate # samples (costing)	
Performed By: Michael Kunnas MK	Date: 6/25/2009
Checked By:	Date:

Total # samples per area
(# Survey units × samples per unit)

* NOT SURE HOW MANY SAMPLES FOR THE REF. AREA → 18*

REFERENCE BACKGROUND:

1	CLASS 2	EAST OF BERM	(2)(18) = 36
2		WEST OF BERM	(3)(18) = 54
3	CLASS 1	SOUTH OF BERM	(9)(42) = 378
4		NORTH OF BERM	(3)(38) = 114
5		LARGE CENTER OF SITE	(16)(43) = 688
6		FORMER D112	(1)(44) = 44
7		SURROUNDING D116	(2)(59) = 118
8		FORMER FOX WAREHOUSE (NW CORNER)	(1)(18) = 18

1468 samples
for CLASS 1 and 2 AREAS

Class 3 (LARGE)

- There appears to be 2 Class 3 areas on site. Since the recommended area for Class 3 is unlimited:

2 areas × 18 samples = 36 samples

Total: 1468
+ 36
1504 samples

This report was prepared under the direction of
Shieldalloy Metallurgical Corporation

by

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Appendix 19.16- SSAB Minutes and Transcript

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation

Minutes from August 15, 2003 Meeting

Attendance: (see attached sign-in sheet)

David R. Smith - SMC
C. Lee Harp, Esq. - Arter and Hadden (facilitator)
Carol D. Berger, C.H.P. - IEM (technical consultant to SMC)
Loretta Williams - Newfield resident
Donna L. Gaffigan - NJDEP representative
Nancy W. Stanley - NJDEP representative
Rick Westergaard - Mayor
(see attached sign-in sheet)

Discussion: (see attached agenda)
Welcome, introductions, sign-in, and a brief discussion on the purpose of meeting was delivered by Lee Harp.

David Smith provided a brief introduction to SMC, including its history, its licensing status and the current decommissioning activities, followed by a brief walking tour and visit to the Storage Yard. *The following handout was provided and attached to these minutes: Background information on SMC*

Carol Berger gave an introduction to the concepts of radiation and radioactivity, with emphasis on definitions, units (i.e., the "millirem"), typical background radiation exposures (U. S. Average is 360 millirem), the regulatory dose limits for license termination for unrestricted use (25 millirem) and restricted use (100 millirem), and radiation-related risks (no demonstrable risks below 10,000 millirem). *The following handouts were provided and attached to these minutes: Presentation Outline ("Introduction to Radiation and Radioactivity"), a brochure on "Radioactivity Basics", and a webcard showing the address of a web site where more information on radiation and radioactivity can be found.*

The regulations associated with decommissioning in general and public involvement in particular was provided and summarized by Carol Berger, with emphasis on those pertaining to stakeholder and public involvement. *The following handouts were provided and attached to these minutes: Presentation Outline ("Purpose of the Site Specific Advisory Board") and USNRC decommissioning regulations.*

Lee Harp discussed the role of the SSAB during decommissioning of the Newfield site. *The following handout was provided and attached to these minutes: "Requirements of 10 CFR §20.1403(d)".*

David Smith presented the three decommissioning options currently being evaluated with respect to radiological and economic impacts (ALARA analysis). These are: "No Action", packaging and shipping all residual radioactivity to the Envirocare disposal site in Utah, and "in-situ" disposal of the residual radioactivity within the Storage Yard under an engineered cap.

Donna Gaffigan asked about "intermediate" options, such as sale of the baghouse dust in concert with off-site disposal. David Smith stated that there are no feasible intermediate options, and then presented SMC's parallel effort to identify recycle/reuse possibilities for the slag and baghouse dust, what has been done to date (slag fluidizers, shielding, shielding constituents, high-strength concrete, dry cask storage for spent nuclear fuel, concrete admixtures), and what is currently being pursued (slag fluidizers, artificial reefs). Additional information on the use of the slag in the construction of artificial reefs and as an amendment to steel manufacture was provided. *The following handout was provided and attached to these minutes: NJ Reef News, 2001 Edition.*

A number of preliminary key issues (summarized below) were discussed. However, there was insufficient time to prepare a complete listing of SSAB interests in the Newfield decommissioning process. Therefore, first meeting of the SSAB was closed with a mutual agreement to hold a follow-up meeting in September of 2003.

Key Issues and Questions to be Addressed:
o(This is a preliminary listing. A more definitive listing will be prepared at the next meeting of the SSAB. SMC will respond to each item, and the item and SMC's response will be incorporated into the decommissioning plan.)

What is the time frame associated with any beneficial reuse options and why has there been no beneficial re-use yet found for the radioactive slag within the past 5 years?

No one knows what future development issues in the Newfield area might arise over the next 1,000 years, thus it is difficult to make decisions on decommissioning.

Is SMC committed to in-situ disposal of the residual radioactivity or are alternatives still under consideration?

A waste broker (American Ecology) provided a preliminary disposal cost for the slag and baghouse dust at Newfield to a member of the SSAB.

Has an environmental impact statement been prepared? If not, is it necessary to prepare one?

How does the SSAB role fit into the typical public involvement role and opportunities for comment under CERCLA?

The recent drop in worker population and the reduction in commercial activities at SMC and the previous bankruptcy filing raises the question about how long SMC will remain a business entity in Newfield over the long term, thus it is not clear how they can possibly remain responsible for the site, and what would happen to the residual radioactivity (and remaining decommissioning funds) at that time.

Is SMC in favor of finding a useful purpose for the subject material if one can be found?

It is doubtful that anyone other than SMC would build a business at the Newfield site for fear of lawsuits.

No one really knows whether there are health risks associated with the radioactivity at the Newfield facility, therefore it is best to simply ship it off for disposal.

It is difficult to accept institutional controls that are supposed to last for 1,000 years.

Has SMC posted enough financial assurance to assure "unrestricted release" of the site if the institutional controls should fail over time or if SMC defaults on decommissioning commitments?

Can the make-up of the SSAB be made broader? (It is, and that others did not accept invitations to attend.)

The SSAB would like more time to develop the list of key issues and concerns, but does not want to be the justification for delaying any submissions (i.e., the August 29, 2003 ALARA analysis) to the USNRC.

It is unclear whether the use of the Newfield slag in the construction of artificial reefs would be acceptable to the State of New Jersey. The SSAB ~~appeared to favor~~ that decommissioning option. [illegible]

The health effects on fish and vertebrates if the slag is used as an artificial reef might need to be investigated.

The SSAB wants to receive a copy of the pending ALARA analysis as well as the draft decommissioning plan.

The SSAB would like to receive sections of the August 28, 2002 decommissioning plan that describe the current radiological and physical conditions of the site.

The SSAB would like to learn more about the use of Newfield slag in the steel manufacturing process.

Action Items and Responsible Individuals:
Distribute minutes (Carol Berger)

Schedule next meeting of the SSAB (David Smith)

Distribute information on the radiological environment at the Newfield facility as described in the most recent version of the decommissioning plan (Carol Berger)

Determine whether there are State (NJ) regulations that would ban the use of Newfield slag in the construction of artificial reefs (Donna Gaffigan)

Distribute information on the use of slag in steel manufacturing (David Smith)

PARTICIPANT SIGN-IN SHEET

Shieldalloy Metallurgical Corporation SSAB: Kick-off Meeting at the SMC Newfield Facility

Date: August 15, 2003 | **Facilitator:** Charles L. Harp, Esq.

Your Name (Print)	Your Signature	Your Address	Your Telephone Number (with area code)	Your e-Mail Address
Charles L. Harp Jr	[illegible]	Nechas & Conner, P.C. [redacted]	[redacted]	[redacted]
CAROL D BERGER	Carol D Berger	[redacted] Gaithersburg MD	[redacted]	[redacted] .Cor
Rick Westergaard	Rick Westergaard	[redacted] Newfield, N.J. 08344	[redacted]	[redacted]
Nancy Stanley	Nancy Stanley	[redacted] Trenton NJ 08625-0415	[redacted]	[redacted]
Donna L Goffigan	Donna Goffigan	[redacted] Trenton NJ 08625-0415	[redacted]	[redacted]
David R Smith	David R Smith	SMC Newfield NJ	[redacted]	[redacted]
Loretta Williams	Loretta Williams	[redacted] Newfield N.J. 08344	[redacted]	

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation

Kick-off Meeting
August 15, 2003, 11:00 a.m. to 1:00 p.m.

Welcome, introductions and sign-in and brief purpose of meeting	C. L. Harp
Introduction to SMC	D. R. Smith
Brief facility tour	D. R. Smith
Introduction to Radiation and Radioactivity	C. D. Berger
Purpose of SSAB	C. D. Berger
How the SSAB process works	C. L. Harp
How the SSAB interests and issues will be addressed as part of the decommissioning process	C. L. Harp
Decommissioning the Newfield Facility	D. R. Smith and C. D. Berger
Listing of SSAB input, interests, and concerns	C. L. Harp
Discussion and clarification of issues	C. L. Harp
SSAB determination as to whether listing is final	C. L. Harp
Summary and review of action items	C. D. Berger
Adjourn	

COPIES OF HANDOUTS

Shieldalloy Metallurgical Corporation

Site Specific Advisory Board Meeting
August 15, 2003

Newfield, New Jersey

Background

Shieldalloy Metallurgical Corporation (SMC) purchased the original property in 1952. The property had previously been owned and operated by South Jersey Specialty Glass Company. SMC's initial production was grinding of metal and metal alloys into powders. One of the primary customers of the metal powders was the welding rods industry. They used the metal powders to coat and shield the welding rod and hence SMC's name [shield alloy] comes from this original application of our first products.

In the late 1950's and early 1960's SMC was beginning to manufacture some of its own metal and metal alloys at the Newfield plant. The manufacturing process used various metal ores, limestone, aluminum powder and a variety of other raw materials in the smelting or manufacturing process.

In 1963 SMC applied for and received a license from the Atomic Energy Commission (AEC) to use ores that contained low levels naturally occurring uranium and thorium (classified as 'source material') to manufacture ferro columbium (an iron and niobium alloy). This original AEC license was later reissued by the U.S. Nuclear Regulatory Commission (U.S. NRC) and is the current license that SMC uses to receive, handle, possess, process, store and ship source materials – SMB-743.

In 1990 SMC discontinued the smelting of chromium metal which had been one of SMC primary smelting operations. The company continued its smelting of ferro columbium and ferro vanadium alloy and also manufactured other ferro alloys through a melting process versus the smelting of ores.

Because of a variety of economic reasons SMC has been transferring the smelting and melting operations to sister companies outside of the U.S. over the last several years. The company has also been purchasing metals and metal alloys from other manufacturer (primarily from outside of the U.S. also). SMC Newfield's current manufacturing and production processes are grinding of metals and metal alloys into powders and also the manufacturing of compacted metal products – briquettes and Altabs.

Because SMC has discontinued of all the furnace operations including the smelting of ferro columbium; SMC is required by NRC and our license to the decommission plant and terminate the operating license. SMC is planning to decommission a portion of the plant for restricted release/use and obtain a possession only license from NRC as the provisions for institutional controls are maintained.

INTRODUCTION TO RADIATION AND RADIOACTIVITY

Carol D. Berger, C.H.P.

August 15, 2003

1. Atoms - The building block of life
2. Definition of radiation and radioactivity
3. Where radiation and radioactivity are found
4. Assessing the risks of radiation exposure
5. Questions?

ITS A QUESTION OF . . .

Integrated Environmental Management, Inc.
Vol. 1 No. 1
September, 1995

Radiation and Radioactivity

What is an Atom?

Everything in the world, and everybody in the word, is composed of different types of matter (chemical elements). The smallest part of each element is called the "Atom". An atom is so small that it can be seen only with the most powerful microscope. But the atom is the core of every substance in the universe.

Are there different types of atoms?

The type of atom is unique for each element, such as gold, silver, lead, tin, radium, carbon, and thorium. Our bodies are made mostly of hydrogen, carbon, oxygen, and calcium atoms. The light fixtures in this room are made of some type of metal atom. The air, as you know, is made of oxygen, hydrogen, nitrogen, and other atoms. Water is hydrogen and oxygen.

What is radioactivity?

Sometimes the center of an atom (its nucleus) has too much energy in it. An atom cannot hold this energy forever. Sooner or later, the atom must get rid of the excess energy and return to its normal (stable) state. Atoms with too much energy in their nuclei are called "radioactive". They get rid of their excess energy by emitting radiation. Some radioactive atoms exist naturally; others are made artificially.

What is radiation?

A radioactive atom gives off radiation to get rid of excess energy. The radiation can be in the form of particles moving at high speeds, or pure energy.

Radiation is a broad term which includes such things as heat, light, radiowaves, microwaves and other familiar forms of energy. When radiations are emitted from an atom they are traveling at very high speeds. This means that they have a lot of "energy". When the radiations collide with something, they deposit some or all of that energy in the thing with which they have collided.

You can compare the radiations from an atom with rays from the sun. When the rays from the sun reach our bodies they deposit their energy and the warmth we feel is the sun's rays' energy. When radiation from a radioactive atom penetrates an object, it deposits its energy in that object just like the sun's rays' deposit energy in our bodies.

What is a "unit"?

A unit is a way in which we express measurements. For example, an "inch" is a unit of length. A "second" is a unit of time. A "pound" is a unit of weight.

What is a "rem"?

A "rem" is a unit of radiation dose. It is typically used to describe how much radiation "energy" is deposited in someone or something. If our body absorbs radiation energy equivalent to about two-millionths of a calorie, we say we have received a "rem" of radiation dose.

Is a rem a large radiation dose?

When compared to the types of radiation doses people commonly receive every day of their lives from natural background radiation, a rem is a large dose . . . just like a "ton" is a large weight when we're talking about toothpicks, and a "mile" is a large length when we're talking about hot dogs.

Are there smaller units than a rem?

Yes. That unit is the "millirem". A millirem is one thousandth (1/1,000) of a rem. An even smaller, but frequently

more practical unit is the "microrem", which is one millionth (1/1,000,000) of a rem.

What does the term "rate" mean?

A rate is the amount of a particular unit of measurement that occurs over some specific time period. For example, "miles per hour" is a rate of speed, or the distance traveled in one hour. Likewise, "millirems per hour" is a dose rate, or the amount of radiation energy deposited in a one hour period of time.

What is a "curie"?

A "curie" is a unit of radioactivity. It tells us how many radioactive atoms in particular collection of atoms are giving off radiation. Just like a "ream" of paper in a drawer tells us that there are 500 sheets in the drawer, a curie of radium in a container tells us that there are 37,000,000,000 radium atoms giving off radiation.

Is a curie a lot of radioactivity?

Yes. Compared to the amount of naturally-occurring radioactivity in our bodies, it is a very large amount -- about ten million times larger. Therefore, it is sometimes more convenient to use units like "picocuries". A picocurie is one trillionth of a curie.

Is there an easy way to distinguish "millirems" from "picocuries"?

Yes there is. A fireplace with a nice fire burning in it is a good way to explain the difference between these two terms. In a fireplace, the burning wood or coals radiate heat. In this case, the amount of burning wood (fuel) in the fireplace is analogous to the number of picocuries of radioactivity. The amount of heat (energy) given off by the fireplace is analogous to the number of millirems of radiation energy.

Is there another example that is an analog to the term "picocurie"?

Yes. This time, picture yourself sitting in a stadium watching a sporting event. When something exciting happens, you are likely to see a lot of flashes coming from the stands where people are taking pictures. If you could somehow count the number of flashes over a particular time period - say 10 minutes - you would know the "flash rate" from all the cameras that are in the stadium. This measurement is similar to how the amount of radioactivity in a particular collection of atoms is determined. In this case we count the bursts of radiation (flashes) being given off by the atoms (cameras) per unit time (10 minutes). When we see 22 bursts in 10 minutes, we know we have measured a picocurie of radioactivity.

How does the term "millirems" fit into this analogy?

Let's say that while you are in the stadium, you take out your light meter and measure how much light is coming from the flashes in the stand over a one hour period. The amount of light measured by the meter is a measurement of the amount of "energy" coming from the cameras in the stadium. This measurement is similar to the radiation dose (energy) from a collection of atoms (cameras) per unit time (one hour). The units of this measurement would be "millirems per hour".

What does the term "picocurie per gram" mean?

This refers to the amount of radioactivity in a particular solid substance. Picture a one-ton batch of concrete that contains 1,000 pounds of gravel, 500 pounds of cement, and 500 pounds of water. To describe this particular mix of concrete, one might say it contains "500 pounds per ton" of cement. This means that for every pound of concrete, there will also be a quarter of a pound of cement present. Similarly, if you wished to describe the amount of radioactivity that typically exists in soil throughout the United States, you would say that it contains about "one picocurie per gram" of radium, one picocurie per gram of thorium, and a host of other radioactive elements. This means that for every gram (about 0.002 pounds) of soil, there will also be one picocurie of radium and one picocurie per gram

of thorium present, along with the rest of the radioactive elements commonly found in soil.

What does the term "picocurie per liter" mean?

This refers to the amount of radioactivity in a liter (about a quart) of liquid substance, such as water.

Water directly out of the tap contains about 0.01 "picocuries per liter" each of uranium, radium, and radioactive lead. It may also contain between 100 and 400 picocuries per liter of radioactive hydrogen, between 100 and 500 picocuries per liter of radioactive carbon, between 10 and 30 picocuries per liter of radioactive beryllium, and a variety of other radioactive elements such as aluminum, chlorine, silicon, lead, bismuth, polonium, and argon.

It can contain several hundred to several thousand picocuries per liter of radon gas, particularly if you get your drinking water from a well.

Is there radioactivity in the world around us?

Yes. The earth has always been radioactive. Everyone and everything that has ever lived has been radioactive. In fact, the natural radioactivity in the environment is just about the same today as it was at the beginning of the Neolithic Age, more than 10,000 years ago.

Is there radioactivity in our bodies?

Yes. During our lifetime, our bodies harbor measurable amounts (billions) of radioactive atoms. About half of the radioactivity in our bodies comes from Potassium-40, a naturally-radioactive form of potassium. Potassium is a vital nutrient and is especially important for the brain and muscles. Most of the rest of our bodies' radioactivity is from radioactive carbon and hydrogen.

We have about 120,000 picocuries of radioactivity in our bodies. These naturally-occurring radioactive substances expose our bodies to about 25 "millirem" per year, abbreviated as "mrem/yr".

Most radioactive substances enter our bodies as part of food, water or air. Our bodies use the radioactive as well as the nonradioactive forms of vital elements such as iodine and sodium. Radioactivity can be found in all foods. As we said before, it is even in our drinking water. In a few areas of the United States, the naturally-occurring radioactivity in the drinking water can result in a dose of more than 1,000 millirem in one year.

Are there other sources of natural radiation?

Another type of natural radiation is cosmic radiation given off by the sun and stars in outer space. Because the earth's atmosphere absorbs some of this radiation, people living at higher altitudes receive a greater dose than those at lower altitudes. In Ohio, for example, the average resident receives a dose of about 40 millirem in one year from cosmic radiation. In Colorado, it is about 180 millirem in one year. Generally, for each 100-foot increase in altitude, there is an increased dose of one (1) millirem per year.

Flying in an airplane increases our exposure to cosmic radiation. A coast-to-coast round trip gives us a dose of about four millirem.

In Ohio, radiation in soil and rocks contributes about 60 millirem in one year to our exposure. In Colorado, it is about 105 millirem per year. In Kerala, India, this radioactivity from soil and rocks can be 3,000 millirem per year, and at a beach in Guarapari, Brazil, it is over 5 millirem in a single hour. Some of the residents who use that beach receive doses approaching 1,000 millirem per year.

If you live in a wood house, the natural radioactivity in the building materials gives you a dose of 30 to 50 millirem per year. In a brick house, the dose is 50 to 100 millirem per year. And, if your home is so tightly sealed that the leakage of outside air into the home is small, natural radioactive gases (radon) can be trapped for a longer period of time and thus increase your dose.

Is there anything else?

Yes. Typical members of the US population may receive the following types of radiation exposures:

1300 millirem per year for the average cigarette smoker

650 millirem per nuclear medicine examination of the brain
509 millirem per nuclear medicine examination of the thyroid
405 millirem per barium enema
245 millirem per upper gastrointestinal tract series
150 millirem per nuclear medicine examination of the lung
110 millirem per computerized tomography of the head and body
7.5 millirem per year to spouses of recipients of certain cardiac pacemakers
6 millirem per dental x-ray
5 millirem per year from foods grown on lands in which phosphate fertilizers are used.
4 millirem per year from highway and road construction materials
2 millirem per year from the use of gas mantles
1.5 millirem from each cross-country airline trip (one way)
1 to 6 millirem per year from domestic water supplies
1 millirem per year from television receivers
0.5 millirem from eating one-half pound of Brazil nuts.
0.3 millirem per year from combustible fuels, (i.e., coal, natural gas, and liquefied petroleum)
0.2 millirem from drinking a quart of Gatorade each week
0.1 millirem per year from sleeping with one's spouse (or "significant other")

So, almost everything is radioactive, right?

Yes, radiation is everywhere. Our bodies and the world around us are radioactive. But there is no cause for alarm. These very small but detectable levels of radioactivity are natural . . . as natural as life itself. We are exposed to a constant stream of radiation from the sun and outer space. Radioactivity is in the ground, the air, the buildings we live in, the food we eat, the water we drink, and the products we use. The average person in the United States receives a dose of about 360 millirem per year from these natural sources of radioactivity as well as from typical medical radiation exposures such as x-rays.

Is a radiation dose of 360 millirem in a year harmful?

No. No effects have ever been observed at doses below 5,000 millirem delivered over a one year period. In fact, effects seen when humans are exposed to 100,000 millirem over a short time period are temporary and reversible. It takes a short-term dose of well over 500,000 millirem to cause a fatality.

Where can I obtain more Information about Radiation and Radioactivity?

There are a number of organizations and agencies that can provide you with additional information on this topic. The following is just a short listing:

Health Physics Society - (703) 790-1745

American National Standards Institute - (212) 642-4900

The American Academy of Health Physics - (703) 790-1745

Conference on Radiation Control Program Directors - (502) 227-4543

American Nuclear Society - (708) 579-8265

National Council on Radiation Protection and Measurements - (301) 657-2652

United Nations Scientific Committee on the Effects of Atomic Radiation - (800) 274-4888

In addition, Integrated Environmental Management, Inc. (IEM) has been providing information on radiation and radioactivity to businesses, government agencies, students, regulators, public officials and members of various communities for many years. Please feel free to contact IEM at 302 Westfield Road, Knoxville, Tennessee 37919, (865) 588-9180, at 8 Brookes Avenue, Suite 205, Gaithersburg, Maryland 20877, (240) 631-8990, or at 2705 N. Main St., Suite 202, Findlay, OH 45840, (419)423-4701.

Or visit our web site at *http://www.iem-inc.com* for even more interesting and useful information about the fascinating world of radiation and radioactivity.

PURPOSE OF THE SITE SPECIFIC ADVISORY BOARD

Carol D. Berger, C.H.P.

August 15, 2003

1. USNRC regulations require the licensee to engage the public on a variety of regulatory matters.

2. Definitions:

   "Public" = individuals, organizations, companies, agencies and governments.

   "Stakeholders" = members of the public that are affected or perceive themselves as being affected by a decision.

3. Characteristics of the SSAB

   Requires formal membership that is representative of the broad range of public interests.

   Local and state government is crucial to ensure a broad regulatory perspective.

   The licensee (Shieldalloy) considers the SSAB to be a resource.

   Membership is fixed and should stay intact in order to conduct joint learning, review proposed actions, and provide periodic input.

   SSAB needs to focus on specific goals.

   If consensus is sought among SSAB members, there should be an allowance for minority opinions if consensus is not achieved.

   If consensus is not required, SSAB activities should produce a range of recommendations and input.

   Licensee may be at the table in either a collaborative process or simply as a resource.

4. Shieldalloy's objectives:

   Identify the public and determine how they would like to be involved in the decommissioning of the Newfield site.

   Identify public concerns and interests (i.e., what are the main concerns about the decommissioning; what issues does the public feel it is most important to be involved).

   Gather information

   Select the appropriate level of public involvement

   Include the public in planning for its involvement.

   Prepare a written public involvement plan.

   Implement an evaluation program (to be sure why the plan "is" or "is not" working, and institute corrective actions a necessary).

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IEM

Integrated Environmental Management, Inc.

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10 CFR 20.1401 General Provisions And Scope.

(a) The criteria in this subpart apply to the decommissioning of facilities licensed under parts 30, 40, 50, 60, 61, 63, 70, and 72 of this chapter, as well as other facilities subject to the Commission's jurisdiction under the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended. For high-level and low-level waste disposal facilities (10 CFR parts 60, 61, and 63), the criteria apply only to ancillary surface facilities that support radioactive waste disposal activities. The criteria do not apply to uranium and thorium recovery facilities already subject to Appendix A to 10 CFR part 40 or to uranium solution extraction facilities.

(b) The criteria in this subpart do not apply to sites which:

(b)(1) Have been decommissioned prior to the effective date of the rule in accordance with criteria identified in the Site Decommissioning Management Plan (SDMP) Action Plan of April 16, 1992 (57 FR 13389);

(b)(2) Have previously submitted and received Commission approval on a license termination plan (LTP) or decommissioning plan that is compatible with the SDMP Action Plan criteria; or

(b)(3) Submit a sufficient LTP or decommissioning plan before August 20, 1998 and such LTP or decommissioning plan is approved by the Commission before August 20, 1999 and in accordance with the criteria identified in the SDMP Action Plan, except that if an EIS is required in the submittal, there will be a provision for day-for-day extension.

(c) After a site has been decommissioned and the license terminated in accordance with the criteria in this subpart, the Commission will require additional cleanup only if, based on new information, it determines that the criteria of this subpart were not met and residual radioactivity remaining at the site could result in significant threat to public health and safety.

(d) When calculating TEDE to the average member of the critical group the licensee shall determine the peak annual TEDE dose expected within the first 1000 years after decommissioning.

[62 FR 39058, July 21, 1997; 66 FR 55732, Nov. 2, 2001]

10 CFR 20.1402 Radiological Criteria For Unrestricted Use.

A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year, including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). Determination of the levels which are ALARA must take into account consideration of any detriments, such as deaths from transportation accidents, expected to potentially result from decontamination and waste disposal.

[62 FR 39058, July 21, 1997]

10 CFR 20.1403 Criteria For License Termination Under Restricted Conditions.

A site will be considered acceptable for license termination under restricted conditions if:

(a) The licensee can demonstrate that further reductions in residual radioactivity necessary to comply with the provisions of §20.1402 would result in net public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA. Determination of the levels which are ALARA must take into account consideration of any detriments, such as traffic accidents, expected to potentially result from decontamination and waste disposal;

(b) The licensee has made provisions for legally enforceable institutional controls that provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) per year;

(c) The licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site. Acceptable financial assurance mechanisms are--

(c)(1) Funds placed into an account segregated from the licensee's assets and outside the licensee's administrative control as described in §30.35(f)(1) of this chapter;

(c)(2) Surety method, insurance, or other guarantee method as described in §30.35(f)(2) of this chapter;

(c)(3) A statement of intent in the case of Federal, State, or local Government licensees, as described in §30.35(f)(4) of this chapter; or

(c)(4) When a governmental entity is assuming custody and ownership of a site, an arrangement that is deemed acceptable by such governmental entity.

(d) The licensee has submitted a decommissioning plan or License Termination Plan (LTP) to the Commission indicating the licensee's intent to decommission in accordance with §§30.36(d), 40.42(d), 50.82(a) and (b), 70.38(d), or 72.54 of this chapter, and specifying that the licensee intends to decommission by restricting use of the site. The licensee shall document in the LTP or decommissioning plan how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and incorporated, as appropriate, following analysis of that advice.

(d)(1) Licensees proposing to decommission by restricting use of the site shall seek advice from such affected parties regarding the following matters concerning the proposed decommissioning--

(d)(1)(i) Whether provisions for institutional controls proposed by the licensee;

(d)(1)(i)(A) Will provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) TEDE per year;

(d)(1)(i)(B) Will be enforceable; and

(d)(1)(i)(C) Will not impose undue burdens on the local community or other affected parties.

(d)(1)(ii) Whether the licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site;

(d)(2) In seeking advice on the issues identified in §20.1403(d)(1), the licensee shall provide for:

(d)(2)(i) Participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;

(d)(2)(ii) An opportunity for a comprehensive, collective discussion on the issues by the participants represented; and

(d)(2)(iii) A publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants on the issues; and

(e) Residual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either--

(e)(1) 100 mrem (1 mSv) per year; or

(e)(2) 500 mrem (5 mSv) per year provided the licensee--

(e)(2)(i) Demonstrates that further reductions in residual radioactivity necessary to comply with the 100 mrem/y (1 mSv/y) value of paragraph (e)(1) of this section are not technically achievable, would be prohibitively expensive, or would result in net public or environmental harm;

(e)(2)(ii) Makes provisions for durable institutional controls;

(e)(2)(iii) Provides sufficient financial assurance to enable a responsible government entity or independent third party, including a governmental custodian of a site, both to carry out periodic rechecks of the site no less frequently than every 5 years to assure that the institutional controls remain in place as necessary to meet the criteria of §20.1403(b) and to assume and carry out responsibilities for any necessary control and maintenance of those controls. Acceptable financial assurance mechanisms are those in paragraph (c) of this

section.

[62 FR 39058, July 21, 1997]

Prev TOC Next

10 CFR 20.1404 Alternate Criteria For License Termination.

(a) The Commission may terminate a license using alternate criteria greater than the dose criterion of §§20.1402, 20.1403(b), and 20.1403(d)(1)(i)(A), if the licensee--

(a)(1) Provides assurance that public health and safety would continue to be protected, and that it is unlikely that the dose from all man-made sources combined, other than medical, would be more than the 1 mSv/y (100 mrem/y) limit of subpart D, by submitting an analysis of possible sources of exposure;

(a)(2) Has employed to the extent practical restrictions on site use according to the provisions of §20.1403 in minimizing exposures at the site; and

(a)(3) Reduces doses to ALARA levels, taking into consideration any detriments such as traffic accidents expected to potentially result from decontamination and waste disposal.

(a)(4) Has submitted a decommissioning plan or License Termination Plan (LTP) to the Commission indicating the licensee's intent to decommission in accordance with §§30.36(d), 40.42(d), 50.82(a) and (b), 70.38(d), or 72.54 of this chapter, and specifying that the licensee proposes to decommission by use of alternate criteria. The licensee shall document in the decommissioning plan or LTP how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and addressed, as appropriate, following analysis of that advice. In seeking such advice, the licensee shall provide for:

(a)(4)(i) Participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;

(a)(4)(ii) An opportunity for a comprehensive, collective discussion on the issues by the participants represented; and

(a)(4)(iii) A publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants on the issues.

(b) The use of alternate criteria to terminate a license requires the approval of the Commission after consideration of the NRC staff's recommendations that will address any comments provided by the Environmental Protection Agency and any public comments submitted pursuant to §20.1405.

[62 FR 39058, July 21, 1997]

10 CFR 20.1405 Public Notification And Public Participation.

Upon the receipt of an LTP or decommissioning plan from the licensee, or a proposal by the licensee for release of a site pursuant to §§20.1403 or 20.1404, or whenever the Commission deems such notice to be in the public interest, the Commission shall:

(a) Notify and solicit comments from:

(a)(1) local and State governments in the vicinity of the site and any Indian Nation or other indigenous people that have treaty or statutory rights that could be affected by the decommissioning; and

(a)(2) the Environmental Protection Agency for cases where the licensee proposes to release a site pursuant to §20.1404.

(b) Publish a notice in the Federal Register and in a forum, such as local newspapers, letters to State or local organizations, or other appropriate forum, that is readily accessible to individuals in the vicinity of the site, and solicit comments from affected parties.

[62 FR 39058, July 21, 1997]

Site Specific Advisory Board Meeting
Shieldalloy Metallurgical Corporation
Newfield, New Jersey
August 15, 2003

Requirements of 10 CFR §20.1403(d)

Subpart 1 of the above regulation requires Shieldalloy to seek advice, from individuals and institutions in the community who may be affected by the proposed decommissioning, regarding the following matters:

"(i) Whether provisions for institutional controls proposed by the licensee:

(A) Will provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) TEDE per year;

(B) Will be enforceable; and

(C) Will not impose undue burdens on the local community or other affected parties.

(ii) Whether the licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site;

(2) In seeking advice on the issues identified in § 20.1403(d)(1), the licensee shall provide for:

(i) Participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;

(ii) An opportunity for a comprehensive, collective discussion on the issues by the participants represented; and

(iii) A publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement or disagreement among the participants on the issues;"

NJ REEF NEWS

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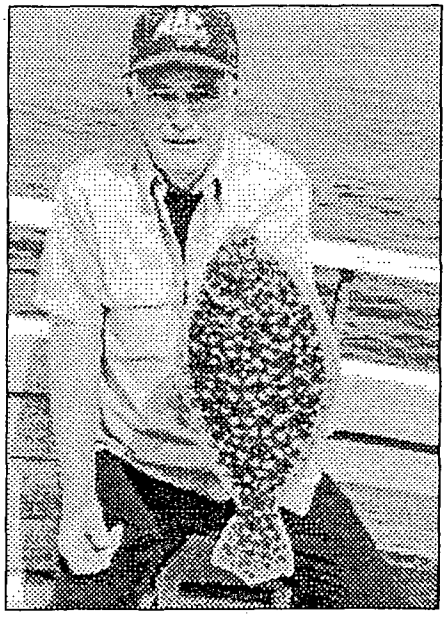
2001 Edition

New Jersey's Recreational Reef Fishery

The Creation of a Marine Resource



New Jersey's reefs have come a long way in the past fifteen years. Prior to 1984, Sea Girt was the only active reef site off the Jersey coast and that site only had a half-dozen reef structures. Since then, the Department of Environmental Protection's Division of Fish and Wildlife developed a network of 14 reef sites, stretching from Sandy Hook to Cape May, and constructed over 1,300 fishing and diving reefs on these sites.

Both fish and fishermen have responded to this effort by the State. Considering only fishing trips for bottom species, such as sea bass, tautog and porgy, artificial reefs accounted for only 7 percent of the private and 3 percent of the party boat trips in 1970; with only a few artificial reefs in existence, the vast majority of bottom fishing occurred on the hundreds of shipwrecks sunk by storms, accidents and wars along the Jersey coast. In 1991, following initial reef construction efforts, use of artificial reefs rose to 42 percent of the private and 20 percent of the party boat bottom fishing activity. By 2000, following extensive reef building, reefs dominated the bottom fishing action, with 90 percent of private and 47 percent of party boat trips targeting bottom species occurring on reefs created by the Division. In other words, for anglers seeking bottom species like sea bass and tautog, private boat captains went to reefs

(continued on next page)

New Jersey Department of Environmental Protection

Division of Fish and Wildlife

SPORT FISH RESTORATION

Recreational Reef Fishery

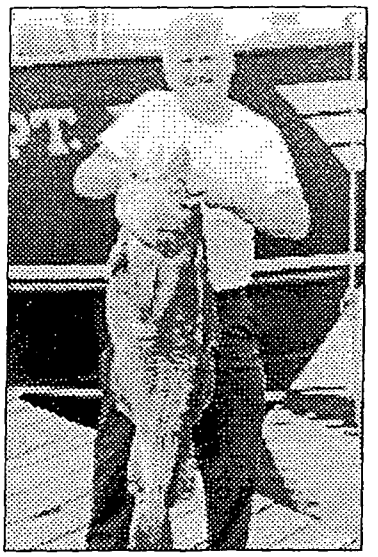
(continued from page 1)

9 out of 10 trips and party boat captains preferred reefs 1 out of every 2 trips.

New Jersey's recreational wreck/reef fishing fleet now consists of 5,401 private, 240 charter and 64 party boats. During the course of the 2000 fishing season, one-third of a million angler-trips targeted wreck/reef species throughout the State's ocean waters. In 2000, these boats caught an estimated 7.9 million wreck/reef fishes, with 4.8 million of these being taken on our 14 ocean reef sites. The most important species in the catch was sea bass (5.6 million), followed by porgy (0.5 million), tautog (0.4 million) and fluke (0.3 million); 25 other species were caught in smaller numbers.

New Jersey anglers caught 4.8 million fish on ocean reefs in 2000.

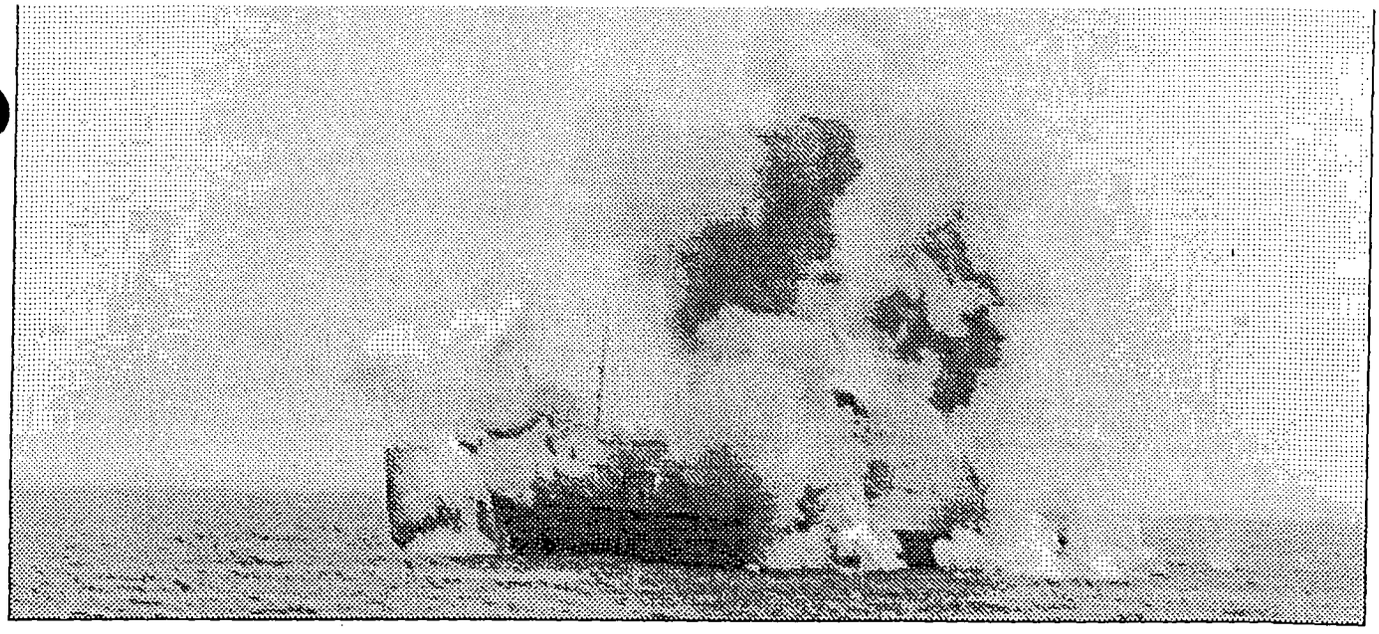
Fortunately, about 56 percent (4.4 million) of the fish caught were released alive. This season was marked by an outstanding run of sea bass that were represented by several strong year classes. For private boats, the Garden State North (28 fish/angler), Sandy Hook (24), Wildwood (23) and Atlantic City (21) reefs produced the best daily catches (includes kept and released), while Shark River (7), Great Egg (10) and Ocean City (13) reefs had the lowest catch rates. The catch rate for bottom fishing on wrecks not on reef sites was 24 fish per angler. National recreational fishing surveys estimated the State's total catch of all saltwater species averaged about 27 million fish annually during 1979-1999. Thus, the reefs accounted for 18 percent of all of the fish caught in our state's saltwaters. In other words, roughly 2 out of every 11 fish caught along the Jersey shore during 2000 were caught on a reef built by the Division of Fish and Wildlife. This is a particularly amazing statistic given the fact that reef sites only comprise 0.3 percent of New Jersey's sea floor. "This survey demonstrates the importance of artificial reefs," said Bob McDowell, Director of the Division of Fish and Wildlife. "The time and effort the Division has invested in developing our ocean reef network is now paying big dividends for New Jersey anglers. The Reef Program is creating a valuable new marine resource that will benefit the State's marine sport fishing industry for decades to come."



This information was collected as part of an intensive survey conducted between April and November, 2000. During this time, the Division interviewed 1,055 private and charter boat captains and 1,012 party boat anglers to obtain information about their fishing activities. We appreciate the support and cooperation of all the fishermen who participated in the study.

Some DGPS Coordinates

Structure	Latitude	Longitude
Coney Island, 250' tanker	4006.285	7341.365
Capt. Etzel, 110' barge	4007.910	7356.168
Ocean Wreck Divers III, 165' tanker	4000.587	7359.555
PSI, tank	3945.016	7401.582
Jerry, 42' tug	3937.757	7400.828
VHFC, 44' CG Cutter	3933.496	7405.991
A.C. Westcoat, 60' barge	3915.540	7414.691
Peggy Diana, 56' LCM	3850.830	7442.510

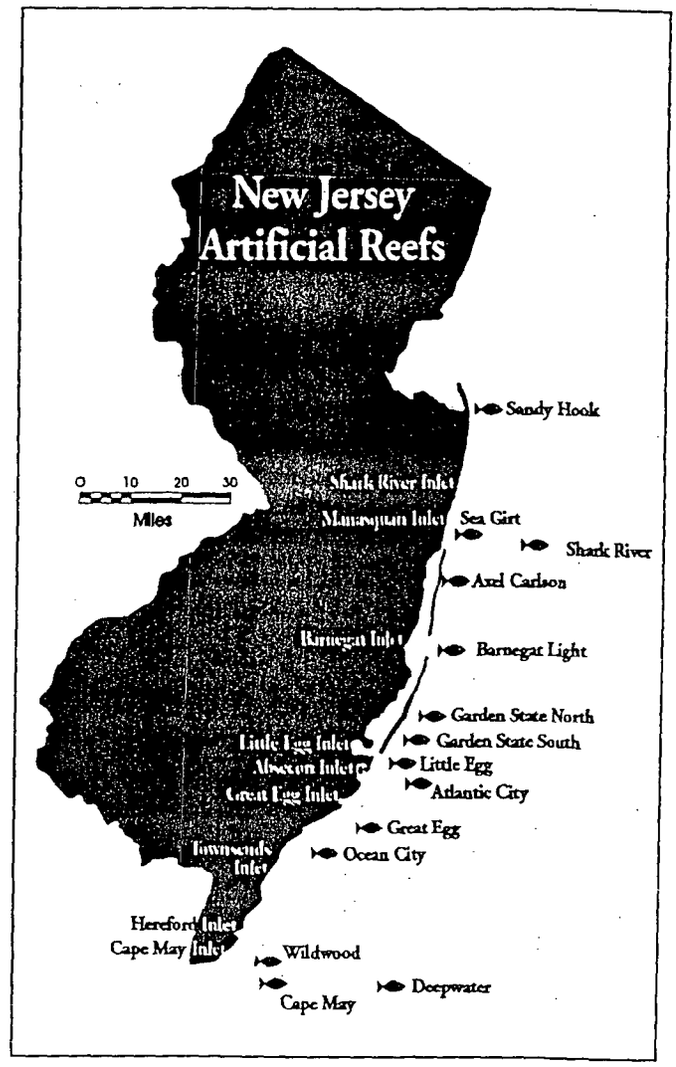


Explosive charges set by the State Police Bomb Squad sank the 165-foot Navy tanker "Capt. Bart" in less than three minutes.

Accomplishment, 1984-2000

Since the inception of the Division of Fish and Wildlife's Reef Program in 1984, 1,374 patch reefs have been built on New Jersey's network of 14 ocean reef sites. A patch reef is a several-square-yard to several-acre reef created by sinking a ship or placing a barge load of other material on the sea floor. In 2000, 60 patch reefs were constructed.

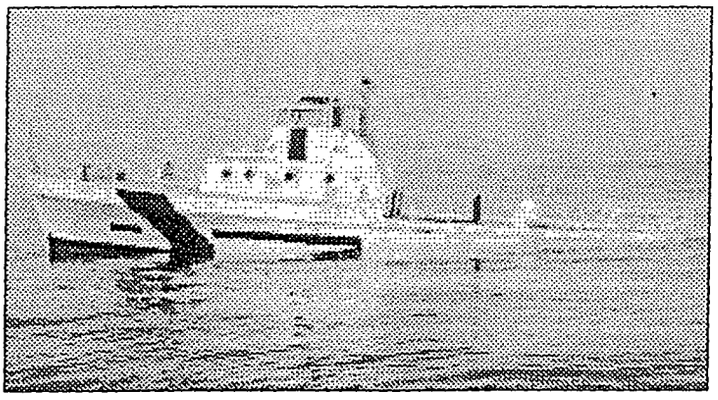
Reef Material	Patch Reefs Built in 2000	Total Patch Reefs Built 1984-2000
Tire Units	—	228
Concrete	2	180
Rock	—	392
Vessels, Barges	4	95
Army Vehicles	—	397
Reef Balls	34	49
Other	20	33
Total	60	1,374



Objectives of The Reef Program

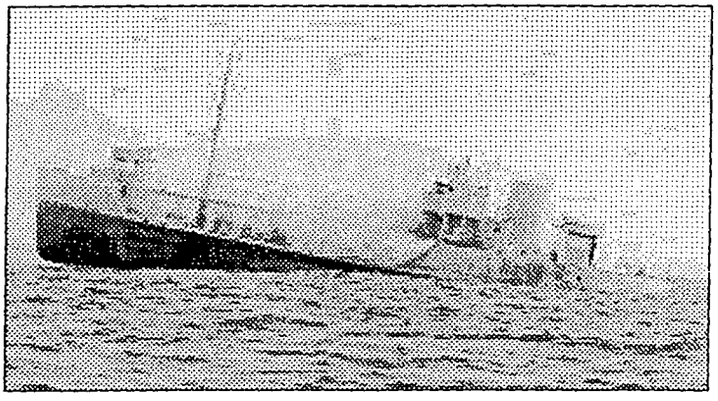
New Jersey's Reef Program is administered by the Department of Environmental Protection's Division of Fish and Wildlife. The objectives of the program are to construct hard-substrate "reef" habitat in the ocean for certain species of fish and shellfish, new fishing grounds for anglers and underwater structures for scuba divers.

New Wrecks in Y2K



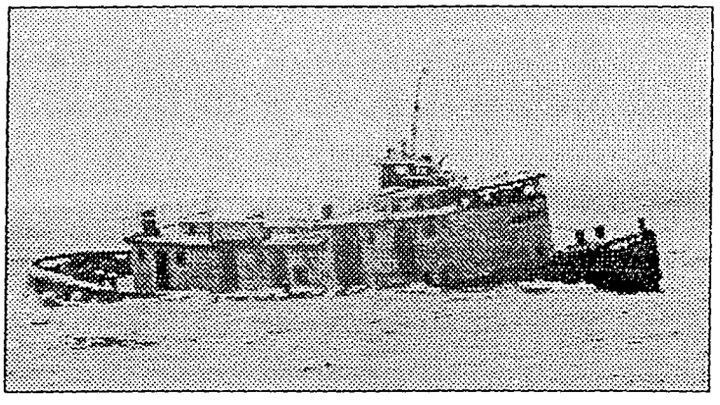
"Point Swift"

An 83' Coast Guard cutter sponsored by the Cape May County Party and Charter Boat Association was sunk on March 30 on the Cape May Reef at DGPS coordinates 3853.621 7440.600.



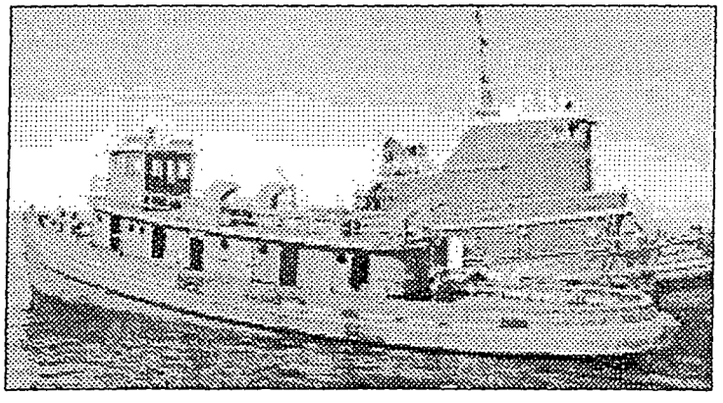
"Captain Bart"

A 174' Navy tanker sponsored by the Greater Pt. Pleasant Charter Boat Association, Crown Beer Distributors and Budweiser was sunk on June 9 on the Shark River Reef at DGPS Coordinates 4007.103 7341.479 in memory of Charlie "Captain Bart" Rozanski.



"McGurr's Tug"

An 85' canal tug sponsored by the Ocean Wreck Divers Scuba Club was sunk on September 12 on the Axel Carlson Reef at DGPS coordinates 4002.473 7359.599 in loving memory of Charles J. McGurr, Jr.



"HRFA-NJ"

A 98' tug sponsored by the Hudson River Fisherman's Association was sunk on September 22 on the Shark River Reef at DGPS coordinates 4006.883 7341.534.

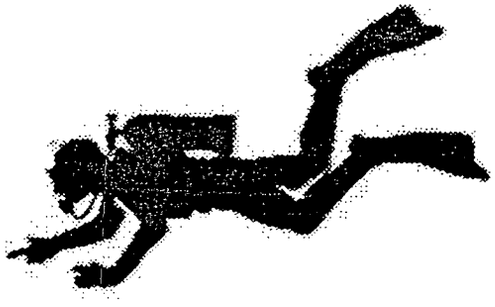
Divers Joe Morrison (left to right), Terry Zeller and Charles Cole retrieved two portholes from the Red Oak, a 157-foot Coast Guard buoy tender sunk on the Cape May Reef in 1999. Photo by Capt. Joe Morrison of the Charter boat "Black Knight".

WANTED

EXPERIENCED DIVERS

The Reef Program needs experienced divers to assess the condition of shipwrecks on New Jersey reef sites. Your underwater observational skills will assist our efforts to inventory over 100 wrecks sunk on artificial reef sites. The types of information we need include depth, shipwreck orientation, hull condition, diver hazards, and more. The ultimate goal of this project is to prepare a book on shipwreck vital statistics for use by divers and fishermen. Each participating diver will be credited in the book.

If you would like to help, call the Reef Program at 609-748-2020. We will supply the data forms and a list of wrecks to be surveyed and their locations.



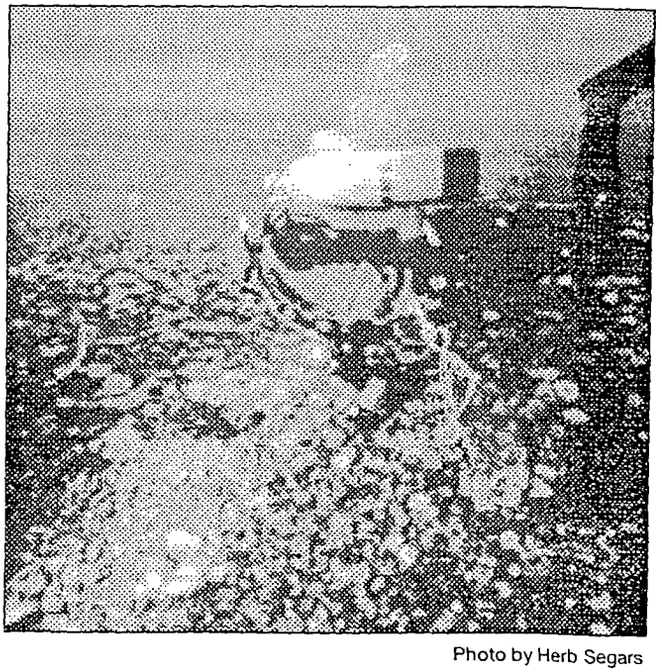
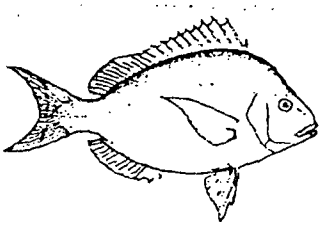
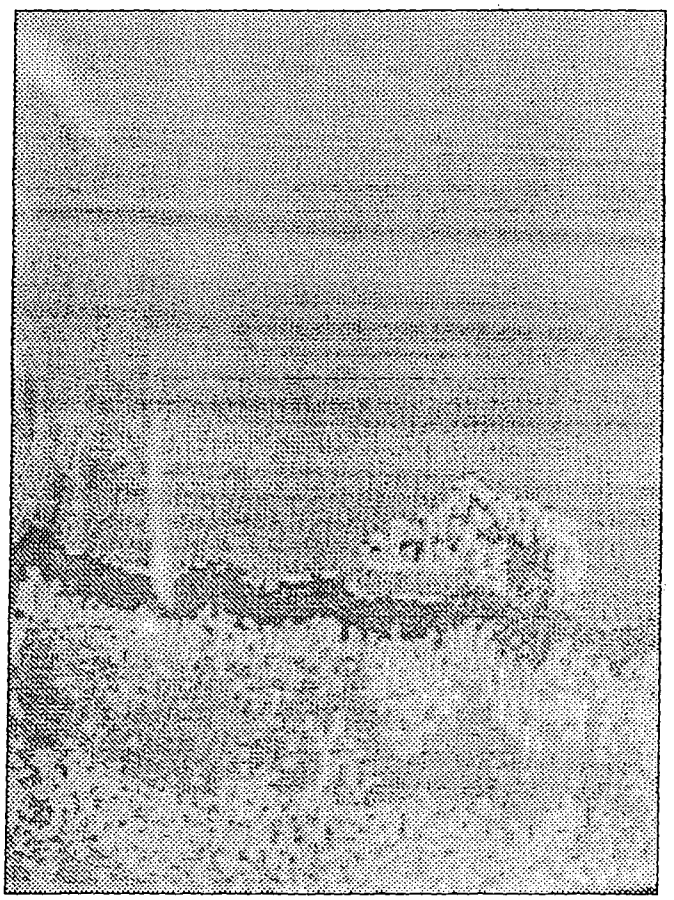


Photo by Herb Segars

Reef Plans for 2001

Reef Ball Habitats	700
Dredge Rock	250,000 cubic yards
Concrete	20,000 cubic yards
APL-31	260' Navy troop transport





What's that structure on the fathometer?

A single Reef Ball habitat on the Axel Carlson Reef as recorded by Capt. John Hawryluk of the party boat Norma K III. The habitats were covered with sea bass and porgy.

How Reef Structures Benefit Marine Life

Surface Area: In the ocean, the surface area of a habitat is very important because it represents the interface between the surface upon which an animal lives and its exposure to the water column where it feeds and respires. The sandy sea floor is two-dimensional and has a relative surface area of 1. Three-dimensional reef structures, on the other hand, have height and thus more living area for the same relative unit of sea floor that they occupy. A human analogy would be a comparison between the floor space of a ranch house and that of a high-rise apartment building, both occupying the same footprint on the ground. The taller and more complicated a structure, the more surface area is available for marine life to colonize and consequently, the more productive it can be.

Firm, Stable Substrate: Unlike sand that is constantly shifting, reef structures provide firm, stable substrates for the attachment of marine life. Once anchored in place on a reef structure, marine life can withstand strong ocean currents and storms.

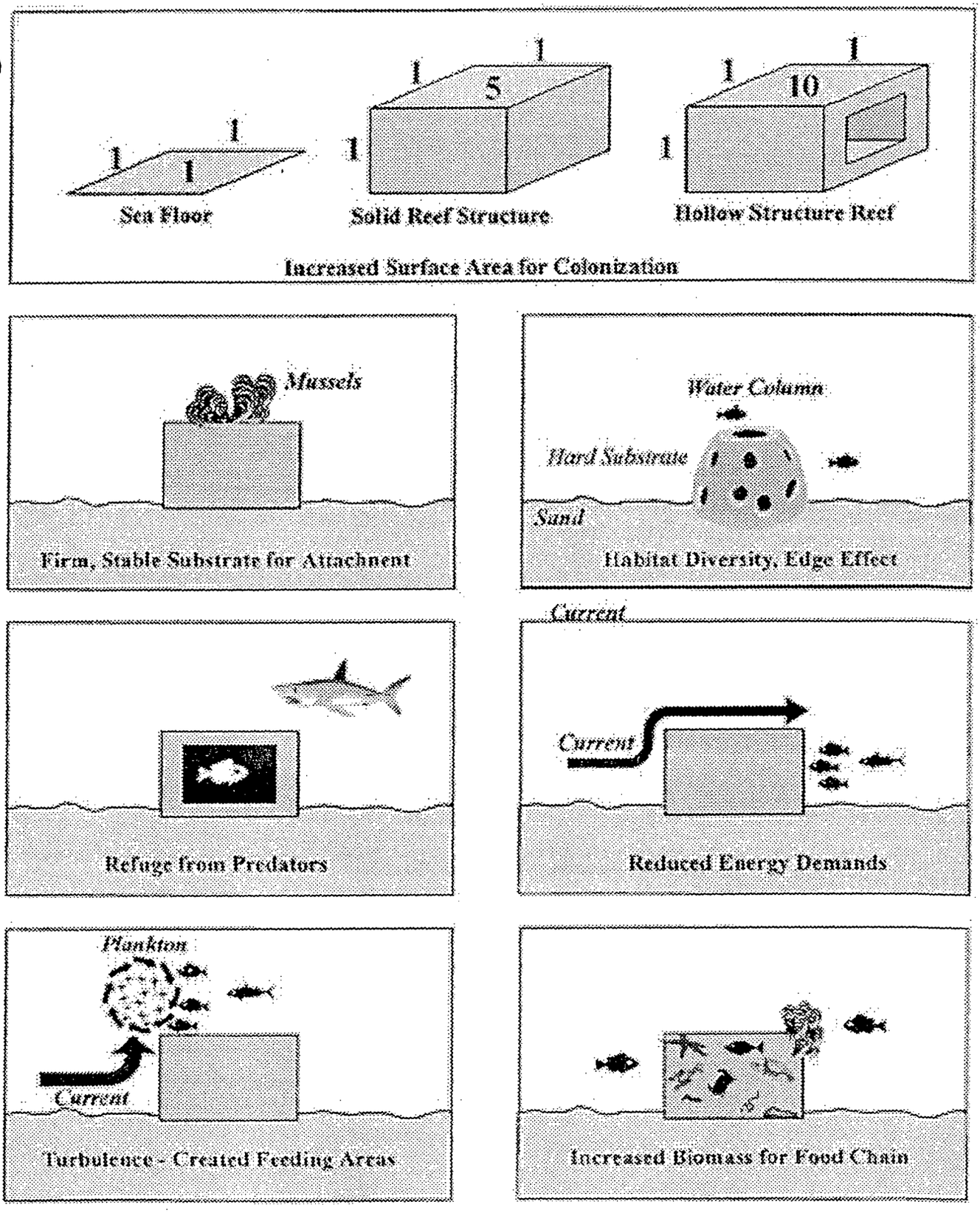
Habitat Diversity: Reef structures add a third component to New Jersey's marine environment, which now consists of sandy sea floor and water column habitats. The more diverse an environment, the more options are available to marine life and thus, the greater the diversity of species living there.

Refuge: The nooks and crevices of reef structures provide hiding places for juvenile and adult fish and other marine life to avoid predation.

Reduced Energy: The diffusion of currents by reef structures provides calm water, resting areas for fish, much like a boulder provides relief for a trout in a stream. Thus, the energy that would otherwise have been wasted upon swimming against the current can be better put towards growth.

Turbulence: The deflection of currents by reef structures can result in the creation of eddies that concentrate plankton, a prime food source for young fish. Schools of planktivorous fish often concentrate in these feeding zones.

Increased Biomass: The increased biomass (weight of marine life) associated with reef structures provides a ready source of food for fish and other marine life.



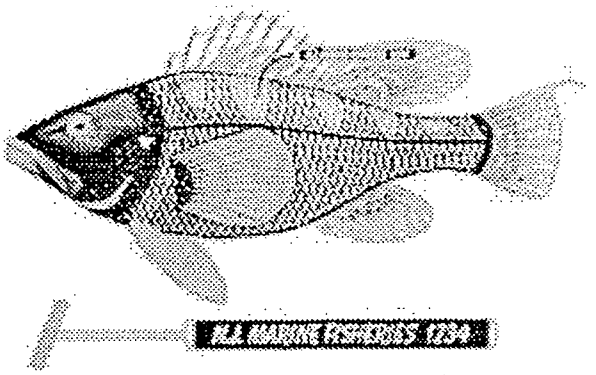
How Reef Structures Benefit Marine Life

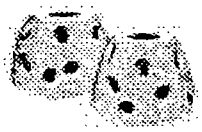
REEF WEB SITE

ATTENTION: "CYBER DIVERS"

The New Jersey Division of Fish and Wildlife's Internet web site provides information about New Jersey artificial reefs: www.njfishandwildlife.com.

Report tagged fish





2000 Reef Ball Habitat Sponsors

Sponsor Kathi Smock created "The Wanderer Reef" for her two brothers, Tom and Don Zmuda.

Reef Ball sponsors from the New Jersey Council of Diving Clubs included Glen Gunther, Peggy Bowen, New Jersey Skin Diving Club, Ocean Wreck Divers, Al Guzzo, On the Bottom Dive Club, New Jersey Aquanauts, New Jersey Divers Association, Shore Aquatic Club, Staten Island Sport Divers, and Philadelphia Sea Horses.

Sponsor Walter Metzger created the "Hi Mom" reef.

Earl Gallup sponsored the "Rande Reef."

Fred Brucker sponsored the "Fred's Beds" reef.

Adam Siodlowski sponsored the "Adam Siodlowski" reef.

Peter O'Connor sponsored the "Ratcatcher" reef.

Marine Academy of Science and Technology Scuba Club sponsored the "MAST PTSA" reef.

Bruce Liming sponsored a reef in memory of his fishing buddy, Frank Maloney, Jr.

Gordon Wiegmann sponsored the "Top Gun" reef.

The Gordon and Barry Wiegmann families sponsored a reef in memory of "Rick" Colicchio.

Janice Kennedy sponsored the "Bob Kennedy Last Chance" reef.

Dr. Nicholas Cavarocchi sponsored the "Alexis" and "Nicky" reefs.

Cynthia Hamilton sponsored the "Woodrow W. Page" reef.

Peter Donnelly sponsored the "Rag Doll" reef.

GWL and LSL sponsored the "GWL/LSL" reef.

Jeff Meckler sponsored the "Mecklerstone" reef.

Michele Fennimore sponsored the "Len Fen" reef.

John Scalzo sponsored the "John's Glory" and "John's Bait Shop" reefs.

Lou Meier sponsored "Lou's Reef".

Carmen Russo sponsored "Russo's Ridge".

See page 11 for details on how you can sponsor a reef habitat.

Y2K Reef Adoptions

"Salty Rinse"

On August 12, 12 Reef Balls sponsored by Robert C. Shawger, Jr. were placed on the Axel Carlson Reef.

"Frank and Elizabeth Frasco Reef"

On August 25, 12 Reef Balls sponsored by Frank and Fran Frasco, Jr. were placed on the Barnegat Light Reef in memory of Frank and Elizabeth Frasco, Sr.

"Bayhead Shores Fishing Club Memorial Reef"

On August 11, 20 Reef Balls sponsored by the Bayhead Shores Fishing Club were placed on the Axel Carlson Reef as a living memorial for past members.

"Foggy Notion Reef"

On August 18, 12 Reef Balls sponsored by Don Kamienski were placed on the Barnegat Light Reef.

"Beach Haven Yacht Club Reef"

On August 20, 7 Reef Balls sponsored by the Beach Haven Yacht Club were placed on the Garden State South Reef.

"Materazzi Reef"

On August 1, 7 Reef Balls sponsored by the Village Harbor Fishing Club were placed on the Garden State South Reef in memory of the club's vice-president, Ernie Materazzi.

"Sam and Jim Blair Reef"

On August 16, 12 Reef Balls sponsored by Lois Blair were placed on the Axel Carlson Reef.

"Morrison's Marina and Restaurant Reef"

On August 20, 12 Reef Balls sponsored by Morrison's Seafood Inc. were placed on the Garden State South Reef.

"Marion and Cliff Reef"

On August 9, 30 Reef Balls sponsored by the Kleimenhagens, Roshellis, Gablers and Figleys were placed on the Garden State South Reef in memory of Marion Figley and Clifford Ellis.

"Sea Gypsies Reef"

On August 2, 20 Reef Balls sponsored by the New York City Sea Gypsies Diving Club were placed on the Axel Carlson Reef.

"Dive Council Reef"

On August 2, 30 Reef Balls sponsored by the New Jersey Council of Diving Clubs were placed on the Axel Carlson Reef.

"Miss Dawnie Reef"

On August 20, 12 Reef Balls sponsored by Walter Herrmann were placed on the Garden State South Reef in honor of his wife's birthday.

"Rick Schmidt's Reef"

On November 8, 50 Reef Balls sponsored by family and friends were placed on the Barnegat Light Reef in memory of Rick Schmidt.

"Thal's Fin Alley"

On November 13, 12 Reef Balls sponsored by James W. Thal were placed on the Axel Carlson Reef Site.

"TNT Reef"

On August 11, 20 Reef Balls sponsored by Thomas and Theresa DePaola were placed on the Axel Carlson Reef Site.

"Edward N. Headley Reef"

On August 28, 12 Reef Balls sponsored by Tom Headley were placed on the Garden State North Reef Site.

"Jacob John Dmitruck Reef"

On November 9, 12 Reef Balls sponsored by Rose Dmitruck and John Racioppi were placed on the Barnegat Light Reef in honor of Jacob John Dmitruck.

"Kirkenir Reef"

On August 21, 12 Reef Balls sponsored by John H. Kirkenir were placed on the Garden State South Reef.

"Billy L. Sidney Reef"

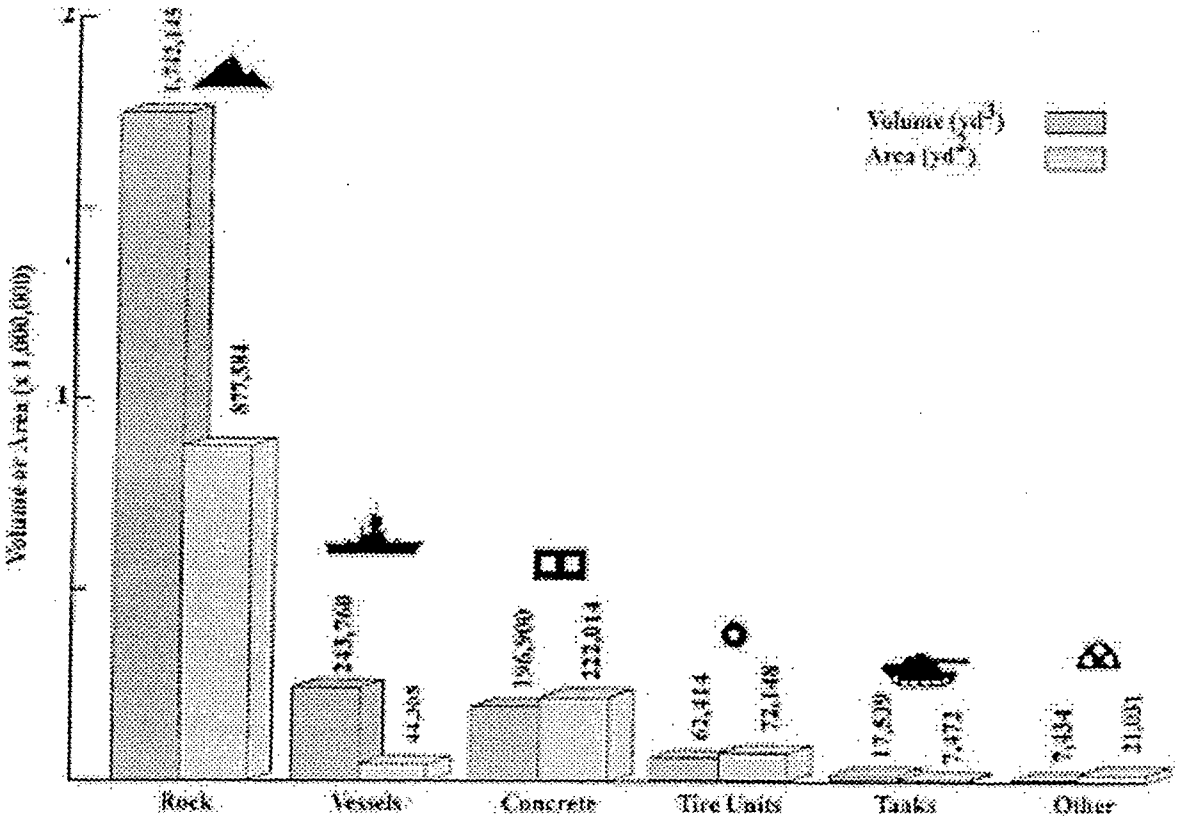
In November, 12 Reef Balls sponsored by Wanda Sidney and friends were placed on the Axel Carlson Reef in memory of Billy L. Sidney.

"Beach Haven Marlin and Tuna Club Reefs"

On August 1 and 21, 20 Reef Balls sponsored by the Beach Haven Marlin and Tuna Club were placed on two sites on the Garden State South Reef.

"Forked River Tuna Club III"

On August 18, 7 Reef Balls sponsored by the Forked River Tuna Club were placed on the Barnegat Light Reef.



The volume and area of reef structures placed in NJ reefs through 2000.

Artificial Reef Association

The Artificial Reef Association (ARA) was founded in 1991 by a group of party and charter boat captains and marina owners. The goal of the ARA is to promote reef construction throughout the State's coastal waters. The primary function of the non-profit organization has been to raise money to help pay the costs of cleaning, preparing and towing ships and barges destined for sinking on reef sites. So far the ARA has provided funds to sink 19 vessels.

The ARA has raised most of its funds through the sale of Reef T-shirts and Reef Books. Donations from fishing and diving clubs are particularly helpful. If your club would like to help sponsor the sinking of a vessel on a reef, contact:

ARA, PO Box 16, Oceanville, NJ 08231

Sportfish Fund

The Sportfish Fund is a nonprofit foundation administered by the Fisherman Magazine. Its purpose is to raise money to promote recreational fishing opportunities. Funds donated to the Reef Program are held in the Sportfish Fund account until they are needed to pay for reef construction activities.

PARTICIPATING AGENCIES

The following agencies have helped make New Jersey's Reef Program a success:

Federal
U.S. Fish and Wildlife Service
U.S. Coast Guard
U.S. Army Corps of Engineers
National Marine Fisheries Service
U.S. Navy and Reserves
U.S. Army and Reserves
U.S. Customs Service
U.S. Environmental Protection Agency

State
N.J. State Police
N.J. State Police, Marine Bureau
State Agency for Surplus Property
Division of Land Use Regulation
Southern State Correctional Facility
N.J. Army National Guard

County
Ocean County Bridge Department
Ocean County Department of Corrections
Cape May Municipal Utilities Authority

Municipal
Atlantic City Police Bomb Squad

ADOPT-A-REEF HABITAT

A great gift or memoriam for a fisherman or diver

CREATE AN UNDERSEA CONDO FOR NEW JERSEY MARINE LIFE

New Jersey's marine life - sea bass, lobsters, crabs and many others - need a place to live. You can help by sponsoring the placement of a concrete reef habitat on a New Jersey ocean reef. Not only will your habitat create a home for marine life to thrive, but it will also provide anglers and divers a new place to fish and explore.

A tax-deductible donation will help pay for the fabrication and transportation of your habitat(s) to a New Jersey ocean reef site.

How much does it cost and what will you receive for sponsoring ocean habitats?

Build your own ocean reef

Number of Habitats sponsored	Donation	A color chart depicting location of your habitat(s)	Listing as a sponsor in next edition of Reef News	A plaque commemorating your habitat(s)	Your reef name published on NJ reef charts
1	$125	yes	yes	no	no
3	$300	yes	yes	no	no
7	$500	yes	yes	yes	no
12	$750	yes	yes	yes	no
20	$1000	yes	yes	yes	yes

Effective January 1, 2001

Adopt-A-Reef Habitat Application

Sponsor's Name _____

Address _____

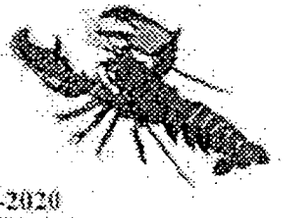
_____ Zip _____ Phone No. _____

Your habitat name" _____ " Number of habitats sponsored ____

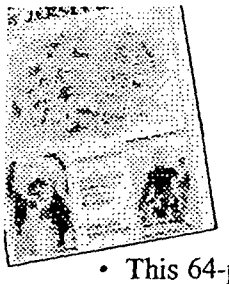
Your donation is tax - deductible

Make check payable to "Sportfish Fund" and mail to:

Adopt-A-Reef Habitat
Artificial Reef Association
P.O. Box 16
Oceanville, NJ 08231

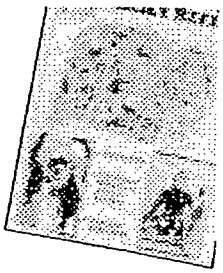


For more information, call the Reef Program at 609-748-2020



The ultimate reef book is here!

A Guide to Fishing and Diving New Jersey Reefs



- This 64-page book is a complete directory of New Jersey's 14 ocean reef sites, which encompass over 1200 reefs.
- The book features both LORAN and DGPS charts of all of the state's 14 reef sites.
- LORAN and DGPS coordinates of every named reef are provided.
- The pages are made of durable, waterproof plastic designed for use in bad weather and at sea.
- The book can be purchased at many bait and tackle shops or ordered through the mail (an order form is provided on the back cover).
- Every fisherman and diver needs these maps to find the sunken treasure (fish and lobster) on New Jersey's 14 reef sites.
- **Don't leave the dock without it.**

ORDER FORM

"The Ultimate Reef Book"

Name _____

Address _____

_____

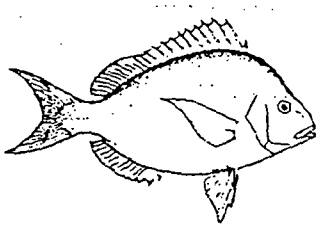
_____ Zip _____

Phone _____

Please send a copy of *"A Guide to Fishing and Diving New Jersey Reefs."* Enclosed is my check, payable to "ARA" for $20.00 ($17.95 for book plus $2.05 for postage).

Artificial Reef Association
PO Box 16
Oceanville, NJ 08231

REEF PROGRAM
DIVISION OF FISH
AND WILDLIFE
P.O. BOX 418
PORT REPUBLIC, NJ
08241



Postmaster
Address Correction
Requested

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation

Minutes of the September 19, 2003 Meeting

SSAB Members in Attendance:

David R. Smith - SMC representative
C. Lee Harp, Esq. - Archer & Greiner (facilitator)
Carol D. Berger, C.H.P. - IEM (technical consultant to SMC)
Loretta Williams - Newfield resident and public school employee
Donna L. Gaffigan - NJDEP Bureau of Federal Case Management representative
Nancy W. Stanley - NJDEP Bureau of Environmental Radiation representative
Rick Westergaard - Mayor of Newfield
Tom Daily - Newfield resident and retired school teacher
Janet Magliocco - Newfield resident and retired school teacher
George R. Sartorio - City of Vineland Health Department
Linda Graumann - Newfield resident and real estate agent
James Woods - Gloucester County Health Department
(see attached sign-in sheet)

Discussion: (see attached agenda)
Lee Harp conducted a review of the minutes of the August 15, 2003 meeting for the benefit of the new SSAB members. Included in that discussion was a review of SMC's preferred decommissioning method for the SMC site, a discussion on applicable radiation dose limits and their comparison to background values, a review of the actions SMC has taken to identify potential beneficial reuses for the slag, and the matter of durable institutional controls.

Carol Berger handed out excerpts from Rev. 0 of the SMC Decommissioning Plan dated August 28, 2002. *Sections of Report No. 94005/G-28247, (Rev. 0), "Decommissioning Plan for the Newfield Facility" that were handed out during the meeting are attached.*

Donna Gaffigan and Nancy Stanley wanted information on site conditions, beyond what was provided in the foregoing handout. SMC committed to providing a full and complete copy of Rev. 0 of the decommissioning plan to Nancy Stanley, Loretta Williams and Rick Westergaard (via Toni VanCamp, Municipal Clerk). However, David Smith and Carol Berger cautioned against further distribution of Rev. 0 since it was not accepted for technical review by the USNRC, and that Rev. 1 would soon be distributed.

Donna Gaffigan offered comments on the draft minutes of the August 15th meeting, which resulted in a correction to those minutes by deletion of a statement concerning the use of Newfield slag in artificial reefs. *A copy of the final version of the minutes from the August 15, 2003 meeting is attached.*

Donna Gaffigan pointed out that NJDEP regulations governing artificial reef prohibits using "radioactive materials". Lee harp stated that his research to date indicated no such prohibition in federal regulations dealing with artificial reefs outside the three-mile limit. While it appears that the use of the slag for artificial reefs would face significant regulatory and public perception challenges, this option has not yet been ruled out by SMC. *A copy of Donna Gaffigan's September 18, 2003 letter that contains comments on the August 15th meeting minutes and regulatory information on artificial reefs is attached.*

In connection with artificial reefs, a question was raised as to whether it might be feasible for SMC to use the slag in an on-site operation to construct concrete reef elements. SMC is taking this into consideration.

Lee Harp posed the following questions for which 10 CFR 20.1403.d.1.i.A, B and C requires a response from members of the SSAB: (1) Does the institutional control proposed by SMC (i.e., maintaining a "possession only" license) provide

reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 millirem per year?; (2) Will it be enforceable?; and (3) Will it avoid undue burdens on the local community or other affected parties? Each member of the SSAB was given an opportunity to provide their response to these questions. In all cases, none felt that they had sufficient information to permit them to give a response, but there was some response that the concept of a "possession only" license would be preferable than traditional institutional controls (i.e., deed restrictions).

Lee Harp then posed the following question that also required input from the SSAB (see 10 CFR 20.1403.d.1.ii): "Whether SMC has provided sufficient financial assurance to enable an independent third party and/or government custodian of the site to assume and carry out responsibilities for any necessary control and maintenance of the site?" Each member of the SSAB was given an opportunity to provide their response to this question, but in all cases they felt that they did not have a good understanding of the amount of financial assurance necessary in order to provide a response. The group generally felt that this question really couldn't be answered until Rev. 1 of the decommissioning plan was provided to them for review.

A number of other issues (summarized below) were discussed during the meeting in addition to those required in 10 CFR 20.1403. These are summarized below. Because there is still important information to be exchanged, the SSAB agreed to meet again in approximately one (1) month, primarily to allow for time for interested SSAB members to review Rev. 0 of the Decommissioning Plan, and for the Mayor to have the engineering details of SMC's proposed on-site construction reviewed by an independent engineer. At this point, the second meeting of the SSAB was closed. David Smith of SMC will schedule the next meeting.

Other Issues and Questions to be Addressed:

Mayor Westergaard expressed disappointment that the Borough of Newfield had not received copies of reports and correspondence related to the decommissioning of the SMC site in the past. SMC confirmed that all future information of this type would be forwarded to the Borough.

There was interest expressed in setting up a repository for SMC-related documents either in the Borough Hall or the local library.

Mayor Westergaard asked about the availability of federal funds to permit the Borough of Newfield to hire its own independent consultants to review the SMC drawings and other commitments was raised. Donna Gaffigan stated that there may be such funding available from the USNRC.

New members of the SSAB were concerned that they were asked to be involved in the decommissioning planning process too late for their input to matter. SMC responded that they are actually getting involved early in the process, since their input would be used in the development of Rev. 1 of the decommissioning plan, which would be provided to them for review and comment. Once all comments were resolved, the USNRC would likely prepare an Environmental Impact Statement that would again offer opportunities for public involvement during the hearing and comment periods.

The question was raised as to whether Newfield residents currently receive any measurable dose from the residual radioactivity in the slag pile. Carol Berger gave the dose rates at the perimeter fence of SMC's property, confirmed that there was no radiological impact on the neighbors due to their distance from the site, and described the radiation monitoring program for SMC employees who have been in relatively close proximity to the slag and baghouse dust over the years, but have incurred no significant dose.

There was additional discussion on the use of slag in steel production. Loretta Williams volunteered to contact steel producers to see if they would be interested in the slag, as long as she had details on what it contained. Carol Berger pointed out that the excerpts from Rev. 0 of the Decommissioning Plan describe the content of the slag, but that attempts to generate interest in the use of slag would likely be met with lack of success. (Previous interactions with a variety of steel mills, both domestic and foreign, by SMC and representatives of SMC did not result in any potential users of the slag for reasons that were unrelated to radiological safety or licensing, but on political and perceived issues.)

The matter of the visual impact of the proposed capped slag piles on a nearby subdivision was raised. The proposed cap design and end dimensions were reviewed, as were the issues of a protective fence around the Storage Yard and the deployment of passive radiation dosimeters as part of the long-term surveillance for the site. It was noted that the top of the engineered cap would not be as high as the top of the existing slag piles.

The type of zoning for the area surrounding the slag yard was raised in order to identify possible long-term land uses. SMC pointed out that this information is contained in Rev. 0 of the Decommissioning Plan.

Donna Gaffigan was concerned about whether SMC's preferred decommissioning methodology might constitute some form of NJDEP-regulated solid waste disposal.

Loretta Williams provided SMC with a recent quotation from a low-level waste processing and disposal firm (from Mr. Tim Curtain of American Ecology). That quotation was for disposal and transportation of approximately 100,000 tons of slag and baghouse dust for a cost of $19M (excluding site work), with a basis of $200 per ton. SMC stated that American Ecology is not eligible to receive SMC's slag or baghouse dust for disposal, and that quotations from Envirocare of Utah, although hard to pin down, appeared to run between $50 and 250 per cubic foot, for an approximate total disposal cost of over $100M. SMC also pointed out that "disposal" of radioactive materials at Envirocare is not necessarily permanent as contracts have a "take back" provision.

During discussions about institutional controls, the impact of the decommissioning on the economics of the Newfield area was raised, and there were concerns about what would happen if SMC discontinued operations in Newfield. SMC pointed out that they are not terminating their business in Newfield; they are only decommissioning those portions of the property that were impacted by the USNRC-licensed operations. Other non-licensed production and manufacturing activities are on-going. While SMC was not sure the employee population would ever exceed 300, they were hopeful that it would increase beyond its current level.

The question of the railroad doing a "rails to trails" conversion where the rail spur runs along the SMC property was raised. The potential impact of that action on SMC's decommissioning, and vice versa, is unknown.

The dimensions of the closed (capped) area of the Storage Yard were discussed.

The SSAB agreed to invite a representative of the USNRC to attend the next meeting of the SSAB, but the meeting would go on regardless of whether a USNRC representative was in attendance.

The issues of leachability of the radioactivity from the slag, as well as the presence of radioactivity in groundwater were raised. David Smith and Carol Berger pointed out that leachability testing on the slag demonstrates that the radionuclides therein are tenaciously retained. David Smith stated that no radioactivity other than background radioactivity has been identified in the groundwater sampling program.

Concerns were raised as to what would happen with the institutional controls if/when SMC leaves the site or sells the property. David Smith and Carol Berger expressed the view that if SMC went out of business with no successor, a perpetual "possession only" license would be in place, coupled with sufficient financial assurance to permit the USNRC to contract out the maintenance and surveillance obligations.

The issue of what the Borough would have to go through in order to make the property productive and what burdens that would impose on the community was discussed.

The issue of whether the method selected for capping the slag and baghouse dust on the SMC property is the best one available was raised.

Action Items and Responsible Individuals:
Distribute minutes (Carol Berger)

Schedule next meeting of the SSAB (David Smith)

Distribute copies of Rev. 0 of the "Decommissioning Plan for the Newfield Facility" (David Smith)

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation

Meeting
September 19, 2003 - 9:00 a.m. to 12:00 a.m.

Welcome. introductions and sign-in and brief purpose of meeting ..... C. L. Harp

Review of minutes from previous meeting ..... C. L. Harp

Response to general questions from previous meeting ..... D. R. Smith/C. D. Berger

Hand-out and review of additional information ..... C. L. Harp

Listing of SSAB input, interests, and concerns ..... C. L. Harp

Discussion and clarification of issues ..... C. L. Harp

SSAB determination as to whether listing is final ..... C. L. Harp

Summary and review of action items ..... C. L. Harp/C. D. Berger

Adjourn

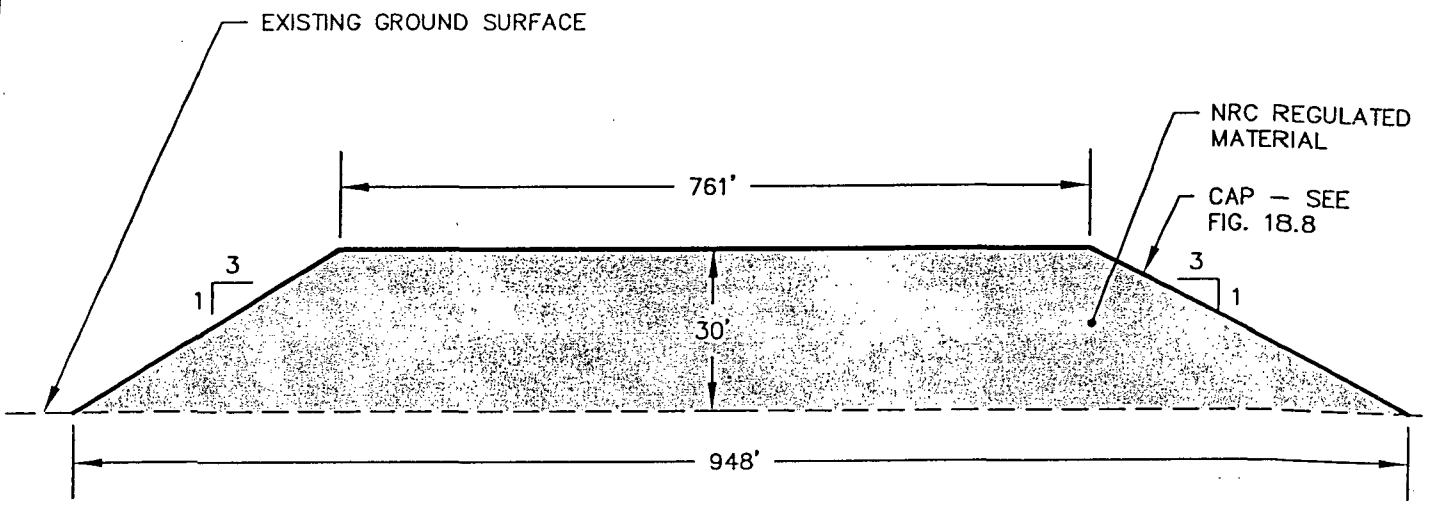
PARTICIPANT SIGN-IN SHEET

Shieldalloy Metallurgical Corporation SSAB: Follow-up meeting at the Newfield, New Jersey facility

Date: September 19, 2003 | **Facilitator:** Charles L. Harp, Esq.

Your Name (Print)	Your Signature	Your Address	Your Telephone Number (with area code)	Your e-Mail Address
Loretta Williams	Loretta Williams	[redacted]		
		Newfield NJ 08344	[redacted]	
Donna Gaffigan	Donna Gaffigan	[redacted] Trenton NJ 08625-0028	[redacted]	[redacted] US
Nancy Stanley	Nancy Stanley	[redacted] Trenton NJ 08625-0415	[redacted]	[redacted].us
Rick Westergaard	Rick Westergaard	[redacted] Newfield 08344	[redacted]	[redacted] com
[illegible]	[illegible]	[redacted]	[redacted]	[redacted]
Janet Magliocco	Janet Magliocco	[redacted] Newfield N.J. 08344	[redacted]	-
CAROL D BERGER	Carol D Berger	[redacted] GAITHERSBURG MD 20877	[redacted]	[redacted] com
GEORGE R. SARTORIO	[illegible]	City of Vineland H.D. [redacted] Vnl NJ 08360-	[redacted]	[redacted] org
LINDA GRABMANN	[illegible]	[redacted] /Newfield	[redacted]	[redacted] P. NJ
David Smith	David R Smith	[redacted] Newfield	[redacted]	[redacted]
James Wade	[illegible]	[redacted] Clayton	[redacted]	[redacted]

COPIES OF HANDOUTS



SECTION A–A'

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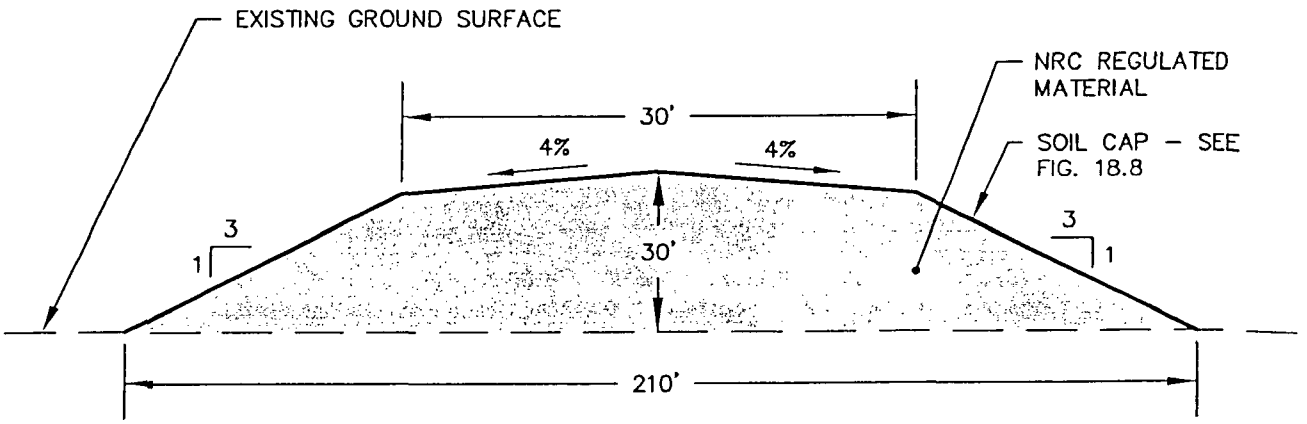


SECTION B–B'

N.T.S.

TRC
Customer-Focused Solutions

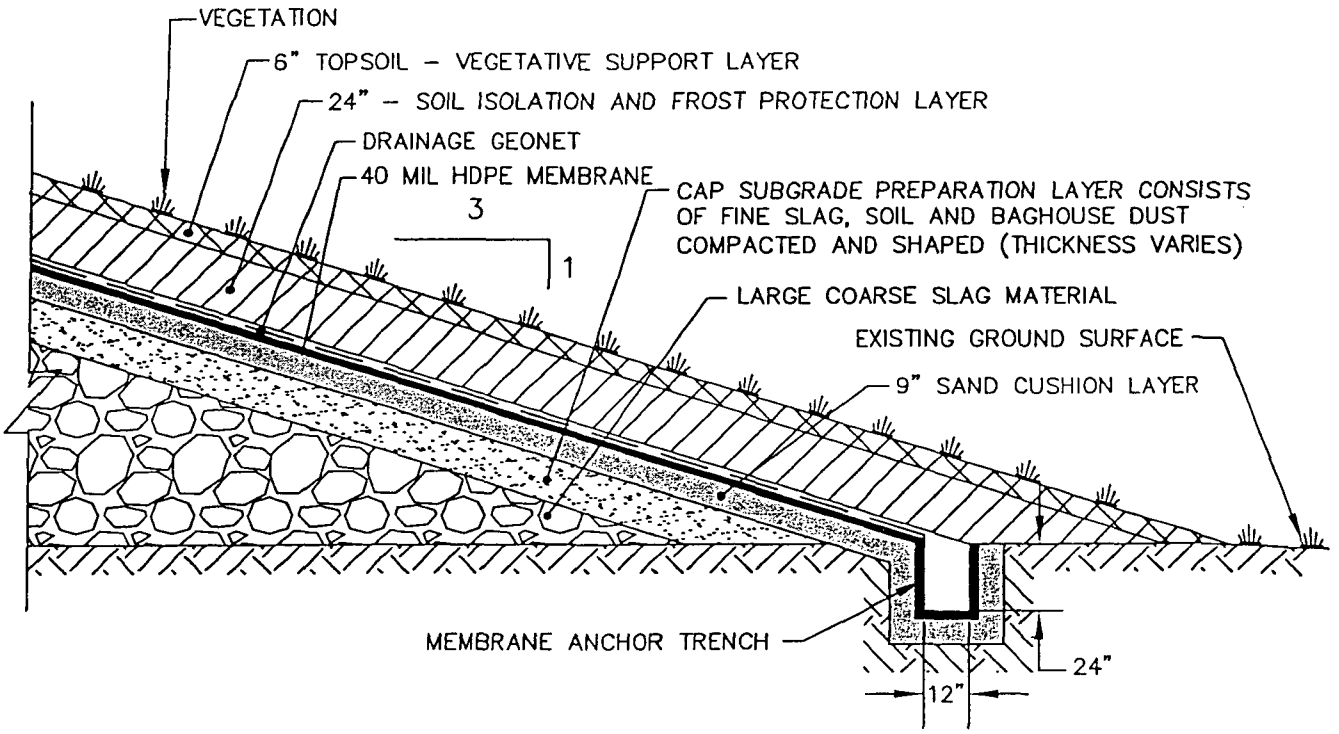
5 Waterside Crossing
Windsor, CT 06095
(860) 298-9692

SHIELDALLOY METALLURGICAL CORPORATION
NEWFIELD, NEW JERSEY

FIGURE 18.11
CAPPED PILE SECTIONS

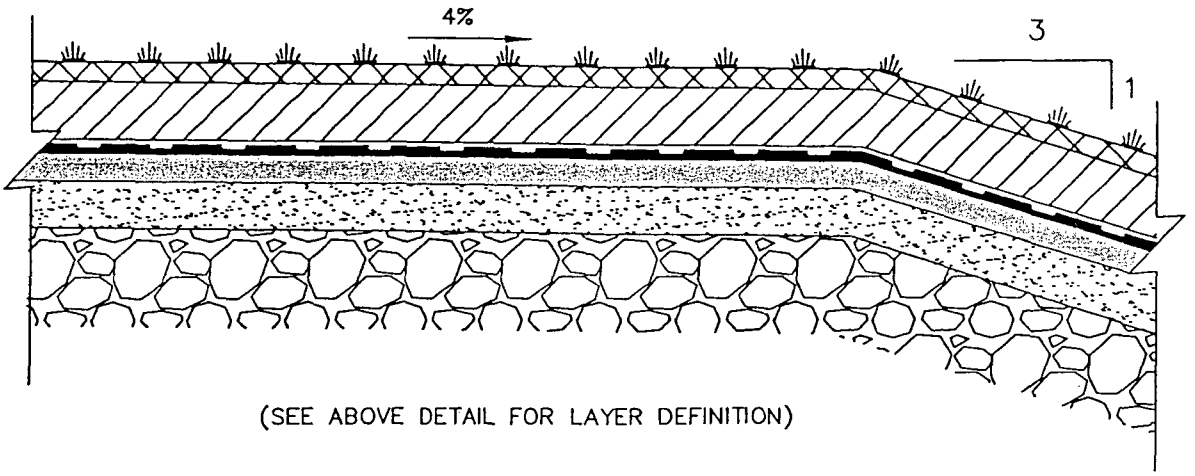
Date: 08/02 | Project No. 37149-0000-00007

\37149\Fig-18.11



TYPICAL CAP SIDE SLOPE DETAIL

N.T.S.



(SEE ABOVE DETAIL FOR LAYER DEFINITION)

TYPICAL CAP TOP DETAIL

N.T.S.

TRC
Customer-Focused Solutions

5 Waterside Crossing
Windsor, CT 06095
(860) 298-9692

SHIELDALLOY METALLURGICAL
NEWFIELD, NEW JERSEY

FIGURE 18.10

CAP CONSTRUCTION DETAILS

Date: 08/02 | Project No. 37149-0000-00007

\37149\FIG-18.10

Decommissioning Plan for the Newfield Facility

Submitted by:

Shieldalloy Metallurgical Corporation
12 West Boulevard, Post Office Box 768
Newfield, New Jersey 08344
(856) 692-4200

Report No. 94005/G-28247, (Rev. 0)
August 28, 2002

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY xx

INTRODUCTION 1

2 FACILITY OPERATING HISTORY 4
- 2.1 License Status 4
- 2.2 License History 4
- 2.3 Previous Decommissioning Activities 4
  - 2.3.1 Haul Road 4
  - 2.3.2 AAF Baghouse 5
  - 2.3.3 Building D203(G) 5
  - 2.3.4 Building D203(A) 6
  - 2.3.5 East End of the Storage Yard 6
  - 2.3.6 Building D111, D102 and D112 6
  - 2.3.7 Non-radiological Activities 7
- 2.4 Spills 9
- 2.5 Prior On-site Burials 9

3 FACILITY DESCRIPTION 10
- 3.1 Site Location and Description 10
- 3.2 Population Distribution 11
- 3.3 Current/Future Land Use 12
- 3.4 Meteorology and Climatology 12
  - 3.4.1 Winds 13
  - 3.4.2 Precipitation 13
  - 3.4.3 Air Quality 14
- 3.5 Geology and Seismology 14
  - 3.5.1 Geologic Characteristics of the Site and Surrounding Area 14
  - 3.5.2 Tectonic History 17
  - 3.5.3 Regional Tectonic Map 17
  - 3.5.4 Structural Geology 18
  - 3.5.5 Crustal Tilting, Subsidence, Karst Terrain, Landslides, and Erosion 18
  - 3.5.6 Geologic Characteristics (Surface and Subsurface) 19
  - 3.5.7 Geomorphology 19
  - 3.5.8 Faults 19
  - 3.5.9 Deformation 19
  - 3.5.10 Man-Made Geologic Features 19
  - 3.5.11 Seismicity 19

3.6 Surface Water Hydrology 20
3.6.1 Site Drainage and Fluvial Features 20
3.6.2 Water Resources Data 21
3.6.3 Topographic Maps 21
3.6.4 Surface Water Bodies 21
3.6.5 Water Control Structures and Diversions 22
3.6.6 Flow Duration Data 22
3.6.7 Aerial Photography of the Site 25
3.6.8 Existing and Planned Surface Water Uses 25
3.6.9 100-Year Floodplain 25
3.6.10 Man-Made Changes 25
3.7 Groundwater Hydrology 26
3.7.1 Saturated Zone 26
3.7.2 Monitoring Wells 26
3.7.3 Ground Water Flow Directions and Velocities 26
3.7.4 Unsaturated Zone 26
3.7.5 Monitor Stations 26
3.7.6 Physical Parameters 27
3.7.7 Numerical Analysis Techniques 27
3.7.8 Distribution of Radionuclides 27
3.8 Natural Resources 28
3.8.1 Potable, Agricultural, or Industrial Ground or Surface Waters 28
3.8.2 Economic, Marginally Economic, or Sub-economic Known or Identified Natural Resources 28
3.8.3 Mineral, Fuel, and Hydrocarbon Resources Near and Surrounding the Site 28
3.9 Ecology/Endangered Species 29
3.9.1 Commercially or Recreationally Important Invertebrate Species Known to Occur within 5 km of the Site 29
3.9.2 Commercially Important Floral Species Known to Occur within 5 km of the Site 29
3.9.3 Commercially or Recreationally Important Vertebrate Animals Known to Occur within 5 km of the Site 29
3.9.4 Estimates of Relative Abundance of Both Commercially and Recreationally Important Game and Non-game Vertebrates 29
3.9.5 A List of All Endangered Species at or within 5 km of the Site 29

4 RADIOLOGICAL STATUS OF THE FACILITY 31
4.1 Contaminated Structures 31
4.2 Contaminated Systems and Equipment 33
4.3 Surface Soil Contamination 33
4.4 Subsurface Soil Contamination 34

4.5 Surface Water 37
4.6 Groundwater 37

5 DOSE MODELING EVALUATIONS 38
5.1 Unrestricted Release 38
5.2 Restricted Release Using Site-specific Criteria 38
5.2.1 Acceptable Dose Limit 38
5.2.2 Assessment Methodology 38
5.2.3 Input parameters 40
5.3 Results 41

6 DECOMMISSIONING ALTERNATIVES AND RATIONALE 42
6.1 Alternatives Considered 42
6.1.1 On-site Stabilization and Disposal Alternative 42
6.1.2 Off-site Disposal Alternative 43
6.1.3 No-action Alternative 44
6.1.4 Sale of Slag for Beneficial Re-use 44
6.2 Rationale for Chosen Alternative 45

7 ALARA ANALYSIS 46

8 PLANNED DECOMMISSIONING ACTIVITIES 47
8.1 Contaminated Structures 47
8.2 Contaminated Systems And Equipment 48
8.3 Soil 48
8.3.1 Cap Construction 50
8.3.2 Adjacent Soil Characterization 51
8.3.3 Cap Completion 51
8.3.4 Final Status Survey 53
8.3.5 SMC Commitment Statement 53
8.4 Ground Water 53
8.5 Decommissioning Schedule 53

9 PROJECT MANAGEMENT AND ORGANIZATION 55
9.1 Decommissioning Management Organization 55
9.2 Decommissioning Task Management 55
9.3 Decommissioning Management Positions and Qualifications 56
9.3.1 Radiation Safety Officer 56
9.3.2 Other Management Positions 56
9.4 Training 59
9.4.1 Visitor Training 59
9.4.2 General Employee Training 59

9.4.3 Radiation Worker Training 60
9.4.4 Tailgate Safety Training 61
9.4.5 Training Records 61
9.5 Contractor Support 61

10 HEALTH AND SAFETY PROGRAM 62
10.1 Radiation Safety Controls and Monitoring for Workers 64
10.1.1 Air Sampling Program 65
10.1.2 Respiratory Protection Program 66
10.1.3 Internal Exposure Determination 66
10.1.4 External Exposure Determination 67
10.1.5 Summation of Internal and External Exposures 68
10.1.6 Contamination Control Program 68
10.1.7 Instrumentation Program 69
10.2 Nuclear Criticality Safety 70
10.3 Health Physics Audits, Inspections and Recordkeeping 70
10.4 Public Health and Safety Requirements 70
10.5 General Health and Safety Requirements 70
10.5.1 Site/Area Access Control 71
10.5.2 Medical Monitoring Program 72
10.5.3 Emergency Procedures 72

11 ENVIRONMENTAL MONITORING AND CONTROL PROGRAM 73
11.1 Environmental ALARA Evaluation 73
11.2 Effluent Monitoring Program 74
11.3 Effluent Control Program 75

12 RADIOACTIVE WASTE MANAGEMENT PROGRAM 76
12.1 Solid Radioactive Waste 76
12.2 Liquid Radioactive Waste 76
12.3 Mixed (Radioactive and Hazardous) Waste 76

13 QUALITY ASSURANCE PROGRAM 77
13.1 Organization 77
13.1.1 Decommissioning Project Manager 77
13.1.2 Radiation Safety Officer (RSO) 78
13.1.3 Health Physics Technicians 78
13.2 Quality Assurance Program 79
13.2.1 Procedures 79
13.2.2 Subcontractor Services 79
13.2.3 Laboratory Services 79
13.2.4 Surveys and Sampling Activities 80

13.3 Document Control 80
13.4 Control of Measuring and Test Equipment 80
13.5 Corrective Action 81
13.6 Quality Assurance Records 81
13.6.1 Laboratory Data 81
13.6.2 Field Survey Data 82
13.6.3 Data Evaluation 82
13.6.4 Sample Chain-of-custody 82
13.7 Audits and Surveillances 83

14 FACILITY RADIATION SURVEYS 84
14.1 Release Criteria 84
14.2 Characterization Surveys 85
14.2.1 Measurement Description 85
14.2.2 Field Instruments, Methods and Detection Sensitivities 85
14.2.3 Laboratory Instruments, Methods and Detection Sensitivities 86
14.2.4 Survey Results 86
14.2.5 Maps and Drawings Showing Non-impacted/Impacted Areas 87
14.2.6 Adequacy of Characterization Survey 87
14.3 Remedial Action Support Surveys 87
14.4 Final Status Survey Design 87
14.4.1 Overview 87
14.4.2 Classification of Areas 87
14.4.3 Background Reference Areas 88
14.4.4 Statistical Tests 88
14.4.5 Scanning Instrument Description 88
14.4.6 In-situ Measurement Instrumentation Description 89
14.4.7 Analytical Instrument Description 89
14.4.8 Sample Collection 89
14.5 Final Status Survey Report 90

15 FINANCIAL ASSURANCE 93
15.1 Cost Estimate 93
15.2 Certification Statement 93
15.3 Financial Assurance Mechanism 94

16 RESTRICTED USE 95
16.1 Eligibility Demonstration 95
16.2 Institutional Controls 95
16.3 Maintenance 96
16.4 Obtaining Public Advice 96
16.5 Dose Modeling and ALARA Demonstration 97

17 TABLES 98
Table 17.1 - Estimated Volume of Stockpiled Materials in the Storage Yard 99
Table 17.2 - Census Information 100
Table 17.3 - Stream Flow Rates 101
Table 17.4 - Hydraulic Parameters for the Cohansey Sand 102
Table 17.5 - Well Characteristics 103
Table 17.6 - Background Soil Concentrations 104
Table 17.7 - Average Radionuclide Concentration 105
Table 17.8 - Derived Source Term 106
Table 17.9 - Partition Coefficients 107
Table 17.10 - Physical Parameters 108
Table 17.11 - Inventory of Materials In the Storage Yard 109
Table 17.12 - DCGL Values 110
Table 17.13 - Gross DCGL Values 111
Table 17.14 - Decommissioning Cost Estimate 112

18 FIGURES 113
Figure 18.1 - Site Location Map 114
Figure 18.2 - Site Plan 115
Figure 18.3 - Storage Yard Plan 116
Figure 18.4 - Land Use Map 117
Figure 18.5 - Existing Monitoring Wells 118
Figure 18.6 - Restricted and Former Restricted Areas 119
Figure 18.7 - Hudson's Branch Watershed 120
Figure 18.8 - Sampling Locations and Results 121
Figure 18.9 - Capped Pile Site Plan 122
Figure 18.10 - Cap Construction Detail 123
Figure 18.11 - Capped Pile Sections 124
Figure 18.12 - Project Schedule 125
Figure 18.13 - Decommissioning Organization Chart 126
Figure 18.14 - Area Classifications 127

19 APPENDICES 128
Appendix 19.1 - Chapter 3 Reference Materials 129
Appendix 19.2 - RESRAD Summary Reports 130
Appendix 19.3 - Radionuclide Concentrations in Soil 131

3.6 Surface Water Hydrology

3.6.1 Site Drainage and Fluvial Features

During periods of increased precipitation, the Hudson Branch originates as far as 300 feet east of the site. At present, under normal conditions, the "headwaters" of the Hudson Branch are located approximately 300 feet, from the toe of the Storage Yard, in a marsh area in the southeast corner of the SMC property (see Figures 18.2and 18.8). The Hudson Branch flows westward through portions of the property and along the southern property boundary.

Historically the site included three permitted discharge outfalls. Outfall 001 historically included discharges of remediated ground water and treated stormwater, stormwater from a portion of the Borough of Newfield north of the SMC site, and non-contact cooling water (which was later rerouted to Outfall 002). Outfall 002 historically included discharges of stormwater and non-contact cooling water. Outfall 003 included discharges from an employee parking lot and industrial areas (laboratory and maintenance department).

Modifications made to site drainage, however, have resulted in the presence of only two stormwater outfalls associated with discharges from the SMC facility, of which only one qualifies as a permitted outfall. Former Outfall 001 still conveys stormwater from off-site Borough of Newfield sources into the Hudson Branch but does not include any facility-generated waters or stormwater. A 36-inch diameter pipe from Newfield Borough enters the SMC facility at the northern property line, crosses the SMC facility from north-to-south, and discharges into the Hudson Branch at this former outfall location. Existing Outfall 002 now conveys a combination of stormwater, non-contact cooling water, and treated water from the on-site ground water treatment system. A small man-made ponded area has been constructed immediately upstream of this outfall. Flows are recorded at an H-flume located at the outfall. While facility stormwater is still discharged at former Outfall 003, activities within the drainage area have been modified such that there is no longer a potential for industrial stormwater impacts.

The Hudson Branch joins the Burnt Mill Branch approximately 6,500 feet southwest of the site. An approximately 15-acre pond (Burnt Mill Pond) has formed at the confluence of the Hudson Branch and Burnt Mill Branch . The Burnt Mill Branch joins the Maurice River an additional 9,000 feet southwest of Burnt Mill Pond.

The historical configuration of the Hudson Branch and tributaries in the immediate site area has changed since the development of the site. A review of historic aerial photographs indicates the characteristics of the Hudson Branch during the period when the facility was used for glass manufacturing (based on a 1940 aerial photograph), and changes in the characteristics of the Hudson Branch as the site was further developed (based on 1951, 1962, 1965, 1974, 1977 and 1986 aerial photographs). The 1940 aerial photograph shows the Hudson Branch as originating in the same area east of the facility, although it appears that drainage from an area east of the facility but north of the railroad track may contribute to the Hudson Branch headwaters. The existing ponded area south of the facility is not apparent in the 1940 photograph. The 1940 aerial photograph also indicates the

presence of a drainageway which enters the Hudson Branch near the location of current Outfall 002. The drainageway extends to the north-northeast through mostly undeveloped land that is currently the center of SMC's production area. The drainageway continues to the railroad tracks along the northern edge of the facility and it appears that drainage from an area north of the railroad tracks (as far north as Catawba Avenue) may also contribute to this drainageway.[26]

The upstream drainage area of the Hudson Branch (upstream of a point adjacent to the slag piles on site) is estimated at 0.55 square miles, of which approximately 95% of the area is only sparsely undeveloped. Ground water discharge is the source of the Hudson Branch in times of no or low precipitation. In addition, the outfalls reportedly represent a major portion of the flow of the Hudson Branch in the vicinity of the site. The initial results of a 1993 study indicated that there is no hydraulic connection between the Hudson Branch and the Maurice River during low-flow conditions; in fact, during the study the flow in the Hudson Branch steadily decreased until there was no measurable flow immediately upstream of Burnt Mill Pond.[27]

When the level of the Hudson Branch rises in response to precipitation, the surface water may discharge to the adjacent aquifers in some areas. Runoff during storm events at the site has been observed to cause flooding of the Hudson Branch in a marsh area at the southwest corner of the site, approximately 900 feet downstream of the slag piles.

The channel of the Hudson Branch on site and adjacent to the site varies in size and ranges from 10 to 20 feet wide and one to three feet deep. During typical flow conditions, the Hudson Branch channel is approximately 300 feet from the slag piles.

3.6.2 Water Resources Data

There are no stream gaging stations on the Hudson Branch or the Burnt Mill Branch downstream of the site. The closest downstream gaging station is located on the Maurice River at Norma, New Jersey, approximately 9,000 feet downstream of the confluence of the Burnt Mill Branch and the Maurice River (4 miles southwest of the site).

3.6.3 Topographic Maps

A copy of information available on the USGS Newfield Quadrangle (photo revised 1994), as reprinted from CD ROM, is shown in Appendix 19.1.

3.6.4 Surface Water Bodies

See Section 3.6.1 above.

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[26] "Remedial Investigation Technical Report", TRC Environmental Consultants, Inc., 1992; Draft Final Feasibility Study Report, TRC Environmental Corporation, April 1995.

[27] "Evaluation of Fate and Transport of Chromium and Total Dissolved Solids in the Hudson Branch-Burnt Mill Branch Tributaries to Maurice River", Environmental Resources Management, Inc., November 6, 1995

3.6.5 Water Control Structures and Diversions

There are no known surface water diversions in the Hudson Branch or the Burnt Mill Branch downstream of the site. The same is true upstream of the convergence with the Maurice River.

Ground water is the primary source of domestic, agricultural, community, and municipal water supplies in the area of the site. Public wells are in the range of 150 to 200 feet deep (probably within the Bridgeton/Cohansey Formation); the depths of private wells vary. Ground water would appear to provide a good quality and reliable quantity of water at an economical depth, whereas it is assumed that surface water is a less reliable source.

The maps in Appendix 19.1 show the locations of water-supply wells within one mile of the site (as of 1994 and additional research conducted in 2001) and the area of a water-supply well restriction area located downgradient of SMC as of 1986.[23] The 2001 survey identified 13 water wells with permitted daily withdrawals of 100,000 gallons or more per day within a one-mile radius search area, which included the site (five of which are owned by SMC). Two wells within the area were listed as owned by the Borough of Newfield and were confirmed to be in use at the time of the survey. The nearest City of Vineland municipal well is outside of the search area, approximately 1.5 miles west of the center of the search area. The table included in Appendix 19.1 lists the addresses of well permits in the one-mile radius search area.

3.6.6 Flow Duration Data

There is no stream flow gaging station on the Hudson Branch, although flow rates in the Hudson Branch have been characterized by a number of studies. There are a number of limitations and apparent inconsistencies in the data, probably owing to seasonal variations in recharge/discharge relationships, local withdrawals, precipitation, etc.

Woodward-Moorhouse & Associates, Inc. (WMAI) conducted a study in 1974, before ground water extraction and treatment was initiated. They reported flows of 225 gpm near Outfall 001, 290 gpm at the culvert under West Boulevard and 360 gpm just upstream of West Arbor Avenue.

Stream flow rates were measured as part of Dan Raviv Associates, Inc. (DRAI) studies conducted in November 1983, June 1988 and April 1989.[24] These studies were all conducted during the period that ground water extraction and treatment was occurring at a rate of approximately 80 gpm. Therein, it was reported that Outfall 001 discharge rates were in the range of 250 to 350 gpm and Outfall 002 discharge rates were approximately 50 gpm during this period. The stream flow rates (in gpm) measured during this period are summarized in Table 17.3.

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[23] Personal communication w/Paul Horner, City of Vineland Water-Sewer-Utility Department on 08/09/02; and TRC file information.

[24] "Modification of Surface Water Discharge Permit", Dan Raviv Associates, Inc., August 1988.

DRAI interpreted the WMAI results and the results presented above, in combination with field observations and ground water quality information, as indicating that the upper segment of the stream (Segment 1), from the headwaters of the Hudson Branch to just upstream of Outfall 001, is intermittent. Segment 2, which continues from Segment 1 to West Boulevard, was characterized as an area in which the stream recharges the ground water or there is a significant difference in the stream gradient and storage compared to other segments of the stream. The second explanation is described as being more probable, since no indication of stream loss (i.e., mounding) was observed in the water levels of nearby monitoring wells. Segment 3 continues downstream from West Boulevard to prior to sampling station 8, with this portion of the stream described as a "gaining" segment (i.e., there is a contribution from ground water to the stream). Segment 4, continuing downstream from sampling station 8 to West Arbor Avenue, is described as an area in which stream recharge and ground water discharge appear to be in equilibrium. [DRAI, 1988a and DRAI, 1990]

While the descriptions presented above have been referenced in subsequent environmental reports, there are other factors which must be considered in their utilization. These are:

- The data do not support the conclusions as unequivocally as they are stated in the reports. For example, while the 1983 and 1988 data indicate a reduction in flow between West Boulevard and Weymouth Road, the 1989 data indicate a 920 gpm increase in flow over this segment. Furthermore, the 1988 data from West Boulevard to sampling station 8 indicate an overall decrease in flow in this stretch which is described by DRAI as a "gaining" segment.

- The data indicate the potential for errors in flow estimates. Again, the 1989 data for the segment between West Boulevard and Weymouth Road indicate a 920 gpm increase in flow over a distance of approximately 500 feet. There are no known direct discharges to the stream within this segment and it is highly unlikely that ground water would be discharging to the stream at such a rate. Therefore, it is likely that an inaccurate estimation of stream flow velocity or stream cross-sectional area is responsible for the suspect results. Other errors in such calculations could impact other estimated flow rates and result in inaccuracies in the hydrologic evaluation of the stream.

- The evaluation did not account for the potential impacts of precipitation events on flow rates, nor did it consider ground water table elevations immediately adjacent to the stream. Existing monitoring wells are not located immediately adjacent to the stream and may not be screened over a sufficiently shallow interval to reflect the true water table elevation.

- The data reflect surface water flow characteristics during a period when the treatment system was operating at a rate of 80 gpm and outfall flows totaled 300 to 400 gpm. This data may not reflect current conditions where ground water is being extracted

2 FACILITY OPERATING HISTORY

2.1 License Status

The majority of the licensed radioactive material inventory at the Newfield plant consists of slag from the D-111 production department, and dust from the D-111 baghouses. After processing of consumable pyrochlore ore and other feed materials for ferrocolumbium and other metallurgical operations, greater than 99% of the radioactive species remained in the slag and, to a much lesser extent, in the baghouse dust.[3]

License No. SMB-743 authorizes possession of up to 303,050 kilograms of thorium in any chemical/physical form, and up to 45,000 kilograms of uranium in any chemical or physical form. As of September 17, 2003, SMC was at 96.8% of the thorium limit and 87.6% of the uranium limit.

2.2 License History

SMC currently holds USNRC License No. SMB-743 which allows possession, use, storage, transfer and disposal of source material ancillary to metallurgical operations. The most recent amendment of SMB-743 was issued on October 9, 2001, and the license expiration date is October 20, 2002.

2.3 Previous Decommissioning Activities

2.3.1 Haul Road

The Haul Road was, at one time, a county right-of-way that ran through SMC's Newfield plant. Over the years, the south portion of Haul Road was surfaced with crushed slag from SMC operations. Although the Haul Road was never used to perform principle activities authorized by License No. SMB-743, it was nonetheless included in site characterization efforts that took place in 1988 and in 1991.[4,5] These surveys showed that the contact exposure rates in and near the Haul Road were only slightly discernible from background, and that the slag used to form the road bed was not characteristic of licensed material (i.e., ferrocolumbium slag).[6]

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[3] IT Corporation, "Assessment of Environmental Radiological Conditions at the Newfield Facility", IT Corporation Report No. IT/NS-92-106, April 1, 1992.

[4] Oak Ridge Associated Universities, "Radiological Survey of the Shieldalloy Metallurgical Corporation, Newfield, New Jersey", Report No. ORAU 88/G-79, July, 1988.

[5] IT Corporation, "Assessment of Environmental Radiological Conditions at the Newfield Facility", Report No. IT/NS-92-106, April 2, 1992.

[6] Exposure rates in and near the Haul Road generally ranged from background to 26 microR per hour, with a maximum exposure rate of 90 microR per hour. The contact exposure rate from ferrocolumbium slag is in the vicinity of 1,000 to 2,000 microR per hour.

The radioactive materials identified within the Haul Road were excavated and relocated to the Storage Yard. A final status survey was performed and documented in the fourth quarter of 1998.[7]

2.3.2 AAF Baghouse

Ferrocolumbium production was performed within a single building (D-111) equipped with an operator control room, mechanical booms and heavy equipment handlers, storage containers, scales, a variety of melting pots, two furnaces, other miscellaneous items, and a dust collection system comprised of two interconnected emission control units with high-efficiency baghouses. One of the emission control units was an American Air Filter baghouse, termed the "AAF Baghouse".

Because of improvements made to the air handling system in the immediate vicinity of the smelting operation, and because maintenance performed on a baghouse that operated in tandem with the AAF Baghouse improved its efficiency, in early 1999, SMC determined that it was no longer necessary to operate two emission control systems. Therefore, the decision was made to decommission the AAF Baghouse.

During the remedial action, which occurred between May 17 and June 17, 1999, the AAF Baghouse was disassembled. Structural components and materials that were generated during the demolition were surveyed to determine whether they could be released for unrestricted use (i.e., without regard for radiological constituents). Those items that did not meet the applicable release criteria were decontaminated and re-surveyed, or controlled as licensed material. A final status survey report was prepared, and the area, with the exception of the concrete pad, was released for unrestricted use in a license amendment.[8] The AAF concrete pad remains in place, and is addressed further in Chapter 5, below.

2.3.3 Building D203(G)

One area at the Newfield plant where source material was temporarily stored pending shipment or use is D203(G), also known as "G-Warehouse". G-Warehouse consisted, primarily, of open floor space to facilitate forklift movement, and a series of storage bays. However, operational and programmatic changes resulted in source materials being stored at locations within the SMC controlled area other than G-Warehouse. Because SMC no longer needed G-Warehouse to perform the primary activities authorized under License No. SMB-743, it was decommissioned.

Routine radiological surveillance of this area demonstrated that it was relatively free of residual radioactivity. Therefore, no remedial actions were necessary. In October of 2000, a final status

[7] Integrated Environmental Management, Inc., Report No. 94005/G-17172, "Final Status Survey of Haul Road", October 1998.

[8] Integrated Environmental Management, Inc., Report No. 94005/G-20187, "Demolition and Final Survey of the AAF Baghouse", November 2000,

survey of G-Warehouse was performed and documented.[9] The building was subsequently released for unrestricted use in a license amendment.

2.3.4 Building D203(A)

Another area where source material was received and temporarily stored pending shipment or use in D203(A), also known as "A-Warehouse". This building was constructed with a concrete slab floor and sheet metal siding and roof, and consisted, primarily, of open floor space to facilitate forklift movement, and a series of storage bays. When SMC no longer needed A-Warehouse to perform the primary activities authorized under License No. SMB-743, it was decommissioned.

Routine radiological surveillance of A-Warehouse indicated that it had become contaminated during use as a temporary storage location for radioactive materials awaiting shipment. The necessary remedial actions were performed, and a final status survey was conducted and documented.[10] The building was subsequently released for unrestricted use in a license amendment.

2.3.5 East End of the Storage Yard

The east end of the Storage Yard was used, at one time, to store ferrovanadium slag. However, placement of those materials often resulted in mixing with ferrocolumbium slag. Eventually, the two slag types were segregated, and the ferrovanadium slag pile was sold for beneficial re-use. The footprint of the pile was then excavated to remove all any remaining ferrocolumbium slag, with the excavated materials segregated within a single pile of soil/slag within the Storage Yard.

Soil sampling and walkover gamma surveys of the excavated area were performed and documented in 1999.[11] The soil sampling results were negative for residual radioactivity above the applicable release criteria, and the USNRC released the area for re-forestation.[12] On the other hand, the ambient exposure rates in the area, as a result of its proximity to the ferrocolumbium slag piles, were too high to permit measurement of residual radioactivity in non-sampled areas.

2.3.6 Building D111, D102 and D112

As part of a commitment made by SMC to the USNRC to continue on-going efforts to reduce the number and size of the existing restricted areas within the facility, in July of 2002, SMC began the

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[9] Integrated Environmental Management, Inc. Report No. 94005/G-16171, "Final Status Survey of G-Warehouse", November 2000.

[10] Integrated Environmental Management, Inc. Report No. 94005/G-16171, "Final Status Survey Report for 'A' Warehouse", October 1998.

[11] Integrated Environmental Management, Inc., IEM Report No. 94005/G-18198, "Soil Sampling/Survey of Storage Yard After Remediation", January 2000.

[12] Olivier, J. A., U. S. Nuclear Regulatory Commission, to D. R. Smith, "Former Storage Yard Area to be Reforested (TAC No. L31310)", April 6, 2000.

decommissioning of the D111 Production Department, and the D102/D112 Production Department from that listing.[13] All work was performed in full compliance with the requirements of License No. SMB-743, and was approved, in advance, by the USNRC.

As of September 1, 2002, the work on this project is still on-going. However, when all remedial actions are complete, SMC will perform and document a final status survey that follows the guidance in NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM), and will enclose a copy of the final status survey report in an application to remove the three buildings from the listing of permanent restricted areas that currently appears on License No. SMB-743.

Because that application will be submitted to the USNRC shortly after the submission of this decommissioning plan, an immediate amendment to the Plan would be necessary. Therefore, for the remainder of this report, it will be assumed that Buildings D111, D102 and D112 were addressed in a *completed* decommissioning activity, and that they are no longer considered to be a permanent restricted area on License No. SMB-743.

2.3.7 Non-radiological Activities

Environmental investigations have been ongoing at the Newfield site since 1972, when the first hydrologic investigation was conducted to evaluate the source of hexavalent chromium, which had been detected in a nearby municipal water supply well. In addition, a series of subsequent ground water and surface water studies were conducted to evaluate potential environmental impacts associated with SMC facility operations. Under the October 1988 Administrative Consent Order (ACO) with NJDEP, SMC contracted the design and installation of a 400 gallon per minute groundwater pump and treat system to control off-site migration of hexavalent chromium. As a result of the October 1988 ACO and further discussions with the NJDEP, SMC commenced with the removal of all of the materials from the Storage Yard that were not regulated by the USNRC. The only materials that in the Storage Yard today are those that are under the USNRC's jurisdiction.

A remedial investigation/ feasibility study (RI/FS) was also initiated under the ACO to fully characterize and evaluate potential non-NRC environmental impacts associated with the site. The 1988 ACO had noted NJDEP's and SMC's disagreement regarding the hazardous waste status of chromium slag piles and solid waste status of other slags, dross and baghouse dusts stored at the facility. The ACO stated that the chromium slag pile area and general slag area had not been fully investigated and required that investigation and remediation of soil and ground water contamination at and emanating from these areas be performed during the RI/FS. The 1988 ACO also acknowledged that the site was regulated by the USNRC and, therefore, certain activities conducted pursuant to the ACO could require the approval of the USNRC in addition to the approval of the NJDEP.

[13] Written communication from D. R. Smith, (Shieldalloy Metallurgical Corporation) to T. S. Sherr (U. S. Nuclear Regulatory Commission), "Intent to Terminate Source Material License No. SMB-743", August 27, 2001.

The RI report was completed in 1992, and several focused feasibility studies and supplemental investigations have been completed since then. A Record of Decision (ROD) was signed on September 24, 1996 which addresses the ground water remedial action.

In 1995, a series of six former wastewater treatment lagoons (designated as B-1, B-2, B-3, B-5, B-11 and B-12) were remediated and closed. The contents of the lagoons consisted of water and settled sludge containing metals (primarily chromium), generated from treatment, storage and settling/polishing stages of the treatment process. Remediation of these lagoons entailed the following primary activities:[14]

- Characterization of the sludge in each lagoon;
- Removal, treatment and discharge of standing water from each of the units;
- Demolition of associated pump houses, valve pits and piping with disposal of all generated wastes;
- Solidification, excavation and off-site disposal of the accumulated sludge, lagoon liner, and impacted underlying bedding material and soils;
- Collection and chemical analysis of confirmatory soil samples from each lagoon;
- Supplemental excavation and disposal of impacted soils located beneath portions of the lagoons; and
- Backfilling and restoration of final grade.

In 1994, a lagoon characterization investigation was conducted for three additional former wastewater treatment lagoons (B6, B7 and B8). The objectives of the investigation were to characterize the lagoons' contents, with respect to quantity and composition. Closure involved the treatment and removal of lagoon surface water, excavation and disposal of sludge, removal and off-site disposal of lagoon liners and contaminated soils, and backfilling and grading of the lagoon excavations. Approximately 2.5 million gallons of chromium hydroxide sludge were removed, dewatered and disposed as part of this remedial action, the details of which were captured in a 1999 report.[15]

[14] TRC Environmental Corporation, Closure Report, Surface Impoundments BB1, B2, B3, B5, B11 and B12, Liner and Contaminated Soil Removal and Disposal, dated April 1996 (revised August 2000).

[15] TRC Environmental Corporation, Closure Report, Surface Impoundments B6, B7 and B8, Liner and Contaminated Soil Removal and Disposal, April 1999.

2.4 Spills

No radiological spills have been reported over the history of the license. Non-radiological incidents are described in Section 8.4, below.

2.5 Prior On-site Burials

No burial of radioactive material, other than that described in Section 4.4, below, has been reported over the history of the license.

3 FACILITY DESCRIPTION

3.1 Site Location and Description

SMC's Newfield facility is located in the town of Newfield, Gloucester County, New Jersey. (A site location map is provided in Figure 18.1.) The primary portion of the site, consisting of the manufacturing facilities and their support areas, covers 67.7 acres. An additional 19.8 acres of farmland, located approximately 2,000 feet southwest of the primary site in Vineland, Cumberland County, New Jersey, are also owned by SMC.[16]

The primary site is bounded to the north by Conrail lines and to the west by East Boulevard. Woods, residential homes, and small businesses are present to the east of the site. The southern property line is bounded by the Hudson Branch and associated wetlands, just north of residences located along Weymouth Road. An unnamed pond is located in this portion of the Hudson Branch.[17] The majority of the site is surrounded by secure steel-wire fencing, except for a small portion of the property along the western property boundary which contains the facility parking lot. A detailed map depicting site boundaries and physical features of the plant is provided in Figure 18.2.

The topography of the Newfield Area is relatively flat, and the SMC facility is located on a slight topographic high (approximately 100 feet above mean sea level), with the ground surface generally sloping to the west-southwest, toward the Hudson Branch. The facility is comprised of three primary areas: (1) Manufacturing Area; (2) Undeveloped Plant Property (including the former Lagoon Area); and (3) Storage Yard, each of which is described as follows:

- Manufacturing Area - This area is characterized by presence of plant operations, offices, loading docks, and other facilities associated with former and present production operations (refer to Figure 18.2). The majority of this area is covered by buildings, other structures, asphalt or concrete. Much of this area has been evaluated with respect to potential environmental concerns including the former Manpro-Vibra Degreasing Unit; the Railroad Siding Area; the Department 102 Area; several areas associated with former underground storage tanks; and the Building 101(B) Glass Stack Area. Operations within the Manufacturing Area have been curtailed, with only limited manufacturing operations presently being performed on-site. Portions of the Manufacturing Area have been investigated, and several areas will be subject to remediation to address identified environmental impacts. In addition, this area also contains the Wastewater Treatment Facility, housed in Building 216 in the

[16] This property has not been impacted by licensed operations other than as described herein.

[17] The Hudson Branch is a tributary to Burnt Mill Pond, from which the Burnt Mill Branch flows to the Maurice River. The Hudson Branch is an intermittent, slow-moving surface water body which flows from east to west adjacent to the site.

southwestern corner of the site, which was installed to treat groundwater contaminated with hexavalent chromium and volatile organic compounds (VOCs). Treated groundwater is discharged to the adjacent Hudson Branch, subject to the requirements of a NJPDES Discharge to Surface Water Permit.

- Undeveloped Property - This area consists of several undeveloped strips of property, the majority of which extends along the southern portion of the property, and includes areas east and west of the Manufacturing Area. No buildings or other significant structures are present in this area. The extent of this area is depicted in Figure 18.2. Areas of potential concern that have been evaluated in this portion of the site include the Former Material Storage Area, the Drum Storage Area, the Former Chromium Button Storage Area, and the Tank T12 Chromium Wastewater Spill Area (site of a 1990 wastewater spill).

- Former Lagoon Area - This area occupied the central portion of the site and consisted of up to nine wastewater treatment lagoons. An unlined lagoon used to hold untreated process wastewater during the 1960s, was subsequently replaced with the nine smaller lined lagoons in which wastewater was treated for discharge. Over time, the wastewater treatment process was modified, and the lagoons were gradually phased out and closed. Final characterization, remediation, and closure of these lagoons were performed in the 1990s. Discussion of these closure activities was provided previously in Chapter 3, above.[18]

- Storage Yard - This area, which comprises about eight (8) acres of the eastern portion of the site, has historically been used to store by-product materials generated as a result of former manufacturing processes. A defined portion of this area has been designated a restricted area in License No. SMB-743. Currently, the Storage Yard contains a number of segregated piles, the layout of which is shown in Figure 18.3. A breakdown of the volumes of the various regulated material types is provided in Table 17.1.

3.2 Population Distribution

The property owned by SMC is located in part in three different communities and two counties; the Borough of Newfield, the City of Vineland, Franklin Township, and Gloucester and Cumberland Counties. Population distribution information is not available by town in Newfield or Franklin Township, therefore a comprehensive demographic listing was created by county. Current population information for the counties surrounding the site was obtained from the U.S. Census

[18] The former Lagoon Area is a relatively flat, open portion of the site and is predominantly covered by grass. Portions of this area are also presently used for temporary storage of equipment and non-regulated materials. Other portions of the Undeveloped Property portion of the facility are generally open and vegetated with grass and/or small shrubs and trees.

Bureau website. The City of Vineland maintains its own website, which includes projected population growth. These data are included in Table 17.2.[19]

3.3 Current/Future Land Use

Current land use in the general vicinity of the site has been determined through review of Master Plans and Zoning maps from the local municipalities, and contact with municipal officials. Specifically, the vicinity of the SMC site within a one-mile radius encompasses several municipal entities: Borough of Newfield, City of Vineland, and Township of Franklin. The site itself is zoned for heavy industry. Figure 18.4 depicts specific land uses within a one-mile radius, based on the following sources:

- Borough of Newfield Master Land Use Plan, February 1979;
- City of Vineland Master Plan, January 1992;
- City of Vineland Zone Map, January 1996; and
- Township of Franklin Zoning Map, April 2001.

Recent contact with municipal representatives indicates that land use planning has not changed substantially since the preparation of these documents. Figure 18.4 shows distribution of residential, business (i.e., commercial and industrial), and cultivation (i.e., agricultural) and woodlands. As can be seen from this figure, much of the region to the east of the site is zoned for residential use while much of that to the west/southwest is agricultural and/or undeveloped. Based upon the available information, no specific planned changes in future land use could be determined.

3.4 Meteorology and Climatology

The Philadelphia International Airport was chosen as a climatologically representative site. Philadelphia, like the Newfield, NJ site, is inland while other airports in the region are coastal and show coastal influences (e.g. sea breezes) that do not typically affect Newfield.

In the 2001 Local Climatological Data-Annual Summary with Comparative Data for Philadelphia, the National Oceanic and Atmospheric Association (NOAA) describes the climate of the region as being moderate:

> "The Appalachian Mountains to the west and the Atlantic Ocean to the east have a moderating effect on climate. Periods of very high or very low temperatures seldom last for more than three or four days. Temperatures below zero or above 100 degrees are a rarity. On occasion, the area becomes engulfed with maritime air during the

[19] Neither Newfield nor Franklin had projections on population growth, and a statistic for the entire state was not included because it would not necessarily be representative of these smaller communities.

summer months, and high humidity adds to the discomfort of seasonable warm temperatures.

Precipitation is fairly evenly distributed throughout the year with maximum amounts during the late summer months. . . . Single storms of 10 inches or more occur about every five years."

National Climate Data Center (NCDC) data were obtained for the years 1972 through 2001. These demonstrate an average annual temperature of 54.7 degrees Fahrenheit, and average annual precipitation of 40.81 inches, and an average amount of snowfall of 19.9 inches. The average annual relative humidity in the afternoon is 55 percent.

3.4.1 Winds

In the *Local Climatological Data-Annual Summary with Comparative Data*, NOAA states that: "The prevailing wind direction for the summer months is from the southwest, while northwesterly winds prevail during the winter. The annual prevailing direction is from the west-southwest. Destructive velocities are comparatively rare and occur mostly in gustiness during summer thunderstorms. High winds occurring in the winter months, as a rule, come with the advance of cold air after the passage of a deep low pressure system. Only rarely have hurricanes in the vicinity caused widespread damage, primarily because of flooding."

The following data from NCDC is based on climatological normals from 1961-1990. The mean annual wind speed is 9.6 miles per hour and the prevailing wind direction is 230 degrees (west-southwest). The maximum 2-minute wind speed of 51 miles per hour at 300 degrees (west-northwest) occurred in June 1998. The maximum 5-second wind speed of 71 miles per hour also occurred in June 1998, from the west-northwest.

3.4.2 Precipitation

The annual average amount of precipitation in the region of the Newfield facility is 41.41 inches. The normal amount of snowfall is 23.2 inches. The normals are based on NCDC data from 1961-1990. The average monthly precipitation is based on data from 1972-2001 and ranges from 2.68 inches in October to 4.25 inches in August.

Thunderstorms occur an average of 27.1 days each year. Snowfall greater than one inch occurs on an average of 6.4 days per year. The mean number of days with heavy fog (visibility less than or equal to ¼ mile) is 21.2.

The site is near the county lines of Gloucester to the east and Cumberland to the west therefore, storm data for both counties was obtained from NCDC. The period of record for the data is January 1, 1972 to April 30, 2002. In Gloucester County 4 tornadoes and 1 funnel cloud were reported during that time period. In Cumberland County 9 tornadoes and 1 tropical storm were reported for the same period.

3.4.3 Air Quality

The nearest Class I air quality area is the Brigantine Wilderness Area, located approximately 31 miles to the east of Newfield. The rest of the state is considered a Class II PSD (Prevention of Significant Deterioration) area. Cumberland and Gloucester Counties are classified as severe nonattainment areas for ozone, although the area is in attainment for all other National Ambient Air Quality Standards.

3.5 Geology and Seismology

3.5.1 Geologic Characteristics of the Site and Surrounding Area[20]

The Newfield site is located in the Atlantic Coastal Plain physiographic province. It is underlain by a thick sequence of unconsolidated materials, comprised of several distinct formations, which overly unconformably on bedrock.

Bedrock below the site consists of a banded, micaceous schist or gneiss of the Wissihickon Formation of Precambrian age. The formation primarily contains mica, quartz, feldspar, and chlorite, and the formation has numerous fractures and joints and folding of individual layers. This formation outcrops northwest of and outside of Gloucester County and, based upon average dip, the top of the formation is projected to be at a depth of over 2,000 feet below grade in the Newfield area. Relative to the overlying unconsolidated materials, the bedrock is not expected to be a significant water supply resource in the area both due to depth and comparatively low yield.

The unconsolidated materials underlie much of southern New Jersey and dip and thicken to the southeast. Therefore, the formations thin to the northwest and further thicken to the southeast of the site area. The Middle to Lower Cretaceous sediments are primarily continental deposits consisting of alternating layers of clay, silt, sand and gravel. The Upper Cretaceous and most Tertiary sediments were deposited in beach and shelf environments, and tend to be finer grained than continental deposits. Very fine grained sediments are recognized as transgressive marine deposits, which formed during major incursions of the sea. Coarsening-upward deposits that overlie the fine-grained units are recognized as marine regressions, deposited in inner-shelf, near-shore or beach environments as the ocean was retreating. The formations typically outcrop in sequential bands striking northeast-southwest, with the earliest deposits outcropping further to the west, near the Delaware River.

The deepest among the sequence of unconsolidated deposits are the Upper Cretaceous Raritan and Magothy Formations. Below the site area, the combined formation thickness is expected to be 500 feet or more. The Raritan Formation is composed of quartzose sand, clay, and some gravel; the Magothy Formation consists of beds of dark-gray to black clays alternating with micaceous fine sand. These formations represent a significant aquifer system in parts of Gloucester County,

[20] "Special Report 30: Water Resources and Geology of Gloucester County, New Jersey", NJDCED, Hardt, W.F, and Hilton, G.S., 1969 and "Generalized Structural Contour Maps of the New Jersey Coastal Plain", Report 4, NJGS, Richards, H.G., Olmsted, F.H., and Ruhle, J.L., undated.

particularly to the northwest, closer to the outcrop area, but the water may be brackish below the site area.

The Raritan and Magothy Formations are overlain unconformably by Upper Cretaceous sediments of the Merchantville Formation. This is overlain, in turn, by the Woodbury Clay, the Englishtown Formation, the Marshalltown Formation, the Wenonah Formation, the Mount Laurel Sand, and the Navesink Formation.

The Merchantville Formation is described as a glauconitic micaceous silt or quartzose or glauconitic sandy clay (the composition varies within the county), and the thickness ranges from 45 to 70 feet. This formation is a minor aquifer within the county and, together with the overlying Woodbury Clay, acts as an aquaclude.

The Woodbury Clay is a dark blue to black clay (with some white sand streaks and marine fossils in some areas). The Woodbury Clay thickness in Gloucester County ranges up to 80 feet.

The Woodbury Clay is overlain unconformably by the Englishtown Formation, which is described as a fine-to-coarse-grained quartzose sand with local lenses of clay and occasional lignite, mica, and glauconite. In some areas the sand grades into clay and is indistinguishable from the overlying and underlying units. Fossil assemblages suggest both continental and marine origins. The Englishtown Formation is a minor aquifer in Gloucester County.

The Marshalltown Formation consists of a dark-green to black clay, sandy clay, and silt, with mica and glauconite in some areas. Marine fossils have been found in the formation. The formation acts as a confining layer for the underlying Englishtown Formation. The top of the Marshalltown Formation is expected to be at an elevation of approximately 800 feet below mean sea level in the Newfield area, or approximately 900 feet below grade level.

The Wenonah Formation conformably overlies the Marshalltown Formation. The Wenonah Formation and the Mount Laurel Sand are similar in composition and are mapped as a single unit in Gloucester County, although the Mount Laurel Sand is the predominant formation. The unit is composed of medium-to-coarse-grained quartz sands with varying percentages of glauconite.

The Navesink Formation conformably overlies the irregular surface of the Mount Laurel Sand and the Wenonah Formation. The formation consists of glauconitic sand and clay mixed with quartz sands, and can be clayey at the surface and pebbly at the base. The Navesink Formation and the overlying Hornerstown Sand function as confining layers.

The Navesink Formation is overlain unconformably by the Tertiary age Hornerstown Sand which is, in turn, overlain by Tertiary sediments of the Vincentown Formation, the Manasquan Formation, the Kirkwood Formation, and the Cohansey Sand.

The Hornerstown Formation is composed of clay and sand and can have significant percentages of glauconite. As noted above, this formation, along with the Navesink Formation, functions as a confining layer. The top of the Hornerstown Sand is at an approximate elevation of 600 feet below mean sea level in the Newfield area or approximately 700 feet below grade.

The Vincentown Formation can occur as a quartz sand with glauconite or a limey sandstone with shell fossils. It ranges up to 55 feet in thickness in Gloucester County. The Manasquan Formation is similar in composition to the Vincentown Formation, so is difficult to distinguish. The Manasquan sand can contain a high percentage of glauconite, and acts as a confining layer for the Vincentown Formation.

The Kirkwood Formation consists of clay, silt, and very-fine-to-coarse quartzose micaceous sand and represents only a minor aquifer in the county. The Kirkwood ranges in thickness from 50 to 100 feet.

The Cohansey Sand is composed of fine-to-coarse quartz sand, lenses of clay, and lenses of gravel and is approximately 130 feet thick in the Newfield area. Grain size varies both vertically and laterally, which is consistent with deposition within a coastal environment. The Cohansey Sand is the second most productive aquifer in the county. The Cohansey Sand below the site is composed of coarse sands and little to trace silt in the upper 40 feet, and generally finer sand and some silt, with some clay and silt stringers in the lower 60 to 80 feet. Discontinuous silt and clay lenses, up to 6 feet in thickness, were encountered. The Kirkwood Formation, described as a gray silt and clay layer, was encountered at a depth of 120 feet below grade in one of the well borings.

The Pleistocene Bridgeton Formation unconformably overlies the Cohansey Sand and is overlain by other sediments of Pleistocene age, including the Pensauken and Cape May Formations. The Pensauken and Cape May Formations, although present in parts of Gloucester County, are not expected to be present in the site area.

The Bridgeton Formation is composed of fine-to-very coarse quartz sand and gravel possibly of glacial or interglacial origins. The Bridgeton Formation reveals itself at the SMC site as a brown sand. Its thickness ranges from 0 feet in the vicinity of well SC-17D to 28 feet in the vicinity of well SC-12D (see Appendix 19.1). In the area of the site it is expected to be hydraulically connected to the underlying Cohansey Sand. Ground water in the Bridgeton Formation is expected to be under water table conditions.

Erosion, deposition, cutting, and filling have altered the landscape in and around the site area. Such actions may expose the Cohansey Sand at the surface where the Bridgeton Formation has been removed. Reworked sediments of the Bridgeton Formation and the Cohansey Sand may be present in stream valleys and floodplains.

3.5.2 Tectonic History

The Newfield site is located above a thick sequence of unconsolidated sediments which lie unconformably upon Precambrian age bedrock. To the north and west of the site lies the Newark Basin which was an active post-Devonian age rift zone. The Ramapo fault and the associated fault zone lie at the approximate western edge of the rift zone, approximately 80 miles north of the site area. The Newark Basin is filled with sedimentary and igneous rock of Triassic and Jurassic ages, including sandstone, siltstone, shale, conglomerates, basalts and diabases. Thrust faults to the north of Philadelphia (possibly a Precambrian suture zone) separate the Newark Basin sediments from the Precambrian bedrock which underlies the site. The attached geologic map of the Newark Quadrangle presents the underlying bedrock structural geology that might influence the tectonics of the site area.

According to NJGS Report 31, "New Jersey is not especially prone to earthquakes and has had no major earthquakes within the last several hundred years."[21] New Jersey is 2,000 miles from the Mid-Atlantic Ridge, the nearest plate boundary. Historical earthquakes felt in New Jersey are caused by fault movements within the North American tectonic plate (not at the plate boundary). The reference cites three general areas of seismic activity that can be felt by seismographs in New Jersey, these include:

- Several northeast-trending faults in north-central New Jersey and New York, of which, the Ramapo fault is the most active. The Ramapo fault is approximately 80 miles north of the site.

- In the Delaware Valley between Trenton and Wilmington and in the Wilmington area. Trenton and Wilmington are 50 miles north and 30 miles west from the site, respectively, and the valley trends northeast-southwest approximately 25 miles northwest of the site.

- Subsidence in the Raritan Bay, which has caused tremors in that area. The Raritan Bay is approximately 80 miles to the northeast of the site.

3.5.3 Regional Tectonic Map

New Jersey is 2,000 miles from the Mid-Atlantic Ridge, the nearest plate boundary. Appendix 19.1 shows the epicenters of earthquakes recorded or felt in New Jersey.[22] Appendix 19.1 summarizes those earthquakes with magnitude of 3 or greater or Mercalli intensity of IV or greater centered within 200 miles of the site which were felt in New Jersey.

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[21] "Catalog of New Jersey Earthquakes through 1990", NJGS Report 31, 1992; "Geologic Map of the Newark 1 x 2 degree Quadrangle, New Jersey, Pennsylvania, and New York", USGS MI Map I-1715, Lyttle, P.T., and Epstein, J.B., 1987.

[22] Copied from "Catalog of New Jersey Earthquakes through 1990", NJGS Report 31, 1992.

3.5.4 Structural Geology

The Newfield plant area is characterized by a thick sequence of unconsolidated materials which overly unconformably on bedrock at a depth of over 2,000 feet below grade. The unconsolidated materials underlie the entire county and dip and thicken to the southeast. Figures in Appendix 19.1 depict the sedimentary sequence.[23]

3.5.5 Crustal Tilting, Subsidence, Karst Terrain, Landslides, and Erosion

Metamorphic and igneous bedrock is present below the Newfield site at considerable depth (see 3.5.1. above). Subsidence, either due to collapse of karst terrain or fault movement related to underlying bedrock is not believed to be a significant concern in the area.

The surficial materials in the vicinity of the site consist of sands, silts, and gravels (Bridgeton Formation and Cohansey Sand). Relief on the site and in the immediate vicinity of the site is slight. Excluding the slag piles, relief depicted on the USGS 7.5-minute topographic map of the area (Newfield Quadrangle, 1994) is on the order of 20 feet or less across the entire site (between 85 and 105 ft NGVD 1929). Local land surface highs are depicted at 130 ft NGVD 1929 (3,000 feet north of the site) and 140 ft NGVD 1929 3,000 feet east-southeast of the site. Because of the low relief and low seismic potential in the area, landslides are not believed to be a significant concern in the site area.

The site is located near the source of the Hudson Branch, the small stream which crosses the southeastern corner of the property. The sandy surficial materials and low relief would be expected to allow infiltration of precipitation in undeveloped areas surrounding the site, consequently, the potential for stormwater movement to cause erosion of surficial materials appears to be slight. After the site is decommissioned and buildings are removed, the overall area of impermeable surface may be reduced, decreasing runoff from the site during and immediately following storm events.

With respect to off-site stormwater crossing the site via the Hudson Branch, the site is located in the upper portion of the drainage area. The 100-year flood zone mapped by the Federal Emergency Management Agency (FEMA) includes a cross section of 100 to 120 feet across the Hudson Branch near the site.[24]

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[23] Copied from "Special Report 30: Water Resources and Geology of Gloucester County, New Jersey", NJDCED, Hardt, W.F. and Hilton, G.S., 1969; "Generalized Structural Contour Maps of the New Jersey Coastal Plain", Report 4, NJGS, Richards, H.G., Olmsted, F.H., and Ruhle, J.L., undated.

[24] "Remedial Investigation Technical Report", TRC Environmental Consultants, Inc., 1992; "Flood Insurance Rate Map and Street Index, Borough of Newfield, New Jersey", FEMA, 1982.

3.5.6 Geologic Characteristics (Surface and Subsurface)

The dominant subsurface geologic characteristic of the site is the large sequence of unconsolidated materials which underlie the site. This dominant feature influences landform, drainage, and water supply availability.

3.5.7 Geomorphology

The deposits of the Bridgeton Formation, possibly of glacial or interglacial origins, rest unconformably on the Cohansey Sand. Surface drainage across these sands during deposition and post-deposition has carved small stream valleys throughout the area, possibly exposing the Cohansey Sand in the stream valleys.

3.5.8 Faults

The nearest mapped fault of seismic significance is the Ramapo fault, located approximately 80 miles to the north of the site. The locations of faults mapped in bedrock to the north and west of the site are documented.[25]

3.5.9 Deformation

Published descriptions of the Precambrian Wissaihickon Formation, which underlies the Newfield site at a depth of over 2,000 feet, indicate that nearer the outcrop area the formation contains fractures, joints, crumpling, and folding. Future deformation of bedrock or the unconsolidated sequence above bedrock at this site is not a significant concern due to the low anticipated seismic potential and the considerable sequence of unconsolidated materials underlying the site and between the site and the bedrock surface.

3.5.10 Man-Made Geologic Features

Fill material has likely been placed along roadways and stream crossings, and the landform at the site and that of surrounding properties may have been modified by cutting and filling.

To the northeast, and bordering the SMC property, is the former Newfield municipal landfill. Aerial photographs from 1962-1986 identify a landfill, which at its largest covered 1.2 acres (estimated on the basis of those photographs. The USGS topographic map of the area does not show any significant change in relief which would suggest the presence of a landfill.

3.5.11 Seismicity

The seismic potential of the area is considered to be low, as described previously. Appendix 19.1 contains a listing of historical earthquakes.

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[25] "Geologic Map of the Newark 1 x 2 degree Quadrangle, New Jersey, Pennsylvania, and New York", USGS MI Map I-1715, Lyttle, P.T., and Epstein, J.B., 1987.

3.6 Surface Water Hydrology

3.6.1 Site Drainage and Fluvial Features

During periods of increased precipitation, the Hudson Branch originates as far as 300 feet east of the site. At present, under normal conditions, the "headwaters" of the Hudson Branch are located approximately 300 feet, from the toe of the Storage Yard, in a marsh area in the southeast corner of the SMC property (see Figures 18.2and 18.8). The Hudson Branch flows westward through portions of the property and along the southern property boundary.

Historically the site included three permitted discharge outfalls. Outfall 001 historically included discharges of remediated ground water and treated stormwater, stormwater from a portion of the Borough of Newfield north of the SMC site, and non-contact cooling water (which was later rerouted to Outfall 002). Outfall 002 historically included discharges of stormwater and non-contact cooling water. Outfall 003 included discharges from an employee parking lot and industrial areas (laboratory and maintenance department).

Modifications made to site drainage, however, have resulted in the presence of only two stormwater outfalls associated with discharges from the SMC facility, of which only one qualifies as a permitted outfall. Former Outfall 001 still conveys stormwater from off-site Borough of Newfield sources into the Hudson Branch but does not include any facility-generated waters or stormwater. A 36-inch diameter pipe from Newfield Borough enters the SMC facility at the northern property line, crosses the SMC facility from north-to-south, and discharges into the Hudson Branch at this former outfall location. Existing Outfall 002 now conveys a combination of stormwater, non-contact cooling water, and treated water from the on-site ground water treatment system. A small man-made ponded area has been constructed immediately upstream of this outfall. Flows are recorded at an H-flume located at the outfall. While facility stormwater is still discharged at former Outfall 003, activities within the drainage area have been modified such that there is no longer a potential for industrial stormwater impacts.

The Hudson Branch joins the Burnt Mill Branch approximately 6,500 feet southwest of the site. An approximately 15-acre pond (Burnt Mill Pond) has formed at the confluence of the Hudson Branch and Burnt Mill Branch . The Burnt Mill Branch joins the Maurice River an additional 9,000 feet southwest of Burnt Mill Pond.

The historical configuration of the Hudson Branch and tributaries in the immediate site area has changed since the development of the site. A review of historic aerial photographs indicates the characteristics of the Hudson Branch during the period when the facility was used for glass manufacturing (based on a 1940 aerial photograph), and changes in the characteristics of the Hudson Branch as the site was further developed (based on 1951, 1962, 1965, 1974, 1977 and 1986 aerial photographs). The 1940 aerial photograph shows the Hudson Branch as originating in the same area east of the facility, although it appears that drainage from an area east of the facility but north of the railroad track may contribute to the Hudson Branch headwaters. The existing ponded area south of the facility is not apparent in the 1940 photograph. The 1940 aerial photograph also indicates the

presence of a drainageway which enters the Hudson Branch near the location of current Outfall 002. The drainageway extends to the north-northeast through mostly undeveloped land that is currently the center of SMC's production area. The drainageway continues to the railroad tracks along the northern edge of the facility and it appears that drainage from an area north of the railroad tracks (as far north as Catawba Avenue) may also contribute to this drainageway.[26]

The upstream drainage area of the Hudson Branch (upstream of a point adjacent to the slag piles on site) is estimated at 0.55 square miles, of which approximately 95% of the area is only sparsely undeveloped. Ground water discharge is the source of the Hudson Branch in times of no or low precipitation. In addition, the outfalls reportedly represent a major portion of the flow of the Hudson Branch in the vicinity of the site. The initial results of a 1993 study indicated that there is no hydraulic connection between the Hudson Branch and the Maurice River during low-flow conditions; in fact, during the study the flow in the Hudson Branch steadily decreased until there was no measurable flow immediately upstream of Burnt Mill Pond.[27]

When the level of the Hudson Branch rises in response to precipitation, the surface water may discharge to the adjacent aquifers in some areas. Runoff during storm events at the site has been observed to cause flooding of the Hudson Branch in a marsh area at the southwest corner of the site, approximately 900 feet downstream of the slag piles.

The channel of the Hudson Branch on site and adjacent to the site varies in size and ranges from 10 to 20 feet wide and one to three feet deep. During typical flow conditions, the Hudson Branch channel is approximately 300 feet from the slag piles.

3.6.2 Water Resources Data

There are no stream gaging stations on the Hudson Branch or the Burnt Mill Branch downstream of the site. The closest downstream gaging station is located on the Maurice River at Norma, New Jersey, approximately 9,000 feet downstream of the confluence of the Burnt Mill Branch and the Maurice River (4 miles southwest of the site).

3.6.3 Topographic Maps

A copy of information available on the USGS Newfield Quadrangle (photo revised 1994), as reprinted from CD ROM, is shown in Appendix 19.1.

3.6.4 Surface Water Bodies

See Section 3.6.1 above.

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[26] "Remedial Investigation Technical Report", TRC Environmental Consultants, Inc., 1992; Draft Final Feasibility Study Report, TRC Environmental Corporation, April 1995.

[27] "Evaluation of Fate and Transport of Chromium and Total Dissolved Solids in the Hudson Branch-Burnt Mill Branch Tributaries to Maurice River", Environmental Resources Management, Inc., November 6, 1995

3.6.5 Water Control Structures and Diversions

There are no known surface water diversions in the Hudson Branch or the Burnt Mill Branch downstream of the site. The same is true upstream of the convergence with the Maurice River.

Ground water is the primary source of domestic, agricultural, community, and municipal water supplies in the area of the site. Public wells are in the range of 150 to 200 feet deep (probably within the Bridgeton/Cohansey Formation); the depths of private wells vary. Ground water would appear to provide a good quality and reliable quantity of water at an economical depth, whereas it is assumed that surface water is a less reliable source.

The maps in Appendix 19.1 show the locations of water-supply wells within one mile of the site (as of 1994 and additional research conducted in 2001) and the area of a water-supply well restriction area located downgradient of SMC as of 1986.[23] The 2001 survey identified 13 water wells with permitted daily withdrawals of 100,000 gallons or more per day within a one-mile radius search area, which included the site (five of which are owned by SMC). Two wells within the area were listed as owned by the Borough of Newfield and were confirmed to be in use at the time of the survey. The nearest City of Vineland municipal well is outside of the search area, approximately 1.5 miles west of the center of the search area. The table included in Appendix 19.1 lists the addresses of well permits in the one-mile radius search area.

3.6.6 Flow Duration Data

There is no stream flow gaging station on the Hudson Branch, although flow rates in the Hudson Branch have been characterized by a number of studies. There are a number of limitations and apparent inconsistencies in the data, probably owing to seasonal variations in recharge/discharge relationships, local withdrawals, precipitation, etc.

Woodward-Moorhouse & Associates, Inc. (WMAI) conducted a study in 1974, before ground water extraction and treatment was initiated. They reported flows of 225 gpm near Outfall 001, 290 gpm at the culvert under West Boulevard and 360 gpm just upstream of West Arbor Avenue.

Stream flow rates were measured as part of Dan Raviv Associates, Inc. (DRAI) studies conducted in November 1983, June 1988 and April 1989.[24] These studies were all conducted during the period that ground water extraction and treatment was occurring at a rate of approximately 80 gpm. Therein, it was reported that Outfall 001 discharge rates were in the range of 250 to 350 gpm and Outfall 002 discharge rates were approximately 50 gpm during this period. The stream flow rates (in gpm) measured during this period are summarized in Table 17.3.

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[23] Personal communication w/Paul Horner, City of Vineland Water-Sewer-Utility Department on 08/09/02; and TRC file information.

[24] "Modification of Surface Water Discharge Permit", Dan Raviv Associates, Inc., August 1988.

DRAI interpreted the WMAI results and the results presented above, in combination with field observations and ground water quality information, as indicating that the upper segment of the stream (Segment 1), from the headwaters of the Hudson Branch to just upstream of Outfall 001, is intermittent. Segment 2, which continues from Segment 1 to West Boulevard, was characterized as an area in which the stream recharges the ground water or there is a significant difference in the stream gradient and storage compared to other segments of the stream. The second explanation is described as being more probable, since no indication of stream loss (i.e., mounding) was observed in the water levels of nearby monitoring wells. Segment 3 continues downstream from West Boulevard to prior to sampling station 8, with this portion of the stream described as a "gaining" segment (i.e., there is a contribution from ground water to the stream). Segment 4, continuing downstream from sampling station 8 to West Arbor Avenue, is described as an area in which stream recharge and ground water discharge appear to be in equilibrium. [DRAI, 1988a and DRAI, 1990]

While the descriptions presented above have been referenced in subsequent environmental reports, there are other factors which must be considered in their utilization. These are:

- The data do not support the conclusions as unequivocally as they are stated in the reports. For example, while the 1983 and 1988 data indicate a reduction in flow between West Boulevard and Weymouth Road, the 1989 data indicate a 920 gpm increase in flow over this segment. Furthermore, the 1988 data from West Boulevard to sampling station 8 indicate an overall decrease in flow in this stretch which is described by DRAI as a "gaining" segment.

- The data indicate the potential for errors in flow estimates. Again, the 1989 data for the segment between West Boulevard and Weymouth Road indicate a 920 gpm increase in flow over a distance of approximately 500 feet. There are no known direct discharges to the stream within this segment and it is highly unlikely that ground water would be discharging to the stream at such a rate. Therefore, it is likely that an inaccurate estimation of stream flow velocity or stream cross-sectional area is responsible for the suspect results. Other errors in such calculations could impact other estimated flow rates and result in inaccuracies in the hydrologic evaluation of the stream.

- The evaluation did not account for the potential impacts of precipitation events on flow rates, nor did it consider ground water table elevations immediately adjacent to the stream. Existing monitoring wells are not located immediately adjacent to the stream and may not be screened over a sufficiently shallow interval to reflect the true water table elevation.

- The data reflect surface water flow characteristics during a period when the treatment system was operating at a rate of 80 gpm and outfall flows totaled 300 to 400 gpm. This data may not reflect current conditions where ground water is being extracted

at a greater rate and outfall discharges are likely to exceed the 1988 rates, based on the treatment of ground water (and its subsequent discharge into the Hudson Branch) at approximately 400 gpm.

Studies conducted by DRAI from August 1991 through May 1992 provided monthly flow rate information for the Hudson Branch. These studies were conducted during a period when the ground water treatment system was operating at a typical rate of 200 gpm. The flow rates measured in the Hudson Branch were significantly reduced from those estimated in previous studies. Flows measured at Weymouth Road (sampling station 4) and at sampling station 8 were less than 25 gpm for all monthly measurements except for those made in February 1992. Again, the flow data did not unequivocally support DRAI's previous interpretation of the inter-relationship between ground water and surface water.[25]

A 1995 study conducted by Environmental Resources Management, Inc. included the collection of flow measurements at nine locations on the Hudson Branch, Burnt Mill Branch and Maurice River during a low-flow period (autumn 1993) and a high-flow period (spring 1995).[26] As with previous studies, flow measurements were collected by measuring flow depth and velocity. The flow rate was then determined by multiplying the velocity by the estimated cross section. The ground water treatment rate during the study period approximated 400 gpm.

During the autumn 1993 portion of the study, the flow in Hudson Branch decreased from Outfall 001 to the confluence with Burnt Mill Pond, with no measurable flow immediately upstream of Burnt Mill Pond. Reductions in flow were consistently measured both from Outfall 001 to Weymouth Road and from Weymouth Road to ERM's downstream sampling station 8 (which was located in the same general area as DRAI's sampling station 8).

During the spring 1995 study, variable flow rates in upstream portions of Hudson Branch were measured. Periods of relatively constant flow, periods of steady flow decreases and one period of steady increases in flow were observed. For the portion of the stream between Outfall 001 and Weymouth Road, reductions in flow rate were observed during every monitoring event but one. For the portion of the stream between Weymouth Road and sampling station 8, flow reductions were measured during four events, flow increases were measured during three events, and relatively constant flows (i.e, within a range of plus or minus 10 gpm) were measured during three events. In the area immediately upstream of Burnt Mill Pond, measurable rates of flow were present during the first half of the spring 1995 portion of the study, but flow was not measurable during the second half of the study period.

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[25] Dan Raviv Associates, Inc., 1991.

[26] "Evaluation of Fate and Transport of Chromium and Total Dissolved Solids in the Hudson Branch – Burnt Mill Branch Tributaries to Maurice River", Environmental Resources Management, Inc., November 1995.

An evaluation of the flow rates estimated during the ERM study in combination with the analytical parameters (i.e., chromium and TDS concentrations) further demonstrate that a more complicated situation is present with respect to the ground water discharge/surface water recharge areas along the Hudson Branch. Areas which may exhibit surface water gain during some times of the year may exhibit surface water loss during others. Areas of surface water loss would be expected to exhibit a loss of flow, with no significant change in chromium or TDS concentration. However, contradictory indications were often observed, such as a measured reduction in surface water flow in combination with an increase in chromium levels.[27]

As described in Section 3.6.1, modifications have been made to site drainage since these Hudson Branch studies were conducted. While no net change in total discharge volume has resulted from these modifications, the individual outfall locations at which the discharges occur, specifically with respect to Outfalls 001 and 002, have changed.

3.6.7 Aerial Photography of the Site

An aerial photograph of the site showing the approximate 100-year floodplain of the Hudson Branch, generated from Federal Emergency Management Agency (FEMA) publications, is included in Appendix 19.1. That figure also shows the separation between the slag piles and the Hudson Branch.

3.6.8 Existing and Planned Surface Water Uses

There are no known or planned surface water diversions in the Hudson Branch or the Burnt Mill Branch downstream of the site and upstream of the convergence with the Maurice River.[28]

3.6.9 100-Year Floodplain

Appendix 19.1, generated from Federal Emergency Management Agency (FEMA) publications, contains the predicted extent of the 100-year flood plain at the SMC site.

3.6.10 Man-Made Changes

The SMC site and the town of Newfield, which is located adjacent to the site and to the north, are partially covered with impermeable materials (buildings and pavement) which would result in increased runoff as compared to undeveloped land. The topographic map of the area (see Appendix 9.1) indicates a likely drainage divide north of the center of the town so that drainage would be directed to both the Mill Branch (north) and the Hudson Branch (south).

Development of the site caused some modification of drainage features at and near the site. Other man-made changes which may influence the surface water flow include: roadway runoff during storm events, culverts below roadways which may restrict flow in significant flood events, and non-

[27] Draft Final Feasibility Study Report, TRC Environmental Corporation, April 1995.

[28] Personal communication w/Paul Horner, City of Vineland Water-Sewer-Utility Department.

stormwater discharges (such as the non-contact cooling water and associated discharges from the SMC site) into the Hudson Branch which add to the base flow of the stream.

3.7 Groundwater Hydrology

3.7.1 Saturated Zone

The Cohansey Sand is the major geologic formation identified in the wells drilled below the site. The Cohansey Sand dips southeast about 11 feet per mile and is about 130 feet thick at Newfield, New Jersey. It is a water table aquifer with depths to ground water ranging from 4 feet in the southern portion of the site to 16 feet in the northern portion. The Cohansey Sand below the site is composed of coarse sands and little to trace silt in the upper 40 feet, and generally finer sand and some silt, with some clay and silt stringers in the lower 60 to 80 feet. Discontinuous silt and clay lenses, up to 6 feet in thickness, were encountered. The Kirkwood Formation, described as a gray silt and clay layer, was encountered at a depth of 120 feet below grade in one of the well borings.

3.7.2 Monitoring Wells

Tabular summaries of the SMC monitoring wells located at and surrounding the site are shown in Tables 17.5 And 17.6. A monitoring well location map (Figure 18.5) and representative ground water level elevation contour maps (Appendix 19.1) are also included.

3.7.3 Ground Water Flow Directions and Velocities

The ground water flow directions in both the water table and lower Cohansey Sand closely correspond to the general topography of the site, which slopes towards the southwest. A downward hydraulic gradient was observed at most of the well clusters across the site. Due to the smaller grain size and increased percentage of silt and clay, the transmissivity of the lower Cohansey Sand is lower than in the upper Cohansey Sand. The average linear shallow ground water flow velocity was calculated at approximately 1 to 3 feet per day.[29]

3.7.4 Unsaturated Zone

Test boring and monitoring well drilling at the site identified primarily fine to coarse sands and gravels in the unsaturated zone at the site; these sediments are likely to be representative of the Bridgeton Formation. The thickness of the unsaturated zone ranges from 0 feet at the Hudson Branch to approximately 17 feet below the northwest portion of the site. The depth to ground water ranges between approximately eight and 15 feet below grade in the vicinity of the slag piles.

3.7.5 Monitor Stations

Figure 18.5 depicts the groundwater monitoring well locations that are present on the Newfield site.

[29] "Ground Water Remedial Alternatives", Dan Raviv Associates, Inc., 1988; "Remedial Investigation Technical Report", TRC Environmental Consultants, Inc., 1992.

3.7.6 Physical Parameters

The hydraulic characteristics for the Cohansey Sand at the SMC site were determined in previous investigations and are summarized in Tables 17.7 and 17.8. These investigations have determined separate transmissivities and specific yield values for both the shallow (water table) and deep (lower Cohansey Sand). These values were averaged from four aquifer tests performed for SMC, as well as from two tests conducted during development the Newfield supply well adjacent to the site (to the northwest):[30,31] Vertical hydraulic conductivities of 0.006 to 3 gpd/ft^2 were calculated at locations across the site.[32]

3.7.7 Numerical Analysis Techniques

Numerous investigations and on-site and off-site hydraulic tests have been performed over the past 30 years associated with the investigation and remediation of ground water contaminated with chromium and volatile organic compounds. The information from the report, "Summary of Geohydrologic Information Collected Since January 1988" (Dan Raviv Associates, Inc., April 1990), shown in the attachments summarizes those results and the data analysis. Computer modeling of the ground water flow system was performed and documented in the report, "Ground Water Remediation Alternatives" by Dan Raviv Associates, Inc. (January 1988).

3.7.8 Distribution of Radionuclides

Several quarterly radiological ground water sampling events were performed from December 1988 through January 1990 utilizing the following onsite monitoring wells: W3 (representative of background conditions), and W2, SC11, SC12, and SC13 (representative of conditions in the vicinity of the Storage Yard), and A (generally downgradient of the Storage Yard and near the downgradient property line. The purpose of the radiochemical sampling was to determine if thorium and uranium, which occurs naturally in some of the raw materials used at the facility, and thus in some of the slag, had impacted ground water. As thorium and uranium decay naturally, energy is released in the form of alpha and beta emissions, measured in picocuries per liter (pCi/l). Both filtered and unfiltered ground water samples were analyzed to determine the influence of suspended versus dissolved solids on ground water quality.

Screening levels established by the USEPA for acceptable concentrations for community drinking water systems are 5 and 50 pCi/l for gross alpha and gross beta, respectively. The highest level of gross alpha was 10 pCi/l and was found at monitoring wells SC12 and SC13 in the vicinity of the slag piles. The highest level of gross beta was 530 pCi/l at SC13. In addition, there were

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[30] Woodward-Moorhouse & Associates, Inc., "Preliminary Report Groundwater Contamination Study Phase II", September 12, 1974.

[31] Roy F. Weston, Inc., "Hydrogeologic Investigation of Ground Water Contamination" Interim Report, February 1972.

[32] "Evaluation of Remediation Alternatives", Dan Raviv Associates, Inc., January 1988; "Remedial Investigation Technical Report", TRC Environmental Consultants, Inc., 1992.

exceedences of the gross alpha screening levels found at SC11, while W2, W3, and A were consistently below the screening levels for both gross alpha and beta. Wells SC11 and SC12 exhibited exceedences of the screening level for gross beta, although these results were lower than at SC13. Greater concentrations of gross alpha or beta were not consistently found in the unfiltered samples, as compared to the filtered samples. Therefore, the suspended sediment in the ground water does not contain significant levels of gross alpha or beta. (It should be noted that the method detection limits for gross alpha and beta analysis varied depending on the amount of suspended solids in each sample, and the error range generally increased as the detection of analytes increased.)

The results of this investigation indicate the presence of radionuclides in the wells in the immediate vicinity of the Storage Yard. However, those wells to the west and downstream of the Storage Yard are below the USEPA screening levels.[33]

3.8 Natural Resources

3.8.1 Potable, Agricultural, or Industrial Ground or Surface Waters

Ground water is used for local water supply by municipal and private wells. The attached maps show the locations of water-supply wells within one mile of the site (as of 1994). There are no known or planned surface water diversions along the Hudson Branch or Burnt Mill Branch downstream of the site and upstream of the Maurice River for water supply or other purposes.

3.8.2 Economic, Marginally Economic, or Sub-economic Known or Identified Natural Resources [34]

According to Daniel Dombrowski of the New Jersey Geologic Survey, there are no known mineral, fuel, hydrocarbon, or other natural resources in the area surrounding the site, with the possible exception of sand or gravel. (Personal communication, 7/29/02). This information is validated in addition by the Geologic Map of New Jersey, which identifies the formations surrounding the site as layers of gravel, sand, silt, and clay. This geologic formation, referred to as the Coastal Plain, "has been mined in the past for bog iron, glass sand, ceramic and brick titanium.... The mineral glauconite for use in fertilizer, and titanium....Today the Coastal Plain sediments continue to supply glass sand, and are extensively mined for construction material. The sand formations are productive aquifers and important ground water reservoirs."[35] Specific listings of mineral resources were not available.

3.8.3 Mineral, Fuel, and Hydrocarbon Resources Near and Surrounding the Site

There are no mineral, fuel, or hydrocarbon resources in the area other than sand and gravel. Mining of sand and gravel beyond the property boundaries in the future should not affect the dose estimates.

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[33] "Quarterly Radiochemical Ground Water Sampling;" reports from 1988 – 1990, Dan Raviv Associates, Inc.

[34] As defined in U.S. Geological Survey Circular 831

[35] From USGS website, www.usgs.gov/

3.9 Ecology/Endangered Species

3.9.1 Commercially or Recreationally Important Invertebrate Species Known to Occur within 5 km of the Site

An inquiry has been made to the Office of Natural Lands Management for a search of the Natural Heritage Database for information on commercially- or recreationally-important species in the vicinity of the Newfield site.[36] The inquiry included the location of the SMC property, its Plane Coordinates, and a USGS quadmap showing the outline of the premises.

3.9.2 Commercially Important Floral Species Known to Occur within 5 km of the Site

According to Jim Johnson, Cumberland County, NJ Agricultural Extension Agent, no native species in New Jersey are harvested for commercial use.

3.9.3 Commercially or Recreationally Important Vertebrate Animals Known to Occur within 5 km of the Site

Refer to Section 3.9.1. Farm animals, domestic animals, and game animals may be present in the vicinity of the site.

3.9.4 Estimates of Relative Abundance of Both Commercially and Recreationally Important Game and Non-game Vertebrates

Refer to Section 3.9.1. No specific information regarding the relative abundance of commercially and recreationally important game and on-game vertebrates could be determined that the time of this Plan's development.

3.9.5 A List of All Endangered Species at or within 5 km of the Site

In 1994, an endangered and threatened plant species survey and stressed vegetation survey were conducted by Amy S. Greene Environmental Consultants, Inc. as part of the remedial investigations for the site. This investigation included a field-based survey as well as database research through NJDEP's Office of Lands Management, Natural Heritage Program. Results of those activities indicated that although habitats specific to several species of concern existed in the vicinity of the site, no specimens of the listed species were identified on the site. A copy of the final report is provided in Appendix 19.1.

More recently, in preparation for this Decommissioning Plan, an updated report of endangered and threatened species was requested from the Natural Heritage Program. The Landscape Project database (Version 1.0) search results show that suitable habitat patches of emergent wetland, forest, and forest wetland occur on the SMC site, however, it identified no records for rare or endangered plants, animals, or natural communities in those habitat areas. A copy of the letter report which presents the result of the research is provided in Appendix 19.1. The report includes list of rare species from records in the Natural Heritage Data Base in the general vicinity of the site, as well as

[36] Office of Natural Lands Management, Natural Heritage Program, PO Box 404, 22 South Clinton Avenue, Trenton, NJ 08625-0404.

lists of rare species and natural communities that have been documented from Gloucester and Cumberland Counties.

4 RADIOLOGICAL STATUS OF THE FACILITY

4.1 Contaminated Structures

The Newfield plant is divided into three functional areas, plus administration facilities. These are the manufacturing area, the Storage Yard, and other undeveloped plant property. The following are brief description of each functional area:

- Manufacturing Area - This area contains a number of operations facilities, offices, and loading docks. For the most part, the area is covered with buildings and asphalt or concrete pavement. Included are the Railroad Siding Area, Department 111 (ferrocolumbium operation), Department 102 (former aluminothermic reduction operation), Department 112 (crushing operations), Department 107 (induction melting) Department 101 (metal grinding operations), Department 115 (aluminum master alloys), Department 116/118 (metal powder compaction operations), Department 203 (warehouse operations), and Department 204 (maintenance operations).[37,38]

- Storage Yard - This area is located on the eastern portion of the property, and is used to store materials generated during manufacturing operations. Slag generated during the ore processing procedures is stored in this area, as is baghouse dust and excavated soils.

- Other Undeveloped Plant Property - This area is located along the southern plant property boundary, and includes all undeveloped and unused areas of the plant.

By far the preponderance of the Newfield site has either never been impacted by licensed operations, or has already been free-released. The former includes the visitor center, administrative offices, Department 107, Department 101, Department 115, Department 116/118, Department 203, and Department 204, all of which have never housed licensed materials. The following is a listing of those structures or facilities that were, at one time, impacted by licensed operations, but that have since been remediated, as necessary, with final status surveys performed and documented, and the facilities subsequently released for unrestricted use: A-Warehouse; G-Warehouse; AAF Baghouse (with the exception of the concrete pad); and the ferrovanadium slag sorting area in the Storage Yard

[37] Department 111 and Department 102 process the radioactive materials for this operation.

[38] At one time, D-116 processed polishing compounds and other materials that are exempt from licensing pursuant to 10 CFR 40.13. Although these materials contained thorium and uranium, the cost of characterization, remediation and final status survey of D-116 is not included in this Plan because it was never a radiologically restricted area, and because the operations therein were exempt from the regulations in 10 CFR 40.

(recently re-forested).[39,40,41,42] Finally, D-111, and D-102/112 were recently decommissioned, and a final status survey is planned for calendar year 2002, a copy of which will be submitted to the USNRC. Section 2.3, above, contains additional information about all previously-decommissioned structures.

There are over 20 buildings on the property, and their construction is either steel or wood frame or concrete block. Only three of them are currently designated as restricted areas, meaning source material was stored/used there at one time. These are D-117 (Cave), D-202 (Laboratory) and D-Warehouse. Figure 18.6 shows the location and size of the three restricted areas.

Ambient gamma exposure rates in background locations have been performed as part of a number of different surveillance operations (e.g., final status surveys of A-Warehouse, G-Warehouse etc.), including the compliance surveys performed and documented each quarter. The following subsections summarize the measured levels.

4.1.3.1 Ambient Gamma

Data acquired with a Bicron Microrem meter at a height of approximately one (1) meter above a ground or floor surface, indicate ambient gamma background dose rates in buildings ranging from seven (7) to eight (8) microrem per hour.[43]

4.1.4.2 Surface Contamination

Alpha backgrounds ranging from zero (0) to two (2) counts per minute were obtained using hand-held instruments. Background alpha activities using a large area floor monitors ranged from eight (8) to thirteen (13) counts per minute. Background beta results for the large area floor monitors ranged from 900 to 1080 counts per minute.

In all three of the restricted areas (D-117, D-202 and D-Warehouse), routine surveillance data acquired each calendar quarter confirm that there is no residual radioactivity in these areas.

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[39] Shieldalloy Metallurgical Corporation, License Amendment Application to remove D203A (known as "A-Warehouse") from listing of permanent restricted areas, submitted on January 28, 1999. Amendment issued on July 20, 1999.

[40] Shieldalloy Metallurgical Corporation, "License Amendment Application to Remove Bldg. D203(G), also known as "G-Warehouse" from the listing of permanent restricted areas, submitted March 30, 2001.

[41] Shieldalloy Metallurgical Corporation, "License Amendment Application to Remove AAF Baghouse from the listing of permanent restricted areas, submitted January 30, 2000.

[42] Integrated Environmental Management, Inc., Report No. 94005/G-18198, "Soil Sampling/Survey of Storage Yard After Remediation", submitted to Shieldalloy Metallurgical Corporation, January 20, 2000.

[43] A Microrem meter provides a tissue-equivalent response allowing a readout in microrem per hour (μrem/hr).

Nonetheless, their final radiological status as compared to the site-specific release criteria will be included in the final status survey report for this decommissioning effort.

Quarterly walkthroughs of the D202 laboratory (upper level) showed general area dose rates of approximately six (6) microrem/hr, even in the vicinity of energized x-ray analysis equipment. Dose rates on the lower level ranged from 6 to 7 microrem/hr (the majority of a separate storage room containing a locked safe housing radioactive materials), with a maximum of 40 microrem/hr at one foot from the aforementioned safe. General area dose rates in Building D117 (i.e., the "Cave") were 6 to 7 microrem/hr. All of these ambient dose rates, with the exception of those near the safe, are consistent with the background data set.

4.2 Contaminated Systems and Equipment

The only buildings that contained systems and equipment for processing source material were D-111, the Flex-Kleen Baghouse, the AAF Baghouse, and D-102/112. The AAF Baghouse was demolished and released for unrestricted use in CY 2001. The Flex-Kleen Baghouse, D-111 and D-102/112 were decommissioned in CY 2002, and the final status survey report is soon to be submitted to the USNRC. Consequently, there are no longer any contaminated systems or equipment to be addressed in the site-wide decommissioning effort.

4.3 Surface Soil Contamination

The only areas within the Newfield plant property lines where residual radioactivity exists in surface soils, other than in the Storage Yard, are the concrete pads that housed the former AAF and Flex-Kleen Baghouses.[44] In addition, residual radioactivity was identified in the Hudson's Branch watershed in the late 1980's.[45] The Hudson's Branch, an intermittent, slow-moving tributary of Burnt Mill Branch in the Maurice River Basin, is the predominant surface water body in the vicinity of the plant. It borders the southern boundary of the property, where it flows from east to west.[46]

Ambient gamma exposure rates in background locations have been performed as part of a number of different surveillance operations (e.g., final status surveys of Haul Road, ferrovanadium slag sorting area, etc.), including the compliance surveys performed and documented each quarter. The values recorded are instrument- and geometry-dependent. However, data acquired with a Bicron Microrem meter at a height of approximately one (1) meter above a ground indicates background dose rates ranging from eight (8) to 15 microrem per hour in outdoor areas.[47]

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[44] Section 4.4, below, describes the radioactive materials present in the Storage Yard.

[45] "Baseline Radiological Risk Assessment for the Hudson's Branch Watershed", IT Corporation Report No. IT/NS-92-116, submitted to Shieldalloy Metallurgical Corporation, Newfield, New Jersey, November 3, 1992.

[46] The Hudson's Branch flows from northeast to southwest after it leaves the SMC property.

[47] A Microrem meter provides a tissue-equivalent response allowing a readout in microrem per hour (μrem/hr).

Background soil samples have been collected and analyzed by a variety of organizations and methodologies over the years. Table 17.6 is a compendium of background soil concentrations of uranium and thorium isotopes acquired during three measurement campaigns.

On and around the concrete pad that remained after demolition of the AAF Baghouse, the only radionuclides of concern are thorium and uranium, with progeny in general equilibrium. From the final status survey report for the AAF Baghouse decommissioning, the concrete pad was shown to contain up to 19,800 dpm/100 cm^2 of residual beta activity.[48] During the most recent quarterly compliance surveillance effort, a maximum of 1868 dpm/100 cm^2 of alpha activity from direct frisks was noted. Smears of the pad are negative for the presence of removable alpha or beta activity, meaning the measured residual radioactivity is affixed to the pad.

The radionuclide concentration in the Hudson's Branch was summarized in a 1992 risk assessment report.[49] There it was shown that the presence of those materials, which were uranium and thorium plus progeny, presented an insignificant radiological risk to members of the public. A scale drawing and map showing the Hudson's Branch Watershed, with ambient exposure rates, is included herein as Figure 18.7. Figure 18.8 shows the location of soil sampling, along with a graphical representation of the results.

4.4 Subsurface Soil Contamination

Subsurface soil contamination, in the form of ferrocolumbium slag, is present in the Storage Yard, and at a number of locations throughout the Newfield plant where slag was used as fill. The dimensions of these locations were described in detail in a 1992 report.[50]

Ferrocolumbium standard slag, ferrocolumbium high-ratio slag, and columbium nickel slag generated from the D111 and D102 smelting operations consist of solid, non-combustible material with the consistency of vitrified rock. All three slag types were maintained separately from the others at their respective points of generation and are transported in trucks from D111 and D 102 to the Storage Yard. There are approximately 20,000 cubic meters of ferrocolumbium slag (high ratio and standard) in the Storage Yard. In addition, baghouse dust was transported by truck to the

[48] Integrated Environmental Management, Inc. Report No. 94005/G-20187, "Demolition and Final Survey of the AAF Baghouse", submitted to Shieldalloy Metallurgical Corporation on January 7, 2000.

[49] "Baseline Radiological Risk Assessment for the Hudson's Branch Watershed", IT Corporation Report No. IT/NS-92-116, submitted to Shieldalloy Metallurgical Corporation, Newfield, New Jersey, November 3, 1992.

[50] Berger, C. D., A. Chance, K. Wiggins and H. Prichard, "Assessment of Environmental Radiological Conditions at the Newfield Facility", IT Corporation Report No. IT/NS-92-106, submitted to Shieldalloy Metallurgical Corporation, Newfield, New Jersey, April 1, 1992.

Storage Yard. Approximately 20,000 cubic meters of baghouse dust are currently in the Storage Yard.[51,52]

Ambient gamma exposure rates in background locations have been performed as part of a number of different surveillance operations (e.g., final status surveys of Haul Road, ferrovanadium slag sorting area, etc.), including the compliance surveys performed and documented each quarter. The values recorded are instrument- and geometry-dependent. However, data acquired with a Bicron Microrem meter at a height of approximately one (1) meter above the ground surface indicates a background dose rate range of eight (8) to 15 microrem per hour.[53] Background soil samples have been collected and analyzed by a variety of methodologies over the years (see Table 17.6).

There are approximately 23 curies each of uranium and thorium in the form of slag and baghouse dust in the Storage Yard. The concentration of each in the slag is approximately 400 pCi/gram. In the baghouse dust, the concentrations are less than 10 pCi/g each.

The physical form of the slag in the Storage Yard slag (glass-like rock) does not permit the radioactive elements to leach out into the regional water supply or local wetlands. Leachability studies performed on samples of the slag support this conclusion.[54] Also, the surface of the baghouse dust pile forms a "crust" when it encounters moisture, which serves to deter fugitive dust emissions. The radiation exposure rates in this area range from background to 0.2 milliR per hour, with the maximum measured exposure rate being due north of the Storage Yard, approximately 30 feet from the slag piles.

The Storage Yard also contains less than 6,500 m^3 of soil excavated during a previous remedial action. In addition, there are other deposits throughout the plant that may be returned to the Storage Yard as part of the decommissioning process. The following is a description of all of these materials:

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[51] Historically, dusts generated from both ferrocolumbium production and un-recycled dusts from ferrovanadium production were not segregated. Currently, however, the ferrovanadium contribution to the collected dusts is negligible.

[52] From the volumetric information obtained from an October, 1991 fly-over of the Newfield site, the Storage Yard contained 16,800 m^3 of standard slag and 1040 m^3 of high-ratio slag at that time, for a total of 17,840 m^3 (Shieldalloy Metallurgical Corporation, "Applicant's Environmental Report for the Newfield, New Jersey Facility", October 1, 1992). The volume of slag produced during ferrocolumbium operations performed after the 1991 fly-over and before the date of this report was added to this total in order to estimate the present-day volume of slag in the Storage Yard.

[53] A Microrem meter provides a tissue-equivalent response allowing a readout in microrem per hour (μrem/hr).

[54] Teledyne Isotopes, "Report of Leachability Studies for Shieldalloy Metallurgical Corporation", Teledyne Isotopes, Westwood, New Jersey, 1992.

- Haul Road - The Haul Road was, at one time, a county right-of-way that ran through SMC's Newfield plant. Over the years, the south portion of the road was surfaced with crushed slag from SMC operations. Characterization efforts that took place in 1988 and 1991 showed that the contact exposure rates in and near the road were only slightly discernible from background, that the contaminants therein were natural uranium and natural thorium, and that the slag used to form the road bed was not characteristic of licensed material (i.e., ferrocolumbium slag).[55,56,57] In September of 1998, approximately 6,500 m^3 of predominantly soil, with some residual slag, was scraped from the road transferred to the Storage Yard. This soil is assumed to contain approximately 0.2 curies of uranium, and thorium.[58] A final status survey of the remediated area demonstrated that the Haul Road may be released for unrestricted use (i.e., without regard for radiological constituents).[59]

- Slag Used as Fill - The remaining areas on the property where fill slag may exist (i.e., the southwest fence line and in the T12 Tank Area) are not designated "Restricted Areas" since the ambient exposure rates in these areas currently range from background to only a few tens of microR per hour.[60] While the mass of fill slag has not been well-characterized, the lateral extent of elevated surface exposure rates identified in a previous site characterization effort (i.e., approximately 8,000 m^2)

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[55] Oak Ridge Associated Universities, "Radiological Survey of the Shieldalloy Metallurgical Corporation, Newfield, New Jersey", Report No. ORAU 88/G-79, July, 1988.

[56] IT Corporation, "Assessment of Environmental Radiological Conditions at the Newfield Facility", Report No. IT/NS-92-106, April 2, 1992.

[57] Exposure rates in and near the road generally ranged from background to 26 microR per hour, with a maximum exposure rate of 90 microR per hour directly over slag pieces. If these are compared to the contact exposure rate from ferrocolumbium slag, which is in the vicinity of 1,000 to 2,000 microR per hour, it is clear that the slag in the road was the result of a different operation.

[58] If the source material content of ferrocolumbium slag (i.e., 400 pCi per gram each of thorium and uranium) is multiplied by the ratio of the maximum contact exposure rates for the materials excavated from the road and ferrocolumbium slag, a reasonable estimate of the source material concentration in the excavated soils is 18 pCi per gram. Assuming a soil density of 1.6 grams per cm^3, and a total soil volume of 6,500 m^3, the curie content of the excavated soils is about 0.2 curies each of uranium and thorium.

[59] Integrated Environmental Management, Inc. Report No. 94005/G-17172, "Final Status Survey of Haul Road", June 22, 1999.

[60] IT Corporation, "Assessment of Environmental Radiological Conditions at the Newfield Facility", IT Corporation Report No. IT/NS-92-106, April 1, 1992.

gives a reasonable estimate the spatial extent of residual radioactivity therein.[61] A conservative assumption of uniform thickness (i.e., one meter) over this entire area results in an estimate of 8,000 m^3 of fill slag on the property, containing approximately 4.2 curies each of uranium and thorium.[62]

The slag and baghouse dust contained within the Storage Yard have been placed directly upon the ground surface. Because the leach rate of radionuclides from these materials is low, sub-surface activity beyond a nominal depth of 30 cm, attributable mainly to slag burial, is unlikely. In those areas on the property where slag was used as fill, the maximum depth of deposition can be reasonably assumed to be one (1) meter or less.[63]

4.5 Surface Water

From many years of sample collection and analysis, it can be shown that the surface water collected from the vicinity of the Newfield site does not exhibit elevated (above background) radionuclide concentrations.[64]

4.6 Groundwater

The radionuclide content of groundwater collected from the vicinity of the Newfield site is described in Section 3.7.8, above. In general, no elevated levels of radionuclides have been identified.

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[61] Berger, C. D., A. Chance, K. Wiggins and H. Prichard, "Assessment of Environmental Radiological Conditions at the Newfield Facility", IT Corporation Report No. IT/NS-92-106, submitted to Shieldalloy Metallurgical Corporation, Newfield, New Jersey, April 1, 1992.

[62] Assuming a source material concentration of 400 pCi per gram each of thorium and uranium in the slag, a slag density of 1.3 grams per cubic centimeter, and a total slag volume of 8,000 m^3, the curie content of the slag used as fill is approximately 8.4 curies each of uranium and thorium.

[63] However, it is important to note that, in order to main the structural integrity of the areas where slag was used as fill, the radionuclide distribution and depth have not yet been well-characterized.

[64] TRC Environmental Consultants, Inc., "Remedial Investigation Technical Report", Project No. 7650-N51, Windsor Connecticut, April, 1992.

8 PLANNED DECOMMISSIONING ACTIVITIES

This chapter contains the description of SMC's approach for decommissioning of the remaining restricted areas at the Newfield site. It also contains a schedule for completion of those activities. As described previously, the decommissioning program will involve the following general steps:

- Finalization of decommissioning work plan and procedures, which will cover the detail and procedures, including the final design and technical specifications, health and safety plans (HASPs), construction issues, and performance and documentation of the Final Status Survey.

- Consolidation, stabilization, grading, and preparation of the regulated material within the Storage Yard;

- Characterization of those portions of the Storage Yard surrounding the final storage area's footprint; construction of the final cap and associated infrastructure (e.g., drainage systems); and

- Performance of the Final Status Survey of the soil excavation areas and the completed capped area to confirm the absence of residual radiological activity above the site-specific criteria.

A detailed description of the planned closure activities, in accordance with the USNRC decommissioning guidance titled *Consolidated NMSS Decommissioning Guidance*, and a schedule for these activities, are presented in the following subsections. In addition to those areas of the facility that will be subjected to active decommissioning processes (e.g., excavation, cap construction, etc.), several additional areas that were formerly associated with radiological source material but no longer exhibit residual activity will be subjected to Final Status Survey assessment as part of this site-wide decommissioning effort.

8.1 Contaminated Structures

As described in Section 2.3, above, residual activity was present in building materials and/or equipment associated with several Newfield site structures. These included Building D-111 and associated (Flex-Kleen and AAF) air handling systems, and the D102-112 Production Department facilities. Associated building and equipment decontamination, demolition, and disposal activities have already been completed. Non-licensed material that has been generated as part of these activities has been recycled or disposed off-site; licensed materials have been stockpiled in the Storage Yard.

As a result of the recent decommissioning actions associated with contaminated structures on-site, approximately 2,630 cubic meters of USNRC-regulated material is assumed to be incorporated into

the Storage Yard closure program. This material is located in the southern part of the Storage Yard, as depicted in Figure 18.3. No additional decommissioning activities are thus necessary in order to address contaminated structures.

8.2 Contaminated Systems And Equipment

As described in Section 2.3, decommissioning activities have been performed to address other identified portions of the Newfield facility that exhibit radiological activity. Contaminated systems and equipment have been managed as part of the contaminated building program, including Building D-111 and its two air handling systems, and the D102-112 Production Department facilities. As a result of those recent decommissioning actions, approximately 110 cubic meters of contaminated materials, in the form of baghouse dust, was generated and placed into the Storage Yard. Based upon the findings of routine surveillance activities and previous radiological site characterizations, as well as historical process knowledge, no additional facilities with residual radioactivity remain at the site.

8.3 Soil

The focus of this Plan is the consolidation, capping and management of remaining process slag, baghouse dust, radiologically-impacted soils and USNRC-regulated materials into the existing Storage Yard. For purposes of this Plan, all of these materials will be categorized as "soil". Site materials exhibiting radiological activity above applicable release criteria will be incorporated into the capped landfill area. The following sequence of steps will be performed to address the management and final disposition of soil materials on-site which exhibit radiological activity above established background levels:

- Installation of erosion and sedimentation control systems to prevent off-site migration of regulated materials during construction activities and the control of run-on into the work areas;
- Dust control;
- Preparation of final capped disposal area (grading, compaction, drainage, etc.);
- Consolidation of regulated materials (slag, baghouse dust, soils, stockpiled decontamination/demolition regulated material) beneath the planned cap;
- Sampling and radiological analysis of surface soils surrounding the capped area, within the Storage Yard, followed by excavation and consolidation of additional regulated soils, if required;
- Final grading, compaction, and cap installation;

- Performance of Final Status Survey of the entire Storage Yard (consisting of capped and surrounding areas; and
- Establishment of O&M and monitoring programs.

Specific activities associated with the first four of these steps, including sequence and methods, are described individually below. The Final Status Survey and long-term monitoring and maintenance of the site are discussed in detail in Chapters 11 and 16, below.

The final design and specifications for the cap will be developed in accordance with USNRC requirements, as summarized in Title 10 Code of Federal Regulations, Section 61.52, with the final plans and specifications provided in a subsequent submission, and will include the following design elements:

- Final contour plan;
- Cap system design details;
- Slope stability analysis;
- Description and availability of final cover material;
- QA/QC Plan for cap construction;
- Detailed description of erosion control measures;
- Post-closure monitoring plan;
- Surface water management system design;
- Contingency plans for differential settling;
- Construction Quality Assurance Plan;
- Performance Standard Verification Plan; and
- Operation and Maintenance Plan.

Primary design considerations include: (1) physical characteristics of the stockpiled regulated materials (size, density); (2) volumes of the material piles; and (3) relative location of the material piles. The cap will be designed and constructed in order to minimize material relocation, while

establishing a stable storage system. Specific design considerations include provision for the following:

- Provide required radiological shielding through installation of calculated soil cap thickness;
- Facilitate drainage off of cap and away from unit;
- Ensure long-term cap slope stability through appropriate design and construction;
- Install erosion controls for implementation during construction and for long-term cap maintenance;
- Provide dust control during cap construction;
- Minimize need for waste material handling (loading, transfer, and installation) to lower construction costs and simplify logistics;
- Utilize baghouse dust, soil and finer slag material as subgrade preparation for the soil cap, over the larger size slag material;
- Minimize requirements for off-site cover material to lower construction costs;
- Minimize surface area of cap while meeting requisite slope stability and other key design objectives to simplify long-term maintenance and lower overall program costs; and
- Use low maintenance vegetative cover materials.

8.3.1 Cap Construction

Construction of the cap will be initiated through consolidation of the collected/stockpiled regulated materials and preparation of the final subgrade for cap construction. Surface drainage systems will be constructed, which will direct surface runoff from the cap away from the capped material. Cap preparation will also involve the physical movement of slag, baghouse dust, and other materials using standard construction equipment (front-end loaders, bulldozers, dump trucks) such that effective consolidation and compaction is achieved.

Due to the large size and rough texture of the resident ferrocolumbium slag, it is anticipated that the finer-grained slag, soils and baghouse dust will be used to prepare the cap subgrade by filling the larger void spaces among the slag matrix. Final decisions as to the location of the various materials within the constructed capped unit will be made by SMC's Contractor based upon field conditions and final cap design considerations.

During consolidation of the various regulated materials into a single pile, comprehensive health and safety protocols will be followed to avoid exposing workers and nearby resident to site contaminants, and to prevent migration of contaminants into the surrounding environment. Water and/or other appropriate dust-control media will be used during all material movement activities. Continuous monitoring of the access and haul roads will be performed and appropriate dust control activities will be performed to minimize vehicle-induced fugitive dust generation. Material loading and unloading activities will also be monitored and controlled in a similar fashion. Further, real-time dust monitoring and radiological monitoring will be performed by SMC's Contractor to ensure exposures to radiological contaminants as well as other constituents of potential concern (i.e., metals) do not occur as a result of materials handling activities.[75] These actions, combined with the fact that the closest residence is more than 28 meters from the SMC property boundary, will ensure radiological and safety conditions that cannot be distinguished from those prior to the start of work will be maintained.

8.3.2 Adjacent Soil Characterization

As part of the regulated material consolidation process into a single pile, supplemental radiological surface soil characterization will be conducted within the Storage Yard by SMC's contractor to determine whether soils outside of the footprint of the storage cap are impacted by radiological contaminants of potential concern. Historical storage of licensed materials in this area could have caused the co-mingling with the underlying site surface soils. These potentially-impacted shallow surface soils may therefore be required to be consolidated in the capped pile.

Following removal of all of the licensed material beyond the areal extent of the final planned capped pile, soil sampling and radiological surveys will be conducted to determine the extent of any possible additional licensed material. Actual number, location, and depth of samples will be determined following completion of all initial consolidation activities, however sampling will involve the collection of a statistically significant number and distribution of shallow surface soil samples, which will be subjected to analysis for radiological constituents.

Upon receipt of the shallow surface soil characterization results, SMC's environmental Contractor(s) will make a determination as to which soils shall be placed beneath the cap. Soils exhibiting radiological activity above the release criteria for soil excavation will be transferred to the Storage Yard for capping. SMC may place other inert (unlicensed) soils beneath the cap to prepare the cap subgrade, to shape the site surrounding the cap or to isolate other soil materials regulated by NJDEP.

8.3.3 Cap Completion

Upon final consolidation of materials, the final cap will be constructed on the prepared subgrade in order to achieve the design criteria described in Section 5.0 of this Plan. The cap has been designed

[75] In the event that exposure levels above established site-specific health and safety action levels are identified, additional dust control activities (e.g., increased application of water or other control medium or use of different/supplemental controls systems) will be implemented.

in accordance with USNRC specifications. On this basis, the final graded and compacted impoundment will be covered with a one-meter-thick compacted soil shield barrier. Thickness of the soil barrier layer was calculated using a RESRAD computer model, and demonstrates that the potential for radiation exposures to from all exposure pathways over the next 1,000 years is less than 100 millirem per year (see Chapter 5, above). The cap in its entirety will consist of a geotextile membrane for water diversion, and one (1) meter of compacted suitable soil, topped with a six-inch thick final vegetative soil layer that is then seeded with suitable low maintenance and drought resistant grasses.

Surface drainage from the top surface of the capped pile will be collected near the top of the side slopes via open drain swales and directed down the side slopes in erosion control-lined downchute open channels. The discharge from the downchutes will be directed away from the pile and either allowed to spread and disperse or it will be directed via open channels or pipe to a suitable stormwater outfall location. Final cover soil material will be secured from a certified off-site source, and will be of appropriate grain size and quality to be stable and augment the overlying vegetative soil layer. Proposed location and dimensions of the final cap are depicted in Figure 18.9; details of design elements are provided in Figure 18.10.

Due to the long-term nature of the planned materials storage program, the size of the capped area, and the future secure nature of the area, SMC intends to evaluate the final storage area as a potential wildlife preserve. Such an application will enhance the aesthetic appearance of the area, provide an undisturbed refuge for local wildlife, and provide a secondary value for the property. To that end, the final cap design process will include a detailed ecological evaluation of the local flora and fauna, as well as the identification of appropriate plant species and other physical features that may be implemented into the final cap restoration. In addition to increased habitat value, the establishment of permanent vegetation also serves to protect the surface from soil erosion and remove water from the cover soils via evapotranspiration.

Given the current conditions that exist on the site, a successional old-field community is proposed in order to provide long-term stabilization of the cap and minimize future maintenance requirements, while promoting rehabitation by indigenous species, as well as migrating birds. The vegetation selected for the restricted release area should include a mixture of herbaceous and shrub species. Upland areas may be planted with a mix of perennial species during the growing season to establish permanent vegetative stabilization. Perennials develop a strong sturdy root structure that generally inhibits the growth of volunteer woody vegetation that may affect the integrity of the cap. The seed mix selected for the area may include grass and legume species including annual rye grass (Lolium spp.), birdsfoot trefoil (Lotus corniculatus), red clover (Trifolium pratense), and vetch (Vicia spp.). Shrub species selected for the area may include juniper (Juniperus communis) and staghorn sumac (Rhus typhina). A monitoring plan would be recommended to ensure successful establishment of selected plant species on the capped area. The final planting scheme would be prepared in close cooperation with the final engineering design of the cap.

8.3.4 Final Status Survey

Following completion of all material consolidation and capping activities, SMC's Contractor will conduct a Final Status Survey of the disturbed areas and capped unit. The survey will follow protocols and methods established in the *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*. The primary purpose of the Final Status Survey will be the confirmation that the former radiologically-controlled and/or impacted areas of the site associated with controlled by-product material used on-site (stored or used as fill) meet the established exposure criteria for the site. Detailed discussion of the Final Status Survey is provided in Chapter 11.

8.3.5 SMC Commitment Statement

SMC is committed to implementation of conservative radiological protection practices, and intends to be consistent with federal requirements that licensed radioactive materials be handled and released in a manner that ensures that exposures are as low as reasonably achievable (ALARA), taking into account economic and societal factors. Because the goal of decommissioning at the Newfield site is to ensure that members of the general population do not incur radiation doses in excess of 100 millirem per year after the license is terminated, these two objectives (i.e., the dose limit contained in 10 CFR 20.1402 and the ALARA provisions) form the basis for the level of effort necessary for decommissioning of this facility.

8.4 Ground Water

As described in Chapter 4, previous investigations at the site, including evaluations in the vicinity of the Storage Yard, yielded no radiological impacts above USEPA screening levels in downgradient ground water. Non-radiological contaminants (e.g., metals and/or volatile organic compounds) were detected in ground water and have been further evaluated and addressed under the NJDEP RI/FS process. Results of previous investigations are presented in the report titled *Remedial Investigation Technical Report*, dated 1992. Based on the absence of exceedances of radiological action levels in downgradient ground water, no decommissioning actions are planned to address the ground water. However, the planned decommissioning program will be designed and implemented in order to prevent discharges of radiological and/or chemical constituents to these environmental receptors through effective erosion and sedimentation controls, materials and equipment management, and proper completion of the designed cap. Future effectiveness of this storage unit will be evaluated through installation of long-term monitoring program; specifications of the O&M and monitoring of this unit are provided in Chapter 16 of this Plan.

8.5 Decommissioning Schedule

The projected schedule for the Newfield Decommissioning program is shown in Figure 18.12. This schedule presents the estimated time that will be required to perform the full closure process, from finalization of the project Work Plan through submission of the Construction Completion Report and receipt of final USNRC approval. The primary tasks depicted on the schedule consist of the following activities:

- Work Plan Development;

- Final Design;
- Bidding and Award;
- Implementation of Decommissioning Activities;
- Cap Construction; and
- Construction Completion Report and Certification.

The presented schedule, which depicts the relative sequence of tasks and the projected time frame for each task/subtask, has been based upon a number of general assumptions, including time requirements for the review and approval of submittals to the USNRC. SMC acknowledges that this schedule may change substantially based on USNRC input, final design requirements, site-specific conditions, etc. In the event that the schedule as provided in this Plan cannot be maintained, as the project moves forward, SMC will develop and submit an updated schedule to the USNRC.

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation

Minutes from August 15, 2003 Meeting

Attendance: (see attached sign-in sheet)

David R. Smith - SMC
C. Lee Harp, Esq. - Arter and Hadden (facilitator)
Carol D. Berger, C.H.P. - IEM (technical consultant to SMC)
Loretta Williams - Newfield resident
Donna L. Gaffigan - NJDEP representative
Nancy W. Stanley - NJDEP representative
Rick Westergaard - Mayor
(see attached sign-in sheet)

Discussion: (see attached agenda)
Welcome, introductions, sign-in, and a brief discussion on the purpose of meeting was delivered by Lee Harp.

David Smith provided a brief introduction to SMC, including its history, its licensing status and the current decommissioning activities, followed by a brief walking tour and visit to the Storage Yard. *The following handout was provided and attached to these minutes: Background information on SMC.*

Carol Berger gave an introduction to the concepts of radiation and radioactivity, with emphasis on definitions, units (i.e., the "millirem"), typical background radiation exposures (U. S. Average is 360 millirem), the regulatory dose limits for license termination for unrestricted use (25 millirem) and restricted use (100 millirem), and radiation-related risks (no demonstrable risks below 10,000 millirem). *The following handouts were provided and attached to these minutes: Presentation Outline ("Introduction to Radiation and Radioactivity"), a brochure on "Radioactivity Basics", and a webcard showing the address of a web site where more information on radiation and radioactivity can be found.*

The regulations associated with decommissioning in general and public involvement in particular was provided and summarized by Carol Berger, with emphasis on those pertaining to stakeholder and public involvement. *The following handouts were provided and attached to these minutes: Presentation Outline ("Purpose of the Site Specific Advisory Board") and USNRC decommissioning regulations.*

Lee Harp discussed the role of the SSAB during decommissioning of the Newfield site. *The following handout was provided and attached to these minutes: "Requirements of 10 CFR §20.1403(d)".*

David Smith presented the three decommissioning options currently being evaluated with respect to radiological and economic impacts (ALARA analysis). These are: "No Action", packaging and shipping all residual radioactivity to the Envirocare disposal site in Utah, and "in-situ" disposal of the residual radioactivity within the Storage Yard under an engineered cap.

Donna Gaffigan asked about "intermediate" options, such as sale of the baghouse dust in concert with off-site disposal. David Smith stated that there are no feasible intermediate options, and then presented SMC's parallel effort to identify recycle/reuse possibilities for the slag and baghouse dust, what has been done to date (slag fluidizers, shielding, shielding constituents, high-strength concrete, dry cask storage for spent nuclear fuel, concrete admixtures), and what is currently being pursued (slag fluidizers, artificial reefs). Additional information on the use of the slag in the construction of artificial reefs and as an amendment to steel manufacture was provided. *The following handout was provided and attached to these minutes: NJ Reef News, 2001 Edition.*

A number of preliminary key issues (summarized below) were discussed. However, there was insufficient time to prepare a complete listing of SSAB interests in the Newfield decommissioning process. Therefore, first meeting of the SSAB was closed with a mutual agreement to hold a follow-up meeting in September of 2003.

Key Issues and Questions to be Addressed:
o(This is a preliminary listing. A more definitive listing will be prepared at the next meeting of the SSAB. SMC will respond to each item, and the item and SMC's response will be incorporated into the decommissioning plan.)

What is the time frame associated with any beneficial reuse options and why has there been no beneficial re-use yet found for the radioactive slag within the past 5 years?

No one knows what future development issues in the Newfield area might arise over the next 1,000 years, thus it is difficult to make decisions on decommissioning.

Is SMC committed to in-situ disposal of the residual radioactivity or are alternatives still under consideration?

A waste broker (American Ecology) provided a preliminary disposal cost for the slag and baghouse dust at Newfield to a member of the SSAB.

Has an environmental impact statement been prepared? If not, is it necessary to prepare one?

How does the SSAB role fit into the typical public involvement role and opportunities for comment under CERCLA?

The recent drop in worker population and the reduction in commercial activities at SMC and the previous bankruptcy filing raises the question about how long SMC will remain a business entity in Newfield over the long term, thus it is not clear how they can possibly remain responsible for the site, and what would happen to the residual radioactivity (and remaining decommissioning funds) at that time.

Is SMC in favor of finding a useful purpose for the subject material if one can be found?

It is doubtful that anyone other than SMC would build a business at the Newfield site for fear of lawsuits.

No one really knows whether there are health risks associated with the radioactivity at the Newfield facility, therefore it is best to simply ship it off for disposal.

It is difficult to accept institutional controls that are supposed to last for 1,000 years.

Has SMC posted enough financial assurance to assure "unrestricted release" of the site if the institutional controls should fail over time or if SMC defaults on decommissioning commitments?

Can the make-up of the SSAB be made broader? (It is, and that others did not accept invitations to attend.)

The SSAB would like more time to develop the list of key issues and concerns, but does not want to be the justification for delaying any submissions (i.e., the August 29, 2003 ALARA analysis) to the USNRC.

It is unclear whether the use of the Newfield slag in the construction of artificial reefs would be acceptable to the State of New Jersey.

The health effects on fish and vertebrates if the slag is used as an artificial reef might need to be investigated.

The SSAB wants to receive a copy of the pending ALARA analysis as well as the draft decommissioning plan.

The SSAB would like to receive sections of the August 28, 2002 decommissioning plan that describe the current radiological and physical conditions of the site.

The SSAB would like to learn more about the use of Newfield slag in the steel manufacturing process.

Action Items and Responsible Individuals:
Distribute minutes (Carol Berger)

Schedule next meeting of the SSAB (David Smith)

Distribute information on the radiological environment at the Newfield facility as described in the most recent version of the decommissioning plan (Carol Berger)

Determine whether there are State (NJ) regulations that would ban the use of Newfield slag in the construction of artificial reefs (Donna Gaffigan)

Distribute information on the use of slag in steel manufacturing (David Smith)

State of New Jersey

ames E. McGreevey
Governor

Department of Environmental Protection

Bradley M. Campbell
Commissioner

September 18, 2003

David R. Smith
Director of Environmental Services
Shieldalloy Metallurgical Corporation
12 West Boulevard
Newfield, NJ 07344

Re: Draft Minutes of August 15, 2003 Site Specific Advisory Board Meeting
Shieldalloy Metallurgical Corporation Site
Newfield, Gloucester County

Dear Mr. Smith:

The New Jersey Department of Environmental Protection (NJDEP) is in receipt of the Draft Minutes of August 15, 2003 Site Specific Advisory Board (SSAB) Meeting. The Draft Minutes were undated, but were received by NJDEP on August 28, 2003.

Upon review, NJDEP offers the following clarifications on the "Key Issues and Question to be Addressed."

1. Can the makeup of the SSAB be made broader? (It is, and that others did not accept invitations to attend.)

   The parenthetical comment must be deleted as it is misleading. As explained at the meeting, only two other individuals were asked to participate, but neither could attend. Both are Newfield Borough business owners. More effort should be made to increase participation. Also, since part of the Shieldalloy property lies in Vineland (although not the portion were the slag and baghouse dust resides), it will be advantageous to include members representing the interests of the citizens, government and businesses of Vineland and Cumberland on the SSAB.

2. It is unclear whether the use of the Newfield slag in the construction of artificial reefs would be acceptable to the State of New Jersey. The SSAB appeared to favor that decommissioning option.

   First, the use of radioactive materials in the construction of artificial reefs is prohibited by the New Jersey Coastal Zone Management Rules, specifically, N.J.A.C. 7:7E-4.21(c), where it is stated that "the reef materials shall not be radioactive." This specific section has been enclosed for your convenience.

   Second, it is not my recollection that the SSAB appeared to "favor" the artificial reef option for decommissioning. Strictly from the rock-like appearance of the slag, it was

stated that the slag material would be useful as an artificial reef, however, the radioactive content of the slag would probably limit its use. Nancy and I stated that we would review the state regulations regarding artificial reefs and disposal of radioactive materials in the ocean. As stated above radioactive material cannot be used as an artificial reef.

The only generalization that can be made regarding the opinion of the SSAB is that the SSAB would prefer reuse of the material, but not if it involves an open-ended search process. It has already been five (5) years since Shieldalloy ceased regulated operations at the site and few visible signs of the United States Nuclear Regulatory Commission required decommissioning are evident. Continued lengthy searches for a reuse option is not acceptable.

If you have any questions, I can be reached at (609) 633-1494.

Respectfully,

Donna L. Gaffigan

Donna L. Gaffigan, Case Manager
Bureau of Case Management

Enclosure

C: Nancy Stanley, NJDEP/BER
Loretta Williams, SSAB
Mayor Rick Westergaard, SAAB
Kenneth Kalman, USNRC
Marie Miller, USNRC
Charles L. Harp, Archer & Greiner
Carol Berger, IEM

reported using latitude and longitude coordinate pairs, in the WGS 84 (World Geodetic System 1984) datum, that were arrived at using the global positioning system (GPS). To reduce the impacts of fishing on cables by notifying the commercial fishing industry of the locations of areas where the cable is buried less than 1.2 meters deep, a copy of the report shall be submitted to the fishing interest groups identified in N.J.A.C. 7:7-4.2(a)3.

10. A report containing the results of inspection and maintenance of the submerged cable required in 8 above, if applicable in the reporting year, a discussion of storm events which could have affected the cable, and reported hits of the cable for the previous year shall be submitted by the permittee to the Department in January of each year. The report shall also indicate if and when the cable becomes out-of-service.

11. Within two years of taking the cable out of service pursuant to Federal Communications Commission regulations, the submerged cable shall be removed both from Surf clam areas, N.J.A.C. 7:7E-3.3, and from areas where Marine fish, as defined at N.J.A.C. 7:7E-8.2, are commercially harvested using mobile bottom-tending gear. The Department may allow all or portions of the cable to remain in place if leaving the cable in place would not result in a long term adverse impact to the ocean and/or ocean resources, and the cable would not unreasonably interfere with fishing or other uses of the seabed. A permittee who seeks to leave an inactive cable in place shall submit a request, including the reasons and justification for leaving the cable in place. The Department shall solicit public input on the request, including input from the fishing interest groups identified in N.J.A.C. 7:7-4.2(a)3.

12. If portions of the cable located either within Surf clam areas, N.J.A.C. 7:7E-3.3, or within areas where Marine fish, as defined at N.J.A.C. 7:7E-8.2, are commercially harvested using mobile bottom-tending gear, are not buried to a depth of 0.6 meters, the permittee shall provide a one-time monetary contribution to the Department's dedicated account for shellfish habitat mitigation. The amount of each mitigation contribution provided under this section shall be based on the length of cable that is not buried to a depth of 0.6 meters, based on the inspection required in (c)8i above. The contribution will be calculated at the rate of $100 per meter of cable which is buried to a depth of less than 0.6 meters. Moneys in the Shellfish Habitat Mitigation account are to be administered by the Department's Bureau of Shellfisheries and utilized for shellfish habitat restoration, enhancement and related research projects.

(d) Rationale: See the note at the beginning of this Chapter.

7:7E-4.21 Artificial reefs

(a) Artificial Reefs are man-made structures intended to simulate the characteristics and functions of natural reefs created by placing hard structures on the sea-floor for the purpose of enhancing fish habitat and/or fisheries. In time, an artificial reef will attain many of the biological and ecological attributes of a natural reef. Artificial reefs do not include shore protection structures, pipelines, fish aggregating devices, and other structures not constructed for the sole purpose of fish habitat.

(b) New reefs shall be sited in accordance with the following:

1. The reef site shall not be located in the following special areas: surf clam areas (N.J.A.C. 7:7E 3.3), prime fishing areas (N.J.A.C. 7:7E-3.4), navigation channels

(N.J.A.C. 7:7E-3.7), inlets (N.J.A.C. 7:7E-3.9), and Submerged infrastructure routes (N.J.A.C. 7:7E-3.12) and historic and archaeological resources (N.J.A.C. 7:7E-3.36);

2. The reef site shall be located in the Atlantic Ocean;

3. The reef site shall be located in a manner that minimizes impacts on commercial fishing operations;

4. The reef site shall not be located within shipping lanes, and/or anchorages;

5. The natural seafloor at the reef site shall have a firm substrate to minimize sinking of reef materials;

6. The reef site shall not be located within an area environmentally influenced by dredge disposal sites, sewage outfalls, or other areas known to experience hypoxic events, contaminated waters or sediment that may impair the quality of fish habitat; and

7. The reef site shall not be located in an area with currents that have the potential to cause material instability, scouring, or sanding over.

(c) Construction of new or expanded artificial reefs is conditionally acceptable provided that at the time of deployment, and at all times after creation, the following conditions are met:

1. The reef materials are of sufficient density so that it will not move outside of the approved reef boundary;

2. The reef materials shall not float;

3. The reef materials shall not pose a hazard to navigation;

4. The reef materials shall not pose a threat to the marine environment;

5. The reef materials shall not be toxic;

6. The reef materials shall not be hazardous;

7. The reef materials shall not be explosive;

8. The reef materials shall not be radioactive;

9. The following reef materials are acceptable for deployment, provided that (c)1 through 8 above are met:

i. Ships;

ii. Armored military vehicles;

iii. Manufactured reef habitats;

iv. Dredge rock;

v. Concrete and steel rubble;

vi. Demolition material free of floating debris;

vii. Obsolete submarine telephone cable; and

viii. Miscellaneous reef materials that meet the conditions in (c)1 through 8 above;

10. The reef material shall be deployed in the following manner:

i. No materials shall be deposited until notification has been provided to the Department at least 72 hours in advance;

ii. Inspection by the Department prior to deployment, to ensure materials are not harmful to the marine environment, and will not pose a threat to human safety, and comply with the reef material conditions (c)1 through 8 above;

iii. Department personnel shall directly observe and oversee the deployment of any reef materials;

iv. To the extent practicable, deployment of reef materials shall not adversely impact the marine environment; and

v. The locations of artificial reef sites shall be recorded using a Global Positioning Satellite (GPS) system.

(d) An Artificial Reef Management Plan shall be submitted for each individual reef permit application and shall include the following:

1. A description of the proposed site;
2. A mechanism for recording materials used in constructing the reef; and
3. A monitoring schedule to measure the stability, durability and biological attributes of reef materials and impacts to the marine environment. The schedule shall include submission of monitoring reports, including a listing of materials deployed in the previous year, to the Department every year during reef construction, and every five years thereafter.

(e) It shall be the responsibility of the reef-builder to provide the location of the artificial reef to the US Department of Commerce, NOAA, National Ocean Survey, 1315 East-West Highway, Silver Spring, MD 20910-3282, for inclusion on nautical charts.

(f) Rationale: See the note at the beginning of this Chapter.

7:7E-4.22 Miscellaneous uses

(a) Miscellaneous uses are uses of Water Areas not specifically defined in this section or addressed in the Use rules (N.J.A.C. 7:7E-7).

(b) Water dependent uses of Water Areas not identified in the Use rules will be analyzed on a case-by-case basis to ensure that adverse impacts are minimized. Non-water dependent uses are discouraged in all Water Areas.

(c) Rationale See the note at the beginning of this Chapter.

SUBCHAPTER 5. REQUIREMENTS FOR IMPERVIOUS COVER AND VEGETATIVE COVER FOR GENERAL LAND AREAS AND CERTAIN SPECIAL AREAS

7:7E-5.1 Purpose and scope

(a) This subchapter sets forth requirements for impervious cover and vegetative cover on sites in the upland waterfront development area, as defined at N.J.A.C. 7:7E-5.2, and in the CAFRA area, as defined at N.J.A.C. 7:7E-5.2. In addition:

1. For a site in the upland waterfront development area, the applicable impervious cover limits and vegetative cover percentages are determined under N.J.A.C. 7:7E-5A, based on the site's growth rating, development potential, and environmental sensitivity; and

2. For a site in the CAFRA area, the applicable impervious cover limits and vegetative cover percentages are determined under N.J.A.C. 7:7E-5B, based on the site's location in a coastal center; in a Coastal Planning Area; in a CAFRA center, CAFRA core, or CAFRA node; or on a military installation.

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation

Minutes of the November 5, 2004 Meeting

SSAB Members in Attendance:

David R. Smith - SMC representative
C. Lee Harp, Esq. - Archer & Greiner (facilitator)
Carol D. Berger, C.H.P. - IEM (technical consultant to SMC)
Loretta Williams - Newfield resident, public school employee and planning board member
Donna L. Gaffigan - NJDEP Bureau of Federal Case Management representative
Jenny Goodman - NJDEP Bureau of Environmental Radiation representative
Linda Graumann - Newfield resident and real estate agent
(see Attachment 1 for the sign-in sheet)

Visitors in Attendance:

Jim Milton - Newfield resident
Patricia Gardner - Chief, NJDEP Bureau of Environmental Radiation
John Nessel - Newfield resident
Jim Kinkade - Sentinel (press) representative
Kevin Keltman - Franklin Township resident
Joseph Diegel - Vice President & General Manager, Shieldalloy Metallurgical Corporation
(see Attachment 1 for the sign-in sheets)

Discussion: (see Attachment 2 for the agenda)
Lee Harp opened the meeting with introductions and a brief discussion on the meeting format and objectives. He then reviewed the minutes of the September 19, 2003 meeting. Following discussion, the minutes were approved without change. Lee Harp reviewed the handout information given to each member of the SSAB, and pointed out where visitors could find copies.

David Smith briefly reviewed licensed operations at the site since 1952 and why the facilities associated with those operations are being decommissioned. The status of the decommissioning effort to date was also reviewed, including the original submission of a decommissioning plan that the USNRC rejected because of acceptability issues (i.e., insufficient institutional controls and a requirement for SSAB involvement only after the plan was submitted). David Smith also briefly reviewed the existing financial assurance for decommissioning of the USNRC-controlled area, which is $5M for the benefit of the USNRC, USEPA and the NJDEP. *[In response to a November 29, 2004 request from the NJDEP, the following additional detail on SMC's financial assurance is hereby provided: The assurance is comprised of a $750,000 trust account for the benefit of the USNRC and a $4.25 million irrevocable standby letter of credit for the benefit of the NJDEP and the USEPA.]*

David Smith recounted events that had occurred since the last meeting of the SSAB. Those included the May, 2004 decommissioning guidance issued by the USNRC, and the June 29, 2004 USNRC public meeting (wherein the guidance was discussed). SMC also had follow-up telephone calls with the USNRC to resolve outstanding technical issues associated with the revised decommissioning plan preparation, and there was a series of letters the USNRC had received from Commissioner Campbell (NJ), Senator Corzine (NJ) and Jill Lipoti (NJDEP).

David Smith then presented the next steps in the decommissioning process. These include additional technical interactions with the USNRC staff, pre-submission of the chapters on dose modeling and environmental reporting (for acceptability review), acquisition of additional environmental data, and then preparation and submission of Rev. 1 of the decommissioning plan. The USNRC will then review the plan for acceptability and make a public announcement that it has been received and submitted for technical review. Once the technical review is complete, and if the plan

is approved for implementation, an environmental impact statement will be prepared. The public will have multiple opportunities to comment on the plan at various stages in the process.

Donna Gaffigan inquired as to whether an ALARA analysis had been performed as part of the phased approach to decommissioning. David Smith and Carol Berger reported that an ALARA analysis had been included in Rev. 0 of the decommissioning plan. A more site-specific analysis is currently being performed and will be included as Chapter 7 of Rev. 1 of the decommissioning plan. Donna Gaffigan asked to receive the Rev. 0 ALARA information. *[Since November 5th SSAB meeting, a review of correspondence with the USNRC reveals that SMC had a number of questions on completing a site-specific ALARA analysis for the Newfield site using the guidance of NUREG-1727. A subsequent telephone discussion with the USNRC resulted in SMC's letter (from D. Smith of SMC to R. Bellamy of the USNRC dated August 22, 2003) with a final commitment on the decommissioning methodology based upon the ALARA analysis that appeared in Rev. 0 of the decommissioning plan. A copy of that letter, along with SMC's August 20, 2003 inquiry regarding the NUREG-1727 methods are included herein as Attachment 3.]*

The issue of beneficial re-use of the slag was raised, and the various options were discussed (i.e., use as a slag fluidizer in steel manufacturing, dry cask construction, uranium reclaimation, artificial reefs). SMC is still pursuing the steel and the reef issues and maintains that any recycle/reuse option would be beneficial for all concerned if one would become available.

There were a number of side discussions on groundwater treatment issues (non-radiological) and the TRC Exit Strategy proposal.

The SSAB then discussed the topic of property subdivision as it pertains to the USNRC's guidance. David Smith reported that the USNRC, at this time, will not permit the property to be subdivided for future sale.

Lee Harp asked the SSAB to complete the input form that was provided as one of the hand-outs. The information on each submitted form will be captured in Rev. 1 of the decommissioning plan, along with SMC's responses to the issues raised by those submitting the completed forms. Particularly, each SSAB member's opinions in regard to the viability of the institutional controls being proposed by SMC for the restricted release decommissioning option, and their opinion on the adequacy of financial assurance available for the site once the Long Term Control (LTC) license is issued was solicited. (Visitors to the meeting were told that additional copies of the input form were available. Each was invited to complete one and submit it to SMC, who would provide a response in the decommissioning plan. Visitors were also encouraged to distribute the form to others that they thought might have an interest in the decommissioning planning for the Newfield site.)

Visitor Comments:

Lee Harp opened the meeting to members of the public who may have comments, questions or concerns. The first to speak was John Nessel, a Newfield resident. He was concerned about why he only earned by accident about the SSAB meeting. He also wanted a cancer cluster study to be done, and expressed concerns about the capped area being near a wetlands. He felt that the community needed an environmental attorney to represent their interests. He said that the site is valuable to Newfield and wants to see it used in the future. He was also concerned about others bringing in other waste to add to the capped piles in the future. Finally, he was concerned about property values in light of SMC's plans.

Jim Milton, a Newfield resident, also complained of the adequacy of SMC's public notice for this SSAB meeting. (David Smith told the audience that the meeting was noticed in the local newspapers - Gloucester County Daily Times and the Vineland Journal - and was given to the SSAB members which include the Borough of Newfield Council members, the Mayor of Newfield and members of the Vineland and Gloucester County Health Departments.) Mr. Milton also inquired as to whether badges would be needed for people visiting the site. (Carol Berger and David Smith explained that workers who frequented the Storage Yard and the operational areas where feed materials were stockpiled/used were monitored for radiation exposure for many, many years. None of the doses of record were even close to the level that required monitoring, thus individual monitoring was discontinued. However, passive monitoring of radiological conditions at the fence line is still on-going.) He was also concerned about acid rain on the slag pile

and whether radioactive materials were leaching. Finally, he raised the issue of the baghouse dust pile and the fact that materials were blowing around. (David Smith and Carol Berger spoke to the low levels of source material in the baghouse dust and its ability to set up like cement, thereby severely limiting the potential for dust migration.)

Jenny Goodman pointed out that according to USNRC decommissioning guidance, the SSAB should have an elected chairperson, a charter and operating procedures.

Jim Kinkade of the Sentinel Newspaper inquired as to the size of the slag piles and other plan-related issues.

Jim Milton inquired about the groundwater wells (e.g., their location, who samples them, etc.). He also asked about the types of materials processing going on right now, whether the site maintained insurance for these matters, and if the slag pile wasn't being shipped off-site because of the cost to SMC.

Carol Berger provided a quick review of radiation fundamentals in order to put the radiological issues associated with decommissioning into perspective.

Jenny Goodman felt that people would understand the issues better if a risk comparison (rather than a dose comparison) was presented. She asked that there be a risk handout for the next SSAB meeting. She then stated that she did not have enough information to complete the input form since they have not had an opportunity to review the decommissioning plan. (Dave Smith and Carol Berger stated that SSAB input to the plan at this stage of the game is required by the USNRC. However, SSAB members would be given a copy of Rev. 1 of the plan and would have an opportunity to comment then, as well as during the EIS process.) She then inquired as to why the focus of and provisions in the decommissioning plan were for only 1,000 years since the residual radioactivity in the slag will be here for a lot more than that period of time. (Carol Berger stated that this was a regulatory planning period only, and that in reality it is impossible to predict events even as far as 100 to 200 years in the future.)

An unidentified member of the audience asked whether the USNRC had been specifically invited to attend this meeting of the SSAB. David Smith responded that while SMC was keeping the USNRC informed of all SSAB matters, including meeting dates, the USNRC had not been specifically invited to attend the November 5th meeting.

There was a closing discussion involving visitors and various SSAB members in regard to property values, rateables, and what would happen if SMC left the area. Both David Smith and Joe Diegel stated that SMC had no intention of leaving the area.

Action Items and Responsible Individuals:
Distribute minutes (Carol Berger)

Complete and return Input Forms to David Smith (all members of the SSAB)

Schedule June/July meeting with SSAB to present and discuss USNRC deliverables and to solicit final input forms (David Smith)

ATTACHMENT I
Meeting Agenda

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation

SSAB and Public Meeting
November 5, 2004 - 9:30 a.m. to noon

Welcome	C. L. Harp
Review and approval of minutes from previous SSAB meeting	C. L. Harp
Background Information	D. R. Smith
Purpose of SSAB	C. L. Harp
Review of new/additional information since last SSAB meeting	C. L. Harp
Summary and review of Pending Activities	C. L. Harp/C. D. Berger
Complete the Listing of SSAB input, interests, and concerns	C. L. Harp
SSAB Open Discussion	C. L. Harp
Audience Questions	C. L. Harp
Adjourn	

ATTACHMENT 2
Sign-in Sheets

PARTICIPANT SIGN-IN SHEET

Shieldalloy Metallurgical Corporation SSAB: Third meeting at SMC's Newfield facility				
Date: November 5, 2004		Facilitator: Charles L. Harp, Esq.		
Your Name (Print)	Your Signature	Your Address	Your Telephone Number (with area code)	Your e-Mail Address
Lore Hamilton	[illegible]	[redacted], Newfield	[redacted]	[redacted]
Lee Fiano	[illegible]	[redacted]	[redacted]	[redacted]
LINDA GRAUMANN	[illegible]	[redacted]	[redacted]	[redacted]
Terry Goodman	Terry Goodman	[redacted], Ewing	[redacted]	[redacted]
Donna L Gaffigan	[illegible]	[redacted], Trenton	[redacted]	[redacted]
David Smith	[illegible]	[redacted], Newfield	[redacted]	[redacted]
CAROL BERLER	[illegible]	[redacted], Gloucester City NJ	[redacted]	[redacted]

PARTICIPANT SIGN-IN SHEET

Shieldalloy Metallurgical Corporation SSAB: Third meeting at SMC's Newfield facility

Date: November 5, 2004 | Facilitator: Charles L. Harp, Esq.

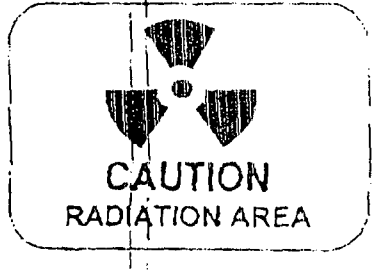
Your Name (Print)	Your Signature	Your Address	Your Telephone Number (with area code)	Your e-Mail Address
Patricia Gardner		[redacted]	[redacted]	
John Nossel		[redacted]	[redacted]	
JIM KINKADE		[redacted] FRANKLINVILLE NJ 08322		[redacted]

VISITOR INFORMATION

In consideration of the agreement by Shieldalloy Metallurgical Corporation to allow me to visit the Newfield Plant and view its premises, I agree that for a period of three (3) years from this date, I will hold any and all information learned form this visit in confidence and that I will not disclose the information to any person other than my employer's employees who have a need to know such information. I understand that I may be responsible for any damages or losses suffered by Shieldalloy Metallurgical Corporation if I violate this confidence. I have been shown an example of a radiation symbol and a radiological caution sign. I will not enter any Restricted Area or any area posted with a radiological warning or caution sign unless an escort has been provided to me. I will contact the Shieldalloy Radiation Safety Officer if I have any questions or concerns about radiological issues.

Date	Arrive	Leave	Signature	Print Name	Company	Contact Person	Hat/ Glasses
10-21-4	1055	1155	[illegible]	Robert U Todd	S.J. Gas Co	Scott Bauriedis	
10.22.04	0802	0835	[illegible]	Yuri Volpin	CRC, Inc	Brett G.	
10.22	10.00		[illegible]	J R Burma	ARC	"	
10/26	1500		[illegible]	D Rutkowski	TRC	D Smith	
10/26	1500	1700	[illegible]	L Bauer	TRC	D. Smith	
10/29	7:40		[illegible]	M.M. Mullen	PWL	Abdul	
10/29/04	8:00a		[illegible]	Carol Bergen	JEM	D Smith	
11/5/04	915		[illegible]	John Wessel	citizen	visiting	
11/5/04	9:20		[illegible]	Donald Gallagher	NJDEP	D Smith	

RADIATION SYMBOL AND RADIOLOGICAL CAUTION SIGNS



VISITOR INFORMATION

in consideration of the agreement by Shieldalloy Metallurgical Corporation to allow me to visit the Newfield Plant and view its premises, I agree that for a period of three (3) years from this date, I will hold any and all information learned form this visit in confidence and that I will not disclose the information to any person other than my employer's employees who have a need to know such information. I understand that I may be responsible for any damages or losses suffered by Shieldalloy Metallurgical Corporation if I violate this confidence. I have been shown an example of a radiation symbol and a radiological caution sign. I will not enter any Restricted Area or any area posted with a radiological warning or caution sign unless an escort has been provided to me. I will contact the Shieldalloy Radiation Safety Officer if I have any questions or concerns about radiological issues.

Date	Arrive	Leave	Signature	Print Name	Company	Contact Person	Hat/ Glasses
11/5/04	9:25		Jenny Gordon	Jenny Gordon	NJDEP		
11/5/04	9:25		Pat Gordon	Patricia Gordon	NJDEP	Dave Smith	
11/5/04	9:25		L. Grau	Linda Graumann	Council	"	

RADIATION SYMBOL AND RADIOLOGICAL CAUTION SIGNS

ATTACHMENT 3
ALARA-Related Correspondence

COPY

Date: August 20, 2003
From: David Smith - Shieldalloy Metallurgical Corporation, Inc.
To: Kenneth Kalman, Mark Thaggard - USNRC
Re: ALARA Analysis using NUREG 1727 methods

Appendix D to NUREG 1727 provides guidance in the performance of an ALARA analysis as part of the site decommissioning and license termination process. In evaluating the decommissioning options applicable to the Shieldalloy Metallurgical Corporation (SMC) site in Newfield, NJ, there are several important considerations that are not addressed in the NUREG. These are listed as follows:

1. The modeling of "no action" is not defined in NUREG-1727. (Recommendation: SMC proposes that the "no action" scenario be modeled by placing a hypothetical residence immediately next to the slag pile in its current configuration, and reducing the viable exposure pathways to direct exposure only.

2. The modeling of the site for an in-situ disposal option is not defined in NUREG-1727. (Recommendation: SMC proposes that the information and conclusions contained in NUREG-1543 "Environmental Impact Statement: Decommissioning of the SMC Cambridge, Ohio Facility" [1996] be used as the bases for in situ disposal at the Newfield site. This proposal is based on the strong similarity between the two sites as it regards the type of material (slag and baghouse dust) being evaluated. The conclusions found in NUREG-1543 are directly transferable to the conditions at the Newfield site for the purpose of ALARA analyses.)

3. The cost modifier that takes into account the additional cost and benefit considerations to be included in the ALARA calculations seems to be missing from the version of NUREG-1727 that is available on the USNRC's web page. Although this modifier is referenced in NUREG-1727, Appendix D, page D10, stating that it should be found in Section 1.7 of the appendix, there is no Section 1.7 in Appendix D.

4. Equations D2 and D8 do not account for either "no action" or in situ disposal. The factor "F," when set to zero drives the "Present Worth of Averted Dose" (equation D2) to zero, and causes the Residual Radioactivity Levels that are ALARA (equation D8) to be undefined. We will accept your recommendation on how to account for retaining materials on-site in order to complete the analysis.

5. If, as was mentioned in our teleconference of earlier today (August 20, 2003) the NUREG-1727 guidance on ALARA analyses was not intended for use at sites where the residual radioactive materials are not shipped elsewhere, are there other guidance

documents that you would suggest we incorporate into the SMC analysis?

In order to meet our August 29, 2003 deadline for submission of our ALARA analysis, we will need to have your response to the aforementioned questions no later than Friday, August 22, 2003. If that timeline is not possible, please let me know as soon as possible so that I can effect a similar delay in the due date for the final report. Thank you in advance for your prompt attention.

Sincerely,

David R. Smith

~~CONFIDENTIAL/PRIVILEGED ATTORNEY/CLIENT/CONSULTANT COMMUNICATION~~

COPY

DAVID R. SMITH
ENVIRONMENTAL MANAGER
Aluminum Products & Powders Division

August 22, 2003

Ronald R. Bellamy, Chief
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406-1415

Re: Preferred Approach to Decommissioning the Newfield Facility (License No. SMB-743, Control No. 132074)

Dear Mr. Bellamy:

On July 30, 2003, Shieldalloy Metallurgical Corporation (SMC) forwarded to you an Action Plan and commitment dates as part of a phased approach to resubmission of the SMC decommissioning plan. Item No. 6 of the Action Plan required SMC to "Present the results of the ALARA analysis to the USNRC to secure approval for the preferred decommissioning approach" on August 29, 2003.

Since the Action Plan was submitted, SMC and representatives of the USNRC have participated in a number of monthly conference calls to discuss various matters related to decommissioning. In our August 22, 2003 call, Mr. Ken Kalman, Mr. Robert Johnson, and SMC agreed to an alternative deliverable for Item No. 6 of the Action Plan. Instead, it was agreed that SMC present its preferred decommissioning approach, with justification, and with feedback from potentially affected parties on August 29th. The purpose of this letter is to provide you with that information.

In order to decommission the Newfield facility, SMC intends to move all licensed radioactive material present at the site to the Storage Yard, where it will be stabilized and capped as described in our August 28, 2003 decommissioning plan.[3] Following capping, institutional controls including access restrictions, maintenance, monitoring (visual inspections, radiation surveys, and groundwater and surface water sampling), and legal restrictions against future residence construction farming or business re-development on the restricted release area would then be implemented. At that time, SMC will amend License No. SMB-743 to permit "possession only" of the 57,240 cubic meters of slag, baghouse dust, and soil under the cap. From analysis performed to date using generous exposure scenarios, SMC is confident that this approach will ensure no member of the general population will incur a radiation dose in excess of 100 millirem TEDE per year for 1,000 years after the license is terminated.

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[3] Shieldalloy Metallurgical Corporation, "Decommissioning Plan for the Newfield Facility", Report No. 94005/G-28247 (Rev. 0), August 28, 2002.

The decision to pursue "restricted release" of the site was made after consideration of three decommissioning options. There were: (1) restricted release, (2) unrestricted release, wherein all residual radioactivity is excavated, shipped and disposed of at a low-level waste disposal facility in Clive, Utah, and (3) no action. An ALARA analysis of the same three options, performed for a site with equivalent residual radioactivity and with other site parameters that are similar to those at SMC's Newfield site, forms the basis for SMC's decision at Newfield. And while it is reasonable to rely upon a non-site-specific analysis for initial planning purposes, SMC will include a site-specific ALARA analysis of the three options in its revised decommissioning plan, currently being prepared for submission to the USNRC. The site-specific analysis will demonstrate that Option (1) for Newfield results in population doses that are as low as reasonably achievable (ALARA), and that further attempts to reduce the dose potential at the site would increase rather than reduce the overall risk associated with the decommissioning.

SMC has convened a Site Specific Advisory Board (SSAB) to provide input to the decommissioning process, and to provide feedback on the various decommissioning options available to SMC. In an August 15, 2003 meeting of the SSAB, there was agreement that maintaining a "possession only" license, with the USNRC serving as the government entity to ensure durability of institutional and physical controls, was preferable assigning that responsibility to a local or state agency, as described in the August 28, 2002 version of the decommissioning Plan. However, SSAB also asked that the viability of other decommissioning options (i.e., beneficial reuse of the slag or baghouse dust) continue to be evaluated. If any are deemed feasible, SMC agreed to repeat the ALARA analysis with the new option incorporated into the comparison.

In summary, SMC is committed to decommissioning the Newfield site under "restricted release" conditions, and to maintaining a "possession only" license as one means of ensuring the durability of institutional controls. This approach has been deemed ALARA at a site with similar radiological and physical characteristics as the Newfield site, thus it is likely to be ALARA for Newfield as well. Nonetheless, a site-specific ALARA analysis demonstrating that further reductions in dose are unwarranted will be included in the re-submission of our decommissioning plan. And if other decommissioning alternatives appear feasible, they will be included in the ALARA analysis along with Options (1), (2) and (3), described above.

Because the scope and extent of this deliverable differs from that which appears in our Action Plan, we are also taking this opportunity to submit a revised Action Plan (attached). This revision incorporates the outcome of our discussions with the USNRC during our monthly conference calls, and it supercedes the July 30th version in its entirety.

We will continue to keep you apprized of any other matters that might impact our decommissioning plans, and we will continue to participate in the on-going teleconferences and meetings with the staff. In the meantime, please do not hesitate to call me at (856) 692-4200, ex. 226 if I can answer any questions or provide you with additional information.

Sincerely,

David R. Smith
Radiation Safety Officer

cc: Eric Jackson
Joe Deigle

Charles L. Harp, Esq. - Archer & Greiner
Carol D. Berger, C.H.P. - IEM
Ken Kalman - USNRC (Hq)
Robert Johnson - USNRC (Hq)

PHASED APPROACH TO DP REVISION
Action Plan and Commitment Dates
November 15, 2004

Item No.	Action	Start Date	Due Date	Current Status
1	Select the preferred decommissioning approach	05/01/03	05/31/03	Complete
2	Meet with Newfield Mayor and City Council to provide preliminary information and solicit input on members of a Site-Specific Advisory Board (SSAB). (Members may include but are not limited to City Council members, immediate neighbors of SMC, and other borough/county/state/federal stakeholders.)	05/16/03	06/06/03	Complete
3	Designate date/time/location for first meeting between potential SSAB members and SMC technical and management personnel. The purpose of the meeting will be to present the preferred decommissioning approach, a listing of issues yet to be resolved, the role of the SSAB in the decommissioning planning process, how information will be communicated to SSAB members, and a suggested (planned and periodic) meeting schedule.	06/09/03	07/01/03	Complete
4	Forward invitations to potential SSAB members to attend first meeting with SMC personnel.	06/16/03	07/01/03	Complete
5	Meet with SSAB. Based on discussions, conclusions and agreements reached during the meeting, finalize the preferred decommissioning approach and prepare a community involvement program plan.	06/23/03	08/15/03	Complete
6	Prepare an ALARA analysis demonstrating the effectiveness, implementability and cost of the preferred decommissioning approach as compared to alternative approaches.	07/31/03	08/29/03	Complete
7	Provide the USNRC with the preferred decommissioning approach, its basis, and a summary of SSAB feedback to the USNRC.	07/31/03	08/29/03	Complete
8	Receive written USNRC concurrence with the preferred approach	TBD	TBD	Open
9	Complete input parameter selection and sensitivity analysis for dose modeling of the preferred decommissioning approach and forward same to the USNRC.	TBD	30 days after completion of Item 8	Open
10	Receive written USNRC concurrence with the parameter selection.	TBD	TBD	Open
11	Update previous environmental assessments, as necessary and submit preliminary draft to the USNRC for completeness review.	TBD	30 days after completion of Item 10	Open
12	Receive written USNRC statement of completeness of the environmental assessment.	TBD	TBD	Open

Item No.	Action	Start Date	Due Date	Current Status
13	Revise decommissioning plan and submit to USNRC as well as members of the SSAB.	TBD	60 days after completion of Item 12	Open
14	Respond to comments on the revised decommissioning plan.	TBD	TBD	Open
15	Implement approved decommissioning plan on the schedule shown therein.	TBD	TBD	Open

Item No.	Action	Start Date	Due Date	Current Status
13	Revise decommissioning plan and submit to USNRC as well as members of the SSAB.	TBD	60 days after completion of Item 12	Open
14	Respond to comments on the revised decommissioning plan.	TBD	TBD	Open
15	Implement approved decommissioning plan on the schedule shown therein.	TBD	TBD	Open

10 CFR 20.1404 Alternate Criteria For License Termination.

(a) The Commission may terminate a license using alternate criteria greater than the dose criterion of §§20.1402, 20.1403(b), and 20.1403(d)(1)(i)(A), if the licensee--

(a)(1) Provides assurance that public health and safety would continue to be protected, and that it is unlikely that the dose from all man-made sources combined, other than medical, would be more than the 1 mSv/y (100 mrem/y) limit of subpart D, by submitting an analysis of possible sources of exposure;

(a)(2) Has employed to the extent practical restrictions on site use according to the provisions of §20.1403 in minimizing exposures at the site; and

(a)(3) Reduces doses to ALARA levels, taking into consideration any detriments such as traffic accidents expected to potentially result from decontamination and waste disposal.

(a)(4) Has submitted a decommissioning plan or License Termination Plan (LTP) to the Commission indicating the licensee's intent to decommission in accordance with §§30.36(d), 40.42(d), 50.82(a) and (b), 70.38(d), or 72.54 of this chapter, and specifying that the licensee proposes to decommission by use of alternate criteria. The licensee shall document in the decommissioning plan or LTP how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and addressed, as appropriate, following analysis of that advice. In seeking such advice, the licensee shall provide for:

(a)(4)(i) Participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;

(a)(4)(ii) An opportunity for a comprehensive, collective discussion on the issues by the participants represented; and

(a)(4)(iii) A publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants on the issues.

(b) The use of alternate criteria to terminate a license requires the approval of the Commission after consideration of the NRC staff's recommendations that will address any comments provided by the Environmental Protection Agency and any public comments submitted pursuant to §20.1405.

[62 FR 39058, July 21, 1997]

10 CFR 20.1405 Public Notification And Public Participation.

Upon the receipt of an LTP or decommissioning plan from the licensee, or a proposal by the licensee for release of a site pursuant to §§20.1403 or 20.1404, or whenever the Commission deems such notice to be in the public interest, the Commission shall:

(a) Notify and solicit comments from:

(a)(1) local and State governments in the vicinity of the site and any Indian Nation or other indigenous people that have treaty or statutory rights that could be affected by the decommissioning; and

(a)(2) the Environmental Protection Agency for cases where the licensee proposes to release a site pursuant to §20.1404.

(b) Publish a notice in the Federal Register and in a forum, such as local newspapers, letters to State or local organizations, or other appropriate forum, that is readily accessible to individuals in the vicinity of the site, and solicit comments from affected parties.

[62 FR 39058, July 21, 1997]

PUBLIC INVOLVEMENT REQUIREMENTS ON ENVIRONMENTAL ISSUES

As part of the restricted-use decommissioning process, the USNRC is required to prepare an Environmental Impact Statement (EIS), as specified in the National Environmental Policy Act (NEPA). Shieldalloy's proposed decommissioning plan would become the "preferred alternative" in the EIS, and the NEPA process provides an opportunity for the public to comment on a much broader range of issues than human health and safety alone, such as how the plan would affect wildlife, impacts on air/water/land resources, and historical assets in the community.

The Council on Environmental Quality (CEQ) oversees the implementation of NEPA requirements in each federal agency, including the USNRC. Public involvement is a major component of the CEQ's regulations under NEPA (found in 40 CFR Parts 15–=1508). In fact, the USNRC is required, to the fullest extent possible, to encourage and facilitate public involvement in agency decisions that affect the quality of the human environment [40 CFR 1500.2(d)]. They must also make diligent efforts to involve the public in preparing and implementing their NEPA procedures [40 CFR 1506(a)]. Here are the required public involvement activities that relate to the preparation of an EIS:

- Writing the draft EIS with the public in mind
- Circulating the draft EIS
- Providing public notice of availability
- Soliciting public comments
- Holding at least ne public hearing
- Considering and responding to public comments on the draft EIS
- Filing the final EIS with the U. S. Environmental Protection Agency and making it available to the public
- Publishing and disseminating the Record of Decision
- Making available to the public copies of any Mitigation Action Plan that is prepared and any relevant monitoring results.

timeline is not possible, please let me know as soon as possible so that I can effect a similar delay in the due date for the final report. Thank you in advance for your prompt attention.

Sincerely,

David R. Smith

DAVID R. SMITH
ENVIRONMENTAL MANAGER
Aluminum Products & Powders Division

August 22, 2003

Ronald R. Bellamy, Chief
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406-1415

Re: Preferred Approach to Decommissioning the Newfield Facility (License No. SMB-743, Control No. 132074)

Dear Mr. Bellamy:

On July 30, 2003, Shieldalloy Metallurgical Corporation (SMC) forwarded to you an Action Plan and commitment dates as part of a phased approach to resubmission of the SMC decommissioning plan. Item No. 6 of the Action Plan required SMC to "Present the results of the ALARA analysis to the USNRC to secure approval for the preferred decommissioning approach" on August 29, 2003.

Since the Action Plan was submitted, SMC and representatives of the USNRC have participated in a number of monthly conference calls to discuss various matters related to decommissioning. In our August 22, 2003 call, Mr. Ken Kalman, Mr. Robert Johnson, and SMC agreed to an alternative deliverable for Item No. 6 of the Action Plan. Instead, it was agreed that SMC present its preferred decommissioning approach, with justification, and with feedback from potentially affected parties on August 29th. The purpose of this letter is to provide you with that information.

In order to decommission the Newfield facility, SMC intends to move all licensed radioactive material present at the site to the Storage Yard, where it will be stabilized and capped as described in our August 28, 2003 decommissioning plan.[3] Following capping, institutional controls including access restrictions, maintenance, monitoring (visual inspections, radiation surveys, and groundwater and surface water sampling), and legal restrictions against future residence construction farming or business re-development on the restricted release area would then be implemented. At that time, SMC will amend License No. SMB-743 to permit "possession only" of the 57,240 cubic meters of slag, baghouse dust, and soil under the cap. From analysis performed to date using generous exposure scenarios, SMC is confident that this approach will ensure no member of the general population will incur a radiation dose in excess of 100 millirem TEDE per year for 1,000 years after the license is terminated.

The decision to pursue "restricted release" of the site was made after consideration of three decommissioning options. There were: (1) restricted release, (2) unrestricted release, wherein all residual

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[3] Shieldalloy Metallurgical Corporation, "Decommissioning Plan for the Newfield Facility", Report No. 94005/G-28247 (Rev. 0), August 28, 2002.

radioactivity is excavated, shipped and disposed of at a low-level waste disposal facility in Clive, Utah, and (3) no action. An ALARA analysis of the same three options, performed for a site with equivalent residual radioactivity and with other site parameters that are similar to those at SMC's Newfield site, forms the basis for SMC's decision at Newfield. And while it is reasonable to rely upon a non-site-specific analysis for initial planning purposes, SMC will include a site-specific ALARA analysis of the three options in its revised decommissioning plan, currently being prepared for submission to the USNRC. The site-specific analysis will demonstrate that Option (1) for Newfield results in population doses that are as low as reasonably achievable (ALARA), and that further attempts to reduce the dose potential at the site would increase rather than reduce the overall risk associated with the decommissioning.

SMC has convened a Site Specific Advisory Board (SSAB) to provide input to the decommissioning process, and to provide feedback on the various decommissioning options available to SMC. In an August 15, 2003 meeting of the SSAB, there was agreement that maintaining a "possession only" license, with the USNRC serving as the government entity to ensure durability of institutional and physical controls, was preferable assigning that responsibility to a local or state agency, as described in the August 28, 2002 version of the decommissioning Plan. However, SSAB also asked that the viability of other decommissioning options (i.e., beneficial reuse of the slag or baghouse dust) continue to be evaluated. If any are deemed feasible, SMC agreed to repeat the ALARA analysis with the new option incorporated into the comparison.

In summary, SMC is committed to decommissioning the Newfield site under "restricted release" conditions, and to maintaining a "possession only" license as one means of ensuring the durability of institutional controls. This approach has been deemed ALARA at a site with similar radiological and physical characteristics as the Newfield site, thus it is likely to be ALARA for Newfield as well. Nonetheless, a site-specific ALARA analysis demonstrating that further reductions in dose are unwarranted will be included in the re-submission of our decommissioning plan. And if other decommissioning alternatives appear feasible, they will be included in the ALARA analysis along with Options (1), (2) and (3), described above.

Because the scope and extent of this deliverable differs from that which appears in our Action Plan, we are also taking this opportunity to submit a revised Action Plan (attached). This revision incorporates the outcome of our discussions with the USNRC during our monthly conference calls, and it supercedes the July 30th version in its entirety.

We will continue to keep you apprized of any other matters that might impact our decommissioning plans, and we will continue to participate in the on-going teleconferences and meetings with the staff. In the meantime, please do not hesitate to call me at (856) 692-4200, ex. 226 if I can answer any questions or provide you with additional information.

Sincerely,

David R. Smith
Radiation Safety Officer

cc: Eric Jackson
Joe Deigle
Charles L. Harp, Esq. - Archer & Greiner
Carol D. Berger, C.H.P. - IEM
Ken Kalman - USNRC (Hq)
Robert Johnson - USNRC (Hq)

PHASED APPROACH TO DP REVISION
Action Plan and Commitment Dates
March 5, 2005

Item No.	Action	Start Date	Due Date	Current Status
1	Select the preferred decommissioning approach	05/01/03	05/31/03	Complete
2	Meet with Newfield Mayor and City Council to provide preliminary information and solicit input on members of a Site-Specific Advisory Board (SSAB). (Members may include but are not limited to City Council members, immediate neighbors of SMC, and other borough/county/state/federal stakeholders.)	05/16/03	06/06/03	Complete
3	Designate date/time/location for first meeting between potential SSAB members and SMC technical and management personnel. The purpose of the meeting will be to present the preferred decommissioning approach, a listing of issues yet to be resolved, the role of the SSAB in the decommissioning planning process, how information will be communicated to SSAB members, and a suggested (planned and periodic) meeting schedule.	06/09/03	07/01/03	Complete
4	Forward invitations to potential SSAB members to attend first meeting with SMC personnel.	06/16/03	07/01/03	Complete
5	Meet with SSAB. Based on discussions, conclusions and agreements reached during the meeting, finalize the preferred decommissioning approach and prepare a community involvement program plan.	06/23/03	08/15/03	Complete
6	Prepare an ALARA analysis demonstrating the effectiveness, implementability and cost of the preferred decommissioning approach as compared to alternative approaches.	07/31/03	08/29/03	Complete
7	Provide the USNRC with the preferred decommissioning approach, its basis, and a summary of SSAB feedback to the USNRC.	07/31/03	08/29/03	Complete
8	Receive written USNRC concurrence with the preferred approach	TBD	TBD	Open
9	Complete input parameter selection and sensitivity analysis for dose modeling of the preferred decommissioning approach and forward same to the USNRC.	TBD	30 days after completion of Item 8	Open
10	Receive written USNRC concurrence with the parameter selection.	TBD	TBD	Open
11	Update previous environmental assessments, as necessary and submit preliminary draft to the USNRC for completeness review.	TBD	30 days after completion of Item 10	Open
12	Receive written USNRC statement of completeness of the environmental assessment.	TBD	TBD	Open

Item No.	Action	Start Date	Due Date	Current Status
13	Revise decommissioning plan and submit to USNRC as well as members of the SSAD.	TBD	60 days after completion of Item 12	Open
14	Respond to comments on the revised decommissioning plan.	TBD	TBD	Open
15	Implement approved decommissioning plan on the schedule shown therein.	TBD	TBD	Open

SHIELDALLOY METALLURGICAL CORPORATION
ALUMINUM PRODUCTS & POWDERS DIVISION
P.O. BOX 768 - 12 WEST BLVD
NEWFIELD, NJ 08344 U.S.A.
856-692-4201 — 1-800-SMC-2020
FAX 856-697-9025

FACSIMILE TRANSMITTAL SHEET

TO: Carol Burger
FROM: Dave Smith
COMPANY: IEM- Inc.
DATE: 2/10/05
LOCATION: Gaithersburg MD
NO. OF PAGES: 4
FAX NUMBER: (240) 631-8991
CC: JTD
SUBJECT: NRC's ltr to Jill Lipoti

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

FYI

THE INFORMATION CONTAINED IN THIS FACSIMILE MESSAGE MAY BE PRIVILEGED AND/OR CONFIDENTIAL INFORMATION AND IS INTENDED ONLY FOR THE USE OF THE INDIVIDUAL OR RECIPIENT NAMED ABOVE. IF THE READER OF THIS MESSAGE IS NOT THE INTENDED RECIPIENT, OR THE AGENT OR EMPLOYER RESPONSIBLE TO DELIVER THIS TO THE INTENDED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION, DISCLOSURE, DISTRIBUTION OR COPYING OF THIS MESSAGE EXCEPT BY OR AT THE DIRECTION OF THE INTENDED RECIPIENT IS STRICTLY PROHIBITED. IF YOU HAVE RECEIVED THIS COMMUNICATION IN ERROR, PLEASE IMMEDIATELY NOTIFY US BY TELEPHONE AND RETURN THE ORIGINAL MESSAGE TO US AT THE ABOVE ADDRESS BY MAIL. WE WILL REIMBURSE YOU FOR THE POSTAGE. THANK YOU.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 28, 2005

Mr. Jill Lipoti, Ph.D., Assistant Director
Radiation Protection and Release Prevention Programs
New Jersey Department of Environmental Protection
P. O. Box 415
Trenton, NJ 08625-0415

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION (NRC) STAFF RESPONSE TO NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION LETTER DATED DECEMBER 6, 2004, REGARDING THE SHIELDALLOY METALLURGICAL (SMC) SITE IN NEWFIELD, NEW JERSEY

Dear Dr. Lipoti:

I am responding to your December 6, 2004, letter to Samuel J. Collins, Regional Administrator of the U.S. Nuclear Regulatory Commission (NRC) Region I office regarding the Shieldalloy Metallurgical Corporation (SMC) site in Newfield, New Jersey. Please note that this response has been transferred here to the Division of Waste Management and Environmental Protection (DWMEP) in NRC Headquarters, because NRC's decommissioning program is managed in the DWMEP Decommissioning Directorate and includes project oversight of the SMC site.

Your letter expressed concerns with how SMC is implementing the requirement of 10 CFR 20.1403 to seek advice from affected parties regarding the use of institutional controls to restrict site use. You noted that SMC's use of the Site Specific Advisory Board (SSAB) was not consistent with NRC guidance and was not effective. The use of an SSAB is one acceptable method described in our guidance that a licensee can use to obtain advice. Although we have provided guidance to licensees on seeking advice from affected parties, the licensee is afforded flexibility for implementing the guidance as long as it meets the requirements of 10 CFR 20.1403. SMC, therefore, is responsible for the effectiveness of seeking advice from affected parties and documenting the results in the Decommissioning Plan (DP) for NRC's review.

We envision the licensee's involvement with its affected parties as an iterative process of informing and seeking advice, starting early at a general level and then becoming more detailed as specific plans and analyses are developed. We expect SMC to provide information about potential approaches commensurate with its early stage in planning, so that the affected parties can provide advice at a general level. For example, qualitative discussions of potential site access and use restrictions and how they could eliminate exposure pathways for specific radionuclides would provide useful risk insights for affected parties to understand and discuss before dose assessments are completed. Preliminary results of dose assessments, also could be discussed. This process for obtaining advice can continue as more detailed plans and analyses are developed by SMC for inclusion in submittal of its DP. Then, affected parties can provide more detailed comments to SMC, and when the DP becomes available, to NRC.

Your letter also noted specific concerns with NRC's implementation of the regulations, the scenarios that are being addressed, and the use of institutional controls. Although NRC has already responded to similar concerns raised in the letter from New Jersey officials about the license termination rule restricted use option and the long term control license, we would like to meet with you in New Jersey to discuss your additional specific concerns.

Please contact Mr. Ken Kalman, the NRC Project Manager for the SMC site if you wish to arrange a meeting date, or if you have any further questions on this matter. He can be reached by telephone at 301-415-6664 or by email at klk@nrc.gov.

Sincerely,

Daniel M. Gillen, Deputy Director
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

cc: Shieldalloy Service List

Shieldalloy Metallurgical Corporation Service List

cc:

David Smith
Environmental Manager
Shieldalloy Metallurgical Corporation
Aluminum Products & Powders Division
14 West Boulevard
P.O. Box 768
Newfield, NJ 08344-0768

Eric Jackson, President
Shieldalloy Metallurgical Corporation
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Jill Lipoti, Ph.D., Assistant Director
Radiation Protection and Release
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P. O. Box 415
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Donna Gaffigan, Case Manager
New Jersey Department of
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Bureau of Case Management
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Trenton, NJ 08625-0028

Trevor Anderson
Emergency and Remedial Response
Division
New Jersey Remediation Branch
280 Broadway 19th Floor
New York, NY 10007-1866

State of New Jersey

Department of Environmental Protection

Acting Governor

Bradley M. Campbell
Commissioner

November 29, 2004

David R. Smith
Director of Environmental Services
Shieldalloy Metallurgical Corporation
P.O. Box 768
Newfield, NJ 08344

Re: Site Specific Advisory Board
Minutes of the November 5, 2004 Meeting
Shieldalloy Metallurgical Corporation
Newfield Borough, Gloucester County

Dear Mr. Smith:

The New Jersey Department of Environmental Protection (NJDEP) is in receipt of the minutes of the November 5, 2004 Site-Specific Advisory Board (SSAB) meeting dated November 15, 2004. Upon review, NJDEP has the following comments. Many of these comments are also reflected in NJDEP's responses on the Input Form which was submitted to SMC under separate cover.

1. Discussion, page 1, paragraph 2

   The minutes shall reflect that the $5 million dollars in financial assurance cited by SMC for the Long Term Control License is actually composed of two separate parts which were established in accordance with paragraph 16 of the March 26, 1997 Bankruptcy Settlement Agreement, not in accordance with 10 CFR 20.1403(c) for license termination under restricted conditions. The two parts include:

   - A $750,000 trust account for the benefit of the United Stated Nuclear Regulatory Commission (USNRC)
   - A $4.25 million dollar irrevocable standby letter of credit for the benefit of NJDEP and the United Stated Environmental Protection Agency (USEPA)

   This information should have been provided to the SSAB to assist in answering the question on the Input Form regarding SMC's ability to provide sufficient financial assurance to enable an independent third party to assume responsibility for control and maintenance of the site.

2. Discussion, page 1, paragraph 3

   The minutes shall state why the "follow-up telephone calls with USNRC" were not announced and accessible to the public.

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also reflect SMC's response, that USNRC was not specifically invited to the meeting. Please note that the meeting minutes for the September 20, 2003 SSAB meeting indicated such an invitation would be made.

9. Page 3, Action Items

There is no mention in the minutes if another SSAB will be scheduled. The minutes must specifically state whether additional SSAB meetings are to be scheduled or if the November 5, 2004 meeting (and the completed Input Forms) represents the end of the public input for this phase of the decommissioning process. See also Comment No. 3, above.

If you have any questions regarding this letter please contact me at (609) 633-1494.

Sincerely,

Donna L. Gaffigan

Donna L. Gaffigan, Case Manager
Bureau of Case Management

C: SSAB members (attached list)
Senator Fred H. Madden
Patricia Gardner, NJDEP/BER
Trevor Anderson, USEPA
Councilman James Milton
Newfield Borough Clerk Toni Van Camp
Kenneth Kalman, USNRC

State of New Jersey

Department of Environmental Protection

[illegible]rd J. Codey
Acting Governor

Bradley M. Campbell
Commissioner

November 29, 2004

David R. Smith
Director of Environmental Services
Shieldalloy Metallurgical Corporation
P.O. Box 768
Newfield, NJ 08344

Re: Site Specific Advisory Board
Input Form
Shieldalloy Metallurgical Corporation
Newfield Borough, Gloucester County

Dear Mr. Smith:

Enclosed please find the Site Specific Advisory Board Input Form for the Shieldalloy Metallurgical Corporation (SMC) Site completed by the New Jersey Department of Environmental Protection (NJDEP). The Input Form was distributed at the November 5, 2004 Site Specific Advisory Board. SMC requested that the forms be completed at submitted by November 30, 2004. As you will see by NJDEP's responses, we do not believe that SMC's proposed financial assurance nor institutional controls are sufficient for the proposed Long Term Control License.

If you have any questions regarding this letter please contact me at (609) 633-1494.

Sincerely,

Donna L. Gaffigan

Donna L. Gaffigan, Case Manager
Bureau of Case Management

Enclosure

C: SSAB members (attached list)
Senator Fred H. Madden
Patricia Gardner, NJDEP/BER
Trevor Anderson, USEPA
Councilman James Milton
Newfield Borough Clerk Toni Van Camp
Kenneth Kalman, USNRC

SSAB Members:

Mayor Richard Westergaard
Councilwoman Linda Grauman
Ms. Loretta Williams
Ms. Janet Magliocco
Mr. Thomas Daily
Mr. George R. Sartorio, City of Vineland Health Department
Mr. James Woods, Gloucester County Department of Health
Mr. Charles L. Harp, Jr., Esq., Archer & Greiner
Carol D. Berger, Integrated Environmental Management, Inc.

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation
Input Form

This form has been designed to facilitate your input to the Shieldalloy Metallurgical Corporation (SMC) decommissioning process. Kindly complete the form to the best of your ability and return it to SMC at the following address:

David R. Smith
Shieldalloy Metallurgical Corporation
35 West Boulevard, PO Box 768
Newfield, NJ 08344

The forms must be received by November 30, 2004 in order for your input to be captured in the site-wide decommissioning plan. We will attempt to but cannot guarantee inclusion of later submittals.

In completing the form, the following definitions may be of use to you:

Financial Assurance - A means of demonstrating that SMC possesses the necessary funds to cover the estimated costs of conducting all licensed activities at the site once the decommissioning plan has been implemented.

Institutional Control - A program to physically control access to the SMC site after implementation of the decommissioning plan. The institutional control program for the site includes the maintenance of a "Long Term Control" license, an environmental monitoring and maintenance program, periodic surveillance, and other requirements to be specified in the decommissioning plan. It also includes funds sufficient to cover the costs for these activities.

Total Effective Dose Equivalent (TEDE) - The sum of the radiation dose from external exposure (i.e., from sources outside of the body) and from internal exposure (i.e., from sources taken into the body by inhalation, ingestion, etc.).

Your input is important to us and we appreciate your time in completing this form and returning it to us. We will be taking your input into account in the preparation of our decommissioning plan. We encourage you to review the plan once it is prepared and provide us with any comments you might have at that time. Other opportunities to provide feedback to SMC throughout the decommissioning process will be described in the plan.

Input Form

ar Name (optional):	Who do you represent: (e.g., yourself, a neighborhood, community organization, etc.)
Donna L. Gaffigan Nancy Stanley Jenny Goodman	New Jersey Department of Environmental Prot

e following sections pertain to SMC's plan to maintain a long-term control license as a means of ensuring long-term institutional ntrol over the decommissioned Newfield site.

Do the institutional controls proposed by SMC provide reasonable assurance that average member of the public will not incur a radiation se in excess of 25 millirem TEDE? ☐ Yes ☐ No ☒ Don't know

mments:

See Attachment

Do you believe the institutional controls will be enforceable? ☐ Yes ☒ No ☐ Don't know

mments:

See Attachment

Do you believe the institutional controls will not impose undue burdens on the local community or other affected parties?
Yes ☒ No ☐ Don't know

mments:

See Attachment

Do you believe SMC can provide sufficient financial assurance to enable an independent third party to assume responsibility for control maintenance of the site? ☐ Yes ☒ No ☐ Don't know

mments:

See Attachment

commissioning option for the following po[illegible]tion groups: (1) on-site workers that do not h[illegible] access to the capped area; (2) on-site workers that perform routine maintenance and inspection of the capped area; (3) trespassers; and (4) the nearest off-site resident. Are there other population groups that you think should be included in the dose assessment process?

☐ Yes ☐ No ☐ Don't know

[illegible] groups:

See Attachment

you have additional concerns, please describe them below, adding additional sheets as necessary.

scribe the issue:

See Attachment

w do you believe that issue should be addressed?

See Attachment

y is this issue a concern to you?

See Attachment

at additional information do you need in order to resolve this issue or understand it better?

See Attachment

ditional sheets attached: ☒ Yes ☐ No

awaiting process:

See Attachment

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation
Input Form

NJDEP's responses:

1. Do the institutional controls proposed by Shieldalloy Metallurgical Corporation (SMC) provide reasonable assurance that an average member of the public will not incur a radiation dose in excess of 25 millirem Total Effective Dose Equivalent (TEDE)?

The New Jersey Department of Environmental Protection (NJDEP) does not have sufficient information on which to base a response. The characterization of the slag and baghouse dust pile was not provided to the Site Specific Advisory Board (SSAB), nor was the engineering design of the cap.

2. Do you believe the institutional controls will be enforceable?

No. There has been no demonstration that the institutional controls proposed will be enforceable for the time period necessary, basically in perpetuity. The United States Nuclear Regulatory Commission's (USNRC) own regulations under 10 CFR Part 61.59 state that institutional controls may not be relied on for more than 100 years.

3. Do you believe the institutional controls will not impose undue burdens on the local community or other affected parties?

No. The institutional controls may well prevent the development of the rest of the SMC site, as well as surrounding properties. The NJDEP believes this presents an undue burden on the local and neighboring communities.

4. Do you believe SMC can provide sufficient financial assurance to enable an independent third party to assume responsibility for control and maintenance of the site?

No. SMC appears to be downsizing this operation. There is no value to the property with the slag pile present, only liability, possibly in the hundreds of millions of dollars. It appears that SMC is seeking the Long Term Control (LTC) option only to continue operating the facility for as long as SMC can profit from it. If SMC can not profit from this operation, abandonment of all radioactively contaminated materials appears likely.

Also, SMC states that it currently has posted $5 million dollars in financial assurance for addressing the USNRC regulated materials on the site. This amount was not posted in accordance with 10 CFR 20.1403(c) for license termination under restricted conditions, but rather in accordance with paragraph 16 of the March 26, 1997 Bankruptcy Settlement Agreement. This amount was posted as a "Predetermined Cost" in bankruptcy negotiations based on licensing issues relevant at that time and was not based on SMC's

and USNRC's current proposal for a LTC license. It is impossible for NJDEP to know if this amount will be sufficient for the current proposal since very few details have been made available to the SSAB.

5. In its decommissioning plan, SMC must present an assessment of the radiation dose potential associated with its planned decommissioning option for the following population groups: (1) on-site workers that do not have access to the capped area; (2) on-site workers that perform routine maintenance and inspection of the capped area; (3) trespassers; and (4) the nearest off-site resident. Are there other population groups that you think should be included in the dose assessment process?

Yes. According to the October 7, 2004 letter to Kenneth Kalman of the USNRC from SMC, the trespasser scenario means recreational, casual visitors, or hunters. While NJDEP agrees that the resident farmer scenario is not realistic because a house cannot be placed directly on top of the slag pile, we believe that a more conservative realistic scenario should be assessed, namely a future resident who uses crushed slag as fill under a house. We believe this is certainly realistic, given the fact that it was done by SMC at this site, even having full knowledge of the radioactive content of the material. NJDEP also believes that the nearest resident scenario should assume that the house is built next to the slag pile and that the engineering controls degrade and completely fail over time (see Comment No. 6 under Additional Concerns, below).

Additional Concerns:

1. NJDEP is on record with the USNRC opposing the issuance of the first Long Term Control license in the country based on both administrative and technical concerns. Please refer to the attached letter dated June 25, 2004 from NJDEP Commissioner Bradley M. Campbell, to USNRC Chairman Nils J. Diaz for details. The information that has been provided to the SSAB to date has not changed NJDEP's position regarding issuance of a Long Term Control license to SMC.

2. The statement made by SMC at the November 5, 2004 Site Specific Advisory Board meeting that one of the reasons SMC does not consider disposal of the slag pile a viable option is because of liability issues, such as the possibility that the material would have to be sent back to Newfield from Envirocare of Utah. Subsequent to the meeting, NJDEP spoke with Envirocare of Utah, who explained that this requirement is just an extension of the USNRC "cradle-to-grave" policy. Every generator of radioactive waste is responsible for the waste that it generates forever. This is a standard part of the contract that every Envirocare client must sign before they will accept the waste. NJDEP has dealt with numerous cleanups across the State with responsible parties ranging from private companies to the United States government. This issue has never been brought up as a reason to abandon disposal as an option.

3. The SSAB does not seem to be functioning as the regulatory framework suggests. Namely, NUREG 1757, Volume 1, Chapter 17 states that the SSAB should elect a

chairperson and adopt a charter and operating procedure. This was not done. The minutes of previous meetings reflect that SMC or its representatives have driven the discussion. Basic radiation protection principles were discussed at two SSAB meetings (which were necessary), but little discussion on specifics of the dose assessments or financial assurance was presented. According to NUREG 1757 the licensee is supposed to provide the SSAB with licensee studies and analyses that are pertinent to the decommissioning. The SSAB does not have the dose assessment or the 1996 Draft Environmental Impact Statement for the SMC site in Cambridge, OH that is supposed to contain the ALARA analysis that the USNRC is allowing to be used at this site. The SSAB should also have been provided with the thermoluminescent dosimeter (TLD) data from the fenceline near the slag pile. This would at least provide a point of reference when discussing regulatory dose limits. The SSAB has no documentation on financial assurance, only the total amount that SMC says is available. The work of the SSAB cannot be considered complete until these documents are distributed and a discussion is held among the members.

4. The cover page to this Input Form states that the form must be completed by November 30 in order for the SSAB input to be captured in the site-wide decommissioning plan. It then states that these concerns will be addressed in the Decommissioning Plan. Is this the final input on the question of institutional controls and financial assurance? If it is going to be included in the decommissioning plan then we assume this is the input that the USNRC is going to evaluate against their regulations. NJDEP believes that the SSAB should work to provide a consensus opinion to SMC. It is difficult for this to happen based on the way the SSAB meetings are currently being conducted.

5. When discussing institutional controls at the SSAB, SMC states that the controls will need to be relied on for 1000 years. This seems inappropriate given the half-life of the material that will be remaining at the site and the exposure rates when the engineering controls fail.

6. A copy of SMC's October 7, 2004 letter to Kenneth Kalman of the USNRC was provided to SSAB members at the November 5, 2004 meeting. NJDEP has concerns regarding item number 3 under Dose Modeling. The USNRC is allowing SMC to assume that engineering controls may or may not fail once institutional controls fail, or their effectiveness may degrade over time. Since we know this material will be present in perpetuity, NJDEP believes it is safe to assume that eventually there will be neither institutional nor engineering controls present. We understand that sometimes a degradation of engineering controls may be considered more conservative because erosion usually occurs irregularly, which may focus the flow and allow contamination to be channeled and concentrated at a particular location, referred to as the "bathtub effect." According to SMC, the type of material present at this site is not readily soluble, so this type of degradation of engineering controls would not be considered conservative in our view. NJDEP believes that all scenarios should be assessed based on the failure of <u>both</u> institutional and engineering controls.

State of New Jersey

James E. McGreevey
Governor

Department of Environmental Protection
PO Box 402
Trenton, NJ 08625-0402

Bradley M. Campb
Commissioner
Tel. # (609) 292-2885
Fax # (609) 292-7695

June 25, 2004

Honorable Nils J. Diaz
Chairman, Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Chairman Diaz:

I am writing to express my deep concern regarding the US Nuclear Regulatory Commission's (NRC) intent to pursue a Long Term Control (LTC), possession only, license for Shieldalloy Metallurgical Corporation (SMC).

The April 15, 2004 "NRC Interim Guidance for a Long-Term Control Possession Only License at the Shieldalloy Newfield Site" states that "The staff expects that lessons learned from this project will be useful for eventually preparing draft regulatory guidance for public comment..." In effect, the NRC is proposing to use New Jersey as a testing ground for an untried and possibly ill-conceived NRC policy.

That experiment would essentially create a low-level radioactive waste disposal facility in New Jersey. Just a short time ago, New Jersey worked very hard to interest a community within the state in becoming a volunteer host for a low-level radioactive waste site. Even large monetary incentives were not enough to persuade any community to host such a site. I do not believe that our residents will be any more willing to accept a low-level radioactive waste site in the guise of an LTC site arriving through the back door.

The NRC has announced a "public meeting" on the proposed LTC on June 29 in Rockville, Maryland. On behalf of the public who will be interested and affected by your decisions in this matter, I ask that the location be changed to Newfield or some nearby location to allow them to participate in the meeting. Participation by telephone conference is not a true substitute for enabling residents to be present when a regulatory agency and its licensee are discussing leaving a large pile of radioactive material in a residential neighborhood for an unspecified time period.

The SMC site is home to some 28,000 cubic meters cubic yards of radioactively contaminated ferrocolumbian slag and 20,000 cubic meters of baghouse dust. Smaller piles of soils and debris bring the total volume of radioactively contaminated materials to 57,000 cubic meters. This large an amount of material should be disposed of in an environmentally responsible manner, not left for an indeterminate time, possibly even for future generations.

The volume and physical characteristics of the material raise concerns regarding the stabilization of the material when it is consolidated. An environmentally robust monitoring program will be

needed to ensure that chemical and radiological contaminants do not migrate off site. The very general discussion of monitoring requirements contained in the interim guidance do not engender a feeling of confidence that the public health and the environment will be properly protected.

The NRC is also proposing to allow much greater exposure to radiation if all controls at the site fail than would be allowed under New Jersey's rules. The NRC would permit an "all controls fail" annual effective dose equivalent of 500 millirem per year while New Jersey's is 100 millirem per year. I strongly believe that the State's more stringent standard is necessary to protect public health and the environment.

There are human and social factors to be considered when delaying the decommissioning of radiologically contaminated sites. Safety practices may decline as a result of the attrition of key personnel. Management interest in an LTC site will be less than if the site were in operating or in active decommissioning. Bankruptcy, corporate takeover or other unforeseen business changes could negatively impact safety at an LTC site. We do not see these concerns as adequately addressed in the guidance document.

I look forward to your actions to address our concerns.

Sincerely,

Bradley M. Campbell
Commissioner

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation

Minutes of the September 21, 2005 Meeting

SSAB Members in Attendance:

David R. Smith - SMC representative
C. Lee Harp, Esq. - Archer & Greiner (facilitator)
Carol D. Berger, C.H.P. - Integrated Environmental Management, Inc. (radiological consultant to SMC)
Loretta Williams - Newfield resident, public school employee and planning board member
Donna L. Gaffigan - NJDEP Bureau of Federal Case Management representative
Jenny Goodman - NJDEP Bureau of Environmental Radiation representative
Linda Graumann - Newfield resident and Newfield Councilwoman
(see Attachment 1 for the sign-in sheet)

Visitors and Others in Attendance:

Jean Oliva - TRC Environmental Corporation (environmental consultant to SMC)
Joseph Diegel - Vice President & General Manager, Shieldalloy Metallurgical Corporation
Dan Gillen - USNRC HQ
Marie Miller - USNRC Region I
Marjorie McLaughlin - USNRC Region I
Others as shown in Attachment 1

Discussion:

Attachment 2 contains a copy of the agenda handed out at the meeting. Attachment 3 contains the meeting transcript.

Action Items and Responsible Individuals:

Prepare and distribute minutes of the September 21, 2005 SSAB meeting (David Smith and Carol Berger)
Launch the SMC Decommissioning Web Site (David Smith)

Post the preliminary cost estimates for the LTC and the LT options on the web site (Jean Oliva)

Post the SSAB Input Form on the web site (Carol Berger)

Place SSAB Meeting Sign-In Sheet and the SSAB Input Forms into the repository (David Smith)

Complete and return SSAB Input Forms to David Smith (all members of the SSAB)

Notify the SSAB when Rev. 1 of the Decommissioning Plan is available on the web site and in the repository (David Smith)

Additional Meetings:

It was the consensus of the SSAB that another meeting was not necessary before Rev. 1 of the Decommissioning Plan is submitted to USNRC. Another meeting will be scheduled once the Plan has been released and reviewed by the membership, if requested.

ATTACHMENT 1
Sign-in Sheets

PARTICIPANT SIGN-IN SHEET

Shieldalloy Metallurgical Corporation SSAB: Fourth meeting at SMC's Newfield facility				
Date: September 21, 1005		Facilitator: Charles L. Harp, Esq.		
Your Name (Print)	Your Signature	Your Address	Your Telephone Number (with area code)	Your e-Mail Address
JAMES P VALENTI	[illegible]	[redacted]	[redacted]	[redacted]
Marie Miller	[illegible]	[redacted] RI	[redacted]	[redacted]
Dan Gillen	[illegible]	[redacted]	[redacted]	[redacted]
Marjorie McLaughlin	[illegible]	[redacted]	[redacted]	[redacted]
Christy Gleason	[illegible]	[redacted]	[redacted]	[redacted]
[illegible]	[illegible]	[redacted] Newfield	[redacted]	
ROBERT WHITE	[illegible]	[redacted] NFLD.	[redacted]	
Jenny Goodman	[illegible]	[redacted]	[redacted]	[redacted]
Donna Griffin	[illegible]	[redacted]	[redacted]	[redacted]
Charles Geva	[illegible]	[redacted] Newfield	[redacted]	
[illegible]		[redacted]	[redacted]	
Ed DiMeo		" "	"	
R.D. Shindel	[illegible]	[redacted]	[redacted]	
Jim Milton	[illegible]	[redacted]	[redacted]	
Gerald MACHORE	[illegible]	[redacted]	[redacted]	[redacted]
Alfred E. Buccino III	[illegible]	[redacted]	[redacted]	

PARTICIPANT SIGN-IN SHEET

Shieldalloy Metallurgical Corporation SSAB: Fourth meeting at SMC's Newfield facility				
Date: September 21, 1005		Facilitator: Charles L. Harp, Esq.		
Your Name (Print)	Your Signature	Your Address	Your Telephone Number (with area code)	Your e-Mail Address
[illegible]	[illegible]	[redacted]	[redacted]	[redacted]
Robert Hamm	[illegible]	[redacted] with DC	[redacted]	[redacted]
[illegible]	[illegible]	[redacted]	[redacted]	
Robert [illegible]	[illegible]	[redacted]	[redacted]	
Terry Ragone	TERRY RAGONE	[redacted]	[redacted]	[redacted]
[illegible]	[illegible]	[redacted] Cumberland NJ	[redacted]	[redacted]
[illegible]	[illegible]	[redacted]	[redacted]	[redacted]
[illegible]	[illegible]	[redacted]	[redacted]	[redacted]

ATTACHMENT 2
Meeting Agenda

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation

SSAB Meeting (Open to the Public)
September 21, 2005 - 6:30 p.m.

Welcome	C. L. Harp
Review and approval of minutes from previous SSAB meeting	C. L. Harp
Purpose of SSAB	C. L. Harp
Background Information	D. R. Smith
Review of new/additional information since last SSAB meeting	D. R. Smith
Summary and review of Pending Activities	D. R. Smith
Summary of Post-Plan Submission Activities and Schedule	Dan Gillen
SSAB input capture	C. L. Harp
SSAB Open Discussion	C. L. Harp
Audience Questions	C. L. Harp
Adjourn	

ATTACHMENT 3
Meeting Transcript

1
2

SHIELDALLOY METALLURGICAL CORPORATION
3 SITE SPECIFIC ADVISORY BOARD
4

5 In the Matter of: : TRANSCRIPT
: OF
6 PUBLIC MEETING in re : PROCEEDINGS
DECOMMISSIONING PLAN :
7 :
- - - - - - - - - - - - - - - - - - - -
8
9 Wednesday, September 21, 2005
Shieldalloy Metallurgical Corporation
10 12 West Boulevard
Newfield, New Jersey 08344
11 Commencing at 6:35 p.m.
12
13 S S A B M E M B E R S P R E S E N T :
14 DAVID R. SMITH
CAROL BERGER
15 JEAN OLIVA
LORETTA WILLIAMS
16 JENNY GOODMAN
LINDA GRAUMANN
17 DONNA GAFFIGAN
RICHARD WESTERGAARD
18 CHARLES LEE HARP, JR., ESQ., Facilitator
19
20
21
22
23
24
25

Page 2

1 MR. HARP: Okay, everybody. We're
2 going to start the meeting right now. And I
3 wanted to let the public who hasn't been here
4 before know what we're doing and what the process
5 is. This is a meeting of the Site Specific
6 Advisory Board of Shieldalloy Metallurgical
7 Corporation in connection with a decommissioning
8 plan to be submitted or pending in part before the
9 United States Nuclear Regulatory Commission.
10 Part of the rules of the Commission
11 require that this kind of body be set up in
12 order to gain input for a few specific
13 questions about the decommissioning plan.
14 And this is actually the fourth meeting of
15 this committee. The first one was in August
16 of 2003.
17 We are going to conduct a meeting here
18 among the Board members. The Board members will
19 be asked to introduce themselves so you will all
20 know who they are. And when we finish, we'll open
21 this for comments and questions from the floor.
22 There will also be an opportunity for comments on
23 Shieldalloy's website, which is written down up
24 here behind me. It's www.Shieldalloy.com. And
25 there's a whole sub-page there for the

Page 3

1 decommissioning effort.
2 So without further ado, I'm going to
3 start the meeting by asking people on the
4 Advisory Board to introduce themselves. And
5 I'll start with the lady on my right. For
6 the court reporter's benefit and public,
7 could you speak up?
8 MS. BERGER: Okay. My name is Carol
9 Berger. I'm with Integrated Environmental
10 Management, and I am a radiological consultant to
11 Shieldalloy.
12 MR. HARP: And on her right is, Linda?
13 MS. GRAUMANN: Linda Graumann. And I'm
14 a councilwoman with the Borough of Newfield.
15 MR. HARP: All right. And --
16 MS. GOODMAN: I'm Jenny Goodman. I work
17 for the New Jersey Department of
18 Environmental Protection in the Bureau of
19 Environmental Radiation.
20 MR. HARP: And Donna?
21 MS. GAFFIGAN: Donna Gaffigan. I also
22 work with the Department of Environmental
23 Protection. I work on the overall cleanup
24 of the site.
25 MR. HARP: Okay. And Loretta?

Page 4

1 MS. WILLIAMS: Loretta Williams. I'm a
2 member the Planning/Zoning Board of the
3 Borough of Newfield.
4 MR. HARP: David Smith?
5 MR. SMITH: Dave Smith. I'm director of
6 Environmental Services and the radiation safety
7 officer for Shieldalloy.
8 MR. HARP: And in the back, Rick?
9 MR. WESTERGAARD: Rick Westergaard. I'm
10 the Mayor of the town.
11 MR. HARP: He's also a member of the
12 Board, although he's sitting back there.
13 And we'll have another person up here
14 momentarily whose name is Jean Oliva, O-l-i-v-a,
15 from ARC Corporation. And they're an
16 environmental consultant advisor to Shieldalloy
17 Metallurgical Corporation. So that's everybody
18 from the Board who's here tonight. Our first
19 order of business has to do with the minutes.
20 MR. SMITH: And she has them. Jean has
21 them.
22 MR. HARP: Oh, Jean has them. So we'll
23 defer till a later time. I should say that
24 my name, by the way, is Lee Harp. I'm an
25 attorney for the company, but I'm acting as

Page 5

1 facilitator of these meetings. And the main
2 purpose of the SSAB is to give input on a few
3 specific questions as to the decommissioning
4 plan.
5 Very briefly -- and I'm speaking now to
6 the Board, but also to the public, so you know
7 what we're talking about -- Shieldalloy has a
8 series of slag piles in the back of this
9 property. And they have radioactive materials in
10 them; fairly low level. And the plan is what to
11 do with them, because Shieldalloy no longer
12 manufactures product using the materials that
13 generated those byproducts. The decommissioning
14 plan that Shieldalloy proposes is to obtain a
15 perpetual possession only license for the NRC, and
16 to reconfigure the slag piles into a single pile
17 that you can hear more detail about that will be
18 engineered and contoured.
19 And the plan also calls for financial
20 assurance for the maintenance and monitoring of
21 that pile for a thousand years. The purpose of it
22 is to make sure that no member of the affected
23 group, potentially affected group -- you will hear
24 more about that -- receives a dose in excess of 25
25 millirems per annum above background.

Page 6

1 Now, all of this will be part of some
2 rather voluminous presentations to the NRC. And
3 the NRC has its own procedures for reviewing
4 that. So we're pretty much at an early stage of
5 that. I neglected to say earlier that we have
6 with us tonight Daniel Gillen, G-i-l-l-e-n, from
7 the U.S. NRC, who will explain the timetable, the
8 processes and the steps that follow once we submit
9 the decommissioning plan in all its many parts.
10 So the purpose of the SSAB, as I said,
11 is to address certain questions. We've had
12 earlier sessions that talked about that, and
13 we have some more information to present to
14 this Board tonight that deal with the issues
15 that the SSAB is supposed to be addressing.
16 I'd like to turn to Mr. Smith just for a
17 little bit of where we are with documentation
18 to the -- that's been submitted to the NRC
19 and what's been put in the --
20 UNIDENTIFIED SPEAKER: Could you speak
21 louder, please? We can't hear you in the
22 back.
23 MR. HARP: Yes. Okay. David Smith, I'm
24 going to ask to tell everybody where we are with
25 the documents that have been produced and are

Page 7

1 about to be produced. So ...
2 MR. SMITH: We in the last year have
3 been working on a number of sections of the
4 decommissioning plan and have submitted drafts of
5 those chapters to NRC for their review and
6 comment. In April we had
7 submitted one on the dose modeling. And then in
8 July we sent in a copy of the environmental
9 report, the draft copy. Everything that we've
10 submitted so far has been draft, because this is a
11 work in progress. We're continuing to put in
12 calculations and information as we are generating
13 that.
14 And then we also have submitted the
15 Chapter 7, the ALARA chapter, ALARA being As Low
16 As Reasonably Achievable. And it looks at the
17 different scenarios of possible exposure of
18 different groups, residents or trespassers,
19 farmers, and such. We're -- once again, all these
20 chapters have been put into the repositories over
21 in the Borough Hall. And tomorrow we're hoping to
22 have our web page up for everyone to look at. And
23 we're going to continue to maintain that once we
24 put it up, and it will be updated periodically
25 with the most current information that we have

Page 8

1 available. They'll keep everyone apprised of the
2 different progress that's being made with this
3 project.
4 And what we're looking to do is we're on
5 target to submit our decommissioning plan in
6 October of this year. And that will still be
7 consistent with what NRC's expectations for
8 this submittal date was. We've been working
9 in close coordination with NRC in a very
10 complex type of decommissioning where we're
11 trying to decommission part of the site for
12 unrestricted use. In other words, it can be
13 utilized for industrial purposes. And then
14 the other part where the slag pile is will be
15 a restricted release, where they'll have
16 engineering controls; the cap, engineering
17 design cap, with a fence. And that will also
18 be overseen by institutional controls, which
19 will be the long-term control license, which
20 we will possess or apply for and get from
21 NRC.
22 NRC will then conduct annual reviews.
23 And I believe on a five-year renewal will
24 apply, and the license hopefully will be
25 reissued on a five-year basis. That's about

Page 9

1 where we are as far as our documents go.
2 MR. HARP: Now, one of those chapters
3 includes cost estimates and the description
4 of financial -- the financial assurance for
5 monitoring and --
6 MR. SMITH: Long-term maintenance.
7 MR. HARP: Long-term maintenance. And
8 Jean Oliva just came in. Jean, would you
9 introduce yourself for the record, please?
10 MS. OLIVA: My name is Jean Oliva. I'm
11 with TRC Environmental Corporation.
12 MR. HARP: And your company is
13 responsible for developing the cost estimate
14 for the cap, and so forth?
15 MS. OLIVA: Yes, we are.
16 MR. HARP: I'd like to submit -- or not
17 submit, but circulate to the Board --
18 UNIDENTIFIED SPEAKER: Would you speak a
19 little louder, please? I can't hear you.
20 MR. HARP: I'm sorry. I'm sorry. I'll
21 do my best. We have here cost estimates for
22 the building of this cap and the land -- the
23 slag pile reconfiguration, plus maintenance
24 and long-term costs. And I was about to
25 circulate that to members of the Board. And

1 we have extra copies for the public, too, and
2 ask Jean Oliva to explain how these were
3 arrived at. So I'll keep one and ask you to
4 pass the rest of them around. And please,
5 I'm sorry if my voice fails. I haven't had
6 any dinner tonight. I'm an old guy.
7 UNIDENTIFIED SPEAKER: We're all in the
8 same boat. We're all in the same boat.
9 MR. HARP: So just let me know if you
10 can't hear me, and I'll try to keep it up.
11 MS. OLIVA: For the on-site
12 stabilization action, the costs include the costs
13 of mobilization and preparing the site for
14 construction. And we estimate that at $80,000.
15 Cap construction itself will include the
16 implementation of dust controls. Monitoring. The
17 consolidation of the materials into a single
18 pile. Preparation of that pile for capping. The
19 construction of the cap, which will include both
20 soil, flares, and a geomembrane. The
21 characterization of soil in the adjacent area of
22 the storage pile. Because some of the materials
23 will be moved to consolidate them in the capped
24 area. And then establishment of vegetation over
25 the cap. Followed by -- that cost is 2.3 million

1 dollars. That would be followed by a final status
2 survey at 50,000.
3 And then there are what we call here
4 implementation costs: the design, administrative
5 and legal costs, and the actual oversight of the
6 construction activities. Those total $800,000,
7 for a total for construction of about 3.2 million
8 dollars. Then after that, there are annual costs.
9 And those include visual and radiation surveys.
10 Maintaining the site security. Maintaining the
11 cover. NRC fees, which include both annual
12 inspections and additional inspections and license
13 fees every five years. And records retention
14 fees. And on an annual basis that would amount to
15 $19,000 per year.
16 We then expanded those out over a
17 thousand years, came up with a present worth
18 estimate, using discount rates that are prescribed
19 in NRC guidance, which is 3 percent and 7 percent.
20 And per NRC guidance, we add a contingency of 25
21 percent to that total number. And that gives us a
22 range of 4.4 to 4.9 million dollars.
23 MR. HARP: And the NRC -- do you have a
24 question back there?
25 UNIDENTIFIED SPEAKER: Yes.

1 MR. HARP: We'd like to ask you to hold
2 the questions till we're through up here.
3 But we will get to you. What input did the
4 NRC have in some of these individual items?
5 MS. OLIVA: I think I mentioned discount
6 rates are prescribed per NRC guidance. The
7 contingency amount is per NRC guidance. The
8 fees that the NRC could charge for their
9 annual surveys, and also the fees every five
10 years for license renewal and surveys, those
11 are accounted for.
12 MR. HARP: Now David, I've had some
13 questions in the past about the nature of the
14 financial assurance for this. Could you tell us
15 what the plan proposes?
16 MR. SMITH: The plan proposes a fully-
17 funded trust fund to cover the cost of the
18 decommissioning. We currently have a trust fund,
19 which was originally established at a hundred --
20 $750,000 that has grown to over a million
21 dollars. In addition to that, there is letters of
22 credit in the amount of 4.25 million dollars. And
23 those letters of credit currently are for the
24 benefit of US EPA and the State of New Jersey for
25 issues associated with the slag pile. If the cost

1 for the decommissioning were to increase above the
2 original 7 point -- or $750,000, the agreement to
3 establish the five million dollar lump sum of
4 financial assurance called for reducing the amount
5 that is in the possession for the state and US
6 EPA. And it would be redirected to the benefit of
7 NRC. So with the current cost estimates, we have
8 sufficient overall financial assurance.
9 But the other issue is the annual
10 maintenance in the monitoring, the 19,000 per
11 year over a thousand years, I believe comes
12 out to somewhere around --
13 MS. OLIVA: Well, depending on whether
14 you use a 3 percent or 7 percent discount
15 rate, it ranges from 277,000 to 655,000 in
16 present worth dollars.
17 MR. SMITH: So the current --
18 MS. OLIVA: 277,000 and 655,000.
19 MR. SMITH: So the current trust fund
20 will address that issue, and the construction of
21 the cap will have to be addressed either, you
22 know, through letters of credit or in another
23 method. But the plan itself calls for putting
24 moneys into a trust fund for the full amount.
25 MR. HARP: Okay. Any questions from the

Page 14

1 Board for either David or Jean?
2 MS. GRAUMANN: I have a question
3 regarding the -- you had mentioned or somebody had
4 mentioned -- I'm sorry -- no, Dave, I think you
5 did -- that the -- every five years the license
6 has to be renewed?
7 MR. SMITH: Yes.
8 MS. GRAUMANN: What's the criteria that
9 needs to be met in order to have a license? To
10 me, when I hear that a license has to be up for
11 renewal, is there the possibility that there's not
12 some threshold has been met, so therefore a
13 renewal of the license could be denied?
14 MR. SMITH: I believe the threshold is
15 if we're not in compliance with the conditions of
16 that license and we are not taking corrective
17 actions, NRC could seek to not renew the -- and
18 take legal action against the company.
19 MS. GRAUMANN: And then what happens? I
20 mean if it's something that you're not maintaining
21 properly, or whatever, I mean then what? So
22 you're in violation. Then there's the potential
23 that there's something in the air that doesn't
24 belong there, something going into the ground that
25 doesn't belong there. I mean it's not just paper

Page 15

1 issues. There's also issues of the maintenance of
2 the site. What's the position of the NRC at that
3 point?
4 MR. SMITH: I believe the position of
5 NRC is they would -- once you take legal action
6 against the company, and as well as take control
7 of the trust fund to make sure that the --
8 MS. GRAUMANN: The violations are being
9 taken care of.
10 MR. SMITH: Yes.
11 MS. WILLIAMS: I have a question about
12 the financial assurances.
13 MR. HARP: She has a question about the
14 financial assurances.
15 MS. WILLIAMS: There's no cost
16 estimates. You didn't give any cost estimates of
17 what this is going to cost over a period of a
18 thousand years to possibly remove the cap and the
19 construction of another.
20 MR. SMITH: That's what we just shared
21 with you.
22 MS. GRAUMANN: If I understand
23 correctly, the cost estimates are based on
24 3 percent and 7 percent, and those are
25 predetermined numbers that were given those

Page 16

1 equations, so to speak.
2 MS. WILLIAMS: What about the scenario
3 about if this has to be recapped sometime?
4 MS. GRAUMANN: That would have to come
5 out of the four point --
6 MS. WILLIAMS: I'm asking him. I'm
7 sorry.
8 MR. SMITH: I'm sure if it had to be
9 recapped, it would have to come out of the trust
10 fund. And they would have to re -- you know, the
11 company would have to reestablish the fund level.
12 MS. WILLIAMS: What if there was a
13 scenario if there was a hurricane disaster --
14 UNIDENTIFIED SPEAKER: We came to a
15 meeting here. We can't hear you. Not a word,
16 what you're saying. What, you have the meeting up
17 there? We want to hear it, too. That's why we're
18 here.
19 MR. HARP: I'll repeat her question.
20 UNIDENTIFIED SPEAKER: What the hell's
21 going on?
22 MS. WILLIAMS: I guess you have to have
23 microphones.
24 MR. NESSEL: May I suggest we have the
25 next meeting at Borough Hall where we have

Page 17

1 air-conditioning and a speaker system? Could we
2 do that next time around?
3 MS. WILLIAMS: What I'm saying is you
4 don't have cost estimates that -- to cover costs
5 over a thousand years. And this particular
6 material stays radioactive for a thousand years.
7 MR. HARP: She's saying we don't have
8 cost estimates for over a thousand years, and this
9 material will stay radioactive for a thousand
10 years. And the response to that is?
11 MR. SMITH: The response to that is our
12 cost estimate is based on a thousand years time
13 period for maintenance, and our design is been
14 designed to address heavy severe erosion issues
15 and address those catastrophes that you're talking
16 about as far as hurricanes and such.
17 MS. WILLIAMS: Hurricanes, and terrorism
18 possibly.
19 MR. HARP: She said terrorism possibly.
20 MS. WILLIAMS: Also there's no liner
21 underneath this pile to prevent any seepage from
22 -- radioactive seepage from going into the
23 groundwater.
24 MR. HARP: She's saying there is no
25 liner under this to prevent any seepage of any

Page 18

1 radioactivity going into the groundwater.
2 MR. SMITH: The design that we've
3 developed is based on including a cap to prevent,
4 you know --
5 MS. WILLIAMS: Cap over.
6 MR. SMITH: A cap over, to prevent
7 precipitation from penetrating into the pile. The
8 material itself, however, is not -- it's extremely
9 low leachability. It's not zero, but it's a very
10 stable material. So nothing is really leaching
11 out of it.
12 MS. WILLIAMS: Where are your
13 leachability studies? I'd like to see your
14 leachability studies. I'm raising my voice. I'm
15 trying to make everybody hear. I'm not shouting
16 or anything.
17 MR. SMITH: Those are going to be part
18 -- you know, they're part of the document that's
19 being prepared and going to be submitted to NRC.
20 But you have -- in the original Revision 0, much
21 of that information already exists.
22 MS. WILLIAMS: How long was the
23 leachability studies done? Is how long ago?
24 MR. SMITH: The original ones that
25 Rev. 0 were based on were quite a few years ago.

Page 19

1 We've done some this past year. That's the work
2 in progress part of it, and to just substantiate
3 and verify the previous information was correct
4 and accurate.
5 MS. WILLIAMS: Well, another thing, this
6 information was -- that was sent to the library,
7 everything had blanks. I mean there was no
8 amounts. Everything -- you know, there were a lot
9 of blanks there. That wasn't telling us
10 anything. We don't have enough information. We
11 need more information.
12 MR. SMITH: The documents were submitted
13 to NRC in order to give them a sense and have
14 their review look at whether once we filled in
15 those calculations and data, would it be
16 acceptable for technical review.
17 MS. WILLIAMS: Why was this meeting
18 held, when we weren't given the information, when
19 the meeting wasn't advertised in any of the
20 newspapers? I received written notice from you
21 two days ago. You're supposed to give a two-week
22 notice. The people from the state heard -- what
23 was it? Eight, nine days before?
24 MR. HARP: Actually we published notice
25 in both the Vineland Daily Journal and the

Page 20

1 Gloucester Times.
2 MS. WILLIAMS: Nobody's seen that. Did
3 anybody see that in the Vineland paper?
4 UNIDENTIFIED SPEAKER: No, ma'am.
5 MR. HARP: Well, I have an Affidavit of
6 Publication from the newspaper that says it was.
7 So that's how we rely on that. So -- and my
8 office sent the notices to those two newspapers.
9 MS. WILLIAMS: Well, as far as I'm
10 concerned, there's no financial assurances because
11 we don't have proper cost estimates. And you
12 didn't even get an estimate from -- did you get an
13 estimate from Envirocare about off-site disposal?
14 MR. SMITH: We did.
15 MS. WILLIAMS: Where is it?
16 MR. SMITH: We received a presentation
17 from Envirocare with -- in which they provided the
18 company with projected numbers or quotes. They
19 have asked us not to disclose that information.
20 We are working with them to determine if we are
21 going to be able to provide it to NRC. But as of
22 right now, we are not allowed to provide that
23 number.
24 Second, in addition to that, however,
25 independently from the Envirocare quote, NRC did a

Page 21

1 quote or a cost estimate for off-site removal and
2 disposal. And that number, we can share with
3 you. And do we have that with us, or not?
4 MS. WILLIAMS: Did they give separate
5 for the slag and the baghouse dust? Was there
6 separate cost estimates for that? Or is it going
7 to be cost for the whole thing?
8 MR. SMITH: Envirocare presentation was
9 a lump sum number for both. It did not go into
10 detail.
11 MS. WILLIAMS: They didn't separate the
12 two.
13 MR. SMITH: No.
14 MR. WESTERGAARD: Question. What's the
15 volume and the dimensions of that pile?
16 MR. HARP: The question -- we have a
17 problem here with the document. David, you heard
18 the question?
19 MR. SMITH: No.
20 MR. WESTERGAARD: What's the volume and
21 the dimensions of the pile?
22 MR. SMITH: The volume --
23 MS. OLIVA: The consolidated volume of
24 the pile will be 76,000 cubic yards.
25 MR. WESTERGAARD: Now, is the

Page 22

1 engineering design for the pile, is that
2 complete?
3 MR. SMITH: The engineering design, no.
4 MR. WESTERGAARD: When will that be
5 completed?
6 MR. SMITH: Once the NRC approves it.
7 We wouldn't go into engineering design package
8 until you have an approved plan and a license
9 amendment.
10 MR. WESTERGAARD: Who would do that?
11 You would bring in a consultant to do that?
12 MR. SMITH: Yes.
13 MS. GAFFIGAN: Is the volume based on
14 more recent surveys of the pile?
15 MR. HARP: She's asking, is the volume
16 based on more recent surveys of the pile?
17 MR. SMITH: Yes. Because we did an
18 aerial fly-over this past year and quantified the
19 materials. Because even though we haven't had
20 production of new slag, there's been activities
21 where soils and other materials from the site have
22 been moved out that will be controlled in there.
23 UNIDENTIFIED SPEAKER: What would you
24 say cubic yard is to --
25 MR. HARP: We just have to hold the

Page 23

1 question. I'm sorry. This is all Board stuff
2 now. Sorry for the delay here. Do you have
3 another question, Rick?
4 MR. WESTERGAARD: Yes. Dave, what were
5 the dimensions of the pile, the length, the width,
6 and the height? Do you happen to know?
7 MR. SMITH: I think Jean will help me in
8 that. You mean once it's built?
9 MR. WESTERGAARD: Right.
10 MR. SMITH: What we're proposing to be
11 built.
12 MS. OLIVA: It's roughly a thousand feet
13 by 200 feet. But it's a boomerang shape, so --
14 it's 30 feet high.
15 MR. WESTERGAARD: 1,000 by 200 by 30?
16 Is that what you said?
17 MS. OLIVA: Right. But like I said,
18 it's a boomerang shape, so that's kind of
19 misleading. It's not a long rectangle.
20 MR. SMITH: I'll take this back and then
21 bring it back.
22 MS. GRAUMANN: Is that something that
23 maybe she has a slide of, an aerial?
24 MR. HARP: While you're looking at that,
25 I wanted to get a little bit more detail on the

Page 24

1 long-term license --
2 MS. GRAUMANN: Can I ask a question?
3 MR. HARP: Yes. Sure.
4 MS. GRAUMANN: Do you guys need to see
5 this? Can I pass this around to the folks just so
6 they can see?
7 MR. SMITH: As long as it comes
8 back.
9 MS. GRAUMANN: As long as it comes back
10 you guys can review this. And this is probably
11 like a construction kind of question, but why --
12 Ms. Williams asked why there's no liner or
13 something underneath. Why not? I mean I realize
14 that would impact the cost of the construction.
15 But if it would give residents a better sense that
16 at least it was better contained, even though it's
17 a low leachability, would that be a problem?
18 MR. SMITH: It would -- something we can
19 evaluate. But the cost will be substantially
20 increased. Right now the design and construction,
21 as I understand it, is to minimize the movement of
22 materials in a manner where the slopes are, you
23 know, gentle enough so that the cap will not be
24 eroded over a thousand years. So they could be
25 done, but the cost would drive the price up

Page 25

1 considerably. Whether it would be -- it's
2 something that possibly could be looked at.
3 MS. GRAUMANN: How much different would
4 the overall cap be with a liner versus without a
5 liner? I kind of get the feeling from what you
6 just said that that would significantly change or
7 alter what the outside cap would look like.
8 MR. SMITH: No.
9 MR. HARP: You have to move all that
10 stuff.
11 MS. GRAUMANN: Right. But that would
12 still be significantly less than hauling it out of
13 here, which you don't want to do.
14 MR. SMITH: Right. I'm not sure of what
15 the cost difference would be. And it's something
16 we can ask NRC to give us the -- to look at and
17 come up with.
18 MS. GRAUMANN: And who would be looking
19 into that for you?
20 MR. SMITH: TRC.
21 MR. HARP: TRC.
22 MR. SMITH: They are the ones that --
23 MS. GRAUMANN: Oh, the cost company.
24 MR. HARP: TRC is the company. Any
25 other questions of the Board?

Page 26

1 MS. WILLIAMS: There's also scenarios it
2 should be expanded to like failure scenarios, such
3 as hurricane. Exposure should be developed for
4 dispersal of radioactivity. And these scenarios
5 may result in and include the increase in
6 population densities that will be affected at
7 least over the next thousand years. And they
8 should -- the selection, the model selection of
9 those modeling should be justified and include the
10 pros and cons of a number of available models. It
11 should not be limited only to the long-term
12 control option, but also include the license
13 termination option and maybe other scenarios.
14 MR. SMITH: I'm not quite clear what you
15 mean about the long-term versus --
16 MS. WILLIAMS: That those modeling
17 should not be limited just to the preselected
18 long-term control license that this is based on.
19 It should also include license termination
20 option.
21 MR. SMITH: You mean moving the material
22 off-site?
23 MS. WILLIAMS: Moving the material
24 off-site, and then the suspension of the license
25 or other scenarios should be included in these

Page 27

1 scenarios as low as reasonably achievable.
2 MR. SMITH: If the material were to be
3 moved off site, those criteria for the site would
4 be the 25 millirem, which is the same criteria for
5 leaving material on site with the engineering
6 controls and institutional controls in place.
7 MS. WILLIAMS: If it was moved
8 off-site, wouldn't it be less than 25 millirems?
9 MR. SMITH: No.
10 MS. WILLIAMS: Why not?
11 MR. SMITH: Because the regulation
12 requires us to meet the 25 millirem.
13 MS. WILLIAMS: Well, you would say that
14 it would be less than that then if it was moved
15 off site.
16 MR. SMITH: No. I'm saying the dose
17 modeling is what individuals would be exposed to.
18 MS. WILLIAMS: It's based on that
19 regulation of the NRC.
20 MR. SMITH: So the 25 millirem for
21 unrestricted release, moving material off-site, or
22 for the restricted release, is the same: 25
23 millirem. The difference is if the institution of
24 controls failed, the long-term control license
25 failed, then NRC or -- then what we're required to

Page 28

1 do is look at the engineering controls
2 disappearing and/or the different exposure
3 scenarios --
4 MS. WILLIAMS: So a hundred millirem.
5 MR. SMITH: To a hundred millirem.
6 MS. WILLIAMS: If Shieldalloy one day
7 just leaves, goes to South America or leaves the
8 country, there is no institutional controls unless
9 we could attach your assets and make sure that
10 the -- whatever cost to do these things is going
11 to be that the NRC could actually attach your
12 assets in order to pay for this, in order to make
13 sure that financial assurances are done, and to
14 make sure that this is -- this procedure, you
15 know, proceeds. So you really have no
16 institutional controls under this plan. Because
17 we can't do that. We can't go after you and bring
18 you back and make you pay for this. You could
19 skip with your assets. We can't attach your
20 assets. I should ask the Board, am I correct in
21 assuming that?
22 MR. HARP: No.
23 MS. WILLIAMS: Why not?
24 MR. HARP: Because that's what the
25 financial assurances are for. That's an

Page 29

1 independently-funded trust fund over which
2 Shieldalloy --
3 MS. WILLIAMS: What if there's not
4 enough money, which I don't think there is.
5 MR. HARP: I understand. But that's an
6 issue that the NRC will pass on. And we
7 understand that you don't think it's enough, and
8 that will be an issue they have to decide. And
9 your comments will be part of what we submit to
10 NRC.
11 MS. WILLIAMS: I see the total cost for
12 the off-site estimate is $58,100,000. I think
13 that's a fair price for 50 years. And if the --
14 the NRC people are here tonight?
15 MR. SMITH: Yes.
16 MS. WILLIAMS: I'd like to say something
17 to the NRC. For 50 years you let this company
18 leave that material here and pile it up. You
19 could have told them every year we have to move
20 them on off-site license facility. You didn't do
21 that. It's the NRC's fault we have this mess,
22 more so than Shieldalloy. And to be honest with
23 you, they let them stay here. You know, you've
24 done this town in. We cannot understand. We
25 cannot develop that piece of ground, that 57 acres

Page 30

of ground with that material sitting there, capped or uncapped.

MR. SMITH: The one thing you should know is the property, the restricted portion of the property is not going to be developed, but the unrestricted is available for development.

MS. WILLIAMS: Can you sell that? Can you subdivide? You haven't gone to the Planning Board and had a subdivision. Is the NRC going to allow them to subdivide that property once that's capped, and allow them to sell it to other companies? Or are they going to operate here for a thousand years?

MR. SMITH: Right now we're -- our plan is not to move. A thousand years, I can't guarantee that.

MR. HARP: But there are other scenarios than selling. You could lease long-term.

MS. WILLIAMS: You could lease.

MR. HARP: Without subdividing.

MS. WILLIAMS: You could lease, but you'd still have ownership, so you'd still have to be held responsible for this site. But you couldn't sell it, part and parts. Am I correct?

MR. SMITH: The current plan does not

Page 31

call for selling parts of it. Because the guides NRC issued for long-term control licenses, they prefer to keep the property as a whole.

MS. WILLIAMS: Intact, to keep responsible. Who is the third party? Who is the third party that's going to regulate, to really be responsible if Shieldalloy should leave? Can I ask that of NRC?

MR. GILLEN: That's not identified yet.

MS. WILLIAMS: Is the NRC willing to take financial responsibility if they skip and their financial assurances isn't enough to cover?

MR. GILLEN: No. Our responsibility is to ensure that there is enough financial assurance.

MS. WILLIAMS: Well, I'm telling you right now that there isn't.

MR. GILLEN: Well, we haven't seen it.

MS. GRAUMANN: I have a question for the NRC. Obviously as a resident of the Borough, I think that I speak on behalf of all of them, the first option would be to ship this stuff off-site. And we've discussed that at previous meetings. Recognizing that that can be cost prohibitive, and perhaps also and in addition to

Page 32

that the NRC doesn't exactly back the Borough in that regard, my understanding is that the NRC, as long as Shieldalloy as a corporation comes up with some kind of feasible plan that's acceptable to you, then that's what you go with. I mean we have limited input through the SSAB. But that's pretty much it. I mean it's not as though we can dig our heels in and say we don't like that you're doing this, and you guys will say, yeah, you know what, they're right. Am I correct?

MR. SMITH: Can I interrupt? Sorry.

MS. GRAUMANN: Okay. I kind of would like --

MR. SMITH: Dan is going to give a presentation in a little bit, part of the meeting. I think he might cover it.

MS. GRAUMANN: My question to you, because we did discuss this at a previous meeting, I have a problem -- if we have to go with this cap system, my problem with that is that we have -- we're only 1.7 square miles. This is like a phenomenal amount of ground for us to just have frittered away because it's under this restricted licensing. So what are the possibilities that you guys would actually approve the site being

Page 33

self-contained -- contained by itself, and whatever we can salvage from the rest of the parcel, which is probably going to be affected by brownfields at the very least, and have that subdivided so at least we still have some viable ratables, that the company or somebody can come in and actually develop again. I understand that you're not wild about that idea, but I'm not wild about seeing 67 acres just sitting here hoping for somebody to come in that's willing to take on the responsibility of the decommissioned license.

MR. GILLEN: There are reasons why -- and we discuss in our guidance, why we prefer to have the site remain as a whole. It keeps the company more involved than just having them have a pile and nothing else; have a valuable piece of land that they can use, they can sell.

MS. GRAUMANN: Well, see, but the fallacy in that, which we've already experienced, is that whether it was the NRC or some other organization, one of the other agencies, they required that Shieldalloy tear down, dismantle some of the buildings that were affected. So they dismantled the buildings. Well, the buildings aren't there anymore. So now it's unimproved

Page 34

1 ground. So they appealed their taxes. That
2 devastated us. We're still just kind of coming
3 out of that. Okay. So you kind of sandwiched
4 them into a corner where yes, they have to keep
5 the whole thing together. Well, they're running
6 on a skeleton crew now. So once everything's
7 finalized, what? They have one token building and
8 a parking lot, and that's it? And then they come
9 back to us and say we're going to take down the
10 rest of the buildings because we're
11 non-operational. And it affects our ratables
12 again. I mean the end result is that we're still
13 left behind with a ghost town as far as this site
14 is concerned. Do you follow what I'm saying?
15 MR. GILLEN: I understand.
16 MS. GRAUMANN: It just continues to
17 regress until it's valueless.
18 MS. MILLER: Marie Miller, NRC Region
19 1. There are no other buildings on the property
20 that were part of the NRC license. So with that,
21 we would not be expecting the need to decommission
22 or dismantle any additional buildings.
23 MS. GRAUMANN: Oh, you may not require
24 it. But if they continue to phase out this
25 location, as they have, and there's not anything

Page 35

1 left to do, well, then what's the point of keeping
2 buildings? Why should they continue to pay in
3 excess of a hundred thousand dollars a year in
4 real estate taxes when it's basically just lip
5 service: it's not a viable business for them
6 anymore. I mean it would make sense to me if I
7 were in their shoes. So, you know, they continue
8 to tear buildings down or dismantle or to try to
9 reduce their costs. Well, and then what are they
10 going to do? Eventually they're going to come
11 back and say, well, you know, we want our stuff to
12 be reevaluated again. Even if it's not required,
13 to me, that's the path that you're in a downward
14 spiral.
15 And all of those things make perfect
16 sense from a business standpoint. Those are the
17 things that I would do if I were in their shoes.
18 But at the same time, I'm in my shoes. I'm in the
19 Borough's shoes. And whether I'm a Councilwoman
20 or not a Councilwoman, I'm concerned as a
21 resident. Because where is this going to go?
22 We're not a Washington -- well, you don't have to
23 go to Washington Township. But I mean we're not a
24 huge town where we can just absorb this. That's
25 the point.

Page 36

1 MS. MILLER: I understand your comment
2 with respect to the buildings. I grew up in South
3 Jersey
4 MS. GRAUMANN: Oh, okay.
5 MS. WILLIAMS: We still need a third
6 party. Is the state going to be the third party?
7 The Borough of Newfield isn't going to be the
8 third party, is it?
9 MS. GRAUMANN: I guess you haven't
10 answered my question on would you take that on
11 advisement as far as to help the town if it became
12 -- if it was a better scenario for us to permit
13 Shieldalloy to subdivide the albatross.
14 MR. GILLEN: Yes, we would.
15 MS. GRAUMANN: You would. Okay. That
16 answers my question. Thank you.
17 MR. HARP: Okay. Just for a little bit
18 more detail on what this institutional control,
19 the long-term license means, Carol, would you just
20 for the Board and for the public lay out what
21 those requirements would be?
22 MS. BERGER: Yes. What that would be in
23 essence is Shieldalloy would have a radioactive
24 materials license, much like the one they have
25 now, which is to follow a certain set of

Page 37

1 provisions or requirements in order to keep that
2 license active. And those requirements would
3 include monitoring, radiation monitoring as well
4 as visual monitoring of the status of the
5 restricted area. It would include surveillance of
6 the cap, making sure that the cap is -- doesn't
7 have any pieces missing out of it, or that
8 somebody's not walked through and dug a hole in it
9 or something like that. And doing all of the
10 necessary reports to the NRC.
11 The NRC would still come in on an annual
12 basis and inspect the site to make sure that the
13 provisions of the license are still in place. And
14 the NRC would then go through the same license
15 renewal process, I would presume that they're
16 going through now, every five years, which is to
17 revisit it, look to see if everything's being done
18 the right way; does the license still contain
19 applicable provisions and requirements. And then
20 if it does and everything else that the NRC looks
21 at seems reasonable, I would presume that the
22 license would be renewed then. And then they go
23 through the same process, every year inspections;
24 every five years relicensing.
25 MR. HARP: Okay. Mr. Gillen, would you

Page 38

1 come up here and -- I'm going to ask Mr. Gillen
2 the tell everybody about what the process is as we
3 move forward.
4 MS. GRAUMANN: Could I just ask one
5 question of Dave? How long your Ohio -- your Ohio
6 facility has a decommissioned license on it,
7 doesn't it?
8 MR. SMITH: It has a decommissioning --
9 it has possession only for decommissioning. And
10 we have two slag piles in Ohio. One, the cap has
11 been finished. And I think it was just completed
12 this past year. The other pile I think is
13 scheduled to be completed in 2006, maybe 2007.
14 MS. GRAUMANN: Oh, okay. So it doesn't
15 have a track record of any kind. I thought it was
16 already done and finished a couple years ago. I
17 guess that's not the case. I guess not, if it was
18 just done last year.
19 MR. SMITH: The final completion of the
20 cap -- the pile has had a cap for -- since '92.
21 MS. GRAUMANN: Oh.
22 MR. SMITH: But there's been an
23 improvement to that cap. And it's not driven by
24 the Ohio Department of Health, but by the Ohio
25 Department of Environmental Protection.

Page 39

1 MR. HARP: Okay. Can you do it from
2 there?
3 MR. GILLEN: Yes, I prefer to do it from
4 here, and that way everyone can hear me.
5 Hopefully I have a little bit louder voice than
6 some people have here. And my kids will attest to
7 that. What I've handed out -- and I wasn't sure
8 -- I thought maybe we were going to be using
9 slides on a projector. So I'm prepared to do
10 that. So I brought 25 copies. It may not be
11 enough to go around. If anyone doesn't have a
12 copy, I can get their name and address and send
13 you one if you'd like.
14 My purpose -- and you got into a little
15 bit of discussion with us already here. This is
16 all pre-submittal of the decommissioning plan to
17 the NRC. And I thank you for inviting me to this
18 meeting and I'm happy to be here to discuss some
19 of the NRC's processes. But we at the NRC have
20 our own process where we would involve the public
21 once we do have the DP in our hands. And I'll get
22 into some details on that.
23 I'm just here basically at the request
24 of the Board and Shieldalloy to discuss some of
25 the process. And as I said, we have not yet had

Page 40

1 submittal of the decommissioning plan. That's
2 scheduled for sometime in October. We have seen
3 little pieces of it, which is something that we
4 have done in our agency up front to try and
5 prevent getting a document submitted to us that's
6 really not acceptable. And what we do is we look
7 at it in general terms. And some of the pieces
8 we've looked at just to give Shieldalloy an idea
9 of whether or not the -- there's big holes in what
10 they plan to submit.
11 Not getting into any technical review at
12 this point in time, so the staff that we have at
13 the NRC has not looked at the details of this.
14 The cost data that's here, really the first time
15 that we've seen anything related to cost. We've
16 not reviewed any of that. So this is all
17 preliminary to us. So we have not yet begun to do
18 our review of this plan.
19 So what I have here -- and I'm going to
20 talk a little bit about our decommissioning
21 standards, the process that we have for the entire
22 decommissioning process, as well as details on our
23 review process of this decommissioning plan. And
24 then some information on what is involved from the
25 NRC's standpoint as far as public involvement.

Page 41

1 So basically the NRC standards in our
2 code of federal regulations for decommissioning
3 has two pieces to it. Decommissioning by our
4 definition is to remove a facility or site safely
5 from service and reduce radioactivity to a level
6 that permits either, one, release of the site for
7 unrestricted use; or two, release under restricted
8 conditions.
9 So under scenarios of unrestricted
10 release, which would be as you heard here if they
11 move the pile somewhere and dispose of it in
12 Envirocare or another disposal area, our standards
13 call for the site, as was discussed already,
14 meeting 25 millirem per year. And that would be
15 using scenarios of some other realistic scenario
16 of use of the land once they remove the pile, to
17 get a dose less than or equal to 25 millirem. And
18 of course we have -- as you heard, the goal is
19 reasonably achievable.
20 So generally when a site removes
21 material and cleans up their site, most of our
22 sites end up being much, much less than 25
23 millirem. And that dose that we have in our
24 standards is calculated for the average member of
25 the critical group, depending on what the scenario

Page 42

1 of future land use would be. And it includes all
2 pathways. In includes pathways from the air and
3 pathways from groundwater. And the performance
4 period that we look at during those assessments is
5 a thousand years.
6 Now, under the restricted release, which
7 is what you're hearing is going to probably be
8 their proposed option, we also have a requirement
9 of 25 millirem per year. But that's, as Dave
10 described, under restrictions, with institutional
11 controls in effect. And that those institutional
12 controls must be legally enforceable. And you
13 heard them talk about the long-term control
14 licenses being a possible option.
15 And then of course we have to assess
16 that if those institutional controls were to fail,
17 then the dose would have to meet criteria of less
18 than a hundred millirem under that supposition.
19 Then of course we talked already in pretty much
20 detail about financial assurance, and that the
21 independent third party that is yet to be
22 identified, but that there would have to be enough
23 financial assurance, and we would review that, to
24 ensure that if for whatever reason Shieldalloy
25 disappeared, there would be enough money to cover

Page 43

1 bringing in a third party to take control of what
2 Shieldalloy had been doing up to that point.
3 And then I'll get into some details in
4 some of my other slides here on the licensing, the
5 NRC public involvement and outreach requirement.
6 For our complex materials sites -- and I use the
7 term "complex." It's basically a term we use to
8 define sites where there's enough complexity at
9 the site where it requires the submittal of a
10 decommissioning plan. There are many sites that
11 NRC has, and licensees that are much less complex
12 and don't even need or require a DP. We have
13 probably 200 to 300 licensees a year, with a lot
14 of small licensees. But this one is complex and
15 requires the submittal of a DP.
16 The process for that whole -- going from
17 deciding we want to terminate to the end starts
18 with them notifying us within 60 days of
19 permanently ceasing their licensed activities,
20 which has been done. And then they're required to
21 submit a decommissioning plan to the NRC within
22 twelve months of that time. Of course we've been
23 beyond that point at this site, and there are some
24 reasons why that occurred. But they did submit a
25 decommissioning plan to the NRC twelve months

Page 44

1 after their decision, but it was rejected by the
2 NRC. And they went back to the drawing board and
3 have subsequently got to this point. There also
4 was a little bit of delay sort of on NRC's part
5 because we were in the midst of developing
6 guidance related to the restricted release option.
7 And then Shieldalloy elected to wait until that
8 guidance was in a more formal state before they
9 submitted their plan.
10 And then once they prepare the DP, they
11 submit it to NRC. And I'll get into some details
12 when that occurs. And we do offer public
13 opportunity to request a hearing and comment. And
14 I have some more details on that on another
15 slide. And then we eventually get to the point
16 where we either approve or disapprove what's been
17 submitted. And we'll go through a period of
18 request for additional information generally.
19 And then the licensee begins -- once
20 there's an approved decommissioning plan in place,
21 the licensee performs all the site
22 decommissioning, during which time NRC continues
23 to do inspection of those activities. You've
24 heard some of us here -- I neglected to introduce
25 Ms. Marie Miller here from NRC is from Region 1.

Page 45

1 She's a branch chief in the decommissioning
2 program there. And Marjorie McLaughlin is fairly
3 new at this site, though she will be the inspector
4 involved in the activities of the site.
5 And so we perform inspections during
6 decommissioning, at which -- and then at the end,
7 the licensee has to perform a final radiological
8 survey, which they then submit a final status
9 survey report to the NRC. And we review that
10 report, and at the same time we go out and perform
11 our own confirmatory surveys to ensure that areas
12 were cleaned up as described in the
13 decommissioning plan, and eventually get to the
14 end and terminate the license. In this case it's
15 not exactly a license termination; it's a
16 termination of the operating license that they
17 have now, and conversion into a long-term control
18 license.
19 What's in the decommissioning plan? You
20 know, you've seen pieces of it that have been put
21 in your library. And but the full plan needs to
22 contain a characterization of the site with the
23 radiological status. Needs to include what the
24 planned decommissioning activities will be. Needs
25 to have a plan to ensure protection of workers and

Page 46

1 the environment during the decommissioning. It
2 has to have what their plans are for that final
3 radiation survey that I spoke of. And it needs to
4 have the cost estimate, which we're seeing pieces
5 of here. And the funding mechanism that they
6 would ensure for financial assurance. It has to
7 include the schedule which they will do the
8 decommissioning. And then in the case of proposal
9 for restricted use, they would have to include in
10 the decommissioning plan information with regard
11 to how they involve the public in their
12 activities and what institutional controls would
13 be involved.
14 Now, once we get the plan in our hands,
15 from this October, the first thing that we do at
16 the NRC is we do an acceptance review. In the
17 case of big projects such as this, our acceptance
18 review generally takes no more than 90 days. It's
19 a fairly detailed acceptance review. And based on
20 some previous actions, we actually did reject the
21 first one that we had from this licensee, which is
22 why we're trying to work up-front in this case and
23 see some pieces so that we don't get something
24 that's totally unacceptable.
25 So once the acceptance review is over at

Page 47

1 the end of 90 days, and if we get the submittal in
2 October, that would take the schedule to about
3 mid-January. Then we send them a letter and say
4 yes, it's acceptable; we are now going to begin
5 our formal review. The formal review generally
6 begins with our noticing the fact that we received
7 a decommissioning plan in the Federal Register and
8 other web page, and offering the public an
9 opportunity for comment and opportunity to request
10 a hearing. And once that's been done, our
11 technical staff begin the review, which generally
12 results in first -- once we -- about a month into
13 the review, we then at NRC have a meeting, which
14 is our standard public meeting that we have at the
15 site. We come here. We will have a meeting to
16 solicit input from the local people that are
17 affected. And at that point in time we'll hear
18 what your concerns are. We'll use that when we go
19 back to begin our review.
20 But that doesn't mean that's the only
21 opportunity you have. You can submit written
22 comments to us in addition to that meeting. And
23 at that meeting, again, I will be talking similar
24 to what I'm doing tonight about our process and
25 the schedule and whether or not that's changed

Page 48

1 since this being here tonight.
2 So generally we have a point in time
3 somewhere into the review where we go to the
4 licensee requesting additional information. My
5 slide says additional information, if necessary.
6 I've never seen a review that we've done where we
7 haven't asked for additional information.
8 Generally I expect that we will come back with
9 questions and request for information that was
10 lacking in the submittal.
11 And then eventually via a license
12 amendment, we will approve a decommissioning plan
13 or whatever that may be at the end of our
14 back-and-forth questioning. And generally we have
15 a projected schedule of twelve months to do the
16 review. That's a goal. Sometimes we're under
17 that, sometimes we're over it, depending on what
18 circumstances, how many rounds of questions there
19 have to be; whatever delays may insert themselves,
20 which we can't predict. So that would put, just
21 for general purposes, our schedule having
22 completed our review of the decommissioning plan,
23 somewhere about January of '07. That would be a
24 year from when we accepted the document this
25 coming January.

Page 49

1 MS. MILLER: Just the overlay of --
2 MR. GILLEN: Marie's reminding me that
3 we also have as part of our process meeting the
4 environmental regulations. We would have to
5 prepare our own environmental assessment at the
6 same time we're getting -- doing the safety review
7 of the decommissioning plan. And we would publish
8 that environmental assessment in the Federal
9 Register and make it available to the public to
10 see that.
11 MR. WESTERGAARD: What part of the CFR
12 is that?
13 MR. GILLEN: 51.
14 MR. HARP: The question was what part of
15 the Code of Federal Regulations. And it's 10 CFR,
16 Part 51, which requires the environmental
17 activity.
18 MR. GILLEN: As far as the interaction
19 with the public, first I've got a slide that kind
20 of describes some of the less formal means by
21 which we involve the public in our activities.
22 Public meetings. Well, this is a public meeting.
23 It's not my meeting. I came as an invite to a
24 meeting being held by Shieldalloy. So I didn't
25 have to notice this meeting. It was up to them to

Page 50

1 involve any noticing. But generally in the NRC
2 and when I host my public meeting sometime around
3 next February or March, it would involve
4 notification in the Federal Register and in the
5 local papers. And we also have to give certain
6 advanced notice of that meeting and meet
7 requirements for advanced notices.
8 We also have during reviews of any kind,
9 whether it be a review of a decommissioning plan
10 or any other licensing action that we're taking
11 with any of our licensees, from time to time the
12 licensees come in to meet with the NRC at our
13 request generally to discuss issues. When we have
14 such a meeting, those meetings are always open to
15 the public. And we notice those meetings about
16 two weeks in advance of their happening. Those
17 are not generally had at the site, as would be the
18 public meeting that I spoke of, but they're
19 generally held in our offices in Washington.
20 MR. SHINDEL: Excuse me. Where does
21 the notification take place at? I'm sorry. My
22 name's Rick Shindel. I'm just a resident.
23 S-h-i-n-d-e-l. I was wondering where the notice
24 of those meetings --
25 MR. GILLEN: We notice those on our web

Page 51

1 page.
2 MR. SHINDEL: On your web page. So you
3 got to go to the web page and look for it
4 basically?
5 MR. GILLEN: Yes.
6 MR. NESSEL: How often?
7 MR. GILLEN: How often?
8 MR. NESSEL: We don't know when it's
9 going to be on there. Wouldn't it be easier to
10 just the notify our Borough Committee, our
11 Mayor, the fact that you're going to have a
12 meeting, so that we as a community can
13 participate? Can we ask you to do that?
14 MR. GILLEN: We generally have certain
15 people that we call and inform, yes.
16 UNIDENTIFIED SPEAKER: My concern is
17 such that I was here in November and I spoke with
18 Mr. Smith and he assured me -- I was standing
19 right over here -- and he assured me that he was
20 going to notice me well in advance so we could
21 notify a lot of the people in the Borough of
22 Newfield when that meeting was going to take
23 place. That didn't happen. Why did we have to
24 sign the paper back here last time, and we were
25 never notified of this meeting this time? What

Page 52

1 was the purpose of that? That's a little suspect.
2 I'm not sure that it is, but --
3 MR. HARP: That's better addressed to
4 us, but we'll respond.
5 MR. NESSEL: You can jump right in.
6 MR. HARP: I'm trying to do this in an
7 orderly way. His notice, is I understood it,
8 Mr. Gillen, the Mayor is on your list of people to
9 be notified of meetings?
10 MS. MILLER: Routine distribution.
11 MR. GILLEN: We have -- each project
12 manager has a routine distribution list. And I'm
13 not at all sure who is on the one for Shieldalloy.
14 But as I said, it's two weeks in advance of the
15 meeting.
16 MR. WESTERGAARD: But what I think the
17 gentleman is saying is like the Federal Register,
18 there's probably nobody in the room that gets it.
19 So what I would request --
20 MR. GILLEN: This is our web page.
21 MR. WESTERGAARD: Okay. But what I
22 would say is so that we know what's going on, if
23 you'd please send our administrator the notices
24 and the press releases, it would really help.
25 Because I bet you nobody in the room reads the

Page 53

1 Federal Register. I don't do it on a daily basis.
2 But I would say that please get this information
3 to us in a timely fashion.
4 MR. GILLEN: For the public meetings I
5 have at this site, you will definitely be well-
6 aware of the meeting. There will be sent out
7 multiple sources of noticing, whether it be in the
8 newspapers, letters to you, or Federal Register.
9 But what I'm speaking of now is multiple means
10 that are had just with the NRC and the licensee.
11 And generally they would be put on our web page.
12 But I'll look into the list that we have of locals
13 to see how we can better serve that purpose.
14 We also have workshops from time to
15 time. We just had one in April this past year
16 where there were a number of issues discussed.
17 Stakeholders, licensees, states, came and
18 attended. And we discussed many technical
19 issues. I mention this now because one of the
20 issues was restricted release options that we
21 had. Also informal contacts with the NRC. Our
22 web page gives how you can send an email to us
23 with any questions. You can look at that list
24 back there. My phone number and email address is
25 on there, as well as Marie's and Marjorie's. And

Page 54

1 you can pick up the phone, call us, and we'll put
2 you in touch with the people who can answer your
3 questions.
4 Press releases. If there are certain
5 issues or site actions that warrant a specific
6 press release, we will issue those, as well as
7 other Federal Register notices on issues. Then
8 again, I mentioned our website. I have the web
9 address as the last slide in here. So it's just
10 recently been expanded. I'll talk a little bit
11 about what kind of things are on the web page.
12 And then there's also licensee initiated community
13 outreach, of which this Board meeting is one.
14 We have some more formal procedures
15 for public involvement, including what's in our
16 regulations at 10 CFR, part 20. And the citations
17 are there. Those are specific to restricted
18 release type options which require certain
19 additional activities on the part of the licenses
20 and the NRC for involvement of the public.
21 MS. GRAUMANN: Is that also on your
22 website, your additional restrictions?
23 MR. GILLEN: Yes. Because on the
24 website you can access those code of Federal
25 Register -- or regulation citations.

Page 55

1 MS. GRAUMANN: What was the code?
2 MR. GILLEN: It's in a slide. 10 CFR
3 20.1403 and .1405.
4 MS. GRAUMANN: You're saying that's in a
5 slide?
6 MR. GILLEN: The citations are on the
7 slide, but the details of the words, you'd have to
8 go to the site page.
9 MS. GRAUMANN: Okay.
10 MR. GILLEN: We also have a hearing
11 process in our 10 CFR Part 2, which describes the
12 -- I mentioned the fact that we offer opportunity
13 for hearing. Describes what would be involved in
14 that process. I also have 2.206 petitions. This
15 is where anyone can request to institute a
16 proceeding related to modification, suspension, or
17 revocation of any license. Then we have Freedom
18 of Information Act requests. Any member of the
19 public can submit a FOIA request for any
20 documentation related to any action. And there's
21 also a process of allegations of inappropriate
22 activity whereas anyone can allege something. And
23 it can be involving matters of -- affecting public
24 health and safety.
25 Last slide I have here is where you can

Page 56

1 go for more information to our web page. And the
2 website is listed there. And the types of things
3 that we have on our web page for decommissioning
4 include information on each of the sites that we
5 have in decommissioning now. And those sites
6 number about 70 different sites that I have right
7 now, from reactors to complex material sites. It
8 has the listing and access to all the regulations
9 and guidance that would apply to decommissioning.
10 It describes the process that I've talked to you
11 about tonight. It has information on public
12 involvement. It has keys into all different
13 program documents that we have: Our guidance
14 documents, or any document related to this
15 activity at Shieldalloy be accessible, as well as
16 information on frequently asked questions and
17 lessons learned and international aspects to
18 decommissioning. So there's lots of information
19 on our decommissioning program.
20 And I'm not sure how you're working the
21 process of questions. Like I said, I'm here in
22 advance of submittal. I prefer not -- I'm hearing
23 a lot of your concerns that are technical
24 related. I can -- I'd prefer to get those once we
25 have it in our hands and start to look at the

Page 57

1 details of the technical proposal. But I can
2 speak to any questions related to our process. Is
3 that appropriate for me to take questions at this
4 time?
5 MR. HARP: We'll see how it goes. I was
6 going to try and finish this meeting and then have
7 you stay, if you wouldn't mind, for questions.
8 MR. GILLEN: I can do that.
9 MS. GRAUMANN: Would it be a problem if
10 we would just take questions while everything is
11 fresh in everybody's mind?
12 MR. HARP: I was just going to say we'll
13 see how it goes.
14 MS. GRAUMANN: Okay.
15 MR. HARP: So the first hand I see is
16 the lady over here.
17 MS. GLEASON: I'm Christie Gleason,
18 G-l-e-a-s-o-n. I'm with the offices of Senator
19 Fred Madden, Assemblyman David Mayer, and
20 Assemblyman Robert J. Smith. My question is in
21 the Nuclear Regulatory Commission review process,
22 where does D.E.P. fit in, if at all? Is there any
23 consultation with the state with regarding the
24 site?
25 MR. HARP: No, the state is --

Page 58

1 UNIDENTIFIED SPEAKER: EPA, you mean?
2 MR. GILLEN: The DEP.
3 MS. GLEASON: The Department of
4 Environmental Protection.
5 MR. GILLEN: The state will probably be
6 doing their parallel review at the same time. Is
7 that correct?
8 MS. GLEASON: I just wanted to make sure
9 everybody understands where, or at all, D.E.P.
10 fits into your process.
11 MS. MILLER: I can answer that. Marie
12 Miller, NRC. We've been working with D.E.P.
13 through these several years with Shieldalloy.
14 There are several opportunities for involvement.
15 But formally we have a policy of cooperation with
16 states, is the first point. From the standpoint
17 of inspections, they're involved in the inspection
18 aspect. So they're going to observe any of our
19 inspections. From the standpoint of license
20 review, we solicit -- we officially send the
21 decommissioning plan, once it's been accepted, to
22 the state for comment. In fact, the last time I
23 notified Jenny, for example, that plan was in, it
24 appeared that there were some major flaws. So
25 rather than burden the state with reviewing the

Page 59

1 document that we weren't going to accept, I said,
2 you know, we won't be soliciting formal comments
3 at this time. However, if you want the document,
4 here it is. That type of relationship we have.
5 As I mentioned, as I guess I should say
6 as I interrupted Dan to mention 10 CFR Part 51,
7 the NEPA process, we're also required to consult
8 not only with D.E.P., but depending on the issues,
9 various agencies: historical committees, Fish &
10 Wildlife, depending on what the issues are. So
11 they're just to name a few off the top of my
12 head. And I don't know if there are any others.
13 But the bottom line is we have an ongoing working
14 relation both with the radiation end, and also
15 with Donna Gafligan with respect to the Superfund
16 activities.
17 MR. GILLEN: Though they are
18 independent, we always cooperate. We don't have
19 to wait for the state to approve the same -- react
20 on our own in this case.
21 MR. HARP: Next question. Sir?
22 MR. McKEE: Yes. My name is Tom McKee,
23 M-c-K-e-e. I'm a volunteer technical assistant
24 with Councilman Milton and Assemblyman Mayer. And
25 I have a question about the financial assurance.

Page 60

1 We were provided with a sheet that lays out some
2 of the money that's going to be used for --
3 MR. GILLEN: The one that I just handed
4 out.
5 MR. McKEE: Right. And to me, this
6 looks like a list of construction costs. And I'm
7 wondering if that is an appropriate -- is this
8 actually financial assurance, or is this
9 construction costs? Are they two different
10 things?
11 MR. GILLEN: One feeds the other. There
12 has to be a cost estimate that involves
13 construction costs as well as any other costs that
14 would be involved to get into the end point of the
15 completion of decommissioning; whatever is
16 proposed. So first of all, they have to lay out
17 the cost. Then they have to provide the mechanism
18 to make that money available in financial
19 assurance.
20 MR. McKEE: Right. But this money will
21 be consumed in the construction. So in terms of
22 the long-term financial assurance that will
23 provide for maintenance, monitoring, and
24 catastrophe response --
25 MR. GILLEN: Financial assurance would

Page 61

1 change after they get to that point.
2 MR. McKEE: So this figure of five
3 million is not necessarily the money that will be
4 in financial assurance after they construct their
5 -- do we have any idea what that figure is?
6 MR. GILLEN: Yes. They would have to
7 have that available. If we told them --
8 MS. OLIVA: That's that $19,000 per
9 year. And when you take that out over a thousand
10 years, depending on whether you use the 3 percent,
11 the 7 percent discount rate, it ranges from
12 $277,000 lump sum in today's dollars, to
13 $655,000.
14 MR. McKEE: So the financial assurance
15 could be as low as $270,000?
16 MS. OLIVA: Yes.
17 MR. McKEE: Is that sufficient to
18 respond to catastrophe scenarios, such as the
19 failure of the cap, or erosion by a hurricane, or
20 things like that? Where would that money come
21 from?
22 MS. OLIVA: It includes a regular amount
23 of maintenance every year. Some years we won't
24 spend that. Some years you'll spend more than
25 that. So it does allow for different events.

Page 62

1 MR. McKEE: But it seems to me that if
2 you calculated that 50 million dollars will be
3 necessary if that material has to be removed, a
4 financial assurance of only -- which is a worst
5 case scenario -- of only $200,000 is not in the
6 ballpark.
7 MR. HARP: Well, I'm sorry to respond.
8 But the financial assurance, if accepted, would
9 assume that the in situ plan is the one that we're
10 going to go with.
11 MR. McKEE: But given that is the one
12 that actually happens, a financial assurance of
13 only $200,000 for foreseeable contingencies
14 related to that facility, it seems like you have
15 to at least have as one of the scenarios you're
16 providing for is the removal of that material
17 eventually, if the license is not renewed or some
18 other catastrophe.
19 MR. GILLEN: There would be -- well,
20 generally I assume that they would -- they'd be
21 replacing it to its original state; not taking it
22 and disposing of it. If there's some kind of
23 disruption of the cover, they'd just put the cover
24 back on.
25 MR. McKEE: Right.

Page 63

1 MR. HARP: Okay. In the back, in the
2 middle.
3 MR. NESSEL: My name is John Nessel,
4 spelled N-e-s-s-e-l. Mr. Gillen, what impact
5 would the input from the general public have with
6 regard to the decision of the NRC to close this
7 site and leave the material on site?
8 MR. GILLEN: The comments that you
9 provide to us during the decommissioning process
10 will be considered in our review.
11 MR. NESSEL: That's basically it. My
12 other question is during the past two decades some
13 of the material that's in question has been
14 removed from site. What's the NRC doing to make
15 sure that that stuff isn't leaching into the soil,
16 or what are they doing to catch up with that
17 stuff?
18 MR. GILLEN: Been moved to where?
19 MR. NESSEL: There was some brought back
20 in front of the fire department on Oak Road. And
21 when the city of Buena found out that it carried
22 -- it was radioactive material, the city made
23 whomever brought it there -- I'm sorry to be
24 vague;I don't mean to be vague -- made them remove
25 that. Now, that's one situation that I know of,

Page 64

1 because it was in the newspaper. But there may be
2 other situations where the material was -- in
3 fact, I found a piece in front of Edgarton School
4 one day. I called the police department, tell
5 them there's a bunch of stone in the road. But
6 the thing is that that stuff has been removed from
7 site off and on during the last two decades. In
8 fact, it was ground on site, pulverized on site.
9 So my concerns are two-fold. You know,
10 what impact has all the dust done, number one.
11 But more importantly, the stuff that was moved off
12 site during the last two decades at different
13 intervals, at different times, what's the NRC
14 doing to track that down?
15 MR. GILLEN: We're not on our own going
16 out to do surveys to track that down. But I would
17 expect the licensee would have to include any
18 cleanup of any additional materials off site as
19 well as on site.
20 MR. NESSEL: Would they have to have a
21 record where it was brought to, and who carried
22 it?
23 MR. GILLEN: They should have, if it was
24 licensed by the NRC.
25 MR. NESSEL: I'm not sure how long you

Page 65

1 guys been involved. It's been two decades.
2 MS. MILLER: Marie Miller, NRC Region I.
3 I'm not aware of any material that was NRC-
4 licensed material that was removed from the site.
5 The reason I'm making the distinguishing point
6 here is that there was some -- there is some
7 material and there was some material at the site
8 that was -- may have contained some radioactivity,
9 but it was not at a level or concentration that
10 required NRC licensure. So I can't comment on
11 that at all because it's not within my purview.
12 But with regard to NRC material, the license
13 specifically prohibits the release of volumetric
14 material.
15 MR. NESSEL: Well, we don't know for
16 sure what material that was released on site. We
17 don't know if it was in fact NRC-licensed material
18 or not.
19 MS. WILLIAMS: Do you have a record of
20 it?
21 MR. SMITH: I'm not sure what material
22 you're talking about specifically.
23 MR. NESSEL: I'm not sure either. But
24 it was out in front of Edgarton School. And there
25 was some brought down -- I mean you guys must have

Page 66

1 some record of -- I don't know how many dump truck
2 loads to fill the retention basin in front of the
3 Vineland fire department on Oak Road. That was in
4 the newspaper. And that's how I knew about it.
5 But I'm going back a few years now, in all
6 fairness.
7 MR. GILLEN: If you have information on
8 this, provide it to us and we'll look into it.
9 MR. NESSEL: Other than just going and
10 researching the newspaper. They would probably
11 have better records than I could probably get, if
12 in fact there are records of it.
13 MS. WILLIAMS: What year was that, John?
14 MR. NESSEL: I don't remember.
15 MS. WILLIAMS: I remember hearing that,
16 but I don't remember --
17 MR. NESSEL: Probably about ten years
18 ago, I'm guessing.
19 MR. GILLEN: Part of the DP includes the
20 characterization. That's an historical look at
21 everything that was done. So if they submit
22 something in there and you think there are things
23 that are missing --
24 MR. NESSEL: But I won't know. Other
25 than that particular thing, I don't know, I can't

Page 67

1 say what other stuff was brought off-site. I
2 don't have any indication. I mean we didn't have
3 as much -- we didn't have a group such as the SAA
4 -- whatever that is, board, to go ahead and
5 monitor that. In fact, we have no rights to go on
6 this property to see what's going on or what's
7 going off, so to speak.
8 MS. WILLIAMS: They don't have to give
9 us any.
10 MR. NESSEL: We have no information at
11 all. In fact, our own fire department isn't even
12 allowed on site, is my understanding, unless
13 they're invited onto the site. Is that accurate?
14 It's kind of like, you know, the X Files here
15 almost, you know. And we're concerned. I mean we
16 have some serious concerns. And I apologize for
17 my manner. I know Mr. Smith characterized me last
18 time as being somewhat abrasive or aggressive.
19 And that's just me. But the point of the matter
20 is that we are concerned. We are very concerned.
21 And the rumor around town is the fact that you,
22 being the NRC, not you personally, but the NRC is
23 entertaining the situation of closing the site
24 here, encapsulating the material here on site, and
25 the D.E.P. takes a different view. That's just

Page 68

1 information I'm receiving from other people. And
2 I'm concerned about that.
3 MR. GILLEN: We have to entertain it as
4 part of our regulations. It evolves. Not just at
5 this site, but any site has the option.
6 MR. NESSEL: Your meeting in Washington,
7 is that -- for what purpose?
8 MR. GILLEN: Which meeting in
9 Washington?
10 MR. NESSEL: You said something about
11 your meeting in Washington.
12 MR. GILLEN: What I said is we will have
13 a meeting similar to this once we've reviewed the
14 decommissioning plan that will be here. Not in
15 this room though. It's too damn hot.
16 MR. NESSEL: I made that suggestion last
17 Council, but no one took advantage.
18 MR. GILLEN: The meetings in Washington
19 I'm talking about are at some point in time during
20 our review I may have a health physicist that has
21 an issue that he wants to discuss with the
22 licensee, and we'll bring them in. And those
23 meetings are the ones that I spoke of that we
24 would give two-week notice if the public wants to
25 be involved. Sometimes the state gets involved,

Page 69

1 and they patch in it by phone and they listen to
2 the meeting. Those kind of meetings are in
3 Washington.
4 MR. NESSEL: The other thing is we as a
5 community, I suggested it to Council, that we as a
6 community hire an attorney, an environmental
7 attorney, to protect we the citizens and our
8 property values. And I think that's a good idea.
9 At what point does he become part of the noticed,
10 you know, list I should say, I guess? I mean if
11 we did that, would you be obligated to notify him,
12 if we make him a matter -- I mean I'm sorry. An
13 attorney of record for the Borough of Newfield?
14 MR. GILLEN: I think we would.
15 MR. HARP: The lady in the back.
16 MS. RAGONE: Terri Ragone, R-a-g-o-n-e.
17 At what point in the process is the environmental
18 impact study done, and how is that disseminated to
19 the public, you know, prior to any public
20 meetings? That's the first part of the question.
21 And the second one is the petition. When you say
22 request revocation or suspension of license or
23 whatever, what rights does the public,
24 municipality have to petition your decision? And
25 how, you know, how effective has that been? Do

Page 70

1 you have any precedents where a town has put forth
2 a petition, rejected your, you know,
3 recommendation that the process go forward?
4 MR. GILLEN: I'll start with the first
5 -- well, I'll start with the second question. I'm
6 not aware of incidents where the public has
7 changed the total plan. And I'm sure there are
8 probably some out there, but at least in my
9 involvement in our decommissioning program. And
10 this restricted release option is not a frequent
11 one. It's, you know, so most sites --
12 MS. RAGONE: We might be the first.
13 MR. GILLEN: There's a couple other
14 ones. There's one in the state of Ohio.
15 MS. RAGONE: I'm familiar with this.
16 MR. GILLEN: So I can't give you an
17 example of where the public -- I know the public
18 has certainly changed aspects of the plan.
19 MS. RAGONE: So what is that petition for
20 then on your -- you have notification hearings,
21 petition.
22 MR. GILLEN: The hearing process, as
23 I've described, is one which when we notice
24 receipt of the decommissioning plan, anyone has
25 the right to request a hearing and provide the

Page 71

1 basis for why they disagree with whatever's being
2 proposed and get involved in our hearing process.
3 MS. RAGONE: But you don't know what that
4 petition would involve in terms of the public
5 involvement, what --
6 MR. GILLEN: The 2206 petition that's on
7 the slide?
8 MS. RAGONE: Yes. That's a public
9 petition.
10 MR. GILLEN: That's a petition on any
11 issue related to -- that's another process.
12 MS. RAGONE: So the public has a right
13 to at least petition with their --
14 MR. GILLEN: Correct.
15 MS. RAGONE: -- opinions, grievances,
16 whatever, to the NRC for your decision. Can that
17 petition go to litigation, or -- I'm just trying
18 to understand the process.
19 MR. GILLEN: Marie's reminding me that
20 on our website there's a description of that
21 process. And also through the website you can get
22 to part 2, which describes the whole hearing
23 process of our code of federal regulations.
24 MS. RAGONE: We have submitted a
25 petition with 200 names on it early on, because

Page 72

1 the very first time that we heard about this
2 meeting, which was held in Vista, not in Newfield,
3 what? How many years ago? Almost ten years ago.
4 MS. WILLIAMS: It was in Franklin
5 Township. It was in Delsea Regional back in '93,
6 I believe.
7 UNIDENTIFIED SPEAKER: '94.
8 MS. RAGONE: That was the first time
9 that we actually heard about the decommissioning
10 process and what it was. So we did petition them
11 to hold it here, and we did have meetings here
12 through the years to try to get some information
13 about it and get some public awareness. So I'm
14 just wondering what the step is in terms of
15 legally opposing any kind of decision. You know,
16 if the municipality has any --
17 MR. GILLEN: It's all laid out in
18 Part 2.
19 MS. RAGONE: I'll take a look at it.
20 MR. GILLEN: If I had one of my lawyers
21 here, he could probably describe it to you in
22 detail. But unfortunately I'm an engineer, not a
23 lawyer.
24 MS. MILLER: To comment on that. Marie
25 Miller, NRC. If you go to the website and under

Page 73

1 Part 2, they do provide contacts that you can
2 contact an NRC legal person to provide general
3 guidance about the process. As technical people,
4 we're not adept at that. But that's why we refer
5 you there.
6 MS. RAGONE: You can see our concerns.
7 I mean we have no regress, as Linda Graumann
8 pointed out. We have no regress, it looks like,
9 to -- as the public.
10 MR. GILLEN: I've laid out multiple ways
11 by which the public can involve themselves through
12 comment and hearing requests and petition.
13 MR. HARP: The gentleman --
14 MR. BUONO: My name is Fred Buono,
15 B-u-o-n-o.
16 MR. HARP: Is that "B" or "D"?
17 MR. BUONO: "B." Maybe I'm a little bit
18 behind the times here, and I apologize; kind of
19 operating on just semi-reliable rumors. Where has
20 the NRC been for the 20 years that we've been
21 having a slag pile pushed on us? I mean at what
22 point did you come into this process, that now we
23 have to abide by your decision?
24 MR. GILLEN: Do you know what year?
25 MS. MILLER: I don't know the year.

Page 74

(Off the record discussion.)
MS. MILLER: I'm just consulting. I'm not speaking --
MR. GILLEN: She's referring to the timeliness rule, which is -- at best it's related to decommissioning. I think these questions go beyond that, back when did we first begin licensing this material.
MS. WILLIAMS: It was licensed in '55, right? By the Atomic Energy Commission? And then the NRC came in --
MR. BUONO: I don't know why she's answering my question. But I was asking it to you.
MR. GILLEN: Well, she knows the date.
MS. WILLIAMS: I know the date, because I know -- '55 they -- right? '55, you started your operations?
MR. SMITH: We started our operations, but I'm not sure when we started our --
MR. HARP: Too many people talking at once. Okay. The question really was when did the NRC license, the operating license, go into effect. That's when NRC asserted jurisdiction over their predecessor agency. We don't have the

Page 75

exact date. Loretta Williams thinks it was about 1955. It's been at least since 1960, do you think?
MR. SMITH: Yes.
MR. HARP: So it's been an operating license for 35 years, plus.
MR. BUONO: So theoretically you've been licensed and supposedly monitoring this all this time?
MR. GILLEN: Correct.
MR. HARP: I'm sorry. We're not through with you. Does that answer your question?
MR. BUONO: That answered my question. Thank you.
MR. HARP: Okay. Anybody else who hasn't? This gentleman right here.
MR. WHITE: My name is Robert White. I live here in Newfield.
MR. HARP: How do you spell your last name?
MR. WHITE: W-h-i-t-e.
MR. HARP: Thank you.
MR. WHITE: You get very few opportunities in your lifetime to shut up, and this probably should be mine. I'm looking at the

Page 76

cost of this. And what I'm getting out of this whole thing -- this is the first time I've been to this thing. It looks to me -- correct me if I'm wrong -- if you guys follow the criteria that the NRC has laid out, you guys are home free. Am I right or wrong?
MR. HARP: Well, the NRC has to approve the license. And we're a long way from that. But assuming we can, yes.
MR. WHITE: Okay. Well, I'm looking at 53 million dollars. Between getting rid of it -- and I don't know where you'd do it. I don't know if you could take it to Yucca mountain. Can you do that? No. But you're going to spend five million dollars. That's a given. You're willing to do that. But you also would be willing to spend as much as 58 million dollars. Is that right?
MR. HARP: No.
MR. SMITH: No.
MR. HARP: Wrong.
MR. WHITE: Okay.
MR. HARP: One of the analyses that Dave Smith referred to is ALARA, A-L-A-R-A, As Low As Reasonably Achievable. And that had to do with

Page 77

costs for alternate methods of disposal, including off-site disposal. So the 58 million, or whatever the number is that you're looking at, was an alternative for off-site disposal. It's not something the company was proposing to do. It's just showing that that would be the cost if they had to do that.
MR. WHITE: Okay. Another question I have is how much radiation is actually being emitted right now as we're talking? Anybody know?
MR. SMITH: Carol, do you want to do a little explanation?
MS. BERGER: Carol Berger. Radiation is everywhere, and it's part of life. So it's not --
MR. WHITE: That's true. You're talking millirems.
MS. BERGER: Right. You have to separate what is naturally occurring and what we're exposed to every single day versus what is contributed by the Shieldalloy operation. And you've heard the numbers. The term millirem, that's just a unit of radiation exposure, just as miles per hour is a unit of speed, and so on. So

Page 78

1 to try to put some of these numbers in
2 perspective, in order for the NRC to approve the
3 decommissioning of the Shieldalloy site,
4 Shieldalloy has to be able to demonstrate to them,
5 to all of their technical satisfaction, that a
6 member of the critical population does not receive
7 more than 25 millirem in any given year. That's
8 the first number to start comparing with.
9 People, just as part of being alive,
10 from radiation exposure we receive from the
11 cosmos, from the ground we walk on, from the food
12 we eat, the water we drink, the air we breathe, we
13 receive anywhere, depending upon where we live in
14 the county, annual average background radiation
15 dose ranging from about 200, 250 millirem to
16 sometimes as high as a thousand. Again, there's a
17 lot of things that go into that. The annual
18 average is about 360 millirem. So that might give
19 you a point of comparison.
20 The 25 millirem is the dose objective.
21 That doesn't mean people will actually receive 25
22 millirem from the decommissioned site. It just
23 means that Shieldalloy has to demonstrate that no
24 one will exceed that. The actual doses are likely
25 to be none. But that's the dose objective that

Page 79

1 has been set by the NRC. So I don't know if that
2 helps or not.
3 MR. GILLEN: He wants to know what's
4 coming off of the pile right now.
5 MS. BERGER: Off of the pile right now?
6 Where you're standing right now, you're getting --
7 MR. WHITE: If I was over there leaning
8 up against that pile, what would I be absorbing?
9 An x-ray, or what?
10 MS. BERGER: No. Again, radiation dose
11 depends upon where you are with respect to the
12 pile, how long you stay there, and then the
13 various pathways for exposure. If you're up next
14 to the pile somewhere, you're being exposed pretty
15 much only by direct radiation. Those are great
16 big rocks. It's really hard to inhale these great
17 big boulders. So unless you're chinking it around
18 or kicking up dust. The only real pathway for
19 exposure, when you're in that storage yard back
20 where that pile is, is direct radiation exposure.
21 Shieldalloy has got little monitoring
22 devices that go all around the outside of the
23 fence there. And we know the exposure rate at
24 different distances from that pile all around.
25 There's one spot that's very close to the pile.

Page 80

1 There's a monitoring device very close to that
2 pile. And then others are farther away. The ones
3 that are farther away on the far side of the
4 fence, and so on, they're indistinguishable from
5 regular normal background exposures. If you get
6 right up next to that pile, you will receive
7 radiation exposures on a quarterly basis of -- if
8 you stood there 24 hours a day, you know, for
9 three months straight -- you can't leave at any
10 point in time; you must stand there -- I believe
11 it was 200 millirem. 200, 230, something along
12 those lines.
13 MR. SMITH: What's that compared to an
14 x-ray?
15 MR. WHITE: Okay. So what you're saying
16 --
17 MS. BERGER: Well, a CAT scan of the
18 whole body could be something on the order of --
19 MR. WHITE: I'm sure it's very low. I'm
20 sure it's very low. But what you just said is ten
21 times more than what you said earlier. And I'm
22 sure -- you know, I don't want to sound like an
23 alarmist. But I guess I'm just going to say it
24 right out, just say it right to your face. You
25 guys been putting that stuff out there for I don't

Page 81

1 know how long. You're going to pay a few million
2 dollars and you're going to buy it back, and
3 Newfield's going to get left with it for a
4 thousand years. Now, if it's not such a big deal,
5 why not just pave the streets with it or something
6 and be done with it? You know what I'm saying?
7 Why are we making such a big deal out of nothing?
8 MR. SMITH: That's a good question.
9 MR. WHITE: Maybe you want to answer
10 that.
11 MR. HARP: Good question.
12 MR. WHITE: Can anyone answer that?
13 MS. GRAUMANN: I think what his question
14 is if it's not a big deal, why are we making a big
15 deal. Isn't that correct? If the pile in fact is
16 not really --
17 MR. WHITE: We're going to have 67 acres
18 in Newfield, which is a lot, that nobody's going
19 to want.
20 MR. HARP: Well, one of the things we
21 talked about in the meetings earlier, for
22 alternative uses in the steel industry. For
23 example, the slag has value. But somebody would
24 have to either become a co-licensee with
25 Shieldalloy or get their own license to handle the

Page 82

1 stuff. Another application would be for an
2 artificial reef in the ocean. So no, no.
3 Please.
4 UNIDENTIFIED SPEAKER: D.E.P. refused
5 that.
6 MR. HARP: D.E.P. has a rule that
7 nothing radiological can be there. But everything
8 is radiological. But anyway, so in New Jersey
9 that wouldn't work. Other areas don't have that
10 kind of restrictions. But really, if you study
11 that material and its potential for radiation and
12 exposure values, a thing like an artificial reef
13 would be good. But we're not able to do that in
14 New Jersey.
15 One of the things that the company has
16 talked about is keeping their options open for
17 some kind of alternate disposal somewhere. Not 58
18 million dollars to get rid of it somewhere, but
19 actually have it be reused. So your idea about
20 putting in a road, that would be nice, except the
21 regulations don't allow it.
22 MR. SMITH: We've actually contracted
23 for a study with Penn State University for looking
24 at use of it as an aggregate in concrete and
25 special types of situations like airport runways

Page 83

1 and stuff like that. But it just becomes cost
2 prohibitive, and the regulatory issues are very
3 difficult to get over. So it's something that
4 we're looking at and we'll probably -- even after
5 the pile gets capped, one of the things about
6 having a long-term control license, the license is
7 -- can be amended later on if there is a
8 beneficial use that can be found.
9 MR. WHITE: I guess what I'm -- I'm just
10 going to finish up with this. Looks to me like
11 everyone has kind of just assumed the fact that
12 we're going to get left with this thing, we're
13 going to do what we have to do, and then we're
14 going to go on our way. That's what I'm getting
15 at. And then further on down the line we're going
16 to have a petition with the NRC, and maybe there
17 will be something resolved with that. I don't
18 think Newfield wants that thing left here. That's
19 -- I mean you can gather that from just seeing the
20 people out here night. And with that being said,
21 I guess that's all I can really say about the
22 matter. Except the fact that Newfield -- pardon
23 the expression -- is getting dumped on here. And
24 I really believe that. And I'm just sorry to hear
25 it, because I like this little old town.

Page 84

1 MR. HARP: These questions really are
2 for Mr. Gillen.
3 MR. WHITE: That's true.
4 MR. GILLEN: That one wasn't.
5 MR. HARP: No, I know that. But what I
6 meant to say was this question section from the
7 public is really directed to Mr. Gillen. We kind
8 of strayed a little bit. Jenny, you have a
9 question?
10 MS. GOODMAN: Yes. I maybe wanted to
11 address your question. And you can correct me if
12 I'm wrong. But you gave the example of the TLD
13 that's the closest to the pile. So if you were
14 there for a year, it would be about 920 millirem
15 just from direct exposure. From background
16 direct exposure you would expect about 43 millirem
17 per year. So that just gives you a comparison.
18 MS. RAGONE: And where did you get
19 those figures? That was my question. Some of
20 those studies, aren't they public, be they federal
21 registry or other?
22 MS. GOODMAN: The TLD data, I just got
23 the last two years from Mr. Smith. The
24 background, I'm just assuming five microwatt per
25 hour.

Page 85

1 MS. BERGER: It's 5 to 18.
2 MS. GOODMAN: So I was a little low.
3 But just to put it in perspective, which I think
4 was your question.
5 MS. RAGONE: According to Ken Kalman,
6 who worked at the NRC last year, April of 2004,
7 there was radioisotopes above the E.P.A. screening
8 limit in the groundwater exceeding their limit in
9 the immediate vicinity of the slag pile. And I
10 have that in an email. So that does give you some
11 sense that there are some contaminations.
12 MS. GRAUMANN: I'm sorry, Terri. Did I
13 understand you to say that the email indicated to
14 you that there's radioactivity in the water?
15 MS. RAGONE: Radio isotopes above the
16 E.P.A. screening limit in the immediate vicinity
17 of the slag pile. In other words, they aren't
18 further afield. But as you get closer, they are.
19 And they said that they were. There was to be an
20 inspection in April of 2004 to be analyzed. And
21 that's as far as I got.
22 MR. MILTON: My name is James Milton.
23 I'm a resident of Newfield. M-i-l-t-o-n.
24 Recently our tests they do -- you know, they send
25 that to us every year -- they had to come back and

Page 86

1 do a second test because the alpha numbers were
2 over the limit. That was only a couple months
3 ago.
4 MS. RAGONE: This was in 2003. They
5 said they would be able to determine whether there
6 was an increase in gross alpha or gross beta
7 activity that may be attributable to the
8 radioactive isotope.
9 MR. MILTON: This was our well, our
10 municipal well, a couple months ago.
11 MS. RAGONE: So I'm just saying there's
12 information -- there's some information gap here
13 that --
14 MR. MILTON: A little less than half a
15 mile away.
16 MS. WILLIAMS: Upgrade.
17 MR. MILTON: Test wells have showed
18 positive for chromium up there.
19 MS. GRAUMANN: Do you have information
20 on that? No?
21 MR. HARP: That's sort of an NRC
22 question. Sir?
23 MR. SHINDEL: Richard Shindel,
24 S-h-i-n-d-e-l. I have a question for the NRC. In
25 the other facilities that were capped over like

Page 87

1 this one here, were they the same radionuclide,
2 the same energies? And what were they
3 contained -- were they the same aggregates? Do
4 you know?
5 MR. MILTON: No.
6 MR. GILLEN: Almost. There are a
7 number of sites around the county that have been
8 capped. There's generally uranium mill tailing
9 sites.
10 MR. SHINDEL: Low population?
11 MR. GILLEN: Pennsylvania. Texas.
12 MR. SHINDEL: Generally low population
13 densities though?
14 MR. GILLEN: Not in Pennsylvania. But
15 generally in the west, yes.
16 MR. SHINDEL: Yeah. Because I mean I
17 know the technology, and it's commonly used out
18 West. I didn't know if it was used in the Midwest
19 or even on the East Coast. And there's problems
20 with that technology as well. Also, as I sit here
21 and listen to this -- that was the only question I
22 had for the NRC.
23 As I sit here and listen to your
24 description of radiation dose, right? What's
25 disturbing to me is this characterization is

Page 88

1 somewhat misleading. Because if you don't know
2 the energies and the radioisotopes, if you're just
3 talking about radiation exposure -- you have to
4 talk in terms of contamination. And you have to
5 talk in terms of uptake. And you have to talk in
6 terms of alpha energy. Because if you don't talk
7 in those terms, then you're not talking about the
8 hazards to the public. I'm not worried about the
9 radiation coming off the slag pile. Why?
10 Because it's just gamma radiation. If you're not
11 standing close to it, it doesn't affect you. It's
12 really no big deal.
13 The concern is leaching from acid rain
14 or whatever of the materials into the water
15 system. I don't see any cost here related to
16 doing water testing. I don't see anything in the
17 remediation plan that talks about preventing
18 entrance into the groundwater. I don't see any
19 airborne contamination issues for the slag
20 movement. Because those are just bad, right? If
21 you get an alpha emitter in your lung, it's a far
22 greater -- these are very low energies -- it's a
23 far greater damaging issue than if you're standing
24 next to a slag pile. I'll sleep on a slag pile,
25 but I won't inhale dust from it. I won't.

Page 89

1 Because I know better. Because an alpha emitter
2 in your lungs is bad. And depending on what the
3 nucleoids are. It could be strontium, which is a
4 great bone seeker. It could be iodine, which goes
5 to your pituitary system. You pick your hazard.
6 But it seems strange to me that the discussion
7 doesn't talk about that at all. Nor does the
8 remediation plan.
9 So I find the conversation somewhat
10 misleading. And when you were talking about dose
11 events, when the woman was speaking about that, I
12 found it surprising when the woman asked you,
13 well, if you remove it all, what will it change
14 the dose to, and you said 25. And that's not the
15 case. You remove it, it's not there.
16 MS. WILLIAMS: It's not there. That's
17 what I'm saying.
18 MR. SHINDEL: What you were reporting
19 was your restricted limit as a license holder. I
20 understand that. It's 25 millirem at the fence.
21 That's fundamentally the same restriction for any
22 license holder. But to say that to the lady was
23 pretty misleading.
24 MR. GILLEN: I want to clarify that we
25 have lots of sites that dispose of material, but

Page 90

1 they still have a standard that we have that they
2 can leave residual radioactivity at a site that's
3 25 millirem. What I'm saying is even if they ship
4 it all off to Utah, they might still leave some
5 around. It's not going to be totally zero.
6 MR. SHINDEL: You can't do it.
7 MR. GILLEN: But it's probably less than
8 25. I would say that.
9 MR. SHINDEL: Yeah. It's incredibly
10 impractical to haul everything away. I've got
11 that thoroughly covered and understand it, you
12 know. But to hide behind the foil of ALARA is
13 kind of surprising, particularly with people here
14 who know that was a design really for not
15 environmental concerns; more so for industrial and
16 the life in the '50s.
17 MR. HARP: We're delaying our --
18 MR. SHINDEL: All I'm saying to you is
19 that I find the conversation misleading about the
20 radiation doses, because you're not talking about
21 contamination. And I found it surprising that the
22 remediation plan doesn't talk about groundwater
23 contamination. That's all.
24 MR. HARP: Well, actually in detail it
25 does. And that's what the purpose of the cap is,

Page 91

1 to keep stuff from running through the landfill
2 into the groundwater. And the portions of the
3 cost estimate would include monitoring. So I
4 think unless you -- we gave a summary of what the
5 cost estimate was, the actual plan. And all those
6 components are far more detailed, as are the dose
7 scenarios that are required to show, to
8 demonstrate compliance with a 25 millirem per
9 annum.
10 MR. SHINDEL: Also you said it's
11 uphill. Uphill according to the aquifer movement
12 that is known? Or uphill physically on a
13 topographical basis? I mean because unless you're
14 talking in terms of the aquifer movement, then
15 it's really neither here nor there, what
16 topographic arrangement is.
17 MR. SMITH: Upgrading from the
18 groundwater movement.
19 MR. SHINDEL: Upgrading from the
20 groundwater movement.
21 MR. SMITH: Yes.
22 MR. SHINDEL: I understand. They serve
23 you with a dye, or do they do that with what?
24 MR. SMITH: Water level measurements
25 from various soils and U.S.G.S. measurements.

Page 92

1 MR. SHINDEL: So it's a U.S.G.S.
2 measurement from like 1962.
3 MR. SMITH: Regional.
4 MR. SHINDEL: So you don't know what the
5 local movement is then. You have no idea.
6 UNIDENTIFIED SPEAKER: It's a very
7 complex system because there's so much pumping
8 from --
9 MR. SHINDEL: Sure. Every time you
10 draw, you can pull the waterway any way you want,
11 especially --
12 UNIDENTIFIED SPEAKER: Agricultural as
13 well as --
14 MR. HARP: Excuse me, gentlemen.
15 Anything else for Mr. Gillen?
16 MR. SHINDEL: I thank you. I didn't
17 mean to --
18 MR. HARP: No, but we're getting into a
19 dialogue that was not related directly to this.
20 And we're going to come back to questions from the
21 public when we get through this meeting.
22 MS. MILLER: I think there was a
23 statement made --
24 MR. HARP: Go ahead. For the record --
25 MR. GILLEN: That is related to the

Page 93

1 question on the groundwater.
2 MS. MILLER: Right. Marie Miller, NRC.
3 The inspection report is dated March 20th, 2005.
4 That was issued. And it included the groundwater
5 sampling that was -- NRC did some independent --
6 in the NRC inspection report there that was issued
7 in March, 2005, we collected five water samples
8 from the Shieldalloy property. We independently
9 analyzed that through our laboratory, our contract
10 laboratory, which is the environmental survey and
11 site assessment program at the Oak Ridge Institute
12 for Science and Education. The results were
13 included in that inspection report. And the
14 samples were analyzed for gross alpha and gross
15 beta. And all five groundwater monitoring wells
16 that were sampled were less than the
17 Environmental Protection Agency screening limits
18 for groundwater.
19 And the wells that we sampled were the
20 wells -- we specifically selected the wells that
21 perhaps would show the highest level. So we did
22 conservative sampling. I know the state did some
23 additional sampling. I can't speak on their
24 behalf. And then as the gentleman mentioned,
25 there was some other sampling. Again, I'm not

1 addressing those. I'm just addressing these five
2 samples that we took. I had shared this with Ken
3 and also with the Mayor's office. So if there's
4 any questions with regard to that, I'd be happy to
5 discuss those later tonight, or give me a call at
6 my telephone number. Thank you.
7 MR. HARP: The court reporter needs to
8 change paper, so we can take -- go outside and get
9 some fresh air.
10 (Whereupon, a recess was taken from 8:30
11 to 8:45 p.m.)
12 MR. HARP: We're going to resume this
13 meeting. Please take your seats. Okay, guys.
14 Mr. Nessel, your hand is up to talk.
15 MR. NESSEL: Yes. I have one other
16 question for Mr. Gillen, if I may, please.
17 MR. HARP: Okay. Mr. Gillen, one more
18 question.
19 MR. NESSEL: My name is John Nessel
20 again.
21 MR. GILLEN: Can I make a couple of
22 clarifications when -- I just stood up, because I
23 was talking to a number of people on the break,
24 and a couple things I want to clarify. One is I
25 think I mentioned when we do our environmental

1 review or we -- I said environmental assessment.
2 In the case of a restricted release proposal to
3 NRC, we immediately do an environmental impact
4 statement. So we go through a stronger analysis
5 than just the environmental assessment, which is a
6 lower review. So in this case we did an
7 environmental impact statement.
8 The other thing I wanted to clarify is
9 when I talked about the criteria that we have in
10 part 20 about restricted and unrestricted release,
11 I may have given the impression that anybody out
12 there who's a licensee to NRC can just say I want
13 to go with restricted release and leave material
14 on my site and have this option. Any licensee has
15 the alternative to propose that. But there are a
16 number of hurdles. The normal course of action is
17 the preferred option of unrestricted release,
18 disposing of all the material, as you all would
19 like.
20 But if they're going to go to a proposal
21 for restricted release, they have a number of
22 hurdles, arguments to make to the NRC to allow us
23 to approve that. It's not just here it is, and
24 NRC, you got to approve it. So there's a number
25 of things, and it's in the regulations, about what

1 needs to be done with regard to various arguments.
2 And of course the institution of controls that we
3 talked about. That's just two points.
4 MR. NESSEL: Along those lines, I have a
5 second question. Along those lines, who's to
6 say -- you said they have hurdles to -- in other
7 words, as long as they meet that criteria, they'll
8 get the opportunity to store that on site.
9 MR. GILLEN: Correct.
10 MR. NESSEL: So basically if they do
11 what you say you want them to do. As a taxpayer
12 and a citizen of the Borough of Newfield is
13 saying, listen, I don't really want this stuff
14 here; what can we do to get it off-site, really
15 doesn't mean a whole heck of a lot.
16 MR. GILLEN: It does if you can plan out
17 something that causes us to disagree with what
18 they propose.
19 MR. NESSEL: Yeah. But if you're
20 setting up restrictions and specifications and
21 they're meeting that, and you say no, can't they
22 sue you for not --
23 MR. GILLEN: You're right about the fact
24 that if they meet everything we require of them in
25 our regulations and make an acceptable proposal to

1 us, we will accept it, yes, even if we don't like
2 it.
3 MR. NESSEL: So your decision won't be
4 based on whether or not the community submits a
5 petition to you saying no, we don't want this
6 here. That doesn't really hold that much weight
7 with you. As long as they meet the restrictions
8 that you set in place, then that's basically it.
9 So basically having meetings with the public is
10 just basically to assure the public that it's
11 going to be done in a proper way; not whether or
12 not we're going to stop it?
13 MR. GILLEN: That's correct.
14 MR. NESSEL: So in other words, you're
15 saying already that as long as they do what you
16 say, we're stuck with the slag pile.
17 MR. GILLEN: If they meet everything
18 that we require.
19 MR. NESSEL: Well, then why are we
20 having public meetings?
21 MR. GILLEN: Because maybe you'll raise
22 an issue that causes them to go back and have to
23 reassess. Maybe you want to know what --
24 MR. MILTON: Because it's part of the
25 compliance. Nobody really cares. They just --

Page 98

1 it's part of the compliance.
2 MR. NESSEL: What concerns can I raise
3 that you should already be raising, because you
4 have a lot more knowledge in that area than I'll
5 ever have. Do you understand what I'm saying? I
6 mean my biggest concern right now, based on
7 walking out the door, has to do with a cancer
8 cluster study. But that's going to be towards
9 Mr. Smith, because that's the portion of the
10 meeting that I think I need to direct that to him.
11 More importantly, if we find people --
12 if people come forth and say you know what, I took
13 material off from Shieldalloy and it's in my
14 property, on my property, and it's here for this
15 reason, that reason, or the other reason, and they
16 want to come forward because they think that
17 there's something has been done of concern. I
18 know Marie spoke about this already. I guess she
19 must have mentioned it.
20 MR. GILLEN: No, she didn't mention any
21 --
22 MR. NESSEL: Well, my concern, what
23 guarantees do they have that they're not going to
24 be responsible for the cleanup?
25 MR. GILLEN: The people who have the --

Page 99

1 MR. NESSEL: On their site. On their
2 property, yes.
3 MR. MILTON: Because there are people in
4 this room now that have it possibly on their
5 property.
6 MR. GILLEN: It depends on the
7 circumstances and the history of why it got there.
8 I mean if it was inappropriately disposed in
9 somebody's back yard, they'd be responsible.
10 MR. NESSEL: Suppose I bought it as
11 fill, and it's innocently --
12 MR. MILTON: Purchased as fill.
13 MR. NESSEL: Suppose I bought it as
14 fill, but for whatever reason -- and now I said
15 wait a minute, this might not be what I thought I
16 was doing. And I come to you and I say, you know,
17 Mr. Gillen, I got some stuff over here that I'm
18 not sure I'm supposed to have. Are you going to
19 say, well, Mr. Nessel, guess what?
20 MR. GILLEN: Either it was
21 inappropriately and illegally sold by the
22 licensee, or it was material that wasn't licensed
23 by NRC and we don't have anything to do with it.
24 MR. NESSEL: Okay. That's fine. So
25 then this property owner can come forward to you

Page 100

1 and say can you check and make sure this isn't the
2 material that we worried about, as opposed to
3 material we think it should be?
4 MR. GILLEN: Yes.
5 MR. NESSEL: That's fine. And the
6 homeowner is free of liability. Is that what
7 you're saying?
8 MR. GILLEN: I would charge the
9 homeowner to come out and survey their property.
10 MR. NESSEL: Who would have to pay to
11 have it cleaned out of there?
12 MR. GILLEN: I don't know the answer to
13 that.
14 MR. HARP: Okay. One more. That's it.
15 Because we got to go back to our --
16 MR. MILTON: I just want to reaffirm and
17 answer my question with him. So in other words,
18 I'm not going to say it. Everything, the way
19 everything's going here, reading from -- you've
20 reviewed past reports, knocked down a little bit.
21 But everything's on sight with leaving that stuff
22 here. There's no -- you're not going to come back
23 and say, hey, we changed our mind, we want out of
24 here. You change your mind is what I mean.
25 Because --

Page 101

1 MR. GILLEN: We don't have our mind made
2 up.
3 MR. MILTON: You're right on track for
4 leaving it here with them. Right?
5 MR. GILLEN: We have an option that
6 allows them to pursue leaving it here. I'm not --
7 we have not reviewed anything.
8 MR. NESSEL: It doesn't matter.
9 MR. GILLEN: Your position that if they
10 meet every requirement we have related to
11 restricted release, yes, we would approve it on
12 this site.
13 MR. NESSEL: But what input do we have
14 as citizens?
15 MR. HARP: We're re-frying the same egg
16 here.
17 MR. NESSEL: I don't think so. We've
18 come up with a new point of view, new point of
19 view being the fact that the NRC has set up some
20 regulations, and as long as you follow those
21 regulations as far as me, him, her, and these
22 couple guys over here, it doesn't mean anything.
23 MR. HARP: He's already explained what
24 their position is. And this is the third time
25 I've heard it. So because we opened this up as a

Page 102

1 courtesy. But I really want to get back to this.
2 If you have more questions, we'll take them later,
3 but --
4 MR. NESSEL: That's fine. There's no
5 more questions. I understand.
6 MR. GILLEN: Our responsibility at NRC
7 is to ensure that whatever end result there is on
8 any of our sites, that the public health and
9 safety is taken care of.
10 MR. MILTON: Are you aware that D.E.P.
11 Commissioner Campbell has a fairly strong language
12 statement supporting the removal of that? Have
13 you seen that?
14 MR. GILLEN: I have not seen that.
15 Maybe you've seen it.
16 MS. MILLER: Yes. And the NRC has
17 responded to that.
18 MR. GILLEN: We've responded to
19 letters. We're aware of this.
20 MR. MILTON: Very strong language. Get
21 it out of here from Commissioner Campbell. You've
22 read that.
23 MR. GILLEN: Yes.
24 MR. MILTON: Okay. Thank you.
25 MR. HARP: Thank you. We're back to our

Page 103

1 internal business. Just as a matter of
2 housekeeping, the minutes of the November 5, 2004
3 meeting was circulated by Dave Smith. The only
4 comments that came back about it were from Donna
5 Gaffigan.
6 MS. GRAUMANN: I don't have a copy of
7 the minutes.
8 MR. HARP: Well, it went out. It went
9 out, did it not?
10 MR. SMITH: Yes, it did.
11 MR. HARP: It did. Anyway --
12 MS. GRAUMANN: Last year? Oh, I'm
13 sorry.
14 MR. HARP: November 5th of 2004.
15 Donna's was the only comment letter we received.
16 UNIDENTIFIED SPEAKER: I think the
17 meeting's a waste. It's a waste.
18 MR. WESTERGAARD: I didn't get a copy of
19 the minutes.
20 MR. HARP: Well, in any event --
21 MS. GRAUMANN: I have a file on you guys
22 at home. So I mean I'm not sure if I do or not.
23 MS. WILLIAMS: I think I got it.
24 MR. HARP: We think everybody got it
25 because we did get comments back from Donna

Page 104

1 Gaffigan. If you didn't get it, Shieldalloy
2 responded -- intended to respond in March of 2005,
3 but the letter did not get sent to Donna Gaffigan.
4 And I have copies of the letter, which we just
5 dated today, attached to which are minutes that
6 have been corrected in accordance with Donna's
7 comments. She hasn't had a chance to look at
8 everything because people were talking. But I
9 want to circulate this to everybody. And if you
10 have a problem with the minutes as they are,
11 please let David know as soon as possible. And
12 Donna is going to get back to him tomorrow. So I
13 will give, you know, the people here who --
14 MS. GRAUMANN: I do remember your
15 questions. Because you have me on the email.
16 I mean you have the original letter.
17 MS. GAFFIGAN: Addressed to me.
18 MR. HARP: Now, where do we go from
19 here? At our meeting of November 5 we again
20 requested input forms. And the only person to
21 submit any was the State of New Jersey. We're
22 going to request that if you have some input to
23 give us, that you do give it to us, and in the
24 following context: What you've heard tonight,
25 Chapter 16.

Page 105

1 MS. BERGER: Somewhere in there. They
2 get renumbered.
3 MR. HARP: Well, there's a chapter of
4 the decommissioning plan that will contain the
5 comments we have received to date. That will be
6 sent out to you by September 30th. Is that
7 correct?
8 MS. BERGER: Yes.
9 MR. HARP: And we will ask you to give
10 us your input at that time by October 14th. We
11 will then revise, if necessary, Chapter 16.4 to
12 incorporate all of that. Our submission to the
13 NRC will also contain a transcript of tonight's
14 meeting and the minutes of tonight's meeting. But
15 we're trying to get your input. We have comments
16 from you in the minutes. We have comments from
17 you, I guess just in the minutes, except for
18 mistakes. So we're anxious to get that together.
19 The submission date for the plan with all its
20 appendages and all its subparts is October 24.
21 That's why we're asking for your input by October
22 14th.
23 We will make available on the website
24 the various documents we're talking about prior to
25 their submission, except for Revision 1, which is

Page 106

1 the original decommissioning plan. We will have
2 available at the Township Borough in the library
3 input forms for any citizen to reflect. And they
4 will be included in the record as well. So that's
5 what we intend to do. Jenny, you have your hand
6 up.
7 MS. GOODMAN: Will the Chapter 5 dose
8 assessment be completed before October 14th then?
9 MS. BERGER: It should be. All of the
10 chapter should be done before October 14th. And
11 that chapter, the ALARA analysis and the
12 environmental report will be put on the website so
13 people can look at them.
14 MS. GRAUMANN: 10-14 was the date that
15 the comments had that to be in by also?
16 MR. HARP: Yes. All of the ones that we
17 thought you might have the greater interest in, up
18 and available.
19 MS. GAFFIGAN: Dated August 29th, you
20 sent comments to NRC on how you plan to address
21 the dose assessment in Chapter 5. When will we be
22 able to see that on the website?
23 MS. BERGER: We're going to try to get
24 them up early. But in reality, it will be -- when
25 the entire decommissioning plan is posted on the

Page 107

1 website will be on the 24th.
2 MS. GAFFIGAN: But how can we comment
3 and give you intelligent comments if we can't read
4 the entire dose assessment to understand exactly
5 what you're doing and that you're doing it in
6 accordance with the guidelines? We need more than
7 a day to incorporate that and form comments.
8 MS. BERGER: Right. The comments we're
9 looking for are primarily -- any comments are
10 welcomed. But the ones we're looking for
11 primarily are the ones that are required as part
12 of the restricted release process. And those are
13 the ones that the NRC is looking to us to respond
14 to in that chapter. The rest of the technical
15 issues associated with the rest of the chapters
16 that are there, that will come when the plan is
17 issued. And then everybody gets a chance to look
18 at it, provide your -- like if there's something
19 we're doing that you think isn't appropriate,
20 that's the kind of information I would say that
21 the NRC would like to receive from you.
22 MS. GOODMAN: Well, I think one of the
23 things that the SSAB is supposed to comment on is
24 the adequacy of the institutional controls. And I
25 don't think we can do that unless we have the dose

Page 108

1 assessment.
2 MS. BERGER: Well, but keep in mind that
3 with all of the institutional controls in place,
4 the dose must be less than 25 millirem, or the NRC
5 won't even talk to us about that. So it's going
6 to be something less than 25. But the comment on
7 the institutional controls, the effectiveness of
8 the institutional controls is the one thing that
9 is new, that is different. One of the biggest
10 differences between this version of the plan and
11 Rev. 0 of the plan is that the NRC becomes the
12 perpetual license, is one of the biggest changes
13 from that version. All the rest of the physical
14 controls are the same.
15 MS. GRAUMANN: Say that again? The NRC,
16 the biggest difference is that the NRC --
17 MR. HARP: The perpetual license is the
18 long-term --
19 MS. BERGER: Right. The federal long-
20 term oversight of the site. We talked about deed
21 restrictions and deeding the property to the state
22 or the borough. That was one of the primary
23 reasons why Rev. 0 the plan was rejected, because
24 the NRC didn't feel that that was a viable
25 institutional control. And so we waited then

Page 109

1 until we, meaning Shieldalloy, until the NRC
2 issued guidance, and that they would be willing to
3 issue a long-term control license where
4 Shieldalloy would in essence remain a perpetual
5 licensee, with the federal government looking at
6 the site as part of the licensing process.
7 MS. GRAUMANN: So how does that impact
8 the Borough then? I mean from our standpoint, is
9 that greater security?
10 MS. BERGER: That's the input that I
11 think the NRC is looking for from SSAB.
12 MS. GRAUMANN: It's a question. I don't
13 know. I'm asking the question. What are the
14 benefits of having the NRC be the perpetual
15 license control versus the original plan, which
16 was what?
17 MR. SMITH: The Borough, or possibly the
18 state.
19 MS. GRAUMANN: I'm sorry?
20 MR. SMITH: Or possibly the state.
21 MS. GRAUMANN: Could you shed a light on
22 that?
23 MR. GILLEN: The requirements in our
24 regulations with regard to getting up-front
25 information from this group essentially limits the

Page 110

1 information to -- I'll read it here: Licensees
2 proposing to decommission by restricted use of the
3 site shall seek advice from such effective parties
4 regarding the following matters. And one, whether
5 provisions for institutional controls proposed by
6 the licensee to provide reasonable assurance that
7 the dose will be 25 millirem. Will be enforceable
8 and will not impose undue burdens on the local
9 community. And then two, whether or not the
10 licensee has provided sufficient financial
11 assurance. So really the focus of the group's
12 comments are on the financial assurance and the
13 institution of controls.
14 MS. McKEE: An undue burden, is that
15 defined?
16 MR. GILLEN: Tom, I don't think it's
17 defined.
18 MR. McKEE: What would be an example of
19 that type of burden?
20 MR. GILLEN: Let's see. I think that
21 means -- that's in terms of the institutional
22 controls themselves, whether the controls that
23 they've set up are requiring, you know, that the
24 local community be somewhat involved in those
25 controls. Those kind of burdens.

Page 111

1 MR. McKEE: For example, opportunity
2 cost to the town in terms of what potential
3 development could be here versus having a
4 landfill. Would that be an undue burden?
5 MR. GILLEN: I don't think that fits
6 what we're talking about here. But you could
7 raise that issue.
8 MS. GRAUMANN: Yes. That would a good
9 comment to put on that comment sheet. But I guess
10 I don't understand -- and forgive me, but I guess
11 I just don't understand, why was this a key
12 change? Understanding this is something that the
13 NRC requested? Or this is part of their new
14 guidelines?
15 MR. SMITH: No. It's something we
16 requested of NRC because we saw a resistance from
17 the state when taking control. And NRC indicated
18 that the municipality was not a large enough
19 organization to last a thousand years, or comment
20 on it for a thousand years.
21 MS. GRAUMANN: We plan on it, but --
22 MR. SMITH: The town being here for a
23 thousand years. So we proposed, because we had
24 success out in Ohio with the possession only
25 license as being institutional control, we

Page 112

1 proposed a similar type of scenario to NRC. They
2 went through and developed guidance specifically
3 for the long-term control license.
4 MS. GRAUMANN: But I guess the
5 institutional control is limited to the items that
6 you just read off?
7 MR. GILLEN: No. What I just read was
8 the items that they're required by our regulations
9 to get up-front input on.
10 MR. HARP: This is a handout that we
11 gave out.
12 MS. GRAUMANN: I have a notebook at home
13 like this.
14 MR. HARP: I'll be happy to send it to
15 you again. But it's in your stuff, the
16 requirements of what we're looking for. And it's
17 also part of the --
18 MS. GRAUMANN: No, no. I'm trying to
19 understand from a practical standpoint what the
20 advantage is of this. What's the advantage? You
21 know, why --
22 UNIDENTIFIED SPEAKER: Is the meeting
23 amongst yourself? We can't hear anything.
24 UNIDENTIFIED SPEAKER: Nobody can hear
25 anything back here.

Page 113

1 UNIDENTIFIED SPEAKER: It's amongst
2 yourselves. What the hell's the use in being
3 here?
4 MR. HARP: Could you move up one row?
5 UNIDENTIFIED SPEAKER: They can't hear
6 either.
7 UNIDENTIFIED SPEAKER: Come on!
8 MS. GRAUMANN: One of the major
9 differences between the last --
10 UNIDENTIFIED SPEAKER: He's doing all
11 the yaking up there. Let's hear it.
12 MR. HARP: She's trying to speak so you
13 can hear her.
14 MS. GRAUMANN: One of the major
15 differences is this last revision has a provision
16 in there that the NRC is going to be the perpetual
17 license control. Is that correct?
18 MR. SMITH: Yes.
19 MS. GRAUMANN: And before, it was going
20 to be the state. And I'm just trying to figure
21 out what the advantages are to changing that.
22 MR. SMITH: The state resisted. They
23 said they would not.
24 MS. GAFFIGAN: They put out the plan
25 without asking us first whether or not we would be

Page 114

1 interested in working with it. And after we saw
2 the revision or the original document, no, we're
3 not interested in overseeing it.
4 MS. GRAUMANN: What exactly are the
5 responsibilities of whoever has the perpetual
6 license control? What would their
7 responsibilities be?
8 MR. SMITH: Their responsibility is to
9 make sure that the engineering controls are
10 maintained in place. And under the long-term
11 control license, there will be the monitoring, as
12 well as the annual inspection and renewals.
13 MS. GRAUMANN: So basically the NRC
14 would be overseeing everything that happens to the
15 site once the decommissioning plan is effective?
16 MR. SMITH: And the trust fund will be
17 set up for them, should there be a failure of the
18 licensee Shieldalloy doing that.
19 MS. GRAUMANN: I don't know where you
20 were when I interrupted you.
21 MR. HARP: Thanks. Okay. The questions
22 are in the form. And we can email you the form
23 again if you'd like.
24 MS. GAFFIGAN: Are you looking for a
25 consensus form from the entire advisory board? Or

Page 115

1 are you looking for individual entries from us and
2 from anybody else who's --
3 MR. HARP: We're looking for individual
4 entries from -- because I don't think we'll get
5 consensus really. So I think we're looking for
6 the sense of the various members. You will get a
7 chance to see how it's characterized in our
8 presentation to NRC before it goes to the NRC and
9 to comment on that. That's October 14th. You
10 know, September 30 to October 14th period we're
11 talking about.
12 MS. GRAUMANN: The last time, you had
13 actually provided us with comment sheets. Is that
14 in this packet somewhere, or --
15 MS. BERGER: No, it's not in there.
16 MR. SMITH: It's going to be posted on
17 our website.
18 MS. WILLIAMS: I don't have access to
19 that.
20 MR. SMITH: I understand that. And
21 we're also going to put it in the library, a
22 number of the forms, so they're available.
23 MS. GRAUMANN: I'll make sure that
24 they're available.
25 MR. MILTON: I can't quite hear what's

Page 116

1 going on. But in other words, you're not going to
2 hand out that comment sheet tonight?
3 MR. SMITH: Not tonight.
4 MS. GRAUMANN: It's available on their
5 website. The comment sheet, you can download and
6 you can print it all.
7 MS. WILLIAMS: And also in the library.
8 MS. GRAUMANN: But it will also be at
9 the library as part of the documentation. And
10 I'll make sure that Tony has it down at Borough
11 Hall.
12 MR. HARP: Okay. Anything else before
13 this Board before we open it to the public?
14 MS. WILLIAMS: I have one thing. I was
15 told that Envirocare did not want you to disclose
16 the bid.
17 MR. HARP: She said that Envirocare --
18 I'm trying to be the microphone. There is an
19 outfit out in Utah, I think, that handles some
20 types of radioactive material. And Loretta was
21 saying that you understand that Envirocare, with
22 whom Dave Smith or about whom Dave Smith spoke a
23 few minutes -- about an hour ago, discussed the
24 price of off-site disposal using Envirocare, and
25 Envirocare would not permit Shieldalloy to divulge

Page 117

1 the number that they were willing to accept the
2 material for.
3 MS. WILLIAMS: Okay. Now, I want to
4 know, who did this? On record.
5 MR. HARP: This is the preliminary
6 estimate of off-site disposal.
7 MS. WILLIAMS: Okay. That's TRC. This
8 is the same company that Shieldalloy is going to
9 contract to clean up their groundwater?
10 MR. SMITH: It is a company which we are
11 in negotiations with. The state, as well as --
12 MS. WILLIAMS: To give you an exit
13 strategy?
14 MR. SMITH: Yes.
15 MR. HARP: Okay. Questions from the
16 floor?
17 MR. McKEE: Follow-up on Loretta's
18 question. The TRC numbers for disposal, is -- was
19 there a particular landfill that they got these
20 costs from?
21 MS. OLIVA: The disposal cost that was
22 used in this estimate was based on information
23 gained from the work that was done at their
24 Cambridge, Ohio site, and also other information
25 that we could glean off the web of other closure

Page 118

cost estimates.
MR. MILTON: You got no quotes from any disposal companies?
MS. OLIVA: Envirocare is pretty much the only game in town. And the quote they provided, they can't share with us.
MR. McKEE: Is that by some kind of confidentiality agreement?
MR. SMITH: It's a confidentiality agreement that they asked us to sign in order to, you know, get a final quote from them.
MR. McKEE: Can you tell us if their number was lower than this number?
MR. SMITH: It was slightly lower. I can tell you that.
MR. McKEE: Would it be -- because it seems like you have a six million dollar charge here just for loading the trucks.
MS. OLIVA: No. That also includes -- it would be going into railroad cars. It would have to be -- a lot of the bigger pieces would have to be crushed before they went into the railroad cars. So that's moving the material to a staging area, crushing it, and putting it in the railroad cars.

Page 119

MR. McKEE: And that costs actually more than building the landfill, just loading it on the railroad cars?
MS. OLIVA: Yes.
MR. McKEE: It just seems like these numbers, if you look at the cubic yard cost, it's over $450 a cubic yard.
MS. OLIVA: It's very expensive to dispose of.
MR. McKEE: And does that compare with -- I mean in order to evaluate that number we really need to know, if Envirocare's the only game in town, what their number is.
MR. HARP: All we can say is that this is a representative ballpark figure. We can't give you the Envirocare figure.
MS. WILLIAMS: How about per tonnage? Wouldn't they also charge you by per tonnage? Wouldn't that be an easier way to come up with a price? I mean if you ask charges per ton, what would they charge per ton? Instead of cubic feet or yards or whatever.
MR. SMITH: They didn't give us even a detail of that type of information in their presentation. Once again, they're very concerned

Page 120

about giving out costs. And I'm not sure why.
MS. WILLIAMS: Case by case basis? Is that what they charge by?
MR. SMITH: They charge generally for disposal on a cubic foot basis. But this project that they were giving us a presentation on was for the removal, shipment, and disposal.
MS. WILLIAMS: Do they also do on-site work?
MR. SMITH: Yes.
MS. WILLIAMS: If, say, for instance after it's removed that they might have to go in and take soil out, and there'd be contaminated soil there after the piles are taken away, do they do that kind of work?
MR. SMITH: They do that kind of work. That was not part of the thing --
MS. WILLIAMS: In other words, that would be an additional cost?
MR. SMITH: That would be additional.
MR. HARP: In the public now. Richard.
MR. SMITH: He's a Board member, too.
MR. WESTERGAARD: I have a question. I work on some of our projects where we actually look at the impact of acid rain leaching materials

Page 121

into the groundwater. If we have a storm event tonight, is anybody monitoring that runoff? Or does anybody know what's in that runoff? I would also request that we do some -- look at if anything is running off, is it percolating into the aquifer? I think those are some of the things that we have to look at. We have enough water supply problems around here, and we don't need another one.
The other thing I'd like to see is -- I've lived here for 53 years. I'd like to see some soil sampling done. I can remember when material was shot off, or the runoff percolating. I'd like to see some soil samples done. And I'd like to see some sampling done in that stream. I saw on the state's web page where they have Hudson branch listed for TMDL in the next so many of years. I think we need some surface monitoring, and I think we need some wetland monitoring done. And I'd like to see those issues addressed ASAP.
MS. BERGER: There's been quite a bit of soil sampling done all around that area as part of --
MR. WESTERGAARD: Can we get copies of that?

Page 122

1 MS. BERGER: -- different campaigns.
2 There's been -- there was -- how do I describe
3 this? There was a different type of slag was in
4 that storage yard at one time. And it was mixed
5 up a bit.
6 MR. MILTON: Could you give us a date on
7 when you'll supply that?
8 MS. BERGER: I'm sorry. Say that again?
9 MR. MILTON: Could you give us a date
10 when we could get that information so we could
11 actually see it?
12 MR. SMITH: She didn't promise that yet.
13 MS. GRAUMANN: She's addressing
14 something else.
15 MR. MILTON: It was a yes or no
16 question.
17 MR. HARP: No was not a yes to the
18 question.
19 MS. BERGER: Anyway, this is just one
20 example. There have been a number of campaigns
21 that have gone on at the facility. This
22 particular one was a pile of a different kind of
23 slag that was sold. And they had to separate that
24 slag from the ferrocolumbian slag, which because
25 the two piles were sort of close to each other

Page 123

1 there was some mixing or whatever with it. And
2 all of the other -- the ferrocolumbian slag was
3 put back on the existing pile. All of that soil
4 in there has been surveyed and sampled.
5 There was sampling done at part of the
6 pond remediation. Jean, I don't know the rough
7 dates of that, when the ponds were closed. That
8 was all sampled for radiological as well, even
9 though --
10 MR. WESTERGAARD: How about during a
11 storm event?
12 MS. BERGER: And there's been sampling
13 as part of the original environmental report.
14 That was fairly a comprehensive sampling and
15 survey at that time. And of course the pile had
16 been there for many, many years before that was
17 ever done. As it turns out, the materials that
18 are in those large rocks are very tightly bound on
19 those rocks. Acid does not make them move.
20 Basic, if you can get the water that it's in
21 really, really, really basic, one of those
22 elements will move slightly into the water. But
23 the rest of them are not. It's very tightly
24 bound.
25 MS. WILLIAMS: What about the dust?

Page 124

1 MS. BERGER: This baghouse dust, same
2 thing. And the baghouse dust has also got very,
3 very low concentrations compared to the slag. The
4 slag is the preponderance of the radioactivity on
5 the site.
6 MR. McKEE: So we have a leachability
7 test that we can review that would confirm those
8 findings?
9 MS. BERGER: The leachability testing
10 and the K sub (d) determinations will be in the
11 decommissioning plan.
12 MS. WILLIAMS: When were these tests
13 taken? How long ago?
14 MS. BERGER: The leachability tests were
15 done back in the early '90s.
16 MS. WILLIAMS: How about getting new
17 ones?
18 MS. BERGER: We have new ones. Some
19 were done just this year on both the slag and the
20 baghouse dust. The testing done in the early '90s
21 were all negative. They said nothing. But their
22 detection limits for those measurements were a
23 little bit high. So that's why we went in and did
24 them again using a methodology with lower
25 detection limits, so we can actually get results,

Page 125

1 as opposed to just saying zero or below this
2 number.
3 MS. GRAUMANN: Now, those test results,
4 are they in some of the stuff that you guys have
5 been sending to us, or not?
6 MS. BERGER: No. They will be.
7 Everything's being compiled.
8 MS. GRAUMANN: Oh, okay. So if it's
9 going to be in the plan, we won't get it in
10 advance of the plan?
11 MS. BERGER: No. Everything will be
12 there. The plan is available for you to see and
13 comment on and provide data input into the NRC.
14 What the SSAB, we're hoping to get input on right
15 now are just those two key questions as part of
16 the decommissioning planning process. After then,
17 you get another opportunity to comment.
18 MS. GRAUMANN: Okay.
19 MR. HARP: Mr. Milton?
20 MR. MILTON: Two questions; one for
21 Mr. Smith. So as I understand it, you've entered
22 into an agreement with Envirocare?
23 MR. SMITH: We have not entered into it,
24 but we don't feel comfortable in disclosing it
25 because we haven't signed it.

Page 126

1 MR. MILTON: I can't imagine what the
2 reason for the secrecy is.
3 MR. SMITH: Pardon me?
4 MR. MILTON: The reason for the secrecy.
5 MR. SMITH: I don't know either. We
6 tried to --
7 MR. MILTON: I know you try to release
8 information at the eleventh hour, so on and so
9 forth. But this one, I can't --
10 MR. SMITH: I can only tell you what I
11 was --
12 MR. MILTON: So if we contacted them,
13 maybe they would release it to us?
14 MR. SMITH: Could try.
15 MR. MILTON: And my second question is
16 about the soil sampling. In the rear of the
17 property, there's a -- several feet of soil was
18 removed. I'll ask someone else if you don't want
19 me to ask you, Ms. Berger.
20 MS. BERGER: Oh, no. I'm sorry. I was
21 -- we were listening to our stomach growling.
22 MS. GRAUMANN: We were having a human
23 moment here.
24 MR. MILTON: So at the rear of the
25 property, the soil sampling was very positive back

Page 127

1 there. That's why so much was removed.
2 MR. SMITH: Soil was excavated. And
3 that was the area that Carol was talking about
4 where we did the lay-down and separation of the
5 two different types of slag. And we excavated
6 that soil, put it onto the pile in the controlled
7 area, then did a MARSSIM release survey and did a
8 final status survey for that release.
9 MR. MILTON: Is it possible that this
10 whole site might have to be scraped off two,
11 three, four, five, six foot, like you did back
12 there?
13 MR. SMITH: No.
14 MR. MILTON: Are you sure of that?
15 MR. SMITH: Once again --
16 MR. MILTON: Where is our information to
17 go by?
18 MR. SMITH: We -- in order to get a
19 release of the soil at that point, it wasn't done
20 on a dose assessment, but on specific analytical
21 numbers that were required to be adhered to in
22 order to release it without going to a dose
23 assessment type of release.
24 MR. HARP: What does that mean, David?
25 MR. MILTON: So you're asking to go a

Page 128

1 little extra that way, is what you're saying.
2 MS. BERGER: No. Well, another
3 important point back there is all of the residual
4 radioactivity that was in that yard was in slag
5 chunks. It wasn't in the soil. The soil, it was
6 just the easiest way to get it up was to pull up
7 some soil and some chunks. But if there was a
8 chunk of slag there, that's what you would pick up
9 when you were walking over with your survey
10 instruments.
11 MR. MILTON: The appearance is that it's
12 not just -- it appears that several feet of soil
13 were removed back there. That was necessary?
14 MR. SMITH: What Carol is saying, I
15 believe, is if we wanted to spend the money to
16 save the soil and separate the pieces of slag, we
17 could go through that process and it would have
18 probably been a ratio of -- let's see. Probably
19 close to one to 50, soil would have been released
20 to the slag.
21 MR. MILTON: The reason I'm asking the
22 question is -- maybe I'm just totally wrong, but
23 when I go back there and look at it, it looks like
24 three, four, five foot of soil was removed in
25 certain areas. I mean it's the steepest gradient

Page 129

1 in Newfield back there. All of a sudden the
2 ground just goes like this.
3 MR. SMITH: No. The ground has been
4 contoured, because we brought back in clean fill.
5 MR. MILTON: Okay. I guess I'm seeing
6 something.
7 MR. HARP: Sir.
8 MR. PRICE: Robert Price. Newfield
9 here. One question the mayor brought up was the
10 stormwater. Say we had a hurricane here, we had a
11 storm surge. What's going to stop that runoff? I
12 know the lady said that the particles are so huge
13 and the water can't penetrate them. But if you
14 pile particle upon particle, you end up with dust,
15 what is not getting in your groundwater.
16 MR. SMITH: No, it's not going to get
17 into the groundwater from particle size. But if
18 it were to actually be leached, that would be one
19 way. That's why we've done the leaching test.
20 MR. PRICE: Could that possibility be
21 the reason why our well came up with
22 contamination?
23 MR. SMITH: It's very unlikely, because
24 your wells are up-gradient, up-wind, and
25 everything else.

Page 130

MR. PRICE: Okay. When we had a drought a couple years ago, weren't we in fear of saltwater coming back in?

MR. SMITH: Down at the seashore.

MR. PRICE: We had 20 feet of water here. And then it goes away. Where is the contamination? Everywhere. Like they have down there with the diesel fuel.

MR. HARP: You lost me.

MR. PRICE: Say we had a storm surge. Say we capped it, and the cap washed off.

MR. NESSEL: You're talking after the thing was closed.

MR. PRICE: Yes.

MR. NESSEL: If you guys are lucky enough to receive your closing permit after that point if there's a strong storm or there's a surge, what would stop the water from washing away the cap and spreading the smaller particles around, I think is what he's saying.

MR. SMITH: One of the things that -- in the design of the cap, in the erosion controls, they look at storm conditions, worst case type conditions in order to design the cap and the runoff.

Page 131

MR. PRICE: Levees.

MR. WESTERGAARD: Just out of curiosity, Dave, did you happen to do a soil erosion sediment control plan for the district? When you put the cap on, did you have to go through any of the permitting process with the Soil Conservation District? Because they usually look at these things. And I would feel more comfortable if we had their engineers, when you come up with this cap, just to make sure there's no possibility of erosion or sedimentation. I'd feel more comfortable if they take a look at that when you get that information.

MR. SMITH: That would be something which NRC, their experts will be doing. And they'll be -- I mean the county's erosion control people can look at it. But it's really NRC's experts that will be looking at it from a technical point once it gets to that stage.

MR. HARP: I'm sorry, I forgot your name.

MS. RAGONE: Terri Ragone, R-a-g-o-n-e. I had a question about the cost estimate in terms of the annual fee for surveillance and monitoring. I was wondering about the site security

Page 132

maintenance, if that's -- human resources, is that 24/7? And if so, it appears that the $19,000 a year is an extremely meager figure.

MS. OLIVA: That's more like maintenance of fencing and physical attributes.

MS. RAGONE: There's really no person on site 24/7. There's no guard on site?

MS. OLIVA: We're not planning on having that, no.

MS. RAGONE: That's just the fence.

MS. OLIVA: Right.

MR. HARP: Sir.

MR. McKEE: I have a question for the D.E.P. people. In New Jersey, if you build a landfill for household waste, you're required to have a liner and monitoring wall system in place. Do similar requirements apply to a radioactive waste landfill such as the one that's being proposed here?

MS. GOODMAN: We do not regulate that material. If we did, we wouldn't allow it to be a landfill situation. And we do have a regulation that says no burial of radioactive material unless written permission is received by D.E.P.

MS. RAGONE: Unless what?

Page 133

MS. GOODMAN: Written permission is received by D.E.P. But that's for material that we regulate.

MR. McKEE: Now, the reason this is not regulated is that it's too high a dose?

MS. GOODMAN: Its source material level concentration, there's a certain limit. If it's above that limit, then the NRC regulates it.

MR. McKEE: Oh, it's subject to less requirements because it's more, quote, dangerous?

MS. GOODMAN: Well, it's subject to federal regulations.

MR. MILTON: You could still view it as a landfill.

MR. McKEE: But because this is also a Superfund site, isn't there an agreement between E.P.A. and NRC that other environmental regulations apply here?

MS. GAFFIGAN: We're reviewing that with E.P.A. right now.

MR. McKEE: Do you have any determination on that yet?

MS. GAFFIGAN: No. We're reviewing that with E.P.A. right now.

MR. McKEE: When do you expect to have

Page 134

that?
MS. GAFFIGAN: A couple weeks.
MR. McKEE: Will you provide that to all these people in the room?
MS. GAFFIGAN: Yes, I will.
MR. McKEE: Thank you.
MR. HARP: I just want to ask, on the sign-in sheet, that people put their email addresses there so we have them?
MR. MILTON: Some.
MS. GRAUMANN: Is there a spot there?
MR. HARP: Because that's another way we can reach you. Mr. Nessel. Anybody else have their hand up? Because we've heard from you. Not stopping you. I just want to see if there's anybody else before we get back to you. And I see no one else.
MR. NESSEL: If in fact the NRC -- well, when the NRC grants your closing permit, what's the long-term plan for this site? For example, what portion of the site will be the closing area? Is it a three-acre piece? We're talking about a five-acre piece? I think we talked about this before. I think it's like a five-acre piece of land.

Page 135

MS. BERGER: The entire storage area is about seven acres. The capped area is about three and a half.
MR. NESSEL: Okay. So we're talking probably around ten acres.
MR. HARP: No. Seven acres.
MS. BERGER: Three and a half acres within the seven acres.
MR. NESSEL: That's fine. And the site, if I'm understanding correctly, is like 65 or 70 acres. Am I right?
MS. OLIVA: 67, I believe it is.
MR. NESSEL: Okay. What's the plan for the remaining property? What are your long-term plans for that?
MR. SMITH: A portion of approximately nine and a half acres is going to be -- have a conservation deed restriction on it. So it would not allow for any building or anything like that. But that's for mitigation of -- you know, wetlands environmental mitigation.
MR. NESSEL: So it would be at the southern portion of the property along Weymouth Road area?
MR. SMITH: It's the portion where -- you know, the portion in the back where we excavated the soil, brought soil in, reforested that.

Page 136

MR. NESSEL: And the remainder of the property, what are your plans for that?
MR. SMITH: The remainder of the property, as far as I am aware, is to continue manufacturing and find additional industrial uses for it.
MR. NESSEL: So there will be buildings on there. You're not planning on tearing down the buildings?
MR. SMITH: I'm not aware of any projects to tear anymore buildings down.
MR. NESSEL: The other thing was there was a piece of paper floating around, and no one seems to have it. I got a look at it. And it was different than their capital costs. The paper says capital costs on there. And there was a figure on there like 232-something dollars to transport this stuff off-site. I don't have -- it was like an exceptional amount of money. Said something about the transport --
UNIDENTIFIED SPEAKER: 58 million. Off-site.

Page 137

MR. NESSEL: So over a thousand a year, what does that represent? In other words, that's what it would cost for you guys to haul it off site and get rid of it? Is that my understanding what that's saying?
MR. SMITH: That's an estimate.
MR. NESSEL: So for a thousand years, what does that mean?
MS. RAGONE: Could be lower with Envirocare.
MR. NESSEL: Right. Could be lower. But what is the -- over a thousand years -- get your cap there, please -- over a thousand years, what is the cost per year?
MR. HARP: They want it paid now, not a thousand years out.
MR. SMITH: Are you suggesting that we wait a thousand years and then move it?
MR. NESSEL: Not at all. What I'm suggesting is, is it going to cost you the same amount of money over a thousand year period to take care of this problem for the Borough of Newfield, the same amount of money that it's going to cost you right now to get rid of it. That's the question. If it's going to be a question of

Page 138

1 58 million dollars over a thousand years or 58
2 million now, I would like to see you get rid of
3 it. If it's going to cost you, it's going to cost
4 you.
5 MS. WILLIAMS: For a period of a
6 thousand years on site, he's talking about, that
7 the off-site might have been a little --
8 MR. NESSEL: Your thousand year figures
9 are really, really misleading. Because it makes
10 it look like you're spending a ton of money. But
11 if you divide the moneys you're suggesting over a
12 thousand years, not all that much money. You
13 know, you're misleading people by using that,
14 quote, unquote, a thousand years. A thousand
15 years.
16 MR. HARP: I think that -- no, there's a
17 disconnect. Because the figure of $19,000 per
18 year is the thousand year figure per year. And
19 the figures that Jean has -- not on this sheet,
20 but she talked about them earlier -- range between
21 $277,000, present dollars, which would be invested
22 over time, to $655,000. We're not saying that --
23 that would be the cost now to put into a trust
24 fund to assure the annual surveillance and
25 maintenance for a period of a thousand years. So

Page 139

1 we're not misleading anybody. That's the figure
2 right there.
3 MR. NESSEL: Per year, that comes out to
4 how much over a thousand years?
5 MS. OLIVA: If you use standard interest
6 tables, $19,000 a year, seven percent interest
7 over a thousand years would be $277,000.
8 MR. NESSEL: Over a thousand years.
9 MS. OLIVA: Right. That's the amount of
10 money you have to put away today.
11 MR. NESSEL: $200,000.
12 MS. OLIVA: $277,000. That will give
13 you enough interest over a period of a thousand
14 years.
15 MR. NESSEL: But $200,000! In a
16 corporation that makes much more than 200,000,
17 that's not a whole heck of a lot of money to set
18 aside.
19 MR. MILTON: That won't do nothing in a
20 catastrophe.
21 MR. HARP: We're having a different --
22 it's not a huge number. But that's the number
23 that the regulations, that the guidance from NRC
24 suggests should be put into a trust fund to make
25 sure that the maintenance goes on if Shieldalloy

Page 140

1 goes belly up or leaves the site.
2 MR. McKEE: We don't have that number.
3 You're mischaracterizing it. That number is what
4 you calculate based in the number you're doing in
5 your estimate.
6 MR. HARP: Yes.
7 MR. McKEE: Using the percentages that
8 we require. Which is a little different. If we
9 didn't agree with your $19,000 a year, it would be
10 a lot bigger number.
11 MR. HARP: That's correct.
12 MR. SMITH: Or if it was 15,000 a year,
13 it could be a lot lower.
14 MR. HARP: I didn't mean to say that NRC
15 had approved the 19,000. I meant to say that the
16 interest rates, those ranges came from NRC
17 guidance. Yes. Okay.
18 MR. NESSEL: My other concern is that's
19 $19,000 a year to maintain it. If there's a
20 problem, and it's going to be a lot more than
21 19,000 bucks to fix, in 20 years from now, let
22 alone a hundred years from now, you guys took it
23 in the net, so to speak, when in fact you were
24 doing something with chrome, plumes, whatever, and
25 you guys had to do all the monitoring now and do

Page 141

1 work to clean up the groundwater. And what's to
2 stop that from -- 50 years from now, somebody from
3 the NRC says wait a minute, we said that was okay
4 back then, but now it's got to be different. And
5 then is there going to be monies -- stockpiled
6 enough to if in fact they say it's got to be
7 off-site to a certain area of the United States,
8 is there going to be enough money there to do
9 that? I mean you're basing all your stuff on
10 2005, 2006, and 2007. But you know what, man?
11 Say 50 years from now, they say, hey, this is an
12 environmentally significant piece of ground, and
13 we want you to get it off here. $19,000 ain't
14 going to do it.
15 MR. MILTON: They're basing it on
16 compliance. That's all.
17 MR. NESSEL: That's what I'm saying.
18 And I mean you guys are doing what the NRC is
19 telling you to do. That's the problem. It's kind
20 of like a dog chasing his tail.
21 MR. MILTON: A fox in the hen house.
22 MR. HARP: Ms. Ragone?
23 MS. RAGONE: I just wanted to know a
24 point of information. And that is to get your
25 license originally, did you -- you have to have a

Page 142

1 decommissioning in place in order to get your
2 license. No?
3 MR. SMITH: Today, in today's world you
4 would have to have that.
5 MS. RAGONE: No, not in 1955. But when
6 they made that regulation, which was what? Like
7 in the '70s or '80s? Somewhere in there.
8 MS. GRAUMANN: The regulation was
9 changed. Does the NRC know when the regulation --
10 which regulation are you talking about? When was
11 it?
12 MS. MILLER: I'm just trying to get a
13 point of information. I can answer that. Marie
14 Miller, NRC Region 1. If you were to apply for a
15 license for an activity, among the many things
16 that you would describe would be your radioactive
17 waste management practices. And then depending on
18 the amount of material that you would be licensed
19 for, you may be required at that point to put a
20 financial assurance before you would get a
21 license. And in the case of Shieldalloy, we
22 didn't require a financial assurance in 1955. The
23 financial assurance requirement came along much
24 later.
25 MS. RAGONE: In the '70s?

Page 143

1 MS. MILLER: Financial assurance
2 requirements, 1980.
3 MS. RAGONE: So 1980 was the financial
4 assurance. So in order to get their license,
5 theoretically they had to provide financial
6 assurance. Now, did they also have to provide a
7 decommissioning plan at that point?
8 MS. MILLER: No. The decommissioning
9 plan is required under a timeliness rule that was
10 passed in 1994. It specifies when you need to
11 submit a decommissioning plan. And so for
12 example, when they ceased operations, principal
13 activities, then you have the time period within
14 twelve months. Or you can request a schedule of
15 relief and submit a decommissioning plan. And
16 that -- this schedule would have to indicate that
17 there would not be an impact on public health and
18 safety, and the reasons why you have the schedule
19 change. And that was the case with Shieldalloy.
20 MS. RAGONE: So theoretically since 1980
21 they should have been putting money away, or
22 having some sort of financial assurance?
23 MS. MILLER: They -- when the rule
24 passed, the financial assurance, there were set
25 amounts that were required at the time. And then

Page 144

1 they were required to submit a decommissioning
2 cost estimate and a funding plan. And they did
3 submit that. And that was viewed as adequate at
4 the time, subject to review. They submitted a
5 decommissioning plan. And when that plan is
6 submitted, they're required to update the
7 decommissioning cost estimate. When we rejected
8 the plan, there was no way for the staff to
9 evaluate cost estimate if you don't know what the
10 plan is. So that's why when the plan is submitted
11 in October, we're expecting to see this
12 decommissioning cost estimate and the funding
13 mechanism. And then we'll make the determination
14 of whether or not it's adequate or not at that
15 time.
16 MS. RAGONE: So that hasn't been in
17 place. Since 1994, that hasn't really been in
18 place. But the NRC keeps the license in time of
19 renewal, even though they haven't submitted a full
20 decommissioning plan or put aside moneys?
21 MS. MILLER: The minimum amount, I
22 think, is $750,000, plus the additional money that
23 was court ordered from the Superfund settlement.
24 It was the E.P.A. bankruptcy settlement.
25 MS. GAFFIGAN: Bankruptcy settlement.

Page 145

1 MS. MILLER: So the approximately five
2 million has been there during this time period.
3 MS. RAGONE: The time frame -- you said
4 from the bankruptcy. But not from 1994 when they
5 were --
6 MS. MILLER: From the '94 time frame, it
7 was the minimum amount of the 750,000. And then
8 but we also have the knowledge of the court
9 settlement amount. And it was used specific to
10 the slag pile remediation. In fact, the NRC did
11 roll down some money from the financial assurance
12 agreement for a period of time.
13 MS. RAGONE: For?
14 MS. MILLER: Because when -- I guess you
15 were in bankruptcy?
16 MR. SMITH: Yes. Bankruptcy.
17 MR. HARP: Mr. Nessel.
18 MR. NESSEL: Just one more little
19 question. Could we in fact have the meetings
20 moved over to the Borough Hall, as opposed to
21 having them here? Would you guys be willing to do
22 that?
23 MR. SMITH: As long as the Borough Hall
24 doesn't mind.
25 MR. WESTERGAARD: I don't think anybody

Page 146

1 would mind.
2 MR. NESSEL: As a citizen, I would
3 appreciate that. And the other question was, a
4 copy of the list, could you also supply that with
5 the information at the library? Could we have a
6 copy of the sign-in sheet tonight? That way if we
7 do have some questions, we can go ahead and
8 contact those individuals or someone else, rather
9 than a hit-and-miss type situation?
10 MR. HARP: Yes. Jenny?
11 MS. GOODMAN: Has Shieldalloy considered
12 moving the slag pile to the Ohio site?
13 MS. GRAUMANN: They've already agreed to
14 have it. Excellent idea.
15 MS. WILLIAMS: You've got your third
16 party there.
17 MS. GOODMAN: I understand that from
18 Ohio, that Ohio's --
19 MS. GAFFIGAN: Their pile's in the
20 middle of a cow field, as opposed to a town.
21 MS. GRAUMANN: They're a bigger town
22 than we are.
23 MR. SMITH: I'm would imagine. Because
24 first of all, the Ohio wouldn't --
25 MR. SHINDEL: Can't take any more than

Page 147

1 what they already have.
2 MR. MILTON: The reason they haven't
3 capped their second pile is because they're
4 actually trying to sell it right now.
5 MS. WILLIAMS: Sell it? To who?
6 MR. MILTON: I don't know. It's a
7 tactic, I guess. But they're saying they're
8 trying to sell it. Probably buying time so they
9 don't have to spend the money to cap it.
10 MR. NESSEL: Probably trying to bring it
11 over here.
12 MS. GRAUMANN: Maybe.
13 MR. MILTON: But the people in Ohio
14 think it's a wonderful idea. They think we should
15 make a reef out of it.
16 MR. HARP: Any further comments or
17 questions from the public? Okay. Thank you.
18 We're going to close the public session, as you
19 guys do. Does this group want to meet again?
20 MS. WILLIAMS: If we meet, we meet at
21 Borough Hall where there's microphones and air-
22 conditioning?
23 MS. GAFFIGAN: What do we need to
24 discuss?
25 MS. GRAUMANN: Between now and when?

Page 148

1 Basically you're saying October 14. Basically I
2 don't see that there's anything further to
3 discuss. We pretty much chewed it up.
4 MR. HARP: Okay. Thank you very much.
5 (Whereupon, the proceedings were
6 concluded at 9:45 p.m.)
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CERTIFICATE

I, MARY CAHILL JOHNSON, a Certified Shorthand Reporter of the State of New Jersey, do hereby state that the foregoing is a true and accurate transcript of my stenographic notes of the within proceedings, to the best of my ability.

MARY CAHILL JOHNSON, C.S.R., R.P.R.

License No. X101739

Notary Public of the

State of New Jersey

Appendix 19.17 - Completed SSAB Input Forms

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation
Input Form

This form has been designed to facilitate your input to the Shieldalloy Metallurgical Corporation (SMC) decommissioning process. Kindly complete the form to the best of your ability and return it to SMC at the following address:

David R. Smith
Shieldalloy Metallurgical Corporation
35 West Boulevard, PO Box 768
Newfield, NJ 08344

The forms must be received by November 30, 2004 in order for your input to be captured in the site-wide decommissioning plan. We will attempt to but cannot guarantee inclusion of later submittals.

In completing the form, the following definitions may be of use to you:

Financial Assurance - A means of demonstrating that SMC possesses the necessary funds to cover the estimated costs of conducting all licensed activities at the site once the decommissioning plan has been implemented.

Institutional Control - A program to physically control access to the SMC site after implementation of the decommissioning plan. The institutional control program for the site includes the maintenance of a "Long Term Control" license, an environmental monitoring and maintenance program, periodic surveillance, and other requirements to be specified in the decommissioning plan. It also includes funds sufficient to cover the costs for these activities.

Total Effective Dose Equivalent (TEDE) - The sum of the radiation dose from external exposure (i.e., from sources outside of the body) and from internal exposure (i.e., from sources taken into the body by inhalation, ingestion, etc.).

Your input is important to us and we appreciate your time in completing this form and returning it to us. We will be taking your input into account in the preparation of our decommissioning plan. We encourage you to review the plan once it is prepared and provide us with any comments you might have at that time. Other opportunities to provide feedback to SMC throughout the decommissioning process will be described in the plan.

Shieldalloy Metallurgical Corporation
Input Form

ur Name (optional):
Donna L. Gaffigan
Nancy Stanley
Amy Goodman

Who do you represent: (e.g., yourself, a neighborhood, community organization, etc.)
New Jersey Department of Environmental Pr

e following sections pertain to SMC's plan to maintain a long-term control license as a means of ensuring long-term institutional trol over the decommissioned Newfield site.

Do the institutional controls proposed by SMC provide reasonable assurance that average member of the public will not incur a radiation e in excess of 25 millirem TEDE? ☐ Yes ☐ No ☒ Don't know

nments:

See Attachment

Do you believe the institutional controls will be enforceable? ☐ Yes ☒ No ☐ Don't know

nments:

See Attachment

Do you believe the institutional controls will not impose undue burdens on the local community or other affected parties?
Yes ☒ No ☐ Don't know

nments:

See Attachment

o you believe SMC can provide sufficient financial assurance to enable an independent third party to assume responsibility for control maintenance of the site? ☐ Yes ☒ No ☐ Don't know

ments:

See Attachment

In its decommissioning plan, SMC must pr nt an assessment of the radiation dose potentia sociated with its planned commissioning option for the following po ion groups: (1) on-site workers that do not h access to the capped area; (2) on-site rkers that perform routine maintenance and inspection of the capped area; (3) trespassers; and (4) the nearest off-site resident. Are there her population groups that you think should be included in the dose assessment process?

☐ No ☐ Don't know

ggested groups:

See Attachment

you have additional concerns, please describe them below, adding additional sheets as necessary.

scribe the issue:

See Attachment

w i believe that issue should be addressed?

See Attachment

y is this issue a concern to you?

See Attachment

at additional information do you need in order to resolve this issue or understand it better?

See Attachment

itional sheets attached: ☒ Yes ☐ No

ase describe any other comment, concerns or recommendations you would like SMC to consider during the decommissioning
ning process:

See Attachment

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation
Input Form

NJDEP's responses:

1. Do the institutional controls proposed by Shieldalloy Metallurgical Corporation (SMC) provide reasonable assurance that an average member of the public will not incur a radiation dose in excess of 25 millirem Total Effective Dose Equivalent (TEDE)?

The New Jersey Department of Environmental Protection (NJDEP) does not have sufficient information on which to base a response. The characterization of the slag and baghouse dust pile was not provided to the Site Specific Advisory Board (SSAB), nor was the engineering design of the cap.

2. Do you believe the institutional controls will be enforceable?

No. There has been no demonstration that the institutional controls proposed will be enforceable for the time period necessary, basically in perpetuity. The United States Nuclear Regulatory Commission's (USNRC) own regulations under 10 CFR Part 61.59 state that institutional controls may not be relied on for more than 100 years.

3. Do you believe the institutional controls will not impose undue burdens on the local community or other affected parties?

No. The institutional controls may well prevent the development of the rest of the SMC site, as well as surrounding properties. The NJDEP believes this presents an undue burden on the local and neighboring communities.

4. Do you believe SMC can provide sufficient financial assurance to enable an independent third party to assume responsibility for control and maintenance of the site?

No. SMC appears to be downsizing this operation. There is no value to the property with the slag pile present, only liability, possibly in the hundreds of millions of dollars. It appears that SMC is seeking the Long Term Control (LTC) option only to continue operating the facility for as long as SMC can profit from it. If SMC can not profit from this operation, abandonment of all radioactively contaminated materials appears likely.

Also, SMC states that it currently has posted $5 million dollars in financial assurance for addressing the USNRC regulated materials on the site. This amount was not posted in accordance with 10 CFR 20.1403(c) for license termination under restricted conditions, but rather in accordance with paragraph 16 of the March 26, 1997 Bankruptcy Settlement Agreement. This amount was posted as a "Predetermined Cost" in bankruptcy negotiations based on licensing issues relevant at that time and was not based on SMC's

and USNRC's current proposal for a LTC license. It is impossible for NJDEP to know if this amount will be sufficient for the current proposal since very few details have been made available to the SSAB.

5. In its decommissioning plan, SMC must present an assessment of the radiation dose potential associated with its planned decommissioning option for the following population groups: (1) on-site workers that do not have access to the capped area; (2) on-site workers that perform routine maintenance and inspection of the capped area; (3) trespassers; and (4) the nearest off-site resident. Are there other population groups that you think should be included in the dose assessment process?

Yes. According to the October 7, 2004 letter to Kenneth Kalman of the USNRC from SMC, the trespasser scenario means recreational, casual visitors, or hunters. While NJDEP agrees that the resident farmer scenario is not realistic because a house cannot be placed directly on top of the slag pile, we believe that a more conservative realistic scenario should be assessed, namely a future resident who uses crushed slag as fill under a house. We believe this is certainly realistic, given the fact that it was done by SMC at this site, even having full knowledge of the radioactive content of the material. NJDEP also believes that the nearest resident scenario should assume that the house is built next to the slag pile and that the engineering controls degrade and completely fail over time (see Comment No. 6 under Additional Concerns, below).

Additional Concerns:

1. NJDEP is on record with the USNRC opposing the issuance of the first Long Term Control license in the country based on both administrative and technical concerns. Please refer to the attached letter dated June 25, 2004 from NJDEP Commissioner Bradley M. Campbell, to USNRC Chairman Nils J. Diaz for details. The information that has been provided to the SSAB to date has not changed NJDEP's position regarding issuance of a Long Term Control license to SMC.

2. The statement made by SMC at the November 5, 2004 Site Specific Advisory Board meeting that one of the reasons SMC does not consider disposal of the slag pile a viable option is because of liability issues, such as the possibility that the material would have to be sent back to Newfield from Envirocare of Utah. Subsequent to the meeting, NJDEP spoke with Envirocare of Utah, who explained that this requirement is just an extension of the USNRC "cradle-to-grave" policy. Every generator of radioactive waste is responsible for the waste that it generates forever. This is a standard part of the contract that every Envirocare client must sign before they will accept the waste. NJDEP has dealt with numerous cleanups across the State with responsible parties ranging from private companies to the United States government. This issue has never been brought up as a reason to abandon disposal as an option.

3. The SSAB does not seem to be functioning as the regulatory framework suggests. Namely, NUREG 1757, Volume 1, Chapter 17 states that the SSAB should elect a

chairperson and adopt a charter and operating procedure. This was not done. The minutes of previous meetings reflect that SMC or its representatives have driven the discussion. Basic radiation protection principles were discussed at two SSAB meetings (which were necessary), but little discussion on specifics of the dose assessments or financial assurance was presented. According to NUREG 1757 the licensee is supposed to provide the SSAB with licensee studies and analyses that are pertinent to the decommissioning. The SSAB does not have the dose assessment or the 1996 Draft Environmental Impact Statement for the SMC site in Cambridge, OH that is supposed to contain the ALARA analysis that the USNRC is allowing to be used at this site. The SSAB should also have been provided with the thermoluminescent dosimeter (TLD) data from the fenceline near the slag pile. This would at least provide a point of reference when discussing regulatory dose limits. The SSAB has no documentation on financial assurance, only the total amount that SMC says is available. The work of the SSAB cannot be considered complete until these documents are distributed and a discussion is held among the members.

4. The cover page to this Input Form states that the form must be completed by November 30 in order for the SSAB input to be captured in the site-wide decommissioning plan. It then states that these concerns will be addressed in the Decommissioning Plan. Is this the final input on the question of institutional controls and financial assurance? If it is going to be included in the decommissioning plan then we assume this is the input that the USNRC is going to evaluate against their regulations. NJDEP believes that the SSAB should work to provide a consensus opinion to SMC. It is difficult for this to happen based on the way the SSAB meetings are currently being conducted.

5. When discussing institutional controls at the SSAB, SMC states that the controls will need to be relied on for 1000 years. This seems inappropriate given the half-life of the material that will be remaining at the site and the exposure rates when the engineering controls fail.

6. A copy of SMC's October 7, 2004 letter to Kenneth Kalman of the USNRC was provided to SSAB members at the November 5, 2004 meeting. NJDEP has concerns regarding item number 3 under Dose Modeling. The USNRC is allowing SMC to assume that engineering controls may or may not fail once institutional controls fail, or their effectiveness may degrade over time. Since we know this material will be present in perpetuity, NJDEP believes it is safe to assume that eventually there will be neither institutional nor engineering controls present. We understand that sometimes a degradation of engineering controls may be considered more conservative because erosion usually occurs irregularly, which may focus the flow and allow contamination to be channeled and concentrated at a particular location, referred to as the "bathtub effect." According to SMC, the type of material present at this site is not readily soluble, so this type of degradation of engineering controls would not be considered conservative in our view. NJDEP believes that all scenarios should be assessed based on the failure of <u>both</u> institutional and engineering controls.

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation
Input Form

Your Name (optional):	**Who do you represent:** (e.g., yourself, a neighborhood, community organization, etc.)
LINDA GRAUMANN	NEWFIELD BOROUGH COUNCIL

The following sections pertain to SMC's plan to maintain a long-term control license as a means of ensuring long-term institutional control over the decommissioned Newfield site.

1. Do the institutional controls proposed by SMC provide reasonable assurance that average member of the public will not incur a radiation dose in excess of 25 millirem TEDE? ☐ Yes ☐ No ☒ Don't know

Comments:

2. Do you believe the institutional controls will be enforceable? ☐ Yes ☐ No ☒ Don't know

Comments:

3. Do you believe the institutional controls will not impose undue burdens on the local community or other affected parties?
☐ Yes ☐ No ☒ Don't know

Comments:

4. Do you believe SMC can provide sufficient financial assurance to enable an independent third party to assume responsibility for control and maintenance of the site? ☐ Yes ☐ No ☒ Don't know

Comments:

5. In its decommissioning plan, SMC must present an assessment of the radiation dose potential associated with its planned decommissioning option for the following population groups: (1) on-site workers that do not have access to the capped area; (2) on-site workers that perform routine maintenance and inspection of the capped area; (3) trespassers; and (4) the nearest off-site resident. Are there other population groups that you think should be included in the dose assessment process?

☒ Yes ☐ No ☐ Don't know

Suggested groups:

ALTHOUGH TRC STATES THAT THERE IS MINIMAL RADIOACTIVE LEACHING FROM THE SLAG PILE INTO THE GROUND WATER, I BELIEVE AN EVALUATION OF EXACTLY HOW MUCH "MINIMAL" IS. IF THE DECOMMISSIONING PLAN IS APPROVED, ONGOING MONITORING OF RADIATION IN THE GROUND WATER SHOULD BE PART OF THE PLAN.

If you have additional concerns, please describe them below, adding additional sheets as necessary.

Describe the issue:

Please see attached page.

How do you believe that issue should be addressed?

Why is this issue a concern to you?

What additional information do you need in order to resolve this issue or understand it better?

Additional sheets attached: ☒ Yes ☐ No

Please describe any other comment, concerns or recommendations you would like SMC to consider during the decommissioning planning process:

Additional Concerns:

1. Issue: Accepted procedure for containing the slag pile under NRC guidelines.

   N.J. DEP guidelines require an impermeable liner under contaminated materials in sites that have a radioactive level of 5 millirem or less. The site in question has radioactive levels of 25 millirem and the NRC does not require a liner, just capping. To further minimize the possibility of continued leaching into the surrounding ground and ground water, I believe the site should have a liner.

2. Issue: NRC discourages subdivision of the slag pile from the rest of the site.

   Newfield is 1.7 square miles big. The Shieldalloy site is approximately 72 acres. The slag pile is approximately 7-8 acres. I'm concerned that the market of companies interested in the remaining 65 acres with buildings that suffer functionally obsolete floorplans, etc. AND the responsibility of maintaining the slag pile and decommissioned license are painfully slim. As a business decision, how long would Shieldalloy maintain a virtually vacant facility? It's not unrealistic that Shieldalloy would dismantle the remaining buildings to alleviate their tax burden.

   The borough has had to absorb the negative impact of Shieldalloy's tax assessment reduction after the NRC required the firm to dismantle contaminated buildings. A loss of additional revenue would be almost insurmountable for our small community to overcome.

   I would urge the NRC to consider subdivision of the slag pile from the site in order to encourage commercial use of the parcel.

SITE SPECIFIC ADVISORY BOARD
Shieldalloy Metallurgical Corporation
Input Form

Your Name (optional): Ruth Dye	**Who do you represent:** (e.g., yourself, a neighborhood, community organization, etc.) myself

The following sections pertain to SMC's plan to maintain a long-term control license as a means of ensuring long-term institutional control over the decommissioned Newfield site.

1. Do the institutional controls proposed by SMC provide reasonable assurance that average member of the public will not incur a radiation dose in excess of 25 millirem TEDE? ☐ Yes ☒ No ☐ Don't know

Comments:

2. Do you believe the institutional controls will be enforceable? ☐ Yes ☐ No ☒ Don't know

Comments:

3. Do you believe the institutional controls will not impose undue burdens on the local community or other affected parties?
☐ Yes ☐ No ☒ Don't know

Comments:

4. Do you believe SMC can provide sufficient financial assurance to enable an independent third party to assume responsibility for control and maintenance of the site? ☐ Yes ☐ No ☒ Don't know

Comments: I certainly hope so since it is SMC's responsibility

5. In its decommissioning plan, SMC must present an assessment of the radiation dose potential associated with its planned decommissioning option for the following population groups: (1) on-site workers that do not have access to the capped area; (2) on-site workers that perform routine maintenance and inspection of the capped area; (3) trespassers; and (4) the nearest off-site resident. Are there other population groups that you think should be included in the dose assessment process?

☐ Yes ☐ No ☑ Don't know

Suggested groups:

If you have additional concerns, please describe them below, adding additional sheets as necessary.

Describe the issue:

Our ground water must be protected for possible of leakage into it.

How do you believe that issue should be addressed?

A liner needs to be placed under this material

Why is this issue a concern to you?

Newfield has a water tower very close to the site and neighboring Franklin Twp. & others have individual home wells that could possibly be contaminated.

What additional information do you need in order to resolve this issue or understand it better?

I went to your website and understand your side. SMC must understand their responsibity to the town of Newfield.

Additional sheets attached: ☐ Yes ☐ No

1. Do the institutional controls proposed by SMC provide reasonable assurance that an average member of the public will not incur a radiation dose in excess of 25 millirem TEDE?

The Department of Environmental Protection (DEP) does not have sufficient information on which to base a response. The dose assessment chapter of the decommissioning plan is not complete. There are blanks for critical input parameters such as the thickness of the contaminated zone, the thickness of the engineered cover, soil density, etc. How can the SSAB be expected to answer this question without SMC providing the calculations to show that 25 mrem/y would be met? SMC has also mentioned leachability studies which we have not received. These would be useful so that accurate distribution coefficients can be used in the modeling.

2. Do you believe the institutional controls will be enforceable?

No. There has been no demonstration that the institutional controls proposed will be enforceable for the time period necessary, in perpetuity. The NRC's own regulations under 10 CFR Part 61.59 state that institutional controls may not be relied on for more than 100 years.

3. Do you believe the institutional controls will not impose undue burdens on the local community or other affected parties?

No. The institutional controls may well prevent the development of the rest of the SMC site, as well as surrounding properties. The DEP believes this presents an undue burden on the local and neighboring communities.

4. Do you believe SMC can provide sufficient financial assurance to enable an independent third party to assume responsibility for control and maintenance of the site?

No. SMC appears to be downsizing this operation. There is no value to the property with the slag pile present, only liability, possibly in the hundreds of millions of dollars. It appears that SMC is seeking the LTC option only to continue operating the facility for as long as SMC can profit from it. If SMC can not profit from their operation, abandonment of all radioactively contaminated materials appears likely.

SMC quotes that it currently has posted $5 million dollars in financial assurance for addressing the NRC regulated materials on the site. This amount was not posted in accordance with 10 CFR 20.1403(c) for license termination under restricted conditions, but rather in accordance with paragraph 16 of the March 26, 1997 Bankruptcy Settlement Agreement. This amount was posted as a "Predetermined Cost" in bankruptcy negotiations based licensing issues at that time and was not based on SMC's and NRC's current proposal for Long Term Control License. It is impossible for NJDEP to know if this amount will be sufficient for the current proposal since very few details have been made available to us.

DRAFT

SMC left out the cost of long term monitoring of the environment, including groundwater and runoff in its cost estimate for the LTC.

5. In its decommissioning plan, SMC must present an assessment of the radiation dose potential associated with its planned decommissioning option for the following population groups: (1) on-site workers that do not have access to the capped area; (2) on-site workers that perform routine maintenance and inspection of the capped area; (3) trespassers; and (4) the nearest off-site resident. Are there other population groups that you think should be included in the dose assessment process?

Again, there is insufficient information on which to base a response. In the unfinished dose assessment chapter, it is stated that a suburban resident builds a house 100 yards from the pile. In the conference call regarding this chapter, the NRC wanted an explanation of why the resident could not be closer than 100 yards. Also, the NJDEP believes that excavation of the cap, or complete failure of the engineering controls, in combination with the suburban resident should be modeled. While we agree that the resident farmer scenario is not realistic because a house cannot be placed directly on top of the slag pile, we believe that a more conservative realistic scenario should be assessed, namely a future resident who uses crushed slag as fill under a house. We believe this is certainly realistic, given the fact that it was done by SMC at this site, even having full knowledge of the radioactive content of the material.

Additional Concerns:

1. The Long Term Control License option has not been proposed as a regulation, as such, it has never been through the public comment period. The NRC is implementing this policy without proper public input. The SSAB forum does not give the public the opportunity to comment on the whole concept of a LTC license. It is clear from the SSAB meeting on September 21, 2005 that the public is not in favor of this option.

2. The cost estimate that was handed out at the September 21, 2005 SSAB meeting for license termination and disposal of the radioactive material may not have been the actual cost because of a disclosure agreement between SMC and Envirocare, according to SMC. This is unacceptable. How can an ALARA analysis be performed without a real cost for disposal?

3. The SSAB does not seem to be functioning as the NRC guidance suggests in NUREG 1757, Volume 1. Chapter 17 states that the SSAB should elect a chairperson and adopt a charter and operating procedures. According to NUREG 1757 the licensee is supposed to provide the SSAB with licensee studies and analyses that are pertinent to the decommissioning. The SSAB does not have a completed dose assessment or ALARA analysis. The SSAB should also have been provided with the TLD data from the fenceline near the slag pile along with a map of the locations. This would at least provide a point of reference when discussing regulatory dose limits. The work of the SSAB cannot be considered complete until these completed documents are distributed and a discussion is held among the members.

DRAFT

4. The Department believes that the SSAB should work to provide a consensus opinion to SMC. It is difficult for this to happen based on the way the SSAB meetings are currently being conducted.

5. When discussing institutional controls at the SSAB, SMC states that the controls will need to be relied on for 1000 years. This seems inappropriate given the half-life of the material that will be remaining at the site and the exposure rates when the engineering controls fail.

6. The NRC is allowing SMC to assume that engineering controls may or may not fail once institutional controls fail, or their effectiveness may degrade over time. Since we know this material will be present in perpetuity, the Department believes it is safe to assume that eventually there will be neither institutional nor engineering controls present. We understand that sometimes a degradation of engineering controls may be considered more conservative because erosion usually occurs irregularly, may focus the flow and allow contamination to be channeled and concentrated at a particular location, referred to as the "bathtub effect". According to SMC, the type of material present at this site is not readily soluble, so this type of degradation of engineering controls would not be considered conservative in our view. The Department believes that all scenarios should be assessed based on the failure of both institutional and engineering controls.

7. Commissioner Campbell pointed out to Chairman Diaz that the LTC is in essence an *ad hoc* low level radioactive waste facility without appropriate public involvement. The idea of storing any amount of radioactive waste was strongly rejected by the citizens of New Jersey when we attempted to site such a facility through the efforts of our Low Level Radioactive Waste Facility (LLRWF) Siting Board. We view the issuance of a LTC license in the same context; storage of radioactive waste with institutional and engineering controls. We realize and acknowledge that no other waste will be stored at this facility.

Only wastes that will decay to acceptable levels within 500 years are allowed to be disposed of at a LLRWF, and then only if they are placed at greater depths. The radioactivity in the SMC waste will remain in the SMC waste for more than *one billion years* and our understanding is that it will not be buried at all, but simply covered.

NRC's own LLRWF regulations state that institutional controls may not be relied on for more than 100 years (10 CFR61.59). How can a LTC NRC license be considered durable for the time period necessary (in perpetuity) with this type of long-lived radioactive waste?

This waste would be excluded from a LLRWF because of its long half life and the SMC site would be excluded from siting the LLRWF because of the presence of wetlands. Even the Assured Storage concept, which was proposed because of the limited success in siting a LLRWF, excluded long-lived radioactive waste. Why does issuance of a LTC license make it acceptable to store long-lived radioactive waste here now?

DRAFT

8. The Health Physics Society recently revised their position statement on Low-Level Radioactive Waste Management. Position 1 states - "The goal of managing LLRW is to ensure the safety of workers and the public and to protect the environment. To achieve this goal, disposal, not long-term storage, is the best and safest long-term approach." We view the LTC license option as long-term storage, not disposal, and agree with the HPS that permanent disposal is the safest, long-term approach.

DRAFT

Appendix 19.18 - Storage Yard/Engineered Barrier Design Drawings

[Due to their size, the drawings are transmitted under separate cover.]

This report was prepared under the direction of
Shieldalloy Metallurgical Corporation

by

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The 13 subsequently listed drawings/figures were individually added to ADAMS, which are available for viewing in ADAMS.