

Nuclear Ship SAVANNAH

Radiological and Non-Radiological Spaces Characterization Survey Report

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Radiological and Non-Radiological Spaces Characterization Survey Report Addendum

This is the first revision issued for the Radiological and Non-Radiological Spaces Characterization Survey Report

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1. EXECUTIVE SUMMARY

The N/S SAVANNAH (NSS) Characterization Project is intended to provide the Maritime Administration (MARAD) with a profile of radiological and non-radiological contaminants on the ship in radiological spaces. The scope of work was to perform a radiological and environmental hazard characterization program of the radiological spaces to document the location and extent of radiological and environmentally hazardous materials within these spaces preceding the decommissioning effort. In addition, a number of smears and samples were taken in non-radiological spaces to facilitate future analyses. The information obtained from this project will enable MARAD to develop appropriate decommissioning strategies and to estimate associated costs.

This characterization task was not intended to document a Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)–compliant termination survey that would be subjected to the rigors of a Nuclear Regulatory Commission (NRC) review. The intent of the characterization program was to provide a basis for which the government could estimate the cost of performing the decommissioning. In addition, the end state of the ship is expected to be complete free release and therefore a MARSSIM based survey is not required. Only those locations and equipment/structures that were expected to be radioactive were surveyed in depth to determine the extent and types of radioactive materials present. The remaining areas (principally aft of the engine room, forward of the reactor compartment, and in the mid-ship-house and public areas) were surveyed less rigorously than radiological areas but in sufficient detail to confirm that no radioactive materials reside in those locations. The characterization program conducted from March 20, 2005 to April 25, 2005 did not include the radiological characterization of the reactor vessel, internals, or neutron thermal shield tank.

The characterization effort was implemented in accordance with a preestablished Characterization Plan that included project-specific procedures encompassing radiological aspects of the project.

The following sampling was performed during the characterization program:

- 1423 smears surveys
- 26 paint scrapings
- 14 metal samples
- 6 secondary containment concrete core bores



- 10 crud (solids) samples from the primary system
- 4 primary water samples from the steam generators
- 1 water sample (chromated water over-rinse residue) from the empty neutron shield tank
- 11 air samples for radioactive contaminants

A representative number of paint, metal, and core bores were sent to General Engineering Laboratories (GEL) in Charleston, S.C. for confirmatory analysis, including detection of tritium in core bores, which was not possible with any shipboard instrumentation. The results of the confirmatory analyses performed by GEL confirmed the finding of the shipboard instrumentation.

Findings of this characterization effort are as follows:

- Confirmed the absence of fission products (other than trace quantities of cesium-137), uranium and its daughter isotopes, as well as transuranics (e.g., plutonium), indicating no discernable fuel failures.
- Minimal crud contribution to total curie content.
- No contamination found in the non-radiological spaces.
- Minimal contamination found in radiological spaces.
- Overall dose rates much lower than expected.
- Previously radiologically identified sites found uncontaminated.
- Containment vessel systems, structures. and equipment exceptionally radiologically clean.

In conclusion, the N/S SAVANNAH is in very good condition from a radiological perspective to support decommissioning. The data gathered during this exercise, and subsequently verified by a certified, independent laboratory, would allow MARAD to develop comprehensive decommissioning strategies along with bounding the costs.

2. HISTORY/STATUS OF NUCLEAR SHIP SAVANNAH

In 1955, President Eisenhower proposed that the United States build the world's first atomic-powered merchant vessel to demonstrate America's peaceful use of the atom. In 1956, Congress authorized construction of the Nuclear Ship SAVANNAH as a joint project of the Maritime Administration and the Atomic Energy Commission. After the ship was commissioned, MARAD took title to and responsibility for the ship.



The reactor plant achieved initial criticality in December 1961 and operated from 1962 to 1970 at an average plant thermal power of 30%, resulting in 2.4 effective full power years of irradiation on the structures inside the containment vessel (CV). The NSS is currently moored along side the Nuclear Barge STURGIS in the James River Reserve Fleet (JRRF) near Fort Eustis, Virginia.

On 29 January 1973, the U. S. Atomic Energy Commission issued Amendment 13 to the Technical Specifications associated with NSS license NS-1. This amendment acknowledged that the NSS's reactor was no longer operational. This decision was based on the fact that all nuclear fuel had been removed from the ship, and the reactor and associated systems had undergone certain modifications to ensure that they were no longer operable.

The following radioactive material/equipment had previously been removed from the ship:

- All fuel elements (32)
- Main coolant pumps and integral motors (4)
- Loose radioactive material (components and waste)
- Fission chambers and start-up source
- Demineralizer resin tanks

The reactor vessel is closed with the head in place (held by six tensioned studs). The control drive system is disconnected mechanically, hydraulically, and electrically.

The primary system was initially thought to be drained of water, though it was estimated that approximately 1100 gallons of water remained in the lower plenum of the reactor vessel below the inlet nozzles. This estimation was performed by the contractor who was responsible for dewatering the primary system in 1976. During the opening of both port and starboard steam generator primary system inlets, water was observed in both steam generators. It is anticipated that water may also be in the pressurizer surge line. The status of the water level in all of the primary components, which is being evaluated under a change order to this contract, will be documented elsewhere.



3. RADIOLOGICAL CHARACTERIZATION

Materials onboard the NSS might contain radioactivity from both activation and contamination processes. Activation is a process by which a material is made radioactive through neutron bombardment produced by the fission of uranium fuel. Radioactivity is induced throughout the material such that the material may be considered radioactive. While an activated material such as steel cannot be cleansed of its radioactive nature, the radioactivity cannot be transported unless the steel itself is degraded (e.g., through corrosion, cutting, or abrasion) and transported.

Activation products in stainless and carbon steel–based reactor and primary system components could include iron (Fe-55), cobalt (Co-60), and nickel (Ni-59 and Ni-63). With only 2.423 effective full power years of irradiation time, none of these nuclides reached saturation (highest activity attainable by an isotope in a specific neutron flux, i.e., rate of production = rate of decay). Fe-55, with the shortest half-life of the principal nuclides, reached 46% of saturation; Co-60 reached 27%. Ni-59, with a half-life of 7.5 x 10^5 years, attained less than 0.003% of saturation, while Ni-63 reached 1.7%. Fe-55 would have been present in large quantities on the NSS at final shutdown but has since decayed through more than 13 half-lives and is now present in only trace quantities. Concrete may contain tritium (H-3). Radon was noted in many of the vessel's enclosed areas and was identified during air sampling.

Radioactive surface contamination generally refers to loose or fixed radioactive material that is transported and deposited onto a surface. This contamination may result from processes such as abrasion, oxidation, or erosion of fission and activation products. Radioactive surface contamination may be easily transported from surface to surface through direct contact. It is important to make the distinction that activated materials present a greater external exposure concern to the human body, while contaminated materials are a greater internal exposure concern to the human body. In addition, during characterization or remediation activities such as cutting, grinding, coring, and other intrusive techniques, the potential for internal exposure is increased.

Chemical action of the coolant water flowing through the core can cause gradual corrosion of the materials forming the reactor pressure vessel (RPV), internals, primary piping, steam generators, and pressurizer. These corrosion products, referred to as "crud," have been or will be activated by neutron irradiation and will circulate with the coolant until they decay or are deposited at locations of low water velocity or stagnation



flow or are removed by purifiers, leaks, or routine replacements of water. Crud would normally be retained in the primary loop unless leaks in the steam generator tubes caused crud carryover to the secondary loop.

Potential airborne radioactivity areas, which might exceed regulatory limits for concentration and could require the use of respiratory protection, were identified early in the characterization program.

The large number of sample categories and locations identified in the Characterization Plan reflects the significance of both activation and surface contamination in the selection of safe, cost-effective decommissioning processes.

4. RADIOLOGICAL CHARACTERIZATION TECHNICAL APPROACH

4A. RADIOLOGICAL CHARACTERIZATION METHODOLOGY

The following describes the methodology that was used to characterize radiological hazards in sufficient detail for MARAD to develop decommissioning strategies. As previously stated, this characterization program was abbreviated in scope compared to the final MARSSIM-based survey, which will be required in preparation for the NRC license termination following decommissioning.

- Containment vessel structures and internal structures may contain trace amounts of radioactivity due to induced activity from exposure to neutron radiation during operation. Samples of the structural metal were taken, and activated nuclides, if any, were identified.
- The reactor vessel, internals, and neutron shield tank were previously characterized by WPI, based on current material standards, actual plant operating data, and the latest analytical computer code (ORIGEN-ARP Version 2.00) accepted by the NRC. This characterization is available in the report entitled, "Nuclear Ship Savannah Reactor Vessel, Internals, and Neutron Shield Tank Characterization and Classification Assessment, revision 0 dated April 3, 2004". The results of the analyses concluded that the reactor vessel, internals, and neutron shield tank satisfied the radionuclide inventory waste acceptance criteria (WAC) for the Barnwell disposal site. To confirm or refine the earlier analytical results, external reactor



vessel dose measurements were obtained from inside the neutron shield tank at the elevation of the core mid-plane.

- The containment vessel rests on a support frame surrounded by a concrete shield lined on the inside with a painted carbon steel plate liner. While no contamination or induced activity was expected in the concrete behind the liner, that assumption was confirmed by drilling through the liner at strategic locations with a hole saw and core boring the concrete with a magnetic base core boring machine to obtain appropriate samples for off-site evaluation.
- Several specific locations were investigated, such as the inside surfaces of the primary system (by opening the primary inlet of each steam generator). Other systems were opened as necessary by removing valve bonnets, heat exchanger manways, pipe flanges, etc. to gain access and samples. All system openings were closed to an airtight (but not hydrostatically tested) condition. Air-handling systems (shut down and in use) were opened and investigated
- The steam plant (secondary side) was characterized by opening the condenser near the steam jet air ejector (SJAE) and the port inspection point steam generator steam drum.
- WPI's extremely knowledgeable and experienced staff identified areas of concern and approached the effort in a thorough and efficient manner. Personnel biographies are contained in Appendix A.

4B. INSTRUMENTATION

4B.1 Calibration

Radiation detection instruments used for the project were either rented from an approved vendor or provided by MARAD. Upon arrival, the instruments were checked for function and condition; all instruments were determined to be in good working condition. Calibration data sheets were reviewed, matched to each instrument, and accepted.

All instrument rentals and calibration sources were procured under WPI's NQA-1 program, which is an NRC-compliant Quality Assurance Program.



Air samplers, on loan from MARAD, were also used on this project. A copy of the calibration data sheet was provided for each air sampler. These were verified as current for each air sampler and accepted.

4B.2 Daily Source Checks

To permit daily checks of the instrumentation, operational check sources for alpha and beta instruments were used. These sources were as follows:

- thorium-230 (alpha emitter) 339 Bq (9.16 nCi)
- technetium-99 (beta emitter) 75.8 Bq (2.05 nCi)

Each portable instrument was checked daily for proper background. This background value was established when the instrument was first put into service on this project. A source count value using an appropriate check source was established initially for the portable instruments. From this initial count, a $\pm 20\%$ range was established for each instrument. On a daily basis or more frequently if appropriate, the appropriate check source was counted with each portable instrument and a count value obtained. The daily source count was entered on the Instrument Source Check Log for each instrument and verified to be within this $\pm 20\%$ range.

No gamma source was provided. An alternative method to source-check the portable radiation detectors (Ludlum 19 μ R meters) was a stateroom commode with porcelain glaze. This glaze contained enough naturally occurring radioactive material (NORM) to provide a reading of 6–9 μ R. The reasons for this method are discussed in Section 4C.2, Frisking. This approach provided a suitable gamma source for a daily source check of the μ R meters. Natural background on the NSS was 2–3 μ R.

The Teletector, a gamma detector with 17-foot telescoping capability, was checked daily, when used, by comparing readings in radiological areas with a Ludlum 19 μ R meter, a method that provided assurance that the Teletector was functioning properly.

A 20-minute average background count was established for the 2929 counters; a daily 20-minute background was performed, and the range verified as ±10% of the average. These daily background values were entered on the Instrument Source Check Log for each instrument.



The 2929s count both alpha and beta simultaneously. Using the Th-230 and Tc-99 check sources, an average 5-minute count value was obtained for each counter when first put into operation for this project. Based on this initial count, a $\pm 10\%$ range was established. Daily count values were obtained from the 2929s using both check sources. These source count values were entered in the Instrument Source Check Log for each 2929 counter and verified to be within this $\pm 10\%$ range. These values were verified by using National Institute of Standards and Testing (NIST) traceable check sources and documented on Instrument Check Source Logs for each instrument.

Copies of the daily source check and background count are included in Appendix B.

4B.3 Instrument Use

Two Radeco Low-Volume Air Samplers were used to detect airborne radioactive particulates. These battery-powered, computer-controlled, totalizer-type air samplers can run for approximately 3 hours on a full battery charge. In addition, augmented battery service was provided through two 800-amp/hour marine batteries purchased for this effort. Air samples were obtained prior to entry into an area without respiratory protection and when opening the primary system.

Ludlum 19 μ R meters were used to monitor for low-level gamma radiation upon first entry into radiological areas and for measuring dose rates up to 5 mR throughout the radiological areas.

Ludlum 3, 12, and 2221 count rate meters with pancake probes were used to monitor for very low levels of beta/gamma contamination throughout the ship and were also used to monitor individuals upon exiting radiological areas.

A Ludlum 2221 count rate meter with an alpha probe was used to monitor for alpha contamination in selected areas of the containment vessel and labs.

One teletector telescoping instrument was used in radiological areas above 5 mR/hour, almost exclusively in containment and shipboard laboratories.

Two Ludlum 2929 scalers with 43-10-1 probe were used to count the smears, air samples, metal samples, and paint scapings taken during this project.



Table 4B.3-1 lists shipboard nuclear instrumentation used during the project.

N.S. Savannan Characterization Project Instrument List						
Instrument model	Serial number	Probe model	Probe serial number	Radiation detected	Readout units	
Ludlum 3	97416	44-9 pancake	NA	Beta/gamma	cpm	
Ludlum 12	75809	44-9 pancake	NA	Bata/gamma	cpm	
Ludlum 12	91037	44-9 pancake	NA	Beta/gamma	cpm	
Ludlum 19	42972	Internal scintillator	NA	Gamma	µR/hour	
Ludlum 19	95499	Internal scintillator	NA	Gamma	µR/hour	
Ludlum 19	95469	Internal scintillator	NA	Gamma	µR/hour	
Ludlum 2221	197766	43-5 scintillator	127385	Alpha	cpm	
Ludlum 2221	94954	44-9 pancake	NA	Beta/gamma	cpm	
Ludlum 2929	102001	43-10-1	103276	Beta/gamma	cpm	
Ludlum 2929	160019	43-10-1	167229	Beta/gamma	cpm	
Teletector 6112D	28991	NA	NA	Gamma	mR/hour	
Radeco H-810DC	0864	Air sampler	NA	Air particulate	NA	
Radeco H-810DC	0865	Air sampler	NA	Air particulate	NA	
Canberra high	S/N 96-	Base unit/detector	SAM 935	Gamma	Kev/Mev	
resolution gamma spectrometer*	5740		(90163/S SR593)			

Table 4B.3-1 N.S. Savannah Characterization Project Instrument List

* SERAT team provided.

4C. RADIOLOGICAL SAMPLING LOGISTICS

To adequately characterize the existing radiological conditions aboard the NSS, seven different types of data were collected: smears for surface contamination including samples taken from the interior of the primary system to estimate the extent of crud buildup (or plate-out) in the reactor vessel, frisking for fixed contamination, dose rate measurements, paint scrapings, metal samples for induced activity, core bores for shielding wall samples, and air samples to identify airborne radioactivity.

4C.1 Dose Rate Measurements

Dose rate measurements (primarily in μ R/hour) were taken in rooms and compartments throughout the ship to determine the radiation levels from any residual radioactive materials or contamination.



4C.2 Frisking

Frisking measurements (in counts per minute) generally preceded the smear samples to identify any locations with fixed or loose radiological contamination. Frisking is the process of detecting radioactive material on personnel or equipment/structures.

Frisking readings and dose surveys in selected commodes and sinks exhibited slightly elevated readings (typically 7–10 μ R/hour) compared to background (2–4 μ R/hour). Investigation of this anomaly revealed that prior to the mid-1970s, a glaze commonly used in the manufacture of porcelain products could contain trace amounts of uranium and/or thorium. Use of a portable energy spectrometer did confirm the presence of thorium in some of the porcelain furnishings.

4C.3 Smears

Smears are 10×10 -cm (4- \times 4-inch) samples taken by rubbing a fixed-size sample paper (nominally a circle about 2.5 cm (1 inch) in diameter on a contiguous area). The area may be any set of dimensions that equals 100 cm^2 . The smear paper is protected from cross-contamination and numbered as to the area and sequential sample number. The smear is then placed in a shielded detector, and any radioactive emissions which occur from decay are "counted" by the detector.

The number of "counts" is an indication of the amount of residual radioactivity (removable) on the originally sampled area. Count rates for all smears above background were converted to the standard nomenclature for radioactive surface contamination, disintegrations per minute (dpm)/100 cm². Surface contamination levels above 10CFR20 regulatory limits (1,000 dpm/100cm² for beta/gamma activity) were posted with appropriate warning signs. In all, 1423 smears were taken during the categorization effort depicted on the radiological survey forms in Appendix C.

In determining the sample distribution in an area, emphasis was given to those areas identified by frisking as being potentially contaminated such as sumps, door sills, contaminated systems pipe flanges, any location with evidence of leakage, etc.

In those areas of the ship not expected to be contaminated, such as staterooms, dining and recreation areas, crew quarters, offices and galleys, predetermined smear locations



included door sills, door knobs, ventilation ducts, bathroom floors, and sinks. As shown in Appendix C, these areas exhibited radiation levels at or below background.

Smears of the interior piping of the primary system were taken at the inlet to the steam generator and on the inlet side of the tube sheets. Smears of the primary system contamination were obtained via inspection ports located on the steam primary side of the steam generators that were subsequently reinstalled. The principal isotope in the crud was confirmed to be Co-60 through use of gamma spectroscopy. Using the highest activity smear (tube sheet entrance) and assuming this crud level to be uniformly distributed over the interior surface of the RPV, a total crud activity level of 1.1 mCi was obtained. In our 3 April 2004 report, the total RPV crud activity level in 2007 was estimated to be less than 0.3 Ci of Co-60. A gamma energy spectrometer was used to confirm that the principal isotope in the crud was Co-60. Details of the crud analysis are provided in Appendix B. The difference in crud levels are due to the fact that one was an estimate based on a dose rate that was obtained in 1971 at the primary inlet piping where an assumption was that the dose rate was an infinite line source. Now the evaluations should be based on actual data obtained during the characterization efforts.

4C.4 Paint Samples

Paint samples were taken using a rasp or scraper to remove all levels (coats) of paint in recognition of the fact that early contaminated coats of paint may have been overcoated with fresh paint and would be impervious to smears. Paint samples included only paint and undercoatings but no metal. Preference was given to locations containing multiple layers of paint and in areas near or around radiological laboratory sinks and any other location with potential for contamination. While the same area planning philosophy as for smears was followed, the paint sampling locations were also selected on the basis of accessibility. Based on the absence of any activity levels above background in the passenger and crew living spaces, as well as other non-radiological portions of the ship, paint samples were taken only in the radiological portions of the ship as shown in the radiological survey forms in Appendix C. The activity levels were nonexistent based on actual results from dose rates and smear samples. Obtaining paint samples in the non-radiological portions of the ship would add no new information to the extensive data base already compiled through dose surveys and smear collection.



The NSS Health Physics staff detected radioactivity levels above background in some samples. Six samples, which showed activity levels above background using shipboard instrumentation, were sent to GEL, a WPI-approved vendor, for confirmatory analysis. Results of GEL's analysis indicated the presence of Co-60 and Cs-137 in the picocurie (pCi) range where 1 pCi=10⁻¹² Curies. Co-60 activity levels ranged from 2.61 to 109 pCi/gm with the highest level at the foundation of the RPV and primary containment wall. Cs-137 activity levels ranged from 2.58 to 342 pCi/gm with the highest level at the interior of the primary vent duct, where airborne Cs-137 would tend to concentrate. The detection of Co-60 and Cs-137 confirmed findings of the onboard characterization effort involving smear collection/counting and portable gamma spectroscopy.

A trace amount of Pb-212, which is a decay product of naturally occurring Th-232, was detected (1.81 pCi/gm). K-40, a naturally occurring isotope in elemental potassium that accounts for about one-third of the external and internal whole body dose resulting from natural sources, was detected at a trace level of 2.76 pCi/gm. Details of GEL's analysis are provided in Appendix C.

4C.5 Metal Samples

To identify radiation sources resulting from the neutron activation of metal components during reactor operation, small metal samples (less than 1 square inch) were cut from metal components/structures with saws, drills, or other bulk metal–removal equipment. The objective was to obtain only metal with no paint, coatings, or other foreign materials. Sample locations were determined based on physical structure type and location in the CV. A set of samples was taken from structural components in close proximity to and in direct line-of-sight of the core mid-plane, where maximum neutron irradiation during power plant operation would have occurred. Another set of samples was taken in structural components near the outer wall of the CV at core mid-plane locations to determine the activation of the CV wall, if any. The activity (if any) was measured to determine curie concentration of the activated metal.

Neutron activation in the CV ceased following reactor final shutdown. Fe-55, the principal isotope of radiological concern in structural steel, has since decayed through thirteen half-lives ($T_{2}^{1/2}$ = 2.7 years) and is currently present in only trace quantities.

Though the metal samples showed no activity above background in the NSS Health Physics Lab, four samples were sent to GEL for confirmatory analysis. Results of GEL's



analysis indicated no detectable radiation levels except naturally occurring K-40, a radioactive isotope of elemental potassium, that measured 2.97 pCi/gm. Details of GEL's analysis are provided in Appendix C.

4C.6 Core Bores

Six core borings were taken through the steel inner liner of the secondary area and into the shield wall to determine the extent to which the concrete external to the steel wall is contaminated or induced activity exists. In addition, the concrete shielding was considered the only credible location for tritium (H-3), other than residual water in the RPV and primary system piping/steam generators. Selection of core bore locations was based on expected maximum activity levels as well as boring equipment accessibility.

It was also necessary to provide drilling water to the core boring machine, which required use of a water recovery system. Core bores were removed and identified as to orientation (outer and inner end and location). The steel plug removed from the core bore access hole in the wall also provided an induced activity sample. The core bore holes in the steel liner were restored by sealing with a sealing material.

Two of the core bore samples, including the steel plugs, were sent to GEL for analysis, including determination of the presence of tritium, whose characteristic low beta energy (20 keV, max) without accompanying gamma emissions was beyond the detection capabilities of any shipboard instrumentation. GEL's analysis indicated no detectable levels of tritium in either of the two samples. Both samples contained trace amounts (< 1 pCi/gm per isotope) of naturally occurring Th-232 decay products (Ac-228, Pb-212 and TI-208) and naturally occurring U-238 decay products (Bi-214, Pb-214 and Th-230). The isotope, K-40, a naturally occurring isotope in building materials such as concrete, was present at activity levels in the 12-14 pCi/gm range, a factor of 4-5 higher than the K-40 content measured in paint or metal. This finding confirms the higher concentration of K-40 that would be expected in concrete versus either metal or paint. The broad array of naturally occurring isotopes (K-40, U-238 and Th-232 daughter products) detected in the bore samples are entirely consistent with the predictable isotopic content of a concrete structure.

The steel plugs exhibited no detectable radioactivity, which is an indication of negligible levels of neutron activation at those locations during reactor operation. This finding is corroborated by the absence of any detectable radioactive material except naturally



occurring isotopes in either of the bore samples. Details of GEL's analysis are included in Appendix C.

4C.7 Air Samples

Airborne radioactive material was determined through the use of RADECO low-volume air samplers followed by quantitative analysis of residual radioactivity retained on the air filters inserted at the flow intake of the samplers. The high initial alpha levels followed by decay to background levels within 24 hours indicated the presence of naturally occurring radon (Ra-222) on the ship. These findings are consistent with likely sources of shipboard radon that include concrete, floor tiles, and porcelain furnishings. Likely sources of radon include concrete, floor tiles, and porcelain furnishings. Air sampling identified no other sources of airborne radioactivity and the results are included in Appendix C.

4C.8 Water Sample

One water sample (chromated water over-rinse residue) was collected from the empty neutron shield tank. No radioactivity was detected using onboard instrumentation. This finding was verified by GEL's analysis that found no detectable levels of radiation in the water sample. Details of GEL's analysis are included in Appendix C.

4D. SAFETY PRECAUTIONS

WPI implemented the N/S SAVANNAH Preliminary Accident Prevention and Health and Safety Plan that had been previously prepared and accepted by MARAD under another contract. This plan established comprehensive procedures for all feasible issues associated with the characterization effort. In addition, MARAD supplied a marine chemist, who released confined spaces, secondary containment, and primary containment for general access. Upon initial opening, the primary containment was oxygen deficient prior to ventilation being established. The Gas-Free Certificate is provided in Appendix D. Appendix E contains Project Exposure information for the team. All work in radiological areas was performed in accordance with a Radiation Work Permit (RWPs). The RWPs are provided in Appendix F.



4E. WASTE MANAGEMENT

Waste management was performed in accordance with project procedures described in Appendix G. All trash removed from radiologically controlled areas was frisked prior to determining its release status. If an item frisked clean, it was disposed of as normal trash following a confirmatory survey prior to leaving the vessel. If an item was found to contain radioactive material, it was bagged and stored onboard the NSS. In addition, before trash was removed from the NSS, the bags were frisked again as a precaution.

5. RADIOLOGICAL CHARACTERIZATION RESULTS

5A. RADIOLOGICAL PROFILE

One hundred eighty-five areas of the NSS were evaluated for radioactivity, including nine decks and seven compartments or areas that span decks vertically. In excess of 1400 smears were taken in these areas. One hundred and one surveys were documented and are included in Appendix C. Many of these surveys included multiple areas; as an example, five staterooms were usually documented on one survey. Summarizations of these areas are included in Tables 5A.3-1 through 5A.6-1.

5A.1 Dose Rates

For radiological areas outside of primary or secondary containment, general area dose rates ranged from background to 50μ R/hour. Contact readings on some pipes reached 2mR/hour.

In non-radiological areas, general area dose rates were at or below background, with one exception in Cargo Hold 4, where shine from the Cold Chemistry Lab produces approximately 250μ R/hour at the Cargo Hold 4 aft wall. Shine is radiation emanating from another location on the ship but being measured remotely.

Inside secondary containment, dose rates in the upper levels of secondary containment were essentially background. In lower secondary containment, general area dose rates varied 0.3–1.6 mR/hour, with contact readings of up to 221 mR/hour.

Inside CV general area dose rates varied 0.1–10 mR/hour, with the highest contact reading around the "U" tube end of the steam generators of 35 mR/hour.



Inside the steam generator primary side inlet plenum dose rates were a maximum of 344 mR/hour in the mid-plane of the plenum and the highest contact reading was 812 mR/hour, on the tube sheet.

A dose rate summary is included in the following sections.

5A.2 Radiological Contamination

No loose radiological contamination was found in unexpected places. Very little contamination was found in areas where it was expected. Several stateroom toilets, sinks, and floor tiles were found to contain NORM. A summarization of these areas is included in the following tables.

5A.3 Non-Radiological Areas

The non-radiological areas were clear of detectable radiological contamination. The non-radiological areas evaluated are summarized in the following table.

Non-Radiological Area Summary					
Deck/compartments	Number of areas evaluated	Dose rate found	Contamination found		
Navigation Bridge Deck	8	Background	All < background		
Boat Deck	10	Background	All < background		
Promenade Deck	2	Background	All < background		
"A" Deck	20	Background	All < background		
"B" Deck	44	Background	All < background		
"C" Deck	31	Background	All < background		
"D" Deck	11	Background	All < background		
Weather Deck ("A" Deck) fwd and aft	15	Background	All < background		
14' Flat Deck	5	Background	All < background		
Hold Deck	6	38 µR/hour*	All < background		
Cargo Hold Number 4 (aft)	5	250 µR/hour**	All < background		
Machinery Casing, boat to "C" Deck	4	Background	All < background		
Engine and Control Rooms	8	Background	All < background		
Hold Number 5, engineering space	2	Background	All < background		

Table 5A.3-1
Non-Radiological Area Summary



*Hold Deck had a pipe running under the deck plate in the passageway that read 38μ R/hour on contact. This pipe ran through a portion of the crossover area also. The pipe is for the waste transfer system. Lower dose rates were recorded at various areas of the passageway above the deck plates.

**Hold Number 4, "D" Deck Starboard, had readings on the aft wall up to 250 μ R/hour. This appears to be shine from the Cold Chemistry Lab.

5A.4 Radiological Areas

Table 5A.4-1 provides a summary of radiological condition found during the evaluation of radiological areas excluding containment. The values listed are maximums. Figure 5A.4-1 provides a cross-sectional view of the NSS radiological area. Brief summaries are provided below with detailed information on the Survey Sheets in Appendix C.

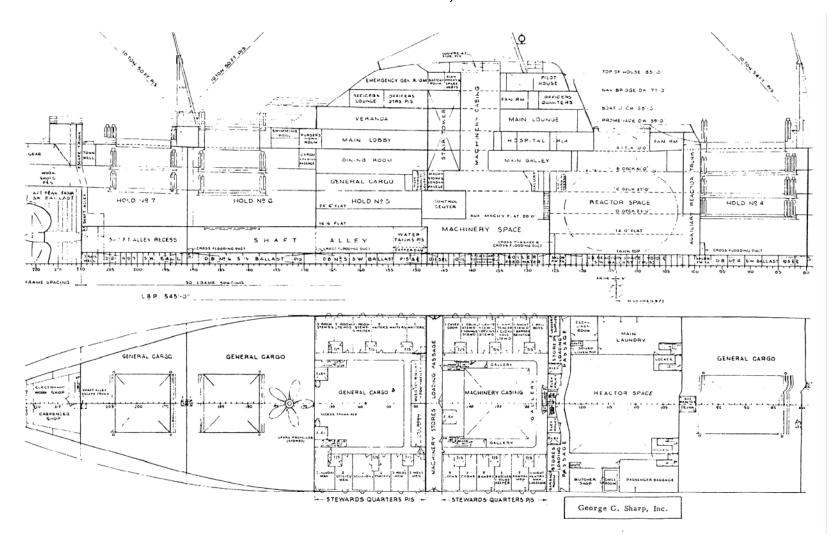
Deck/compartments	Dose rate found	Contamination found dpm/100cm ²
Hot Chemistry Lab, "D" deck off of the control room	Background	< 1000
Port Forward Stabilizer Room, upper level off of 14' flat	8 μR/hour	All < background
Port Forward Stabilizer Room, lower level	150µ R/hour	All < background
Fan Room "B" Deck, starboard side	Background	All < background
Stateroom B-1 (radiological waste storage)	Background	All < background
Cold Water Chemistry Lab, upper level	50 µR/hour	All < background
Cold Water Chemistry Lab, lower level	2000 µR/hour	Max 3904
Hold #4, "D" Deck, starboard	250 µR/hour	All < background
Charge Pump Rooms, port and starboard	180 µR/hour	All < background
Health Physics Lab., "A" Deck	5 µR/hour	Max 1221
Hold Deck, outside containment, port-to-starboard crossover passage	25 µR/hour	All < background
Hold Deck, outside containment, port and starboard passages	38 µR/hour	All < background

Table 5A.4-1 Radiological Area Summary



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Figure 5A.4-1 N/S SAVANNAH Cross Section, Frames 80–270





Hot Chemistry Lab, "D" Deck off of the Control Room

No radiological readings were found. Two locations had detectable contamination < 1000 dpm/100cm². See survey number NSS-0081. Detectable contamination was noted from smear samples taken at the drains in the hot lab. No radiological dose readings were noted above background.

Port Forward Stabilizer Room, upper level off of 14' flat

General area dose rates at mid walkway were 8 μ R/hour. Forward of this at end of walkway dose rate was 5 μ R/hour. Both appear to be shine from lower level. No radiological contamination was found. See survey number NSS-0059.

Port Forward Stabilizer Room, lower level

General area along walkway ranged 5–50 μ R/hour. Green piping (waste transfer piping) on either side of walkway ranged 20–150 μ R/hour on contact. No radiological contamination was found. See survey number NSS-0060.

Fan Room "B" Deck, starboard side (connects to Cold Chem. Lab) No radiological readings were found. No radiological contamination was found. See survey number NSS-0062.

Cold Water Chemistry Lab, upper level, "C" Deck (port entrance)

The lab extends from port to starboard between stairwells. The general area dose rate on the port side is 4 μ R/hour. A large, continuous air-monitoring unit covered with lead is stored in the starboard side. Dose rates of 4–50 μ R/hour were found in and around this monitor. No radiological contamination was found. See survey number NSS-0064.

Cold Water Chemistry Lab, lower level, access is from upper level

Filter canisters located on port side of room read 200–600 μ R/hour on contact. Overhead pipes on starboard side read 2000 μ R/hour on contact. One location showed smearable radiological contamination. The sample sink inside the hood was 3904 dpm/100 cm². See survey number NSS-0070.

Hold #4, "D" Deck, starboard

The aft portion of this deck in Hold #4 has radiation readings 6–250 μ R/hour. An overhead vent pipe has a reading of 38 μ R/hour. The highest readings appear to be shine coming from the Cold Chemistry Lab, which is on the other side of the



bulkhead. No radiological contamination was found. See survey number NSS-0063.

Charge Pump Rooms, port and starboard, lower level of engineering space General area dose rate was background (2–4 μR/hour). On contact with the charge pumps, a maximum reading of 180 μR/hour was recorded. No radiological contamination was found. See survey number NSS-0086.

Health Physics Lab, "A" Deck at Hospital

General area in lab was background (2–4 μ R/hour). Inside sink dose rate was 5 μ R/hour. Frisker read 350 cpm in bottom of sink. Radiological contamination was found in bottom of sink at 1221 dpm/100 cm². See survey number NSS-0068.

Hold Deck, outside containment, port to starboard crossover passage

A reading of 25μ R/hour was found on the floor of the passage, port side. No radiological contamination was found. See survey number NSS-0066.

Hold Deck, outside containment, port and starboard passages, for and aft

Slightly elevated dose rate readings were found on the containment wall (7 μ R/hour) on the starboard side. On the port side, a reading of 38 μ R/hour on contact with a pipe under the deck plate was found. Tracing the pipe for to aft, elevated readings on the deck plate were found from 4 μ R/hour to 18 μ R/hour. No radiological contamination was found. See survey number NSS-0065.

5A.5 Secondary Containment

Table 5A.5-1 summarizes radiological conditions found during the evaluation of Secondary Containment. The values listed are maximums. Consult the write-ups below the table and survey sheets for details.

During initial entries and during other entries, outer shoe covers and outer gloves were frisked to determine whether radiological contamination was present. No contaminated shoe covers or gloves were found.



Deck/compartments	Dose rate found*	Contamination found (dpm/100cm ²)*
"B" Deck, access area aft of reactor	Background	All < background
"B" Deck, area forward of reactor	Background	All < background
"C" Deck forward, access from "B" deck	Background	All < background
"A" Deck around cupola	Background	All < background
Top of Cupola	4 μR/hour	All < background
Aft Mezzanine, mid level between "C" and "D" Decks	3–5 µR/hour	All < background
Lower level of Secondary Containment	221 mR/hour	All < background
*Soo write up below for details		

Table 5A.5-1				
Secondary	y Containment Radiological Summary			

*See write-up below for details.

"B" Deck, access area aft of reactor

Dose rates in this area were background (2–4 μ R/hour). Frisking showed no locations above background (20–40 cpm). No radiological contamination was found. See survey number NSS-0067. No smearable contamination was noted. Dose rates were present due to activated material or contamination inside of other systems.

"B" Deck, area forward of reactor

Dose rates in this area were background (2–4 μ R/hour). No radiological contamination was found. See survey number NSS-0072.

"C" Deck forward, access from "B" Deck

Dose rates in this area were background (2–4 μ R/hour). No radiological contamination was found. See survey number NSS-0071.

"A" Deck around cupola

Dose rates in this area were background (2–4 μ R/hour). No radiological contamination was found. See survey number NSS-0073.

Top of Cupola

No radiological contamination was found. See survey number NSS-0090.

Aft Mezzanine, mid level between "C" and "D" Decks and decon shower on "C" Deck General area dose rates were 3–5 µR/hour. No radiological contamination was found. See survey number NSS-0075.



Lower level of Secondary Containment, access down ladder tube only

General area starboard side 300–1000 μ R/hour, 1400–1600 μ R/hour head high. Overhead yellow line emits 221 mR/hour on contact. These lines are posted. Starboard forward general area is 400–500 μ R/hour. Port side general area was 60–80 μ R/hour. No radiological contamination was found. See survey number NSS-0076.

5A.6 Primary Containment

Table 5A.6-1 provides a summary of radiological condition found during the evaluation of Primary Containment. The values listed are maximums. Consult the write-ups below the table and survey sheets for details. Figures 5A.6-1 through 5A.6-5 provide a layout of the primary containment by elevations and plan views.

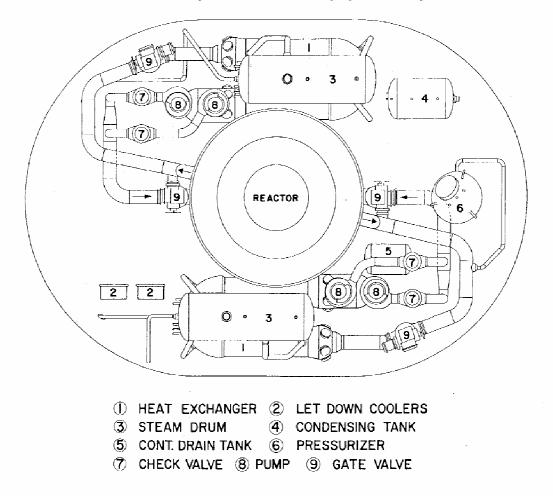
During initial entries and during other entries, outer shoe covers and outer gloves were frisked to determine whether radiological contamination was being spread. No contaminated shoe covers or gloves were found.

Frimary Containment Radiological Findings				
Deck/compartments	Dose rate found	Contamination found (dpm/100cm ²)		
Primary Containment, upper hatch closed	15 µR/hour	All < background		
Primary Containment, upper hatch open	400 µR/hour	All < background		
Primary Containment, 1 ST level	500 µR/hour	1200		
Primary Containment, inside shield tank upper ring	7 mR/hour	All < background		
Primary Containment, 2 nd level	3 mR/hour	All < background		
Primary Containment, 3 rd level	10 mR/hour	< 1000		
Primary Containment, 3 rd level, area over U-tube	35 mR/hour	< 1000		
steam generator				
Primary Containment, 4 th level	3 mR/hour	All < background		

Table 5A.6-1
Primary Containment Radiological Findings



Figure 5A.6-1 Primary Containment Equipment Layout



⊟> FWD



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Figure 5A.6-2 Primary Containment Level 1 (Top)

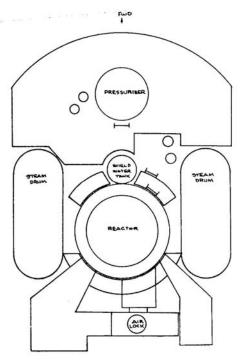
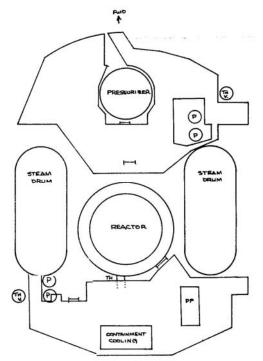


Figure 5A.6-3 Primary Containment Level 2





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Figure 5A.6-4 Primary Containment Level 3

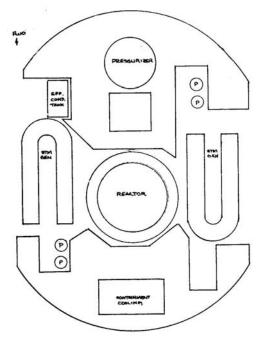
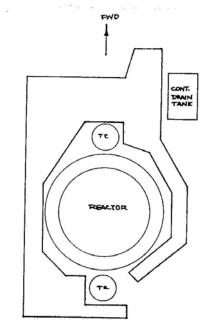


Figure 5A.6-5 Primary Containment Level 4 (Bottom)





Primary Containment, upper hatch closed, after plug removal

Dose rate at gauge on upper hatch 15 μ R/hour. No radiological contamination was found. See survey number NSS-0069. No smearable contamination was noted. Dose rates were present due to activated material or contamination inside of other systems.

Primary Containment, upper hatch open

Dose rate in airlock 400 μ R/hour. No radiological contamination was found. See survey number NSS-0074 and NSS-0077. No smearable contamination was noted. Dose rates were present due to activated material or contamination inside of other systems.

Primary Containment, 1ST level

The aft area of 1st level general area dose rate is 0.1–0.5 mR/hour. Next to and forward of the reactor, dose rates vary, with the highest being on the starboard side of the pressurizer at 0.7 mR/hour. Radiological contamination found in several locations <1000 dpm/100cm². One location to right of pressurizer has radiological contamination at 1200 dpm/100cm². See survey numbers NSS-0087, NSS-0079, and NSS-0083.

Primary Containment, inside shield tank upper ring, neutron wells, and inside neutron shield tank access area

General area dose rate $300-500 \mu$ R/hour. Readings were taken in neutron detector wells that extend down next to the reactor wall inside the neutron shield tank. There is lead shielding installed on the OD of the neutron detector wells.

Neutron well	Midpoint reading Bottom rea	
Aft well	2.2 mR/hour	3.4 mR/hour
Forward well	2.4 mR/hour	3.7 mR/hour

There is a personnel hatch into the neutron shield tank. Reading taken 7 feet down from flange (core mid-plane) was 7 mR/hour. No radiological contamination was found inside the shield tank upper ring or inside the shield tank. See survey number. NSS-0087 and NSS-0091.

Primary Containment, 2nd level

Dose rates on Level 2 vary 0.1–3 mR/hour. Highest reading is forward starboard near steam drum. No radiological contamination was found. See survey number NSS-0084.



Primary Containment, 3rd level

Dose rates on Level 3 vary 0.1–10 mR/hour. Highest reading is aft starboard near U-tube steam generator. Radiological contamination was detected up to 300 dpm/100cm² in two locations. See survey number NSS-0085.

Primary Containment, 3rd level, area over U-tube steam generators

Starboard steam generator dose rate between down-comers was 24 mR/hour. Port steam generator dose rate between down-comers was 35 mR/hour. Radiological contamination was detected ~150–~650 dpm/100 cm² in six locations between the down-comers on the U tube steam generator, starboard side. See survey number NSS-0089.

Primary Containment, 4th level

General area dose rate was 1–3 mR/hour. No radiological contamination was found. See survey number NSS-0082.

Primary Containment, 3rd level, opening primary system of steam generator

Port and starboard generators were opened. Unexpectedly, both had significant water in them, which was not indicated to be the case when the plant was originally dewatered.

Dose rates	Starboard steam generator (mR/hour)	Port steam generator (mR/hour)
Outside inner cover seal	32	34
At opening plane	45	NA
At mid plenum	275	344
At tube sheet	525	812
	Survey number NSS-0096	Survey number NSS-0097

Contamination levels	Starboard steam generator (dpm/100cm ²)	Port steam generator (dpm/100cm ²)	
Inside, top of plenum	14,798	22,000	
Inside, left of access	13,183	6,096	
opening			
Inside, right/below of	51,682	4,144	
access opening			
Plenum tube sheet	166,730	378,673	
Inside surface of SS	10,211	7,654	



cover seal		
	Survey number NSS-0096	Survey number NSS-0097

Surveys after work was performed showed smearable radiological contamination of <500 dpm/100cm² in work areas. This is well below the regulatory limit of 1000 dpm/100cm².

From the RPV dose rate information taken at the RPV external wall near the core midheight location, the following is known. The actual reading of 7 mR/hour that is about an order of magnitude lower than expected is attributable to the residual Co-60, which was estimated from previous analytical analysis to be 1108 curies distributed throughout the internals and structural components of the RPV. Though other nuclides are known to reside in the RPV, only the gamma radiation from Co-60 (1.17 and 1.32 MeV) are sufficiently energetic to penetrate the thermal shields, core barrel, and RPV wall resulting in measurable doses above background external to the RPV.

An estimate of dose rate at the exterior of the vessel was made using a point source approximation along the centerline of the vessel at mid-core height as outlined in Appendix B. This analysis gave a dose rate of 85 mR/hour. The higher estimated versus measured dose suggests an overprediction of the total RPV curie content in the original analysis. The difference between measured and calculated is likely attributable to one or more of the following factors:

- overprediction of thermal neutron flux in the core internals
- use of high natural cobalt (Co-59) content (0.141%) for analysis (maximum ASTM values)
- underprediction of Co-60 gamma shielding/absorption by the heterogeneous arrangement of core internals and structural components that tend to depress neutron flux during normal operation.

5A.7 Air Samples

To reduce the time project members spent wearing respirators and to protect them from potential inhalation of radiological material, air samples were taken on initial entry into radiological areas and during evolutions with potential radiological consequences. A total of 11 air samples were taken. Locations are listed below.



All of the air samples were heavy with radon when counted right after sample acquisition. All samples required several counting periods with the last count in excess of 72 hours to thoroughly demonstrate the lack of any airborne radioactivity other then radon. This resulted in excess respirator time for some of the project members. Refer to Appendix H for respiratory protection discussion.

After the last count for each air sample was completed, all samples showed negative for airborne radioactivity. See Appendix C for individual air sample data.

Air sample locations:

- Cold Chemistry Lab, initial
- Access to Secondary Containment
- Charge Pump Room starboard
- Airlock for Primary Containment
- Primary Containment, 1st level
- Charge Pump Room, follow-up
- Cold Water Chemistry Lab, follow-up
- Primary Containment, 2nd level
- Secondary Containment, lower level
- Primary Containment, 4th level
- Primary Containment, 3rd level at port U-tube steam generator access hatch

6. ENVIRONMENTAL CHARACTERIZATION (HAZMAT)

6A. SCOPE

The objective of the NSS hazardous materials characterization program was to support MARAD in its decommissioning planning, cost estimating, radiological engineering, and scheduling efforts. To this end, hazardous materials (e.g., PCBs, lead, asbestos, etc.), which potentially may impact the decommissioning activities and/or downstream waste management will be identified. Under this scope, hazardous materials associated with fixed surfaces on the ship were surveyed and identified in both radiological and nonradiological spaces on the vessel

Personnel used existing vessel data, visual surveys, and sample collection/chemical analysis as part of the hazardous material characterization effort. All efforts were



conducted in a manner consistent with the Characterization Plan and specified elements of Quality Assurance Project Plan. Prior to the sampling effort, personnel reviewed available details of the vessel's infrastructure and operational equipment for potential sources, amounts, and relative hazards of potential contaminants. Target sampling items and locations were indexed and located on vessel schematics.

6A.1 Asbestos-Containing Material

Using available information and visual surveys, potential asbestos-containing materials (ACM) were identified, indexed, and mapped. This effort took place within both the radiological and non-radiological parts of the ship. Within the radiological spaces, samples of potential ACM were collected, mapped, and photographed. These samples were analyzed by an off-site laboratory (Aerosol Monitoring and Analysis, Lanham, Md.) to identify asbestos content. Within non-radiological spaces, representative samples of potential ACM were acquired, mapped, and photographed. These samples of potential ACM were acquired, mapped, and photographed. These samples of potential ACM were acquired, mapped, and photographed. These samples were placed in labeled bags and left aboard the ship for potential future analysis, as necessary.

Subsequent to the receipt of analytical results of samples collected from the radiological areas of the ship, quantities of ACM were estimated based on observations, data, and available maps of the ship. Personnel did not revisit the ship subsequent to the receipt of the analytical data to develop more accurate estimates of ACM quantities on those surfaces that tested positive for asbestos (i.e., Chrysotile or Amosite).

6A.2 Lead-Based Paint

The lead-based paint (LBP) testing was performed with a Radiation Monitoring Device (RMD) Model LPA-1 X-ray fluorescence analyzer (XRF). The XRF contains a small radioactive (cobalt-57) source, which emits radiation when pressed against a surface and the trigger is depressed. If the paint contains lead, the radiation stimulates the lead atoms to emit characteristic X-rays, which are sensed by a detector in the unit. The XRF then converts these signals to a final reading in milligrams per square centimeter. The LPA-1 XRF is capable of achieving a 95% confidence level in readings to a depth of 3/8-inch.

Calibration of the RMD LPA-1 was conducted in accordance with the manufacturer's instructions. Prior to obtaining readings from suspect surfaces, three calibration readings were collected on a National Institute of Technology (NIST) Level III Standard



Reference Material paint film. The LAP-1 must calibrate to 1.0 mg/cm^2 with a tolerance of $\pm 0.3 \text{ mg/cm}^2$ for the average of the three readings. If the calibration readings fell outside of this range, the equipment was rechecked and recalibrated before use.

For this survey, the XRF was set to a default value of 1.0 mg of lead per square centimeter of surface area tested. The Virginia Lead-Based Paint Activities Regulations, 18 VAC, 15-30-20, defines a lead-containing substance as any coating, paint, plaster, or surface encapsulation material containing greater than or equal to 1.0 mg/cm² of lead.

6A.3 Liquids

The location of equipment and tanks which potentially contain fuels, lubricants, and coolants were identified and noted on vessel schematics, and an index was compiled. Samples of liquids identified on the ship were collected for material characterization to assist in future decommissioning activities. This effort included both aqueous samples and oils. Samples from the non-radiological portion of the ship were labeled and left on the vessel for potential future analysis. Liquid samples from the radiological areas of the ship were transferred to a WPI-approved vendor for analytical testing.

6A.4 PCBs

Electrical equipment that potentially contains PCB-containing dielectric and electrical conduit was identified through review of vessel information and visual survey.

6A.5 Mercury

As part of the hazardous materials characterization, thermometers and switches were inspected in an effort to determine whether they potentially contained mercury. As these units were sealed, no samples were collected.

6B. RESULTS

Results of the hazardous materials characterization of the NS Savannah are presented below. With the exception of lead-based paint testing, the multimedia samples collected from the non-radiological areas of the ship were not analyzed. Those samples, which were collected, were transferred to MARAD for potential future analysis. These



samples from the non-radiological spaces were not within the scope of the project. The samples were gathered for future analysis if desired.

Table 6B-1 provides an analytical summary of the results of the water and oil samples obtained in the radiological spaces.

Radiological Spaces Elquid Sample Summary								
Sample ID	Units	Secondary Containment Sump (oil)	Secondary Containment Sump (water)	Primary Containment (hydraulic oil)	Stabilizer Rooms (hydraulic oil)	Stabilizer Rooms (lube oil)		
Metals								
Cadmium	mg/L	NA	0.02	NA	NA	NA		
Chromium	mg/L	NA	0.3	NA	NA	NA		
Mercury	mg/L	NA	0.00027	NA	NA	NA		
Lead	mg/L	NA	0.5	NA	NA	NA		
PCBs								
Aroclor 1016	mg/kg	76	NA	1180	28	BQL*		
Aroclor 1260	mg/kg	197	NA	430	12	BQL*		
Total halogens	mg/kg	107	NA	242	73	BQL*		

Table 6B-1Radiological Spaces Liquid Sample Summary

* BQL = below the quantification limit.

6B.1 Asbestos-Containing Materials

To asses the asbestos content of materials on the ship, samples of potential ACM were collected from both the radiological and non-radiological areas. Samples collected from the radiological sections of the ship were submitted to Aerosol Monitoring & Analysis, Inc. (AMA) for analysis. Samples collected from the non-radiological areas of the ship were secured in labeled zip-lock bags, documented on field log sheets, and stored in a box on the vessel for potential future analyses, as determined by MARAD.

Asbestos samples were collected using appropriate coring devices and proper wetting techniques to minimize potential fiber release. Average sample size was approximately 0.5×0.5 inches. The samples were placed in sealed bags and labeled with a unique sample identification number (ID). All sample locations were encapsulated using duct



tape and labeled with the appropriate sample ID Number. Sample locations were recorded on the arrangement drawings, and a digital photograph of each sample was taken. Sample location maps and the photographic documentation are presented in Appendix I and Appendix J, respectively.

Three bulk samples of each homogeneous material were taken. Samples taken from the non-radiological areas of the ship were provided to MARAD for cataloging purposes and potential future analysis. Samples taken from the radiological areas were analyzed via polarized-light microscopy (PLM) by AMA. A material that contains \geq 1% asbestos is considered an ACM. A material is not considered to be an ACM if the three samples of the homogeneous material contain <1% asbestos. Field datasheets and sampling results are given in Appendix K and Appendix L, respectively. Most of the samples analyzed from the radiological areas of the vessel contained asbestos (i.e., both Chrysotile and Amosite). Subsequent to receipt of the laboratory data, personnel estimated quantities of ACM from the radiological areas of the ship. This rough estimate was based on observations made during sample collection and room dimensions obtained from vessel maps. Personnel did not revisit the ship subsequent to receipt of the lab data to refine these estimates of ACM quantities. The listed estimates in Appendix L are rough orders of magnitudes.

In addition to sample collection logs and diagrams of each deck showing the location of each ACM sample, photographs of all the sample locations were obtained. These photographs are included in Appendix J.

6B.2 Lead-Based Paint

On-site XRF technology was employed for rapid lead content quantification in paints throughout the vessel. Representative locations were analyzed to quantify lead content in real-time using XRF techniques. Excluding calibrations, 523 readings on the accessible painted interior and exterior surfaces of the NS Savannah were collected. WPI was assisted in this task by ERM and AMA of Lanham, Md.

Of the 523 readings, 57 were $\geq 1.0 \text{ mg/cm}^2$. As noted previously, this is the value at which the state of Virginia classifies materials as "lead-containing." Results for each measurement taken during the screening can be found in the field forms attached in Appendix M. In addition, Tables 1 and 2 within Appendix M summarize the positive analytical readings collected in the radiological and non-radiological areas of the ship,



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respectively. Tables 1 and 2 in Appendix M also summarize the analytical results obtained from paint chips collected on the ship and analyzed at the AMA laboratory for quality control purposes. Selected photographs of the lead-based sampling effort throughout the ship are presented in Appendix N.

6B.3 Liquids

As part of the ship characterization effort, liquids that remain in the radiological and nonradiological areas of the boat were sampled for characterization. Samples were collected using a dedicated plastic bellows-type sampler and placed in laboratory supplied bottleware. Once collected, the samples were sealed in zip-lock bags and placed in a cooler with ice. Liquids collected from the radiological areas of the boat were analyzed by Froehling & Robertson (F&R), a Virginia-certified environmental laboratory located in Richmond. Liquid samples collected from the non-radiological areas of the boat were documented and placed in a cooler that remained on the ship for analysis at a later time, if desired.

Samples collected from the non-radiological areas of the ship include hydraulic oils from the winches and steering gear, and lubricating oils from the boat emergency generator. Liquid samples collected from the radiological area included water and oil from the sump in the lower Secondary Containment area, hydraulic oil from the Primary Containment area, and lube oil and hydraulic oil collected from the ship stabilizer compartments. These samples were analyzed to assist in the characterization of these materials for the purpose of future disposal options by a decommissioning contractor.

Oils were analyzed for total halogen content and PCBs, and the water sample was analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. Analytical results for the liquid samples collected from the radiological areas of the boat were analyzed, and the results are included in Appendix O. Halogens and PCBs were detected in the Secondary Containment sump oil, Primary Containment hydraulic oil (oil from control rod drive mechanisms), and Stabilizer Room hydraulic oil. Metals were detected in the Secondary Containment sump water. It should be noted that volumetric estimates of the liquid samples could not be obtained, as the size of the liquid containment for the various liquids was not discernable.



6B.4 PCBs

In addition to the liquid oil samples collected for PCB analysis, power transformers on the ship were inspected to evaluate PCB content. According to personnel knowledgeable about historic ship operations, power transformers on the boat were all dry-type transformers. The vessel was checked for liquid-containing transformers by those involved with the characterization and none were found. However, based on the date of ship construction, it is likely that capacitors in the fluorescent light ballasts present throughout the ship contain small quantities of PCBs. These ballasts ended using PCBs content in 1978. Samples of light ballasts and electrical wiring were not collected for analytical testing as part of the characterization.

Polychlorinated Biphenyls (PCBs) are a concern for ships of the SAVANNAH's vintage. WPI characterized several liquids but the description of the non-liquid items that may contain PCBs was a bit brief. Section 6A.4 provides general information related to dielectric and electrical conduit, but you should be aware that PCBs may also be in paint coatings as well as other non-liquid media.

Painted surfaces that contain \geq 50ppm PCBs may not be torch cut. Combustion of PCBs is prohibited per 40 CFR 761.50. If the decommissioning entails the cutting of painted surfaces, the paint should be analyzed for PCBs or presumed to contain regulated concentrations. "Regulated" painted surfaces must be mechanically removed at and around the burn line to prevent heating of the paint.

The reader should be aware that PCBs may be found in non-liquid media aboard the vessel. "High probability" non-liquid media includes: electrical cable, ventilation gaskets, grease, rubber applications such as electrical channel rubber and pipe hanger liners, adhesives, and caulking/grouting. If these items are removed during the decommissioning, they must be handled and disposed of in accordance with 40 CFR 761 et seq.

6B.5 Mercury

As part of the hazardous materials characterization, thermometers and switches throughout the ship were inspected in an effort to determine the potential presence of mercury-containing materials. Based on the inspection, and in accordance with WPI sources knowledgeable of the ship, no mercury-containing thermometers or switches were documented on the boat. Visual observations of the thermometers did not suggest that any thermometers contained mercury. Based on the year of construction and years



of operation, it is possible that some fluorescent light bulbs on the vessel contain mercury.

7. QUALITY ASSURANCE

The characterization effort was performed in accordance with the Quality Assurance Project Plan. WPI's Nuclear QA program was applied to data/sample management, vendor analyses, and instrument calibration/use. Project implementing procedures were developed and followed during the implementation of the project.

8. SERAT REPORT

Thomas Jefferson National Accelerator Facility (Jefferson Lab) entered into an agreement with the MARAD to provide support for the SERAT. Commensurate with its role of health physics support for Savannah Emergency Response Assessment Team (SERAT) efforts, Jefferson Lab conducted a series of measurements to confirm the primary nuclides of concern remaining in the reactor systems of the NSS. The report detailing these findings is contained in Appendix P.



Appendix A

Appendix A Key Personnel Biographies

R. Jon Stouky

Project Manager

Mr. Stouky has over 44 years of experience in nuclear-related activities, including decommissioning, waste management, spent fuel, safety, and risk assessment. Currently, he is WPI's Senior Vice President, Energy Services and is responsible for managing the nuclear field services lines. Previously, Mr. Stouky was the owner and president of a company focused on nuclear decommissioning services, as well as being the president and chief operating officer of a nationally known nuclear waste management and disposal company.

Mr. Stouky managed the radiological and non-radiological support for the characterization program on the U.S. Army Nuclear Barge STURGIS. He also served as the Project Manager for the contractor engineering support services for the STURGIS in the Panama Canal Zone and preliminary decommissioning efforts. Mr. Stouky has served in several capacities on the N/S SAVANNAH shore and shipboard staff dating back to 1961.

Mr. Stouky has specific expertise in decommissioning, maintenance, and operational aspects of nuclear power plant management, including spent nuclear fuel handling and storage and waste processing. In addition, he has developed techniques and tools for the processing of irradiated and contaminated equipment/components. Recently, Mr. Stouky has been involved in reviewing and recommending options to a nuclear utility company regarding the development of an Interim Spent Fuel Storage Installation (ISFSI) and the selection of an appropriate spent fuel storage container.

Patsy Hosner

QA Manager

Ms. Hosner has over 20 years of experience in quality assurance and communications. She has developed, implemented, and managed the WPI Nuclear Quality Assurance (NQA) program used by WPI following the guidance of NQA-1, Quality Assurance Requirements for Nuclear Facility Applications, which complies with NRC requirements. Her responsibilities include developing and maintaining the NQA documentation system (e.g., manual and implementing procedures), developing and maintaining NQA online training, and NQA auditing.



Appendix A

John Bowen

Project Engineer

Mr. Bowen has over 22 years of experience in the nuclear industry with a focus on decommissioning, spent fuel project management and engineering, spent fuel storage/transport systems design and fabrication, reactor vessel engineering issues, and project management and engineering for nuclear power plant systems startup, installation and maintenance. He currently serves as WPI's Chief Engineer, Nuclear Services.

He has been a project manager for the design, testing, NRC licensing, fabrication, and delivery of a spent fuel dry storage/transport system, including ISFSI design. Additionally, he was involved the fabrication and delivery of a spent fuel management system (dry storage and transportation) with primary interface responsibility for all customer fabrication concerns, questions and managing various fabrication vendors.

Mr. Bowen has extensive nuclear operations experience and held a Senior Reactor Operator certificate for a commercial power plant. In addition, he was intimately involved with several commercial nuclear power plant initial power ascension test programs in both the start-up coordinator and test director positions. He was involved and coordinated major power plant modifications and outages.

Richard Ranellone, P.E. Nuclear Engineer

Mr. Ranellone has over 34 years of experience in decommissioning engineering, project management, and technology development. He has supervised up to 50 engineers on design/technology development projects. Mr. Ranellone is knowledgeable of all nuclear power systems, including fuel cycles, disposition of nuclear waste, safeguards and health physics. He has a masters degree in nuclear engineering and is a registered professional engineer.

Mr. Ranellone provided health physics and technical assistance in the radiological and non-radiological characterization of the STURGIS. He also provided services in the selection of sampling points and the equipment used in the analysis. Mr. Ranellone has managed U. S. Department of Energy and commercial programs, including nuclear facilities design, maintenance and characterization, depleted uranium disposition, decontamination and decommissioning, waste management, spent nuclear fuel handling/storage/transportation, and radioactive metal recycle.



Appendix A

Franco Godoy

Environmental Management

Mr. Godoy, a chemical engineer with over 20 years of experience as an environmental R&D, systems, and consulting engineer, provides the team with life-cycle plant design and operations environmental support. His experience base spans environmental support throughout the process development and design phases, planning and permitting, through operation and closure. Mr. Godoy's experience includes heavy industry, manufacturing, and transportation sectors with representative clients including General Dynamics, Northrup, Lockheed, Rockwell, McDonnell Douglas, Morton Thiokol, General Electric, and Norfolk Southern. His background includes work as a process/systems engineer involved in scale-up of pilot processes and included characterization of materials and wastes to facilitate optimal management/control. He brings an extensive background in hazardous material/waste management in the areas of characterization, control, and regulatory/reporting requirements. He has provided support to both industry and regulatory agencies in the development and/or review of emissions, discharges, and waste management permitting. Mr. Godoy has also been instrumental in the development and implementation of facility and enterprise-wide environmental management systems.

Robert Pennock

Radiological Operations

Mr. Pennock is a qualified health physicist with 25 years of experience in field and laboratory operations. He has provided services both as a consultant and a direct utility employee in the areas of training, HP management, supervision, industrial hygiene, and safety. In addition, he has worked as a technician on the radiological and non-radiological characterization of a nuclear facility. Mr. Pennock has developed and implemented employee training and ALARA programs. He has also extensive experience in industrial hygiene program development and management.

Loman Scott

Lead Technician

Mr. Scott is a retired municipal employee who has provided mechanical and electrical services to contractor's facilities, tooling, access to spaces, as well as sampling services in the characterization of the STURGIS. He also assisted in radiological and non-radiological services and was trained/qualified to JRRF requirements.



Appendix B

Appendix B Radiological Calculations and Calibrations

REACTOR PRESSURE VESSEL EXTERNAL DOSE RATE

A gamma dose rate measurement was taken at the Reactor Pressure Vessel (RPV) external wall near the core mid-height location. The reading was 7 mR/hour, as measured on inside wall of the Neutron Shield Tank. This dose is attributable to the residual Co-60, which was estimated from previous analytical analysis to be 1108 curies distributed throughout the internals and structural components of the RPV. Though other nuclides are known to reside in the RPV, only the gamma rays from Co-60 (1.17 and 1.32 MeV) are sufficiently energetic to penetrate the thermal shields and RPV wall, resulting in measurable doses above background external to the vessel.

Other isotopes within the RPV that contribute to the total curie content include Ni-59 and Ni-63 with trace amounts of Fe-55, C-14, and Nb-94. Ni-59 decays by electron capture and emits K-shell X-rays with a maximum energy of 8 keV. The large attenuation coefficients in stainless and carbon steel resulting from the photoelectric effect for these low energy photons would preclude their contribution to dose rates external to the vessel. Ni-63 decays by beta emission with an average beta energy of 17 keV. Even if it is conservatively assumed that all beta energies are converted to radiation by deceleration in the electric field of a nucleus (bremsstahlung), as with Ni-59, the emitted photons would not penetrate the vessel wall.

In addition, the carbon steel RPV contains no natural nickel or cobalt that would have been activated during reactor operation. Previous calculations also showed that the thin stainless steel liner on the interior of the vessel contributes negligible activity to the current internal curie content.

The distribution of Co-60 activation in the RPV is heterogeneous, being dependent on stainless steel location, geometry, and neutron thermal flux profiles in the reactor during operation. The core basket and upper and lower transition nozzles comprise over 80% of the total Co-60 curie content in the vessel. The core barrel and inner and outer shield are intended to reduce the total neutron fluence on the RPV wall, thereby limiting degradation of the vessel's ability to endure abnormal transients.



An estimate of dose rate at the exterior of the RPV was made using a point source approximation located at the centerline of the vessel at the core mid-height. Though all internals and structural components provide some absorption and attenuation of Co-60 gamma photons, primarily through Compton scattering, shielding credit was taken only for the inner and outer shield, core barrel, RPV wall and steel annulus external to the RPV where the dose measurement was taken.

Appendix B

The following formula was used to estimate the exposure rate from a point that emits gamma rays:

$$D(R/hour) = 0.5 C E/r^2$$
,

where

- C = activity in curies = 1108 curies from previous analysis,
- E = gamma energy in MeV = 1.17 MeV + 1.32 MeV = 2.49 MeV,
 (Note: Co-60 emits two gamma rays in over 99% of its disintegrations)
- r = distance from point source in meters = 1.12 m,

 $D_{0} = 1108 \text{ R/hour.}$

Using this quantity for the gamma flux incident on the slab shield formed by the inner and outer shield, core barrel, RPV wall and steel annulus for insulation containment, the exposure dose external to the RPV was calculated using the formula for uncollided gamma flux multiplied by a suitable buildup factor:

D (measurement point)/D_o = B(E, μ t) e^{- μ t},

where

- μ = energy-dependent linear attenuation coefficient for steel = 0.395 /cm,
- t = thickness of shield material between reference point and measurement point = 9.82 cm,
- B = buildup factor dependent on gamma energy (E) and relaxation lengths (μ t)= 10.

Substituting these values in the above equation and solving for D:

$$D = 85 \text{ mR/hour}$$
.



CRUD ANALYSIS

Smears of the interior piping of the primary system were taken at the entrance to the port and starboard side steam generators by removing access covers. A total of five smear samples was obtained from inlet of each steam generator hot leg, including three in the vicinity of the access cover, one on the interior of the access cover, and one at the tube sheet entrance. The principal isotope in the crud was confirmed to be Co-60 through use of gamma spectroscopy.

All 10 smears were counted on the Ludlum 2929 counter (#2). The smear taken at the port side tube sheet had a count rate 2.3 higher than any of the other nine smears and was used for crud analysis.

Net count rate = 78,764 counts per minute (cpm) Counter efficiency = 20.8%

All smears were assumed to be 100 cm^2 , so the activity level in disintegrations per second (dps) is:

 $78,764/0.208 = 378,673 \text{ dpm}/100 \text{ cm}^2 \times 60 \text{ sec/min} = 6311 \text{ dps}/100 \text{ cm}^2$.

1 curie = 3.7E10 dps .

Activity = $6311 \text{ dps}/100 \text{ cm}^2 \text{ x} 3.7\text{E}10 = 1.71\text{E}-9 \text{ C/cm}^2$.

Assuming this crud concentration to be uniformly distributed over the interior surface of the reactor pressure vessel:

Reactor Pressure Vessel dimensions = 27 ft. H x 8 ft. D . Surface area = $6.79E2 \text{ ft}^2 \times 9.29E2 \text{ cm}^2/\text{ft}^2 = 6.30E5 \text{ cm}^2$.

Activity = $(1.71E-9 \text{ C/cm}^2) \times (6.30E5 \text{ cm}^2) = 1.08E-3 \text{ C} \sim 1 \text{ mC}$.

This is a negligible quantity compared to the total estimated activity level in the pressure vessel of 4066 curies.



Smear/Air Sample Counting LLD, MDA, and Activity Determinations

Each counter's average background count rate was determined and source efficiency tests performed. Background and source counts were based on a series of 20-minute counts. Results were as follows:

Counter #1

Alp	ha	Beta				
Background	Efficiency	Background	Efficiency			
0.325 cpm	33.6%	39.2 cpm	25.2%			

Counter #2

Alp	ha	Beta				
Background	Efficiency	Background	Efficiency			
0.525 cpm	31.2%	42.15 cpm	20.8%			

Lower limit of detection (LLD) (also referred to as net minimum detectable count rate [MDCR]) and minimum detectable activity (MDA) calculations were performed for several counting times based on NUREG/CR-4007.

MDA (dpm) = LLD

Fff

LLD (net cpm) =
$$2.71 + (3.29) / \frac{R_b (t_s) (t_s + t_B)}{t_B}$$

where:

- R_b = background count rate (cpm),
- $t_{\rm B}$ = background count time (min),
- t_s = sample count time (min).

Gross minimum detectable counts were determined for each count time by the following formula.

$$MDC = t_{S} [net MDCR (cpm) + background (cpm)]$$

For air samples of 100 ft³ volume, MDA concentration in μ Ci/cc were calculated for appropriate counting times using the following formula:



MDA (μ Ci/cc) = MDA(dpm) 1 μ Ci 1 ft³ 1 L (2.22E6 dpm) (100 ft³) (28.32 L) 1000 cc

Results for all the above calculations for each counter are tabulated in the following charts.

Counter # 1 (Serial #102001)									
	ŀ	Alpha				В	eta		
	Count	time (mir	nute)			Net	MDCR		
Count	Net	Gross	MDA	Air	Net	Gross	MDA	Air MDA**	
time	MDCR	MDC	(dpm)	MDA**	MDCR	MDC	(dpm)	(µCi/cc)	
(minutes)	(cpm)			(µCi/cc)	(cpm)				
60	0.529	51	1.57	2.5E ⁻¹³	5.35	2673	21.2	3.4E ⁻¹²	
30	0.632	28	1.88	2.99E ⁻¹³	6.03	1357	23.9	3.8E ⁻¹²	
10	0.997	13	2.97	4.7E ⁻¹³	8.2	474	32.5	5.2E ⁻¹²	
1	4.63	5	13.78	-	23.8	63	94.4	1.5E ⁻¹¹	
0.5	8.1	4	24.1	-	34.9	37	139	-	

** For 100-ft³ samples only.

Counter #2 (Serial #160019)									
		Alpha				E	Beta		
	Count	time (mi	nute)			Net M	DCR (cpr	n)	
Count	Net	Gross	MDA	Air	Net	Gross	MDA	Air MDA**	
time in	MDCR	MDC	(dpm)	MDA**	MDCR	MDC	(dpm)	µCi/cc	
(minutes)	(cpm)			(µCi/cc)	(cpm)				
60	0.66	71	2.12	3.36E ⁻¹³		2862	26.7	4.25E ⁻¹²	
30	0.779	39	2.50	3.97E ⁻¹³		1452	30.1	4.79E ⁻¹²	
10	1.19	17	3.81	6.07E ⁻¹³	8.54	506	41.1	6.53E ⁻¹²	
1	5.15	6	16.52	-	24.6	66	118	1.88E ⁻¹¹	
0.5	8.8	4	28.3	-	36	39	173	-	

** For 100-ft³ samples only.

Smear Activity Determination

When count rates exceed LLD values, smear activity is determined as follows.

Where net cpm = <u>gross count</u> – background cpm count time

Values for LLD and smear scanning trigger levels are tabulated below.



Counter #1

Beta counts								
1-minu	ute count	30-second count						
Gross count	Activity	Gross count	Activity					
Gloss coulit	(dpm)	Gloss could	(dpm)					
63	95 (MDA)	37	139 (MDA)					
165	500	82	500					
291	1000	145	1000					
Alpha counts								
1-minu	ute count	30-second count						
Gross count	Activity	Gross count	Activity					
Gloss coulit	(dpm)	Gloss could	(dpm)					
5	14 (MDA)	4	24 (MDA)					
7	20	16	100					
33	100	-	-					

Counter #2

Beta counts								
	ute count	30-second count						
Gross count	Activity (dpm)	Gross count	Activity (dpm)					
66	118 (MDA)	39	173 (MDA)					
146	500	73	500					
250	1000	125	1000					
Alpha counts								
1-minu	ute count	30-second count						
Gross count	Activity (dpm)	Gross count	Activity (dpm)					
5	16 (MDA)	4	28 (MDA)					
6	20	15	100					
31	100	-	-					



Air Sample Activity Determinations

When count rates exceed LLD values, air sample activity is determined as follows:

Activity (μ Ci/cc) = <u>net cpm</u> 1 μ Ci Eff 2.22E6 dpm volume (cc)

For 100-ft³ (2.832E⁶-cc) air samples, the net count rate can be inserted into the following instrument-specific equations as applicable.

Counter #1

Alpha airborne activity (μ Ci/cc) = (net cpm) x (4.73E⁻¹³). Beta airborne activity (μ Ci/cc) = (net cpm) x (6.31E⁻¹³).

Counter #2

Alpha airborne activity (μ Ci/cc) = (net cpm) x (5.1E⁻¹³). Beta airborne activity (μ Ci/cc) = (net cpm) x (7.65E⁻¹³).

Instrument Calibration and Use Logs are attached to this appendix.



(×41 2-24-03

Duratek Instrument Services 628 Gallaher Road Kingston, TN 37763 Phone: (865) 376-8337 Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

	CUSTOMER INFORM	MATION		IN	STRUMENT INFOR	MATION
Customer Name: Duratek Instrument Services				Manufacturer: Ludlum		
Address: 628 Gallaher Rd Kingston, TN 37763				Model: 19	Serial Number: 95469	
Contact Name:	Thomas F. Scott			Probe: N/A	Serial Number: N/A	
Customer Purch Order Number:	N/A	Work Ord Number: 2 TRUMENT CA		onic And Source		
	ШІЗ	I KUMENI CA		trument		
Range	Calibration Standard	Tolerances		esponse	Com	ments
(μ R/h r)	Value	(µR/hr)	As Found (µR/hr)	As Left (µR/hr)	Calibrated in accorda CP-IN-WI-211 Rev 1	nce with
5000	4000 μR/hr	3600 - 4400	*N/A	3800	Pulser: 101500	Cal Due: 09/24/05
Black	2500 μR/hr	2250 - 2750	*N/A	2500	D-812: 2816	Cal Due: 04/15/05
	1000 μR/hr	900 - 1100	*N/A	1000	DVM: TW12663	Cal Due: 03/22/05
	400 μR/hr	360 - 440	*N/A	390	DTH-1A: 100799	Cal Due: 11/11/05
500 Black	250 μR/hr	225 - 275	*N/A	250		
	100 μR/hr	90 - 110	*N/A	100	Temp: 20.5°C	Humidity: 31%
	Input cpm = 32,600	180 - 220	*N/A	195	Pressure: 742mmHg	
250 Red	Input cpm = 19,500	108 - 132	*N/A	120		
	Input cpm = 8,150	45 - 55	*N/A	50	Geotropism: SAT	Over Range: SAT
	Input cpm = 6,560	36 - 44	*N/A	39.5	Batteries: SAT	Mech. Zero: SAT
50 Black	Input cpm = 4,090	22.5 – 27.5	*N/A	25	F/S Response: SAT	Audio: SAT
	Input cpm = 1,440	9 - 11	*N/A	10	Light: SAT	Precision Test: SAT
	Input cpm = 3,260	18 – 22	*N/A	19.5	Source: Cs-137 04971	1 Cert. Date: 04/09/0
25 Red	Input cpm = 1,956	10.8 - 13.2	*N/A	12	High V As Found: 800V	/oltage As Left: 725V
	Input cpm = 815	4.5 – 5.5	*N/A	5	cpm/µR/hr: As Found	d: 192 As Left: 163
			COMMENTS	;		

* All As Founds off by more than 20% due to HV being set outside of correct plateau voltage setting.

STATEMENT OF CERTIFICATION

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).

Instrument

Calibrated By: M.H

Calibration Date: 03/18/05

Reviewed By: Limos F Date: 3-18-05 Calibration Due: 03/18/06r

LUDLUM 19 HIGH VOLTAGE PLATEAU DATA SHEET

Date: 03/18/05

Serial Number: 95469

High Voltage	Background	uR/hr
575	2	190
600	2	1600
625	3	2200
650	3	2900
675	4	3500
700	4	4100
725 (SET)	5	4600
750	6	4600
775	7	4900
800	9	offscale

* Source Geometry on contact with Detector-Cs137 #019455 @ 5uCi*

Performed By: Mike Aul' Date: 3-18-05 Reviewed By: *June Reviewed* By: *June Reviewed* By: *June Reviewed* Date: 3-18-05



0{10 3-24-05

Duratek Instrument Services 628 Gallaher Road Kingston, TN 37763 Phone: (865) 376-8337 Fax: (865) 376-8331

CUSTOMER INFORMATION				INSTRUMENT INFORMATION			
Customer Name	: Duratek Instrument Serv			Manufacturer: Ludlum			
Address: 628 Gallaher Rd Kingston, TN 37763				Model: 19	Serial Number: 95499	1	
	Thomas F. Scott			Probe: N/A	Serial Number: N/A		
Customer Purch Order Number:		Work Ord Number: 2		Calibration M Electr	lethod: onic And Source		
	INS	TRUMENT CA	LIBRATIO	N INFORMA	TION		
Range	Calibration Standard	Tolerances	Re	rument sponse		ments	
(µR/hr)	Value	(µR/hr)	As Found (µR/hr)	As Left (µR/hr)	Calibrated in accorda CP-IN-WI-211 Rev 1	nce with	
5000	4000 μR/hr	3600 - 4400	3800	3800	Pulser: 101500	Cal Due: 09/24/05	
Black	2500 μR/hr	2250 - 2750	2450	2450	D-812: 2816	Cal Due: 04/15/05	
	1000 μR/hr	900 - 1100	950	950	DVM: TW12663	Cal Due: 03/22/05	
5 00	400 µR/hr	360 - 440	400	400	DTH-1A: 100799	Cal Due: 11/11/05	
500 Black	250 μ R/h r	225 - 275	250	250			
	100 µR/hr	90 - 110	105	105	Temp: 20.5°C	Humidity: 31%	
	Input cpm = 40,000	180 - 220	205	205	Pressure: 742mmHg		
250 Red	Input cpm = 24,000	108 - 132	120	120			
	Input cpm = 10,000	45 - 55	50	50	Geotropism: SAT	Over Range: SAT	
	Input cpm = 7,880	36 - 44	40	40	Batteries: SAT	Mech. Zero: SAT	
50 Black	Input cpm = 4,990	22.5 – 27.5	25	25	F/S Response: SAT	Audio: SAT	
	Input cpm = 1,960	9 - 11	10	10	Light: SAT	Precision Test: SAT	
	Input cpm = 4,000	18 - 22	20	20	Source: Cs-137 04971	1 Cert. Date: 04/09/04	
25 Red	Input cpm = 2,400	10.8 - 13.2	12	12	High As Found: 650V	Voltage As Left: 650V	
	Input cpm = 1,000	4.5 – 5.5	5	5	cpm/µR/hr: As Found	d: 194 As Left: 200	
			COMMENTS	5			
	Specia	l Remarks: High	Voltage: 650	Volts cpm/µR	/hr: 200		
		STATEMEN	T OF CERI	IFICATION	· · ·		
	nstrument listed above was calibrate rr Calibration Measurements are tra- is instrument).						
Instrument							
Calibrated By:	M. Paul	Reviewed H	sy Clon	as (- Ac	Date:	3-18-05	
Calibration Date: 03/18/05 Calibration Due: 03/18/06							



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Duratek Instrument Services 628 Gallaher Road Kingston, TN 37763 Phone: (865) 376-8337 Fax: (865) 376-8331

CUSTOMER INFORMATION				INSTRUMENT INFORMATION			
Customer Name: Duratek Instrument Services				Manufacturer: Ludlum			
Address: 628 Gallaher Rd Kingston, TN 37763				Model: 19	Serial Number: 42972	2/	
Contact Name:	Thomas F. Scott			Probe: N/A	Serial Number: N/A		
Customer Purch Order Number:		Work Orde Number: 2		Calibration M Electr	lethod: onic And Source		
	INS	TRUMENT CA	LIBRATIO				
Range	Calibration Standard	Tolerances	Re	rument sponse		ments	
(µR/hr)	Value	(µR/hr)	As Found (µR/hr)	As Left (µR/hr)	Calibrated in accorda CP-IN-WI-211 Rev 1	nce with	
5000	4000 μR/hr	3600 - 4400	3950	3950	Pulser: 101500	Cal Due: 09/24/05	
Black	2500 μR/hr	2250 - 2750	2500	2500	D-812: 2816	Cal Due: 04/15/05	
	1000 µR/hr	900 - 1100	1000	1000	DVM: TW12663	Cal Due: 03/22/05	
	400 μR/hr	360 - 440	410	380	DTH-1A: 100799	Cal Due: 11/11/05	
500 Black	250 μR/hr	225 - 275	260	250			
	100 μ R /hr	90 - 110	110	105	Temp: 20.5°C	Humidity: 31%	
	Input cpm = 42,000	180 - 220	200	200	Pressure: 742mmHg		
250 Red	Input cpm = 25,200	108 - 132	120	120			
	Input cpm = 10,500	45 - 55	50	50	Geotropism: SAT	Over Range: SAT	
	Input cpm = 8,450	36 - 44	40	40	Batteries: SAT	Mech. Zero: SAT	
50 Black	Input cpm = 5,240	22.5 – 27.5	25	25	F/S Response: SAT	Audio: SAT	
	Input cpm = 2,070	9 - 11	10	10	Light: SAT	Precision Test: SAT	
	Input cpm = 4,200	18 – 22	20	20	Source: Cs-137 04971	1 Cert. Date: 04/09/04	
25 Red	Input cpm = 2,520	10.8 - 13.2	12	12	High As Found: 660V	Voltage As Left: 660V	
••••••••••••••••••••••••••••••••••••••	Input cpm = 1,050	4.5 - 5.5	5	5	cpm/µR/hr: As Foun	d: 213 As Left: 210	
			COMMENTS				
	Specia	l Remarks: High V	Voltage: 660	Volts cpm/µR	/hr: 210		
		STATEMENT	Г OF CERT	IFICATION			
We Certify that the ir further certify that ou shipment or use of thi	nstrument listed above was calibrate or Calibration Measurements are tra is instrument).	ed and inspected prior ceable to the National	to shipment and Institute of Stan	that it met all the M dards and Technolo	fanufacturers published operatogy. (We are not responsible f	ting specifications. We for damage incurred during	
Instrument				~			
Calibrated By: M. Paul Reviewed By: Climes G- Scall Date: 3-18-05							
Calibration Date	: 03/18/05			Calibration Du	ae: 03/18/06		



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Duratek Instrument Services 628 Gallaher Road Kingston, TN 37763 Phone: (865) 376-8337 Fax: (865) 376-8331

Г	CUS	TOMER INFORM		panieu by Canora		NSTRUMENT INFOI	RMATION	
ŀ	Customer Name: Dura			Manufacturer: Ludium				
- 1-	Address: 628 Gallaher			Model: 12 Serial Number: 91037				
ŀ	Contact Name: Thoma			Probe: 44-9	Serial Number: N/A			
L	Contract/Task Work Orde Number: N/A Number: 2				Calibration Me	thod: Electronic and So	urce	
Ī		IN			TION INFORM	ATION		
Ī	Instrument Range Calibration Standard V		ard Value	Instrumen Before	t Response After		nments ce with OEM Technical	
Ļ				Calibration	Calibration	Manual		
	X 1	100		100	100	Pulser: 101500	Cal Due: 09/24/05	
	X 1	250		250	250	D-812: 2816	Cal Due: 04/15/05	
l	X 1	400		400	400	DTH-1A: 100799	Cal Due: 11/11/05	
1	X 10	1,000		1,000	1,000			
L	X 10	2,500		2,500	2,500	Temperature: 23.0 °C		
ŀ	X 10	4,000		4,000	4,000	Pressure: 738mmH	Ig	
	X 100	10,000		10,000	10,000	Humidity: 23%		
ſ	X 100	25,000		25,000	25,000			
ſ	X 100	40,000		40,000	40,000			
F	X 1000	10 0,000 -		100,000	100,000	Audio: SAT	Batt. Check: SAT	
ſ	X 1000	250,000		- 250,000	250,000	Fast/Slow: SAT	Reset: SAT	
Ī	X 1000	400,000		400,000	400,000	HV Pushbutton: SAT	Overange: SAT	
Ī		EFFICIENCY DE	TERMINA	TION		Geotropism: SAT		
ſ	Instrument Range	Source ID and	Value	Net cpm	Efficiency	Background: 50cpm	Threshold: 35mV	
Ī	EFF X1	Tc-99#119720 at 2	2,562dpm	290	11.3%			
Ī	EFF X10	Tc-99#119718 at 2	0,520dpm	2,600	12.7%			
Ī	EFF X100	Tc-99#109408 at 25	9,518dpm	29,950	11.5%			
ł	Average	N/A		N/A	11.8	Limited Use: X1000 Sc Use with 44-9.	ale for information only.	
Ī	High Voltage	900V		897V	897V	1 Use with 77-7.		
Ī			STAT	EMENT OF CI	ERTIFICATIO	N		
Í	We Certify that the instrume further certify that our Calif during shipment or use of th	oration Measurements are	rated and inspe traceable to th	ected prior to shipm e National Institute	ent and that it met al of Standards and Te	l the Manufacturers published chnology. (We are not respor	d operating specifications. We sible for damage incurred	
F	Instrument Calibrated By:	rikefanti	Reviewed 1	By: Almes	F. Acal	1 Date:	3-10-051	
ſ	Calibration Date: 03/1	0/05			Calibration Du	ne: 03/10/06 🗸		





		INSTRUMENT INFORMATION					
	TOMER INFORMATION	Manufacturer: Ludlum					
Customer Name: Durat							
Address: 628 Gallaher R	load, Kingston, TN 37763	Model: 12	Serial Number: 75809 V				
Contact Name: Thomas			Probe: 44-9	Serial Number: N/A			
Contract/Task Number: N/A	Work Ord Number:		Calibration Me	thod: Electronic and Source			
Number: IVA			TION INFORM	IATION			
T							
T I I D	Calibration Standard Value	Instrumer Before	t Response After	Comments Calibrated in accordance with OEM Technical			
Instrument Range	Candration Standard Value	Calibration	Calibration	Manual			
X 1	100	100	100	Pulser: 101500 Cal Due: 09/24/05			
X 1	250	250	250	D-812: 2816 Cal Due: 04/15/05			
X 1	400	400	400	DTH-1A: 100799 Cal Due: 11/11/05			
X 10	1,000	1,000	1,000				
X 10	2,500	2,500	2,500	Temperature: 23.0 °C			
X 10	4,000	4,000	4,000	Pressure: 738mmHg			
X 100	10,000	10,000	10,000	Humidity: 23%			
X 100	25,000	25,000	25,000				
X 100	40,000	40,000	40,000				
X 1000	100,000	100,000	100,000	Audio: SAT Batt. Check: SAT			
X 1000	250,000	250,000	250,000	Fast/Slow: SAT Reset: SAT			
X 1000	400,000	400,000	400,000	HV Pushbutton: SAT Overange: SAT			
·····	EFFICIENCY DETERMINA	TION		Geotropism: SAT			
Instrument Range	Source ID and Value	Net cpm	Efficiency	Background: 40cpm Threshold: 36mV			
EFF X1	Tc-99#119720 at 2,562dpm	305	11.9%				
EFF X10	Tc-99#119718 at 20,520dpm	2,460	12.0%				
EFF X100	Tc-99#109408 at 259,518dpm	29,460	11.4%	The William William Carls for information only			
Average	N/A	N/A	11.8%	Limited Use: X1000 Scale for information only. Use with 44-9.			
High Voltage	900V	901V	901V				
			ERTIFICATIO				
further certify that our Calib	We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. W further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).						
Instrument	\bigcirc	~	\frown	1			
Calibrated By: Mike Taul' Reviewed By: Clume - Calibrate Date: 3-10-05							
Calibration Date: 03/10	0/05		Calibration D	ue: 03/10/06 🗸			



84P 3-24-05

Duratek Instrument Services 628 Gallaher Road Kingston, TN 37763 Phone: (865) 376-8337 Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

5

CUSTOMER INFORMA	TION		INSTRUMENT INFORMATION				
Customer Name: Duratek Instrument Services			Manufacturer:	Ludlum			
Address: 628 Gallaher Road, Kingston, TN 377	63		Model: 3	Serial Number: 97416			
Contact Name: Thomas F. Scott			Probe: 44-9	Serial Number: N/A			
Contract/Task	Work C		Calibration Method:				
Number: N/A		r: 2005-02626	Electronic and Source				
INSI	RUME	NT CALIBRA	TION INFORM				
		Instrumen	t Response		mments		
Instrument Range Calibration Standard	d Value	Before Calibration	After Calibration	Calibrated in accordan CP-IN-WI-219, Rev.0.	nce with		
X0.1 100		100	100	Pulser: 101500	Cal Due: 09/24/05		
X0.1 250		250	250	DVM: TW12663	Cal Due: 03/22/05		
X0.1 400		400	400	D-812: 2816	Cal Due: 04/15/05		
X1 1,000		1,000	1,000	DTH-1A: 100799	Cal Due: 11/11/05		
X1 2,500	2,500		2,500				
X1 4,000	4,000		4,000	Temperature: 23.0	•C		
X10 10,000	10,000		10,000	Pressure: 738 mm	Hg		
X10 25,000	25,000		25,000	Humidity: 23 %			
X10 40,000		40,000	40,000				
X100 100,000		100,000	100,000	Audio: SAT	Batt. Check: SAT		
X100 250,000		250,000	250,000	Fast/Slow: SAT	Reset: SAT		
X100 400,000		400,000	400,000	Background: 40 cpm	Threshold: 35mV		
EFFICIENCY DETR	RMINA	TION*		Overange: SAT			
Instrument Range Source ID and V	alue	Net cpm	Efficiency	* Efficiency determine	ed ~¼ " from 45 mm disc.		
EFF X1 Tc-99#119720 at 2,5	62dpm	260	10.1%				
EFF X10 Tc-99#119718 at 20,5	520dpm	2,260	11.0%				
EFF X100 Tc-99#109408 at 259,	518dpm	29,460	11.4%				
Average Efficiency N/A		N/A	%	Limited Use: X100 Sca Use with 44-9.	ale for information only.		
High Voltage 900V (±5%)		902V	902V				
			ERTIFICATIO				
We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).							
Instrument Calibrated By: Nike Taul' Reviewed By: Climas 5- Scalt, Date: 3-10-05							
Calibration Date: 03/10/05	1 200100		Calibration Du				



Duratek Instrument Services 528 Gallaher Road Kingston, TN 37763 Phone: (865) 376-8337 Fax: (865) 376-8331

Manufacture:: Automess Manufacture:: Automess Address: 628 Galaber Road Kingston, TN. 37763 Model: 6112D Serial Number: 28991 Contract Name: Tom Scott Prob:: N/A Serial Number: N/A Contract Name: Tom Scott Calibration Method: INSTRUMENT CALIBRATION INFORMATION Instrument Range Comments Before Calibration Comments Instrument INSTRUMENT CALIBRATION INFORMATION Instrument Response Comments Before Calibration Calibration Instrument RARA 10 DVM: TW12662 Cal Due: 03/04/05 mR/h 1 DVM: TW12662 Cal Due: 03/04/05 mR/h 10 Dei: 11/11/05 mR/h 1 Contract Name: Tw12662 Cal Due: 03/04/05 mR/h 10 Dei: 11/11/05 MR/h 200 164-240 161 Calibration Maximum Cali		CUSTOMER I			INSTRUMENT INFORMATION				
Contact Name: Tom Scott Probe: N/A Serial Number: N/A Contract/Task Number: N/A Work Order Number: N/A Calibration Method: Electronic and Source Instrument Renge Desired **Tolerance Calibration Method: Electronic and Source Instrument Renge Desired **Tolerance Instrument Response Comments MR/h 1 .80-1.20 1 1 D-812: 2816 Cal Due: 03/04/05 mR/h 1 .80-1.20 1 1 D-812: 2816 Cal Due: 04/08/05 mR/h 40 32 - 48 42 40 DTH-1A: 10079 Cal Due: 04/15/05 mR/h 40 32 - 48 42 40 DTH-1A: 100799 Cal Due: 11/11/05 mR/h 200 160-240 161 170 Sources Used: mR/h 616 493-739 530 631 Cs137 019701 Cert. Date: 04/08/04 E/h 1.88 1.50 - 22.6 2.1 1.9 Temp: 24.1 °C Humidity: 36 % R/h 98 78.4 -118 111 <td< td=""><td>Customer Name:</td><td>Duratek Instrumen</td><td>t Services</td><td></td><td>Manufacturer: A</td><td>utomess</td></td<>	Customer Name:	Duratek Instrumen	t Services		Manufacturer: A	utomess			
Contract/Task Number: Work Order NA Calibration Method: Electronic and Source Instrument Range Desired **Tolerance Instrument Response Comments mR/n Desired **Tolerance Instrument Response Timer: 02010806 Cal Due: 03/04/05 mR/n 1 .80-1.20 1 1 D-812: 2816 Cal Due: 03/04/05 mR/n 40 32 - 48 42 40 DTH-1A: 100779 Cal Due: 04/08/05 mR/n 40 32 - 48 42 40 DTH-1A: 100779 Cal Due: 11/11/05 mR/n 40 32 - 48 42 40 DTH-1A: 100779 Cal Due: 11/11/05 mR/n 616 493-739 530 631 Cs137 019701 Cert. Date: 04/08/04 C R/h 1.88 1.50 - 22.6 2.1 1.9 Temp: 24.1 °C Humidity: 36 % R/h 21.1 16.9 - 25.3 23.3 21.7 Pressure: 738 mmHg R/h 98 78.4 -118 111 116 Precision is ± 20%.	Address: 628 Ga	allaher Road Kingsto	on, TN. 37763		Model: 6112D	Serial Number: 28991			
Number: N/A* Electronic and Source Instrument Range Desired **Tolerance Listrument Response Comments Before Calibration After Calibration Timer: 02010806 Cal Due: 03/04/05 mR/h 1 .80-1.20 1 1 D+812: 2816 Cal Due: 03/04/05 mR/h 1 .80-1.20 1 1 D+812: 2816 Cal Due: 11/11/05 mR/h 40 32 - 48 42 40 DTH-1A: 100799 Cal Due: 11/11/05 mR/h 200 160-240 161 170 Sources Used:	Contact Name: T	om Scott			Probe: N/A	Serial Number: N/A			
Instrument RangeDesired**ToleranceInstrument ResponseCommentsRange-*ToleranceBefore CalibrationTimer. 02010806Cal Due: 03/04/05mR/h1.80-1.2011D>812: 2816Cal Due: 03/08/05mR/h1.80-1.2011D-812: 2816Cal Due: 04/15/05mR/h4032 - 484240DTH-1A: 100799Cal Due: 11/11/05mR/h200160-240161170Sources Used:			Number: N/A			Electronic and Source			
Range Desired ** Tolerance Response Comments Range After Calibration Timer: 02/0108/06 Cal Due: 03/04/05 mR/h 1 .80-1.20 1 1 D-S12: 2816 Cal Due: 03/08/05 mR/h 1 .80-1.20 1 1 D-S12: 2816 Cal Due: 04/15/05 mR/h 40 32 - 48 42 40 DTH-1A: 100799 Cal Due: 11/11/05 mR/h 200 160-240 161 170 Sources Used:	Instrument	Г	T	Contract of the second s					
Calibration Calibration Timer: 0201006 Cal Due: 0300/05 mR/h 1 .80-1.20 1 1 D-812: 2816 Cal Due: 03/06/05 mR/h 1 .80-1.20 1 1 D-812: 2816 Cal Due: 03/06/05 mR/h 40 32 - 48 42 40 DTH-1A: 100799 Cal Due: 11/11/05 mR/h 200 160-240 161 170 Sources Used:		Desired	**Tolerance			Comments			
mR/h 1 .80-1.20 1 1 D-812: 2816 Cal Due: 04/15/05 mR/h 40 32 - 48 42 40 DTH-1A: 100799 Cal Due: 11/11/05 mR/h 200 160-240 161 170 Sources Used: mR/h 616 493-739 530 631 Cs137 019701 Cert. Date: 07/16/04 C S137 019702 Cert. Date: 04/08/04 Cs137 019702 Cert. Date: 04/08/04 R/h 1.88 1.50 - 2.26 2.1 1.9 Temp: 24.1 °C Humidity: 36 % R/h 1.1 16.9 - 25.3 23.3 21.7 Pressure: 738 mmHg R/h 98 78.4 - 118 111 116 "Per manufacturer manual, instrument presion is ± 20%. R/h 360 288-432 390 344 Geotropism: N/A R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT *Exposed to 616 mR/hr field for 60 <td< td=""><td></td><td></td><td></td><td></td><td></td><td>Timer: 02010806 Cal Due: 03/04/05</td></td<>						Timer: 02010806 Cal Due: 03/04/05			
mR/h 40 32 - 48 42 40 DTH-1A: 100799 Cal Due: 11/11/05 mR/h 200 160-240 161 170 Sources Used: mR/h 616 493-739 530 631 Cs137 019701 Cert. Date: 07/16/04 mR/h 616 493-739 530 631 Cs137 019702 Cert. Date: 04/08/04 R/h 618 1.50 - 2.26 2.1 1.9 Temp: 24.1 °C Humidity: 36 % R/h 1.88 1.50 - 2.26 2.1 1.9 Temp: 24.1 °C Humidity: 36 % R/h 98 78.4 - 118 111 116 **Per manufacturer manual, instrument precision is ± 20%. R/h 98 78.4 - 118 111 116 **Per manufacturer manual, instrument precision is ± 20%. R/h 360 288-432 390 344 Geotropism: N/A R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT	*****************		mR/hr	.		DVM: TW12662 Cal Due: 03/08/05			
mR/h 200 160-240 161 170 Sources Used: mR/h 616 493-739 530 631 Cs137 019701 Cert. Date: 07/16/04 mR/h 616 493-739 530 631 Cs137 019701 Cert. Date: 04/08/04 Cs137 019702 Cert. Date: 04/08/04 Cs137 019702 Cert. Date: 04/08/04 R/h 1.88 1.50-2.26 2.1 1.9 Temp: 24.1 °C Humidity: 36 % R/h 16.9-25.3 23.3 21.7 Pressure: 738 mmHg ***Per manufacturer manual, instrument precision is ± 20%. R/h 98 78.4-118 111 116 **Per manufacturer manual, instrument precision is ± 20%. R/h 360 288-432 390 344 Geotropism: N/A R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT **Exposed to 616 mR/hr field for 60 seconds* Precision Test: SAT Hgh Voltage Digital Zero: SAT Hi	mR/h	1	.80-1.20	1	1	D-812: 2816 Cal Due: 04/15/05			
mR/h 616 493-739 530 631 Cs137 019701 Cert. Date: 07/16/04 R/h 616 493-739 530 631 Cs137 019701 Cert. Date: 07/16/04 R/h Cs137 019702 Cert. Date: 04/08/04 Cs137 049711 Cert. Date: 04/08/04 R/h 1.88 1.50 - 2.26 2.1 1.9 Temp: 24.1 °C Humidity: 36 % R/h 21.1 16.9 - 25.3 23.3 21.7 Pressure: 738 mmHg R/h 98 78.4 - 118 111 116 **Per manufacturer manual, instrument precision is ± 20%. R/h 360 288-432 390 344 Geotropism: N/A R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR (Exposure Rate) Batteries: SAT Precision Test: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT *Exposed to 616 mR/hr field for 60 seconds* Precision Test: SAT High Voltage Digital Zero: SAT HV	mR/h	40	32 - 48	42	40	DTH-1A: 100799 Cal Due: 11/11/05			
R/hr Cs 137 019702 Cert. Date: 04/08/04 R/hr Cs 137 049711 Cert. Date: 04/09/04 R/h 1.88 1.50 - 2.26 2.1 1.9 Temp: 24.1 °C Humidity: 36 % R/h 21.1 16.9 - 25.3 23.3 21.7 Pressure: 738 mmHg R/h 98 78.4 - 118 111 116 **Per manufacturer manual, instrument precision is ± 20%. R/h 360 288-432 390 344 Geotropism: N/A R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT High Voltage Digital Zero: SAT Precision Test: SAT Hu du Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Instrument Reviewed By: Ward Date: 2 - 15 - 05	mR/h	200	160-240	161	170	Sources Used:			
R/hr Cs137 049711 Cert. Date: 04/09/04 R/h 1.88 1.50-2.26 2.1 1.9 Temp: 24.1 °C Humidity: 36 % R/h 21.1 16.9-25.3 23.3 21.7 Pressure: 738 mmHg R/h 98 78.4-118 111 116 **Per manufacturer manual, instrument precision is ± 20%. R/h 360 288-432 390 344 Geotropism: N/A R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT MR 10.2 8.2 - 12.3 11 11 Over Range: SAT MR 10.2 8.2 - 12.3 11 11 Over Range: SAT High Voltage Digital Zero: SAT Precision Test: SAT Digital Zero: SAT HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION </td <td>mR/h</td> <td>616</td> <td>493-739</td> <td>530</td> <td>631</td> <td>Cs137 019701 Cert. Date: 07/16/04</td>	mR/h	616	493-739	530	631	Cs137 019701 Cert. Date: 07/16/04			
R/h 1.88 1.50-2.26 2.1 1.9 Temp: 24.1 °C Humidity: 36 % R/h 21.1 16.9-25.3 23.3 21.7 Pressure: 738 mmHg R/h 98 78.4-118 111 116 **Per manufacturer manual, instrument precision is ± 20%. R/h 98 78.4-118 111 116 **Per manufacturer manual, instrument precision is ± 20%. R/h 360 288-432 390 344 Geotropism: N/A R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT *Exposed to 616 mR/hr field for 60 seconds* Precision Test: SAT High Voltage Digital Zero: SAT HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Reviewed By:						Cs137 019702 Cert. Date: 04/08/04			
R/h 21.1 16.9 - 25.3 23.3 21.7 Pressure: 738 mmHg R/h 98 78.4 - 118 111 116 **Per manufacturer manual, instrument precision is ± 20%. R/h 360 288-432 390 344 Geotropism: N/A R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT *Exposed to 616 mR/hr field for 60 seconds* Precision Test: SAT High Voltage Digital Zero: SAT HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We furth certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Instrument Reviewed By: Weak Weak Weak Weak Weak Weak Weak Weak			R/hr	•••••••••••••••••••••••••••••••••••••••	••••••••••••••••••••••••••••••••••••••	Cs137 049711 Cert. Date: 04/09/04			
R/h 98 78.4 - 118 111 116 **Per manufacturer manual, instrument precision is ± 20%. R/h 360 288-432 390 344 Geotropism: N/A R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR (Exposure Rate) Batteries: SAT mR (Exposure Rate) Batteries: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT *Exposed to 616 mR/hr field for 60 seconds* Precision Test: SAT High Voltage Digital Zero: SAT HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION STATEMENT OF CERTIFICATION Instrument. Instrument. Sensitivity of during shipment and that it met all the Manufacturers published operating specifications. We furth certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Date: Sensitive during shipmen Calibrated By: Reviewed By: Words Additional Calibration Sensitive during shipmen Date: Sensitive during shipmen	R/h	1.88	1.50 - 2.26	2.1	1.9	Temp: 24.1 °C Humidity: 36 %			
K/n 93 78.4 - 118 111 116 precision is ± 20%. R/h 360 288-432 390 344 Geotropism: N/A R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR (Exposure Rate) Batteries: SAT Batteries: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT *Exposed to 616 mR/hr field for 60 seconds* Precision Test: SAT High Voltage Digital Zero: SAT HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION STATEMENT of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Instrument Reviewed By: Wando Graduards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument).	R/h	21.1	16.9 - 25.3	23.3	21.7	Pressure: 738 mmHg			
R/h 720 576 - 864 806 700 Sensitivity Check: SAT mR (Exposure Rate) Batteries: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT *Exposed to 616 mR/hr field for 60 seconds* Precision Test: SAT High Voltage Digital Zero: SAT HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION Statement listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We furth certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We furth or use of this instrument). Instrument Reviewed By: Wave Date: 2 - 15 - 55	R/h	98	78.4 -118	111	116				
mR (Exposure Rate) Batteries: SAT mR 10.2 8.2 - 12.3 11 11 Over Range: SAT *Exposed to 616 mR/hr field for 60 seconds* Precision Test: SAT High Voltage Digital Zero: SAT HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We furth certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Instrument Calibrated By: Manybox Reviewed By: Manybox Date: 2 - 15 - 25	R/h	360	288-432	390	344	Geotropism: N/A			
mR 10.2 8.2 - 12.3 11 11 Over Range: SAT *Exposed to 616 mR/hr field for 60 seconds* Precision Test: SAT Digital Zero: SAT High Voltage High Voltage HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We furth certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Instrument Calibrated By: Werewed By: Warewed By: Many Date: 2 - 15 - 45	R/h	720	576 - 864	806	700	Sensitivity Check: SAT			
Exposed to 616 mR/hr field for 60 seconds Precision Test: SAT High Voltage Digital Zero: SAT HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION STATEMENT of CERTIFICATION We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We furth certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Instrument Instrument Maryin Reviewed By: Maryin Date: 2 - 15 - 95			mR (Exposure Rate)			Batteries: SAT			
High Voltage Digital Zero: SAT HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We furth certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Instrument Reviewed By: Mando Total Date: 2 - 15 - 05	mR	10.2	8.2 - 12.3	11	11	Over Range: SAT			
HV #-600 vdc #-600 -546 -546 * Returned repaired from Eberline. STATEMENT OF CERTIFICATION We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We furth certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Instrument Maryin Reviewed By: Maryin Date: 2 - 15 - 05		*Exposed to	616 mR/hr field for 6	0 seconds*		Precision Test: SAT			
STATEMENT OF CERTIFICATION We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We furth certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Instrument Calibrated By: Reviewed By: Current Calibrated By: Calibrated			High Voltage			Digital Zero: SAT			
We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We furth certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipmen or use of this instrument). Instrument Calibrated By: Reviewed By: Reviewed By: Current Calibrated By: Current Current Calibrated By: Current Curr	HV	#-600 vdc	#-600	-546	-546	* Returned repaired from Eberline.			
Instrument Calibrated By: Reviewed By: Jumo T- Sell Date: 3-15-05	certify that our Calib	ration Measurements are	as calibrated and inspecte	d prior to shipment a	nd that it met all the Ma				
Colliburation Data (02/14/05	Instrument (-11.	Reviewed By:	imo (T-)	Sell	Date: 5 - 15 - 05			
Calibration Date: 02/14/05	Calibration Date:	02/14/05		•	Calibration Due:	02/14/06			



WPI - Richmond Office

11 S. 12th Street – Suite 210 Richmond, VA 23219 Tel: (804) 783-0183 Fax: (804) 783-0185



DBR-1 Reader Calibration Certificate

DBR-1 Reader Serial Number:	230011
ROM Version:	1.02
RAM Version:	1.16.53
Calibration Plug Serial Number:	204024
Calibration Plug Calibration Date:	25Feb2005 / Battery Voltage: 8.9V/8.8V

The Calibration of the DBR-1 Reader was performed in accordance with DBR-1 User's Guide version 1.16, Section 3.4 entitled "Calibrating the DBR-1".

As-Found readings for the DBR-1 Reader were:

Parameter	Reading	Tolerance	Parameter	Reading	Tolerance		
G	-2	+/- 26	M	42	+/- 26		
R	30	+/- 26	L	2	+/- 26		
Н	325	+/- 101	1	110	+/- 5001		

As-Left readings for the DBR-1 Reader were:

Parameter	Reading	Tolerance	Parameter	Reading	Tolerance
G	0	+/- 26	M	0	+/- 26
R	0	+/- 26	L	0	+/- 26
Н	12	+/- 101	I	110	+/- 5001

MARAD Contract # DTMA2P05133 Work Performed In Accordance with WPI's Nuclear QA Manual

Date: <u>014762005</u> Calibrated by: John Bowen Reviewed by:

Robert Pennock



	This Certificat	te will be accomp	anied by Calibrat	ion Charts or Re	adings where applicable				
C	USTOMER INFO	RMATION			INSTRUMENT INFORM	ATION			
Customer Name: WI	PI			Manufacturer	: Radeco				
Contact Name: John	n Bowen			Model: H-810DC					
Address: 2000 Kraf	t Drive, Suite 2100, B	lacksburg, VA 2	4060	Serial Numbe	r: 0865				
Contract/Task Numb	er: WP105-0079	Work Order :	2005-02636	Calibration M	lethod: Air Flow				
		INSTRUMEN	T CALIBRAT	ION INFORM	IATION				
Instrument Range (LPM)	Standard Value (LPM)	Tolerance (±10%)	As Found	As Left	Comme	ents			
14 - 99	43	39-47	42	42	Barometer: 8029	Cal Due: 12/13/05			
	70	63 - 77	68	68	Thermometer: 8029	Cal Due: 12/13/05			
	93	82 - 102	93	93	Venturi: 8029	Cal Due: 12/13/05			
					DTH-1A: 100799	Cal Due: 11/11/05			
	Ī				Temperature: 20.4 °C				
					Pressure: 739mmHg				
					Humidity: 32%				
					Previous Media: N/A				
					Current Media: Customer	Provided Glass Fiber			
					Final Range: 14 – 99 LPM				
					Calibrated IAW OEM				
	L	STATE	MENT OF CE	RTIFICATIO	N				
We Certify that the instru- further certify that our C: shipment or use of this in	libration Measurements a	librated and inspect are traceable to the l	ted prior to shipmen National Institute of	t and that it met all Standards and Tee	the Manufacturers published oper chnology. (We are not responsible	ating specifications. We for damage incurred during			
Instrument	1.1.				1				
Calibrated By:		Reviewed By:	Clong (
Calibration Date: 03	/1/1/05			Calibration Due: 03/17/06					



	This Certifica	te will be accomp	anied by Calibra	tion Charts or Re	adings where applicable			
C	USTOMER INFO	RMATION		INSTRUMENT INFORMATION				
Customer Name: WI	PI			Manufacturer	Radeco			
Contact Name: Johr	n Bowen			Model: H-810DC				
Address: 2000 Kraft	t Drive, Suite 2100, B	lacksburg, VA 2	4060	Serial Number: 0864				
Contract/Task Numb	er: WP105-0079	Work Order :	2005-02636	Calibration M	lethod: Air Flow			
1 - CAR - 2 - 24 	ta da serie de la composición de la com La composición de la c	INSTRUMEN	T CALIBRAT	ION INFORM	LATION			
Instrument Range (LPM)	Standard Value (LPM)	Tolerance (±10%)	As Found	As Left	Comr	nents		
14 - 99	42	38-46	31	42	Barometer: 8029	Cal Due: 12/13/05		
	68	61 - 75	57	68	Thermometer: 8029	Cal Due: 12/13/05		
	89	80 - 98	82	89	Venturi: 8029	Cal Due: 12/13/05		
					DTH-1A: 100799	Cal Due: 11/11/05		
					Temperature: 20.4 °C			
					Pressure: 739mmHg			
					Humidity: 32%			
					Previous Media: N/A			
					Current Media: Custome	r Provided Glass Fiber		
					Final Range: 42 – 89 LPN	1		
					Calibrated IAW OEM			
			99-1994 - 2014 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111					
		STATE	MENT OF CE	RTIFICATIO	N			
	ibration Measurements a				the Manufacturers published ope hnology. (We are not responsible			
Instrument				\sim				
Calibrated By: Ha	tagtal	Reviewed By:	Clamo	10 5 Autor Date: 3-22-05				
Calibration Date: 03/	1/105			Calibration Du	ie: 03/17/06			





	CUSTOMER INFO	RMATION			INSTRU	MENT INFO	RMATION		
Customer Nam	e: Duratek Instrument S	ervices		Manufacturer	: Ludlum				
Address: 628 (Gallaher Road, Kingston	, TN 37763		Model: 2221		Serial Numb	ial Number: 197766		
Contact Name:				Probe: N/A		Serial Numb	er: N/A		
Customer Purc Number: N/A	hase Order	Work Order Number: 2004	_02391	Calibration M Electroni					
Number: IVA			MENT CALIBRA						
			meter			Tolerances	Scaler Response		
Instrument	Calibration Standard	Res	ponse	Calibration Standard	Time Base	(cpm)	Kes	Jourse	
Range	Value CPM	As Found	As Left	Value CPM	(min)	±10%	As Found	As Left	
X 1	100	100	100	1,000 CPM	.1	90 - 110	99	99	
X 1	250	250	250	1,000 CPM	.2	180 - 220	200	200	
X 1	400	400	400	1,000 CPM	.5	450 - 550	499	499	
X 10	1,000	1,000	1,000	1,000 CPM	1	900 - 1,100	994	994	
X 10	2,500	2,500	2,500	1,000 CPM	2	1.8K-2.2K	1,987	1,987	
X 10	4,000	4,000	4,000	1,000 CPM	5.	4.5K-5.5K	4,987	4,987	
X 100	10,000	10,000	10,000						
X 100	25,000	25,000	25,000						
X 100	40,000	40,000	40,000					×	
X 1000	100,000	100,000	100,000						
X 1000	250,000	250,000	250,000						
X 1000	400,000	400,000	400,000						
	.L		TEMENT OF						
We Certify that the certify that our Ca use of this instrum	e instrument listed above was a alibration Measurements are tra nent).	calibrated and inspendent contract of the second seco	cted prior to shipmer nal Institute of Stand	nt and that it met all lards and Technolog	the Manufac gy. (We are n	turers published ope ot responsible for da	rating specification mage incurred dur	ns. We further ring shipment or	
Instrument			~	<u> </u>	,				
Calibrated By	· M.Paul	Reviewed By:	Comos (J- Acrit		Date: 17	- 7-04		
Calibration Da	ate: 12/07/04 🖌		Calibration Du	ne: 12/07/05					

Model: <u>2221</u>

Serial Number: 197766

	M	I&TE					Environmen	tal Condition	S		
Volt Meter	Due Date:	03/08/05	D	TW12662	2 D-8	812	Due Date:	04/15/05	ID:	2816	
Pulser	Due Date:	09/24/05	D	10150) DTH	I-1A	Due Date:	11/1/05	ID:	100799	
Timer	Due Date:	03/04/05	D	02010800	806 Temp: 22.1 °C Pressure: 736 mm		736 mmHg	Hu	nidity: 54%		
		INS	TRU	MENT CALIBRA	ATION INF	ORMAT	ION				
				Specia	l Test						
Geotrop	oism	Sat (√) Unsat ()				Hold		Sat	(√) Uns	at ()	
BAT >		Sat	(√) Uı	nsat ()	1	Volume To	est	Sat	(√) Uns	at ()	
Mechanica		Sat	(√) Ui	nsat ()	A	Audio Divi	ide	Sat	(√) Uns	sat ()	
Digital 2	Zero	Sat	(√) Uı	nsat ()	W	'indow Sw	itch	Sat	(√) Uns	sat ()	
Coun	· · · · · · · · · · · · · · · · · · ·	Sat	(√) Uı	nsat ()		Lamp		Sat	(√) Uns	sat ()	
				High Voltage	calibratio	n					
Voltage	Voltage Tolerance ±2%						As Found		As	Left	
400			±2% 392-40				404		4	04	
1,000			80-1,0				1,001		. 1,	001	
1,000			470-1,			1,501			1,501		
1,500			862-1,	•			1,900		1,	900	
1,900		-		ain Calibration (Desired Ra	tio <u>10</u>	mV/100)	L			
Input		As Found Va		As Found R		I	As Left Valu	ie <u>As</u>	Left R	atio (mV/100	
<u>10</u>		96		1	0.4		96		-	10.4	
20		203		5	0.9	203			9.9		
30		309		9	0.7	309			9.7		
40		411			9.7 411			9.7		9.7	
				Logmeter Scale	Linearity (Check					
	Input			±20%	<u>Folerance</u>		<u>As Found</u>		<u>A</u>	s Left	
LOG		400		320)-480		400			400	
LOG		4,000		3,20	0-4,800		4,000		4	1,000	
LOG		40,000		32,00	0-48,000		40,000		4	0,000	
LOG		400,000		320,00	0-480,000		400,000		4(00,000	
		<u> </u>		COM	MENTS						
Calibrated in acc	ordance with (the OEM Tec	hnical	Manual							
nstrument		> , 、		Devices	By:	- A AA	- Aca	м г	Date: /	12-7-04	
Calibrated By:	M.ta	sel		Reviewed	By: (72)	-	7. 1.00	<u> </u>		<u></u>	
alibration Date	: 12/0//04										



3-30-05 CALIBRATION CERTIFICATE Page 1 of 2

Calibration Date: 08/05/04 🗸

This Certificate will be accompanied by Calibration Charts or Readings where applicable

	CUSTOMER INFO	RMATION		INSTRUMENT INFORMATION						
Customer Nam	e: Duratek Instrument S	ervices		Manufacturer	: Ludlum					
	Gallaher Road, Kingston			Model: 2221 Serial Nur			umber: 94954			
Contact Name:				Probe: N/A		Serial Numbe	er: N/A			
Customer Purc Number: N/A		Work Order Number: 2004	-01977	Calibration M Electroni						
Number: INA				ATION INFOR	MATION					
			meter ponse	Calibration	Time	Tolerances	Sca Resp			
Instrument Range	Calibration Standard Value CPM	As Found	As Left	Standard Value CPM	Base (min)	(cpm) ± 10%	As Found	As Left		
X 1	100	100	100	1,000 CPM	.1	90 - 110	98	98		
X 1	250	250	250	1,000 CPM	.2	180 - 220	198	198		
X1	400	400	400	1,000 CPM	.5	450 - 550	494	494		
X 10	1,000	1,000	1,000	1,000 CPM	1	900 - 1,100	988	988		
X 10	2,500	2,500	2,500	1,000 CPM	2	1.8K-2.2K	1,975	1,975		
X 10	4,000	4,100	4,100	1,000 CPM	5	4.5K-5.5K	4,940	4,940		
X 100	10,000	10,000	10,000							
X 100	25,000	25,000	25,000							
X 100	40,000	40,500	40,500							
X 1000	100,000	100,000	100,000					,		
X 1000	250,000	250,000	250,000							
X 1000	400,000	400,000	400,000							
		STA	TEMENT OF	CERTIFICA	FION					
We Certify that the certify that our C use of this instrument	he instrument listed above was Calibration Measurements are to ment)	calibrated and insp aceable to the Natio	ected prior to shipme onal Institute of Stan	ent and that it met all adards and Technolog	l the Manufac gy. (We are n	turers published op ot responsible for da	erating specification mage incurred dur	ons. We turther ring shipment		
Instrument			α		,	~	the sta			
Calibrated B	y: Mitani	Reviewed By	Clome (r. Acut	7	Date: 8-	5-09			

Calibration Due: 08/05/05 🖍

Model: <u>2221</u>

Serial Number: 94954

	M	&TE					Environmen	tal Condition	\$		
Volt Meter	Due Date:	03/08/05	D	TW12662	D-	814	Due Date:	10/22/04	ID:	2525	
Pulser	Due Date:	09/18/04	D	101500	Psy	chron	Due Date:	02/10/05	D:	7480	
Timer	Due Date:	10/23/04	D	22226011	Temp:	20.4°C	Pressure:	738mmHg	Hu	midity: 48%	
		INS	TRU	MENT CALIBRA	FION INI	FORMAT	ION				
				Special '	Test						
Geotrop	oism	Sat	(√) Uı	nsat ()		Hold		Sat (√) Un	sat ()	
BAT >	4.5	Sat	(√) Uı	nsat ()	,	Volume Te	est	Sat (√) Un	sat ()	
Mechanica	l Zero	Sat	(√) Uı	nsat ()		Audio Divi	de	Sat (√) Un	sat ()	
Digital 2	Zero	Sat	(√) Uı	nsat ()	W	/indow Sw	itch	Sat (√) Un	sat ()	
Cour	ıt	Sat	(√) Uı	nsat ()		Lamp		Sat (√) Un	sat ()	
		<u></u>		High Voltage (Calibratio	n					
Voltage		Tolerance ± 2%				I	s Found		As	Left	
400		392-408					388		4	100	
1,000		980-1,020					981		1,003		
1,500		1,4	70-1,	530			1,468		1,500		
1,900		1,8	62-1,9	932			1,855		1,	898	
		Thresh	old/G	ain Calibration (D	esired Ra	tio <u>10</u>	mV/100)				
Input		As Found Va	ue	As Found Rat	<u>io (mV/1(</u>	<u>)0)</u>	<u>As Left Valu</u>	e <u>As</u> l	eft R	atio (mV/100	
10		91		10.9	10.9				10.9		
20		183		10.9	10.9				10.9		
30		289		10.4	10.4			289		10.4	
40		391		10.3	10.2 391					10.2	
				Logmeter Scale L	inearity (Check					
	Input			<u>±20% To</u>	lerance		<u>As Found</u>		A	s Left	
LOG		400		320-4	180		400			400	
LOG		4,000		3,200-4			4,000			,000	
LOG		40,000		32,000-4	18,000		45,000			5,000	
LOG		400,000		320,000-4			450,000	I	45	50,000	
				COMMI	ENTS						
Calibrated in acco	ordance with th	e CP-IN-WI	-237 r	ev 1							
Instrument	Nike			Reviewed R	v. (1	ma (-	Acad	Э Ds	ite: 🖉	8-5-04	
Calibrated By:		· au					- New		<u></u>		
Calibration Date:	08/05/04			Calibration							



R&P 3-30-65

DETECTOR CERTIFICATE

Duratek Instrument Services 628 Gallaher Road Kingston, TN 37763 Phone: (865) 376-8337 Fax: (865) 376-8331

C	USTOMER I	NFORMATIO	DN		DETECTOR INFORMATION			
Customer Name: Duratek	Instrument S	Services			Manufacturer: I	udlum		
Address: 628 Gallaher Rd	Kingston, T	N 37763			Detector Model: 43-5			
Contact Name: Thomas So	ott			₩,1883.Ξ <i>β</i> ολ	Serial Number: 1	27385 🗸		
Customer Purchase Order Number: N/A	•	Work Order Number: 20			Evaluation Method Source	:		
	DETEC	TOR EFFIC	IENCY/RESPONS	E/PREC	SION INFORMATI	ON		
1) Source Nuclide: Th ²³⁰	Serial Num	Serial Number: 119739 Activity (dpm) : 18,600			Certif	ication Date: 10/2	0/97	
Parameter	As Found	As Left	L	inearity	Test	CPM (S	ource #1)	
Count 1	2,270	2,270	C	ount 1 (F	feel)	2,;	355	
Count 2	2,171	2,171	Co	ount 2 (Co	enter)	2,	173	
Count 3	2,230	2,230	Count 3 (Toe)			2,	329	
Average	2,224	2,224		Averag	e	2,286		
Background (cpm)	4.6	4.6		Pass/Fa	il	PA	ASS	
Net Counts	2,219	2,219				Tolerance ±10%		
Efficiency %	11.9%	11.9%				Min: 2,057	Max: 2,515	
SCA	LER INFOR	MATION			DETECTO	R INFORMATIO	N	
Model	<u>Serial</u>	Number	Due Date	Ba	ckground (cpm)	Operating Voltage	<u>Threshold</u>	
2221	193	766	12/07/05		4.6	550V	$100 = 10 \mathrm{mV}$	
Detector Setup Report	YES	NO 🗸	Barcode Rej	port Y	ES NO 🗸	Voltage Plateau	YES 🖌 NO	
			COMMEN	NTS		# 11		
			5 minute back	ground		#0.000		
		STA	ATEMENT OF CE	RTIFICA	TION			
We Certify that the detector lister further certify that our Calibration shipment or use of this detector).	t above was eva n Measurements	uated for proper are traceable to t	operation prior to shipn the National Institute of	nent and the Standards	t it met all the Manufactur and Technology. (We are	rers published operatir not responsible for dar	ng specifications. We nage incurred during	
Detector Certified By: M.Fe	Zuch.	Reviewed By	: Canoo 6	. A	But Date	: 3-28-	05	
Certification Date: 04/30/0	4 🗸			Certification Due: 04/30/05 V				



R# 3-30-03

Duratek Instrument Services 628 Gallaher Road Kingston, TN 37763 Phone: (865) 376-8337 Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			amed by Ca	anoration Charts of I		Instrument Informa	tion				
		tomer Informatio			Manufacturer:	Lud						
Customer Name:								/				
Address: 628 Gal	laher R	oad, Kingston, Th	N 37763		Model: 2929							
Contact Name: T	homas ]	F. Scott			Probe: 43-10-1		Number: 167229	<i>V</i>				
<b>Customer Purchas</b>			Work Order Number: N/A		Calibration Method: Electronic And Source							
Order Number:	N/A		the second s		bration Informatio							
		ID Nun			ation Due Date		Environmen	tal Con	ditions			
M&TE					10/22/04	Temr	erature (°C)		21.8			
Thermomete		252:					ure (mmHg)		748			
Barometer		252			10/22/04				48			
Hygrometer	r	748	0		02/10/05	Hum	idity (%)		-10			
Pulse Generat	tor	762		04/13/05 Calibrated in accordance wi					DEM.			
DVM		TW12	662		03/08/05		T					
Isotope		Source ID	Number .	Origina	l Activity (dpm)	Sa	urce Cert. Date	Deca	ecayed Activity (dpm)			
Th ²³⁰		1197	01		19,080		10/14/97		19,080			
Pu ²³⁹		0194	42		13,613	06/01/92		13,608				
Tc ⁹⁹		1094	07		24,288 10/01/94				24,287			
Sr/Y ⁹⁰		0902	13		45,200	08/04/98			39,063			
51/1		1		Frequen	cy Calibration	L						
			Alpha As F	-	Alpha As Left	t	Beta As Found		Beta As Left			
Desired (cpm)	Tole	erances (cpm)	(cpm)		(cpm)	(cpm)			(cpm)			
40		40	40		40		40	40				
400		(392-408)	400		400		400		400			
4,000	(3	i,920-4,080)	4,000		4,000		4,000		4,000			
40,000	(3	9.2K-40.8K)	40,004	4	40,004		40,004		40,004			
400,000	(3	92K-408K)	400,04	0	400,040		400,041		400,041			
Backgrou	Ì`		Alpha As l	Found	Alpha As Lef	t	Beta As Found	1	Beta As Left			
	unts, C		. 20		6		1,374		1,189			
	T _b	(min)	20		20		20		20			
Time,			1		0.3		68.7		59.5			
Rate,	R _b	(cpm)	<b>^</b>	Statemon	t of Certification		L	I				
We Certify that th specifications. We responsible for da Instrument	further	certify that our Ca	hbration Measu nent or use of th	nd inspecte rements are nis instrume	d prior to shipment a e traceable to the Na ent).			acturers and Te	s published operating chnology. (We are not			
Calibrated By:	A.	je)	Reviewed B	y:Tun	mo F.A.	nt .	Date:	5-4	-04			

Calibrated By:

Calibration Due: 08/04/05

Calibration Date: 08/04/04 -

#### **CROSS TALK SHEET & EFFICIENCY SHEET**

As Fou	nd Alpha	Threshold (I	nv)	() As Left Alpha Threshold (mv)									
	20						175	5					
			Alpha So	ource: Perform	ned using Pu ²³⁹	019442							
Paramter and Tolerance	A	lpha As Fou	nd	Alpha	As Left	J	Beta As Fou	nd	Beta As Left				
Source Count, C,		26,040		25	,562		1,510		259				
Time, T _s (min)		5			5		5		5				
Rate, R _s (cpm)	+	$R_{s[\alpha]} = 5,207$		R _{s[a]} =	5112.4		$R_{s[\beta]} = 302$		$\mathbf{R}_{\mathbf{s}[\boldsymbol{\beta}]} = 51.8$				
EFF (% c/d) (>25%)	<u> </u>	38.3%		37	.6%		N/A		N/A				
%Crosstalk [α to β] (< 10%)					$\frac{R_{s[\beta]} - R_{b[\beta]}}{R_{b[\alpha]}} =$	51.8 - 5,112.4	59.5 = ( _0.3	)%					
As Found Beta Low Th	reshold	As Left ]	Beta Low	Threshold	As Left E	Beta High Threshold							
6.0 mv			4.0 mv		As Found Be	65 mv			50 mv				
		L	Beta Se	ource: Perform	ned using Tc" 1	09407							
Paramter and Tolerance	A	lpha As Fou	nd	Alpha	As Left		Beta As Fou	nd	Beta As Left				
Source Count, C,		2			2		29,607		25,562				
Time, T _s (min)		5			5		5		5				
Rate, R, (cpm)		$\mathbf{R}_{s[\alpha]} = 0.4$		R _{sia}	_] = 0.4		$\mathbf{R}_{s[\beta]} = 5852$	.7	$R_{s[\beta]} = 5,112.6$				
EFF (% c/d) (>10%)		N/A		r	¶/A		24.1%		20.8%				
%Crosstalk [β to α] (< 1%)				$\frac{R_{s[\alpha]}-R_{b[\alpha]}}{R_{s[\beta]}-R_{b[\beta]}} \qquad \frac{0.4-0.3}{5,882.6-59.5} = 0.002\%$									
				High Vol	tage Power								
Desired Voltage	Tole	rance	DVM	As Found	DVM As	Left	2929 Mete	r As Found	2929 Meter As Left				
600	540	- 660		603	603		6	00	600				
800	720	- 880		807	807		8	00	800				
1,000	900 -	- 1,100		1,014	1,014		1,0	000	1,000				
1,200	1,080	- 1,320		1,214	1,214		1,2	200	1,200				
1,300	1,170	- 1,430		1,318	1,318		1,	300	1,300				
	- <b>14</b>		A	s Found	Vern Dial R	leading	As	Left	Vern Dial Reading				
High Vo	mage			883V	3.42		80	0V	3.20				
We Certify that the instru specifications. We further responsible for damage in	certify the	at our Calibra	tion Meas	and inspected purements are to	aceable to the N	and that : ational In	it met all the stitute of Sta	Manufacture ndards and T	rs published operating echnology. (We are not				
Instrument Calibrated By:	J.	Ž	Review	wed By:	oma F	- A	all	Date: 8	4-04				
Calibration Date: 08/0	4/04				Calil	oration D	ue: 08/04/	05					

#### **EFFICIENCY SHEET**

#### Instrument ID: 160019

As Found	l Alpha ]	Threshold (mv)		As Left Alpha Threshold (mv) 175								
	175											
			Alpha Source	: Th ²³⁰ #119738								
Paramter and Tolerance	Al	oha As Found	Alpha	As Left	Beta As Fou	nd	Beta As Left					
Source Count, C _s		N/A	29	,721	N/A		4,300					
Time, T, (min)		5		5	5		5					
Rate, R _s (cpm)		R _{s[a]} = N/A	R _{s[a]}	= 6,759	$\mathbf{R}_{\mathbf{s}[\boldsymbol{\beta}]} = \mathbf{N}/A$	<b>N</b>	$R_{s[\beta]} = 800.5$					
EFF (% c/d) (>25%)		N/A	31	.2%	N/A		N/A					
%Crosstalk [α to β] (< 10%)				$\frac{\mathbf{R}_{\mathbf{s}[\boldsymbol{\beta}]} - \mathbf{R}_{\boldsymbol{b}[\boldsymbol{\beta}]}}{\mathbf{R}_{\mathbf{s}[\boldsymbol{\alpha}]} - \mathbf{R}_{\boldsymbol{b}[\boldsymbol{\alpha}]}} =$	<u>N/A</u> =	N/A						
As Found Beta Low Thre	shold	As Left Beta Lov	r Threshold	As Found Be	ta High Threshold	As Left Beta High Threshold						
4.0mv		4.0m	,		50mv		50mv					
			Beta Source:	Sr/Y** 090213								
Paramter and Tolerance	Alj	oha As Found	Alpha	As Left	Beta As Fou	nd	Beta As Left					
Source Count, C,		N/A	1	12	N/A		84,221					
Time, T, (min)		5		5	5		5					
Rate, R, (cpm)		R _{s[a]} = N/A	R _{s[a]}	$\mathbf{R}_{\mathbf{s}[\mathbf{\alpha}]} = 22.1 \qquad \mathbf{R}_{\mathbf{s}[\mathbf{\beta}]} = \mathbf{N}/\mathbf{A} \qquad \mathbf{R}_{\mathbf{s}[\mathbf{\beta}]}$								
EFF (% c/d) (>10%)		N/A	N	V/A	N/A		43.0%					
%Crosstalk [ß to a] (< 1%)				$\frac{R_{s[\alpha]} - R_{b[\alpha]}}{R_{s[\beta]} - R_{b[\beta]}} =$	<u>N/A</u> =	N/A						
			Statement of	Certification								
We Certify that the instrumer pecifications. We further cer esponsible for damage incur	rtify that o	our Calibration Meas	arements are tra	aceable to the Na	and that it met all the l tional Institute of Star	Manufacture Idards and 1	ers published operating Technology. (We are no					
Instrument Calibrated By:	À	Revie	wed By: 7	imas 6	- Scutt	Date:	8=4-04					
Calibration Date: 08/04/04	1			Calib	ration Due: 08/04/05							

																							- 1	Beta	-11	-34	4-	-46	-48	- 44	-505		0
																							A/N	Alpha			0	0	7-7	-		0	0
																							A	Beta	÷	-34	-41	-46	-48	-84	-505		0
		Beta																					N/A	Alpha	0	0	0	0	-2	-	0	0	0
	A'N	Alpha											N/A				8/4/04	104.59		#DIV/0			66	Beta	1824	3072	4022	5060	5820	5734	5387	0	0
		Beta											_										Tc-99	Alpha	0	0	0	0	0	-	0	0	0
	N/A	Alpha											N/A				8/4/04	104.59		i0//IC#			239	Beta	-11	169	156	171	224	413	1178	0	0
Data (Cour	6	Beta	1835	3106	4063	5106	5868	5818	5892				_									Σ	Pu-239	Alpha	4199	4770	5028	5145	5149	5199	5277	0	0
#167229 Raw Data (Counts)	Tc-99	Alpha	0	0	0	0	2	0	0			Source Info	Tc-99	109407	24288	10/1/94	8/4/04	9.84	2.13E+05	24287		Net CPM	Alpha Eff.	(%)	30.9%	35.1%	36.9%	37.8%		38.2%	38.8%	0.0%	%0.0
	39	Beta		203	197	217	272	497	1683			Sol	•								50 VDC		Beta Eff.		7.51%	12.65%	16.56%	20.83%	23.96%	23.61%	22.1	0.00%	0.00%
Detector 43-10-1	Pu-239	Alpha	4199	4770	5028	5145	5151	5200	5277				Pu-239	19442	13613	6/1/92	8/4/04	12.18	2.41E+04	13608	50				0.0%	0.0%	0.0%	0.0%	0.0%	%0.0	0.0%	#DIV/0	#DIV/0
	pur	Beta	11	34	41	46	48	84	505				Nuclide Pu-239		Initial DPM	Certification Date	Todav's Date	Source Age (Years)	Half-Life (Years)	<b>Corrected Activity</b>	crements:		MDA/Cross-Talk	Alpha MDA Beta-Alpha	8.8	7.7	7.3	7.2	24.6	19.3	7.0	#DIV/01	#DIV/01
	Background	Alpha	0	0	0	0	2	-	0							Certific	Tot	Source A	Half-L	Correct	Voltage Increments		MDM	Reta MDA	9	235.9	196.3	164.5	145.8	192.1	483.6	#DIV/0	#DIV/0
		Voltage	600	650	200	750	800	850	006	950	1000													Voltade	600	650	2002	750	800	850	006	950	1000

8-5-04 8-4-04

R Comes



0840 3-30-05

Duratek Instrument Services 628 Gallaher Road Kingston, TN 37763 Phone: (865) 376-8337 Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

Γ	Cu	stomer Informati		and by co	Instrument Information							
Customer Name:					Manufacturer:	Lud	lum					
Address: 628 Ga					Model: 2929	Seria	l Number: 102001	1	,			
Contact Name: 1					Probe: 43-10-1	Probe: 43-10-1 Serial Number: 103276						
Customer Purchas			Work Order		Calibration Method:							
Order Number:			Number: 200		Electronic And Source							
Instrument Calibration Information           M&TE         ID Number         Calibration Due Date         Environmental Conditions												
M&TE		ID Nun	aber	Calibra	tion Due Date			tal Co	T			
Thermomete	r	252:	5	1	0/22/04	Tem	perature (°C)		21.1			
Barometer		252	5	1	10/22/04	Press	sure (mmHg)		746			
Hygrometer	r	748	0		)2/10/05	Hum	idity (%)		76%			
Pulse Generat	tor	1209	35		04/13/05	Calil	orated in accordance	with	CP-IN-WI-235			
DVM		65650	015	1	10/14/04		/i accui mancui dance	*****				
Isotope		Source ID	Number .	Original	Activity (dpm)	So	ource Cert. Date	Dec	ayed Activity (dpm)			
Th ²³⁰		1197	39		18,600		10/20/97	18,600				
Tc ⁹⁹		1197	18		20,520		10/14/97	20,520				
Pu ²³⁹		0194	42		13,613		06/01/92		13,613			
		1		Frequenc	y Calibration	<b>.</b>			ga ga an			
Desired (cpm)	Tole	erances (cpm)	Alpha As I (cpm)	1	Alpha As Left (cpm)	t	Beta As Found (cpm)		Beta As Left (cpm)			
4		4	4		4		4	4				
40		(39-41)	40		40		40	40				
400		(392-408)	398		398		398	398				
4,000	(3	,920-4,080)	3,984		3,984		3,982		3,982			
40,000	(39	9.2K-40.8K)	39,830	6	39,836		39,824		39,824			
400,000	· · · · ·	92K-408K)	398,31	.8	398,318		398,345		398,345			
Backgroun			Alpha As I	Found	Alpha As Lef	t	Beta As Found					
	unts, C		6		4		1,193		1,088			
	Ть	(min)	20		20		20		20			
	 R _b	(cpm)	.30		.20		59.65		54.4			
· · · · ·	-			Statement	of Certification			·				
specifications. We responsible for dar	We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).											
Instrument Calibrated By:	All The Arth and 12.04											
Calibration Date:	09/13/	04			Calibra	tion D	oue: 09/13/05 🖌					

.

#### CROSS TALK SHEET

As Fo	und Alpha	Threshold (	mv)		As Left Alpha Threshold (mv)							
	18	0			180							
	*****	Alpha	Source:	Cross Talk	- Perforn	ned usi	ng Pu ²³⁹	019442				
Paramter and Tolerand	ce A	lpha As Fou	nd	Alph	n As Left	As Left			nd	Beta As Left		
Source Count, C _s		26,546		20	6,546			982	982			
Time, T, (min)			5			5	5					
Rate, R, (cpm)	]	$R_{s[\alpha]} = 5,309.$	2	R _{s[a]} :	= 5,309.2			$R_{s[\beta]} = 196.$	4	$R_{s[\beta]} = 196.4$		
EFF (% c/d) (>25%)	)	28.5%		2	8.5%			N/A		N/A		
%Crosstalk [α to β] (< 10%)				$\frac{\mathbf{R}_{s[\beta]} - \mathbf{R}_{b[\beta]}}{\mathbf{R}_{s[\alpha]} - \mathbf{R}_{b[\alpha]}} = \frac{196.4 - 54.4}{5309.2 - 0.2} = 2.68\%$								
As Found Beta Low 1	hreshold	As Left	Beta Low	Threshold	As For	und Be	ta High '	Threshold	As Left ]	Beta High Threshold		
4mv			4mv				50mv			50mv		
		Beta S	Source:	Cross Tal	k-Perforn	ned usi	ng Tc ⁹⁹ 1	19718				
Paramter and Tolerand	ce A	lpha As Fou	nd	Alph	a As Left			Beta As Fou	nd	Beta As Left		
Source Count, C _s		5			5			26,119		26,119		
Time, T _s (min)		5			5	5		5		5		
Rate, R _s (cpm)		$\mathbf{R}_{\mathbf{s}[\alpha]} = 1$		R,	_[a] = 1			$R_{s[\beta]} = 5,223$	5.8	$R_{s[\beta]} = 5,223.8$		
EFF (% c/d) (>25%)	)	N/A			N/A			25.2%		25.2%		
%Crosstalk [β to a] (< 1%)				$\frac{R_{s[\alpha]} - R_{b[\alpha]}}{R_{s[\beta]} - R_{b[\beta]}} = \frac{1.0 - 0.20}{5233.8 - 54.4} = 0.00015\%$								
				High Vo	tage Pow	er						
Desired Voltage	Tole	rance	DVM	As Found	As Found DVM As Left 2929 Meter As Fo				r As Found	d 2929 Meter As Left		
600	540	- 660		600		600		61	00	600		
800	720	- 880		800		800		80	00	800		
1,000	900	1,100		1,000		1,000		1,0	00	1,000		
1,200	1,080	- 1,320		1,200		1,200		1,2	200 -	1,200		
1 <b>,300</b>	1,170	- 1,430		1,300		1,300		1,3	600	1,300		
17:_L X	altaga		As	Found	Vern	Dial Ro	eading	As	Left	Vern Dial Reading		
High V	onage			750V		3.26		75	0V	3.26		
				Statement o	of Certific	tion						
We Certify that the instr specifications. We further responsible for damage i	er certify that	t our Calibra	tion Meas	irements are t	raceable to							
Instrument	41			_	7		ור					
Calibrated By:	ly		Review	ved By:	omas	12-	Aca			-13-04		
Calibration Date: 09/1	3/04					Calib	ration D	ue: 09/13/	/05			

#### EFFICIENCY SHEET

#### Instrument ID: 102001

As Found	l Alpha Threshold	(mv)			As Left	Alpha I	hreshold (1	nv)
	180					18	0	
	Alph	a Source:	Efficiency	determined usin	g Th ²³⁰ #1197	39		
Paramter and Tolerance	Alpha As Fo	ound	Alpha	a As Left	Beta	As Fou	nd	Beta As Left
Source Count, C,	31,208		31	1,208		N/A		N/A
Time, T, (min)	5			5		N/A		N/A
Rate, R _s (cpm)	$\mathbf{R}_{\mathbf{s}[\alpha]}=6,24$	1.6	R _{\$[a]} =	= 6,241.6	Rs	_[] = N/A	<b>\</b>	$R_{s[\beta]} = N/A$
EFF (% c/d) (>25%)	33.6%		3.	3.6%		N/A		N/A
%Crosstalk [α to β] (< 10%)			_	$\frac{\mathbf{R}_{\mathfrak{s}[\beta]} - \mathbf{R}_{\mathfrak{b}[\beta]}}{\mathbf{R}_{\mathfrak{s}[\alpha]} - \mathbf{R}_{\mathfrak{b}[\alpha]}} =$	N/A N/A	_ =	N/A	
As Found Beta Low Thre	eshold As Lef	t Beta Low	Threshold	As Found B	eta High Thre	shold	As Left	Beta High Threshold
4.3mv		4.3mv			50mv			50mv
	Beta	Source:	Efficiency	determined usi	ng Tc ⁹⁹ #1197	15		
Paramter and Tolerance	Alpha As Fo	ound	Alph	a As Left	Beta	As Fou	ınd	Beta As Left
Source Count, C _s	N/A			N/A		26,119		26,119
Time, T _s (min)	N/A			N/A		5		5
Rate, R, (cpm)	$\mathbf{R}_{s[e]} = \mathbf{N}/\mathbf{I}$	Ά.	Rsie	$a_i = N/A$	R _{s[\$}	₁ = 5,223	3.8	$R_{s[\beta]} = 5,223.8$
EFF (% c/d) (>25%)	N/A			N/A		25.2%		25.2%
%Crosstalk [β to a] (< 1%)			-	$\frac{\mathbf{R}_{\mathbf{s}[\alpha]} - \mathbf{R}_{\mathbf{b}[\alpha]}}{\mathbf{R}_{\mathbf{s}[\beta]} - \mathbf{R}_{\mathbf{b}[\beta]}} =$	N/A 	_ =	N/A	
			Statement of	of Certification				
We Certify that the instrume specifications. We further or responsible for damage incu	ertify that our Calib	ration Meas	urements are t	raceable to the N	and that it me ational Institut	t all the te of Sta	Manufactur ndards and	ers published operating Fechnology. (We are not
Instrument Calibrated By:	no	Review	ved By:	omas (-	South		Date:	9-13-04
Calibration Date: 09/13/0	4				bration Due:	09/13		

			N.S. SAV					Page	of
			UMENT SOU						
	LUDLUM M			ial No		869			
Calibration		3-10-06		iciency f		<u>0%</u> a			
Average $\alpha$ s Average $\beta$ s		800	cpm	Rang		1	to	~ ~ ~	
Average p s			cpm	Rang		640	to	960	
Date	bkg. Count (cpm)	Source C	Count (cpm)	Res	ults fail		Initial of	& Comment	
3-31-65	30	ar <b>ar</b> a ¹²	780	V		RG			
4-1-05	30	~~~~.	700	1		BLP	,		
4-4-05	70		780	V		RSI			
4-5-05	20	<b></b>	830	1		RUP			
4-6-05	30	and the second sec	800			REP		·····	
4-7-05	30		800	V		RUM	·····		
1-8-05	30		860	V		RUP			
+ 11- 05	30		800			TEC			
1-12-65	70		800			RUP	£		
1-13-05	30		900	arbox		2 HL			<del></del>
1-14-05	30	and the set	800	~		GHL			
	30		800	!	ť	A.			
-18-05	30		800	Ľ		FAL			
1-14-05	40		750	V		RUP		******	
- 20.05	30	<b></b>	800	-		2HZ			
1-21-05	30		800	~		9HZ			
- 22-05	20		800	$\checkmark$		9HL			

			N.S. SAV	ANNA	H			Page	of
			JMENT SOU						
	LUDLUM MO				910				
Calibration		3-10-06		iciency β		<u>5%</u> a_			
	ource count	900	cpm	Rang		1.12	to	<i><i>Q</i>() <i>b</i></i>	
Average p s			cpm	Rang		640	to	968	±20
Date	bkg. Count (cpm)	Source Co a	bunt (cpm) B	Res pass	ults fail		Initial	& Comment	
3-31-05	30		760		1411	RUA			
21-105	40		860	V		11.91° D(A			
4-4-05		_	860	V		AGA RGP			
4-5-05		-	770			211			
4-6-05				$\mathcal{V}$		DIN			
4-7-05	20		800 800			RI.D			
1-8-05	20			V		DIP			
4-11-05	30	-	<b>828</b> 800	$\checkmark$		RY C			n:
4-12-05	40		800			RI.P			
4-13-05			860			8 jul			
4-14-03			800	V		Litte			
4-15-05	30	. <b></b>	<u> </u>			244			
4-18.05	20		900			PIP			
4-14-05	30		800	~		RUP			
1-20-05			800	V		CH			
t-21-05	30		800	/		Q.H			
-22-05	30	_	800			ALL			
~~ ~ ~ ~			0.000			C'Ne -			

		N	. s. s.	AVAN	NAH		Page_of
		INSTRUM					
Instrumen	t 2221 Lu	NUM FRIS	<u>K14</u> 2	Se	rial No	94954	
Calibration	Due Date						
Average so	urce count		_µR/hr	Ra	ange	to	
Date	bkg. Count	Source Count		sults	-	Initial & Comment	:
	(µR/hr)	(µR/hr)	pass	fail			
		XII		11	W C		·····
		/ X60		15	VA D		
			and the second		h/	7	
				1	/11/		
	· · · · · · · · · · · · · · · · · · ·			//			
					<u></u>		

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	····.		UMENT SO	URCE C	HECK	LOG			
	LUNLUM MO,			rial No.	97				
	Due Date			ficiency β		<u>2.1%</u> a			
	ource count ource count		cpm	Rang		(1 ~)	to	• • •	
Average p 3			cpm	Rang		400	to	600	
Date	bkg. Count (cpm)	Source (	Count (cpm) B	Res	ults fail		Initial	& Commen	t
3-31-65	30	-	500			RGP			
4-1-05	40	-	500	/		RUN			
4-4-05	30		500	~		RGP			
4-5-05	36	-	500			RU	)		
4-6-05	30	_	500	V		RGP			
4-7-05	30	_	500	V		REP			***
4-8-05	30		500	V		PSP	2		
4-11-05	3 U	_	500	$\checkmark$		BIS			
4-12-05	30		500	~		Rup			
1-13-05	30	-	550			SHL			
1-14-05	30	-	550			JHL			
1-15-05	30	<u> </u>	550	~		JHL.			
1-18-05	30		500			JHL.			
1-19-05	30	-	500	L		RYP	and an		
1-20-05	30		500			SHE			
1-21-05	30		500	~		JHL.			
1-22-05	30		500			9NZ			
1.25.05	30	~	500			VEÇ	•		

			N.S. SAV	'ANNA'	H		Page_of
			UMENT SOU				
Instrument	LUDLUM MODE	1 2221 R F.	AIGMA Seri	al No.	197	<u>7766 / 1273</u> a_11.	345 PROBIE
Calibration !	Due Date /2	-7-105 / 41-	<u> 70-05</u> Effi	ciency \β	,	<u> </u>	9%
Average $\alpha$ s	source count	2700	cpm	Rang	ze [.]	<u>2/60</u> to	3240
Average β s	source count	N/A	cpm	Rang		to	
Date	bkg. Count (cpm)	Source Co	ount (cpm) ß	Resu pass	ults fail	Initia	al & Comment
4-4-05		2700				RIP	
4-4-05	0	:2750	<u> </u>	V		RGP	
			1	+	i	VIII	
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		INSTRUM		URCE	CHECI	K LOG	
		9 MR Mit	n v	Seri	al No.	42972	
Calibration		3-18-06					
Average sou	Irce count	7.5 p. R/h	_µR/hr	Ran	ige	6 uR/m to_	9 ju R/h
Date	bkg. Count (µR/hr)	Source Count (µR/hr)	Res	ults fail		Initial & Con	mment
3-31-05		2	pass		D1.1		
4-1-05	<u>3</u> 3	7.5	V	P.	RUP		
4-4-05	2	8	V	6	RGP		
4-5-05	2	7			RGP	······································	
4-6-65	2	7.5	~		RUP		
4-7-05	2	7.5			RUP		
4-8-05	3	6.5	$\checkmark$	)	RYP		
4-11-05	3	7.0	V		HK		
4-12-05	2	8	V		74P		
4-13-05	53	8	r		-HL		
4-14-05	3	8	V	9	HK.		
4-15-05	3	8	~		7NL	_	
4-18-03	3	Š	/	{	HK		
4-19-05	2	7.5	~	0			
4-20-05	2	7			HL ,		
		8	r		+HK		
1-22-05	2.5	8		Þ	HA		
							an Maria Marina ana amin'ny farita amin'ny farita amin'ny farita amin'ny farita amin'ny farita amin'ny farita a
							······································
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		INSTRUM		DURCI	E CHECK	LOG		
		9 pr R MIETR,	17	Se	rial No.	9546	.9	
Calibration		3-18-06						
Average sou	Irce count	7	_µR/hr	R	ange	5,6	_to	8.4
Date	bkg. Count (µR/hr)	Source Count (µR/hr)	Res pass	ults fail		Initia	1 & Co	mment
3-31-05		2		1411	RYP			
4-1.05	3	7.5			RLP			
4-4-05	2	7	V		RGP			
4-5-05	2	2	V		RUP	····		
4-6-65		2			Rup			
4-7-05		6.5	V		Rhp			
4-8-85	2	2	$\checkmark$		REP			
4-11-05	3	6.5 6.5	r		Ath			
4-12-05	2	6	<		Rup			
4-13-05	2-5	4	~		9HZ			
4-14-05	2	6	~		SHL			
+-15-05	2	6	6		QHL.			
4-18-05	3	6	L		Ed			
4-19-05	2	6	~		RYP			
4-20-05	2	6	~		AH			
4-21-05	3	6	~		JHL.			
1-22-05	2.5	6			8HL			
4-20-05 4-21-05 4-22-05 4-25-65	3	7		ć	Si 4F			
							****	
							ala in 1990 in	

		N	. <b>S.</b> SA	VAN	NAH			Pag	ge_of
		INSTRUM	ENT SC	DURCH	E CHECH	K LOG			
Instrument	LUDLUM 1	9 MR MATRI	<u> </u>	Se	rial No.	95 49	9		
Calibration I	Due Date	3-19-06							
Average sou	irce count	8	_µR/hr	R	ange	6.4	to	9.6	±20
Date	bkg. Count (µR/hr)	Source Count (µR/hr)	Res			Init	ial & Cor	nment	
3-31-05	3 	(µ1011) 8	pass	fail	RLP				
4-1-05	2.5	8	V		RLP				
1-4-05	2	8	V		RGP				
4-5-05	3	8			JH				
4-6-05	2	7.5	V		REP				
4-7-05	2	8			J.H.L.				
1-8-05	3	8	V	Ĺ	GHL				
4-11-05	3	8	~	C	IN	_			
4-12-05	2,5	7.5	$\checkmark$		RUP				
1-13-05	(C)	8	$\checkmark$		SH				
4-14-05	3	8	V		AHL.	,			
1-15-05	3	8			JHL.				
-18-05	3	8	<i>i</i> ⁄		JHL.				
1-14-05	2	S	V	د.	R40				
1-20-05	3 3 3	7,5	V		SHE	(			
H-21-05	3	Z	4		SHI	<u>`</u>			
1-22-05	3	8	V		8HK				

### N.S. SAVANNAH DAILY DOSIMETRY READER CALIBRATION CHECK

#### **RADOS DBR-1**

### Dosimeter reader

Limits	$G = \pm 2$	26, $R =$	±26, H=	= ±101,	$M = \pm 20$	5, $L = \pm$	26, I = :	±5001			
Date 4	4-2-05	4-6	1-05	4-5	-05	4-0	6-05	4-7	-05	4-8	8-05
Code	Value	Code	Value	Code	Value	Code	Value	Code	Value	Code	Value
G	/	G		G	ス	G	2	G	2	G	2
R	0	R	4	R	3	R	2	R	2	R	0
H	41	H	97	H	65	H	15	H	3	H	48
M	6	M	19	M	17	M	6	M	2	M	3
L	4	L	9	L	16	L	4	L	5	L	0
I	110	I	110	I	110	I	110	I	110	I	110
Pass	REP	1	REP		RGP		REP		REP		REP
	<u> 4-11-05</u>		2.05	4.	13-05	4-	14 -05	4-	15-05	4.	-18-05
Code	Value	Code	Value	Code	Value	Code	Value	Code	Value	Code	Value
G		G	2	G	2	G	2	G	2	G	1
R	4	R	3	R	5	R	4	R	3	R	5
H	28	H	27	H	8	Н	26	H	40	H	35
M	9	M	/	M	7	M	/	M	<u> </u>	M	10
L	3	L		L	2	L	0	L	4	L	4
Ι	110	Ι	110	I	110	I	110	I	110	I	110
Pass	REP		RY		RGP		RGP		REP		Rhf
	4-19-05		20-05		1-05	4-7	12-05	4.	15-05	4-2	6-05
Code	Value	Code	Value	Code	Value	Code	Value	Code	Value	Code	Value
G	2	G		G	2	G	/	G	1	G	1
R	7	R	3	R	4	R	4	R	0	R	
H	5	H	37	H	71	H	85	H	8	H	5
M	<u>8</u> 3	M	3	M	11	M	22	M	0	M	1
L I		L I			6	L	9	L	0,	L	
Pass	110	1	110	Ι	110	Ι	102	I	108	Ι	108
Date	REP		REP		INT		Jutz		JUNS		July
Code	Value	Code	Value	Code	Value	Code	Value	Cada	XZ-1	0.1	/
G	Value		value	Code	Value	Code	Value	Code	Value	Code	Value
R		G R		G R	/	G R		G	-/	G	
H	-/	H	$\prec$	H H		H H	- <u>(</u> )	R H	-{	R	<u> </u>
M	$\leq$	M		M	/	 М	/			H	
			/		-/		-/	M L	-/	M L	-/
 I		I	- (				-6-				/
Pass				- 1		<u> </u>	l	<u> </u>		1	

Initial under Value column for Pass

Page ____ of ____



Appendix C

### APPENDIX C RADIOLOGICAL DATA SHEETS

(Log summary, radiological data sheets NSS – 0001 through 0101 with sample location maps and confirmatory lab analyses)

Survey No.	Date	Location
NSS-0001	3/28/05	PORT SIDE "A" DECK STATEROOMS & OTHER ROOMS
NSS-0002	3/28/05	POAT SIDR "A" DIECK STATEROOMS & OTHER ROOMS
NSS-0003	3/28/05	STHRIBOARD STATEROOMS "A" DECK
NSS-0004	3/28605	STANBOARD STATRADOMS "A" DECK
NSS-0005	3/28/05	"A" DISCIL STANBOARD BARBER SHOP
NSS-0006	3/28/05	STARBOARD SIDIE "B" DECK CAEW STATEROOMS
NSS-0007	3/28/05	STANBOARD SINA B DACK CRAW 4 OFFICAR STATAROOMS
NSS-0008	3/28/05	"B" DIECIC PONT SIDE UNIVERSITY OF SOUTH CONOLINA OFFICES
NSS-0009	3/28/05	"B" DALIC PORT SIDE CARW PANTRY
NSS-0010	3/29/65	STATARGOM 34 PORTGINIE "A" PIECIC
NSS-0011	3/29/05	"B" DECK PORT CART. MIESS ROOM & CART. LOUNCA
NSS-0012	3/29/05	"B" DIECK PORTSIAN OFFICIENTS MIDSS
NSS-0013	3/29/05	"B" DECK PONT SIDA STATAGOMS, OFFICE, CLAAMING GAME LOCHAN
NSS-0014	3/29/65	B" DIECK CRNTKI LINIA ROOMS FAM ROOM COMPERENCE ROOM
NSS-0015	3/29/05	"B" DECK CTR. LIME MAIN GALLAY
NSS-0016	3/29/05	"B" DECK CTR LINE DINING Room
NSS-0017	3/29/05	"B" DACK INBOARD PORT SIDE STEWARD LAUMDAY
NSS-0018	3/29/05	"B" DECK CREW BARBAR SHOP
NSS-0019	3/29/05	PROMEMEDIE DECK VIERAMISH & MAIN LOUNCE
NSS-0020	3/29/05	BOAT DECK OFFICERS OTES
NSS-0021	3/29/05	BOAT DIECK OFFICIERS OTRS
NSS-0022	3/29/05	NAVIGATION BRIDGE DIGCE & PILOT HOUSE

Survey No.	Date	Location
NSS-0023	3/30/05	"C" DECK CREW CABINS
NSS-0024	3/30/05	"C" DRCK MACITIMA LODDING PRESDER
NSS-0025	3/30/05	"C" DECK CO2 Room
NSS-0026	3/30/05	"C" DIECK STAN BOARD SIDIE ROOMS
NSS-0027	3/30/05	"C" DECK PORT STURBOARD ROOMS
NSS-0028	3/30/05	FAGINA ROOM UPPAN LANDING TU MACIAINA PASSAGEWAY
NSS-0029	3/30/05	FAUCIMA Room Uppen LAURE
NSS-0030	3/30/05	"C" DECK LOCKARS FOR BREATHING GRAR
NSS-0031	3/30/05	"A" DECK BOTTOM DANIM OF EXHAUST VEAT TO TOP OF MAGT IN FROM OF # 4 HOLD COURD
NSS-0032	3/31/05	"C" DECK LAUMINEY & LIMPEN Roms
NSS-0033	3/31/05	"C" PONT & STARBOARD PASSAGE WAYS
NSS-0034	3/31/05	"C" HALLWAY AND LAUNDAY ENTRAMOR
NSS-0035	3/31/05	SOURCIE RECIRPT
NSS-0036	3/31/05	NAVIGATION DECK - EMERG. GEN. Rom
NSS-0037	3/31/05	"B" DECK HYPROLIC Equipment PLATFORM
NSS-0038	3/31/65	"B" DIECH CRAW LAUMARY, LICHTING LOAD CTR. CLIEAMING GEAR LOCKER.
NSS-0039	3/31/05	BOAT DIECK -> PROMEMANA DECK -> A" DACK -> B"DECK -> "C" DECK /> TACHINER CASING SPACE
NSS-0040	3/31/05	
NSS-0041	3/31/05	ENGIMERAINE WORK STATION HOLIS # 5
NSS-0042	<b>3</b> /31/05	MAIN ENGINE Ren LOWER LEVEL PORT SING OF SHAFT
NSS-0043	3/31/05	MAIN ENGINIX RM LOWAR LAURL STARBOARD SIDA OF SHART
NSS-0044	3/31/05	MAIN SHAFT ALLEY

Survey No.	Date	Location
NSS-0045	4/1/05	CONTROL ROOM For REALTON
NSS-0046	4/1/05	141' FLAT DECK STARBOARD SIDE
NSS-0047	4/1/05	"D" DECK FOOD STORAS STARBOARD SIDE
NSS-0048	4/1/05	"D" DECK FOOD STORAS STARBOARD SIDR
NSS-0049	4/1/05	D' DECK SPRUNC STORMS PORT SIDE
NSS-0050	4/1/05	"A" DECK AFT HOUSE
NSS-0051	4/1/05	"B" DECIL STERM COMPARTMENTS
NSS-0052	4/1/05	"C" DECK EMERL. H. P. LIHB
NSS-0053	4/1/05	"C" DIECK (AFT OF H.P.LANS) COMPARTMENTS
NSS-0054	4/1/65	CARGO HOLD # 4 B, C, D, HOLD DACKS
NSS-0055	4/4/05	"A" DIECK PONT SIDIE FAM SOOT AND PLANUM
NSS-0056	4/4/05	"B" DECIL STATIEROOM B-1, RAD WASTA STORAGE
NSS-0057	4/4/05	141 FLAT FWID STABLIZER Rin STARBOARD
NSS-0058	4/4/05	FWD STAISLICKA Rm STAABONAD LOWTER LOUAL
NSS-0059	1/4/05	FWID STABILIZER RM PORT UPPER LEUEL
NSS-0060	4/4/05	FWID STABLIZIER Run PORT LOWER LEVIL
NSS-0061	1/1/05	FUN WEATHAN DACK HOUSES BETNEAN HATCHAS 144
NSS-0062	4/5/05	"B" DRCIL FAN ROOM
NSS-0063	4 /5/05	HOLD ATU "D" DIECK STARBORRD
NSS-0064	4/5/05	"C" DIECK COUD WATTER CHEM LAS Uppier LAUTE
NSS-0065	4/5/05	HOLD DIELIC PORT & STARBONRD
NSS-0066	4/5/05	HALL WAY (CRISSOURA) ON HOLD DRCK

Survey No.	Date	Location
NSS-0067	4/6/05	SECONDARY CONTAINMENT "B" DECK AFFOF REACTOR
NSS-0068	4/6/05	"A" DECK HPLAB AT HOSPITAL
NSS-0069	4/7/05	PRIMARY CONTAIN MENT INSING HATCH CONTROLS
NSS-0070	4/7/05	"D" DECK (COLD CHEM LAD) (FROM"C" DACK) RAD SAMPLING ROOTH GAS ABGOABTION, EQUIP ROOM, WASTR STORAGE "C" DECK SECONDAM CONTAIN MENT FWD
NSS-0071	4/8/05	"C" DIECK SECONDARY CONTAINMENT FWD
NSS-0072	1/8/05	"B" DRUK SECOMPARY CONTAINFAME .
NSS-0073	4/8/05	"A" DECK SECONDAR CONTRIMENT
NSS-0074	4/8/05	PRIMARI CONTRIMANT AIR LOCK
NSS-0075	4/8/05	SECOMBRAJ CONTRIMMENT "D" DECK AFT MEZANINE PNIL LOWER ARRES
NSS-0076	4/8/05	SECONDARY CONTRIMMENT LOWER LAUNC (HOLD DACK)
NSS-0077	4/11/05	PRIMARY CONTRINMENT HATCH (LOWER)
NSS-0078	4/11/05	PRIMARY CONTRINGARME ("C" DECK) 15T LIEURI PRECIMINARY SMEARS
NSS-0079	4/14/65	PRIMARY CONTAINMENT ("C" PACK) 1ST LAVIEL FUD
NSS-0080	4/11/05	STRAM COMDENSON HATCH (ENGINE Room)
NSS-0081	4/11/05	"D" DECK HOT CHEM. LAR AT COMTNOL ROOM
NSS-0082	4/12/05	PRIMMY CONTRINM, ENT 41H LEVEL (HOLD DACK)
NSS-0083	4/12/05	PRIMARY CONTAINMANT 1ST LAURE ("C" DROK)
NSS-0084	4/12/05	PRIMARY CONTAINMATENT 2nd LIDVIEL ("D" DRCK)
NSS-0085	4/12/05	PRIMARY CONTAINMENT 3rd LAURE (14' FLAT)
NSS-0086	4/12/05	CHANGE PUMp Rooms (PORT & STBD)
NSS-0087	4/13/05	PRIMARY CONTAINMENT 1ST LISUAL ("C" PROR)
VSS-0088	4/14/65	SECONDAR CONTAINMENT LOWRAL FOURI CORR BOAR LOCATIONS

Survey No.	Date	Location
NSS-0089	4/14/05	"U"SHAPED STEAM GENERATORS IN PRIMINA COMT.
NSS-0090	4/19/05	TOP OF CUPOLA STBID NITHOLAN VALUE FLANCE
NSS-0091	4/20/05	PRIMARY WATRA STARUP TAMK
NSS-0092	4/53/05	LEAD SAMPLA LOCATION - OUTRA RAALTON WALL
NSS-0093	4/21/05	PRIMARY CONTRIMMANT - STBO STRAM GAM WOUN HUAN
NSS-0094	4/21/05	PRIMARY CONTRIMART FWIDUF RANCTOR 1ST & 2nd LAUSU
NSS-0095	4/21/05	PRIMARY CONTRIMANT PORT UTUBR STIEton Corem
NSS-0096	4/20/05	PRIMARY CONTRIMMENT STBD VIUBR STRAM (JEN. INSIDE PRIMARY SIAR
NSS-0097	4/21/05	PRIMARY CONTAINMENT PORT UTURA STRAM CAM.
NSS-0098	4/22/05	PRIMARY COMTAINMANT PORT UTURM STRAM GAM. POST JOB SURVEY
NSS-0099	41/25/05	SURVEY OR METARS USEN ON JOB
NSS-0100	4/25/65	PORT STERM DRUM SECONDARY
NSS-0101	4/26/05	PIPE FROM NITROBAN LINE IN PRIMAM CONT.
NSS-0102		
NSS-0103		
NSS-0104		
NSS-0105		
NSS-0106		
NSS-0107		
NSS-0108		
NSS-0109		
NSS-0110		

Survey No.	Date	AIR SAMPLIES Location
NSS-0111	4/5/05	COLD CHEM LAS "C" DECK
NSS-0112	4/4/05	ACLIESS TO SECONDARY CONTRIMMENT
NSS-0113	4/7/05	CHARLE PUMP Rom STBD.
NSS-0114	4/8/05	AIR LOCK For PRIMARY CONTRINMANT
NSS-0115	4/8/05	PRIMARY CONTAINMAND 1ST LEVAL
NSS-0116	4/8/05	CHARCE PUTT RAM STBD RECHACK
NSS-0117	4/11/05	"C" DRCK COLD CHAIR LAB RACHECK
NSS-0118	4/11/05	PRIMARY CONTRIMMENT 2nd LIEVEL
NSS-0119	4/11/05	SECONDAR CONTRINIENT LOWER LEVEL
NSS-0120	4/12/05	PRIMARY CONTAINMENT 4 THE LEVIEL
NSS-0121	4/22/05-	Palkang Coutrimmin U TUBA STANIN GAN. ALLASS COURA OPAMING.
NSS-0122		nocrigs Colyme Offern / A Co.
NSS-0123		
NSS-0124		
NSS-0125	-	
NSS-0126		
NSS-0127		
NSS-0128		
VSS-0129		
JSS-0130		
ISS-0131		
ISS-0132		

NSS-01	SURVEY NO. <u>//SS-0001</u>				
Date 3/28/05 Time 9:00 Am	DOSE RATE	CONTAMIN	NATION		
Surveyor Cranbock	Inst. Type LUDLUM	Beta Alpha	BetaAlpha		
Signature Acddock	Serial No. 95499	Inst.Sn 974/6			
Reviewed Ka Willimanh	β  Factor	Eff. 10 %			
	BKG 44 R/h	Bkg. 30 cpm	cpm		
AREA TORT SIDE A DECL	c / /				

COMPONENT_

TOILIEI PORCMIN & GUNCA BRANS 7-8 MR/hn Du To WARMIUM ON THRONIUM

LESS THAN BEED

7100 CPM IN STRM 12-15 MAN RESTRM > BKGD * >1000CPM TOLLY 12-15 MR.M RESTROOM -* 5 Louder PASS LAUNDR EBK4D STRM 14 BKGD Chain CHAIN LOCKET CIBKG 210000 100 CAM < 100 Cpm B-BETA in mRAD/hr/100 CM² SMEAR RESULTS IN DPM/100 CM² RESULTS NO. RESULTS NO. RESULTS NO. NO. RESULTS NO. RESULTS < B.K.L. < BRG < BKG A BICG-1 ~ BKG < <u>BKG</u> < <u>BKG</u> < BKG2 くちく < BRG <del>х</del> ВКС-2 3 ٤ 3 < <u>BK</u>I-9 × BKG-S BKG < B.K.(-Z 4 <u>< BKG</u> 4 L < BKG × BKG LBKG-< <u>BKU</u> 5BKG ~ BKG KBK6-< BKL-< BKG-

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA – RADIATION CONTROL AREA

NSS-01	SURVEY NO. <u><i>NSS-0002</i>.</u>		
Date 3/28/05 Time 10: 15 AM	DOSE RATE	CONTAMINATION	
Surveyor CRADDOCIC	Inst. Type Lun	BetaAlphaBetaAlpha	
Signature Sandlale	Serial No. 95499	Inst.Sn 97416	
Reviewed Real Elimah	β  Factor	Eff. 10 %	
	3KG YR	Bkg. <b>30</b> cpm cpm	n
AREA JONET SDE AT	) ECK Yr		

COMPONENT

Norm THRESHULD -1 DOOR KNOB -2 BATH FLOOR -3 AIR VONT (OVHD) - 4 BATH ROOR KNUB - 5

TOILIET GLAZE a PORCHUM READS 7-8 MR/h Due To Vermium or Housing

RESTRA >BKGD

RESTRORMAROUS RESTRONTOILET >1000 (PM >BKG-D >1000 CPM A FLOOR Z #000 QPM <BKG-D < 1000 CPM KBKGD «BRGD STRM#20 STRM 26 SRM 29

SRM 32 STRM 26 SMEAR RESULTS HIDDRM/100 CM2  $B = BETA in mRAD/hr/100 GM^2$ NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS ~BKG < BK6-- BKG × PIKG <u>2</u> 3 KBK6 ~ BKC ~BKG ~ BKC 4 ~BKG <BR6 - BKG ~ BKG < BRG < BKG

**RA - RADIATION AREA** 

**CA – CONTAMINATION AREA** 

ALL DOSE RATES IN µrem/hr

HI

**RCA – RADIATION CONTROL AREA** 

NSS-01		SURVEY NO. //	<u>55-0003</u>
Date 3-28-05 ime 8100	DOSE RATE	CONTAMI	NATION
Surveyor LOMAN SEOTT	Inst. Type LUD MDI 19	Beta_V Alpha	BetaAlpha
Signature amar forth	Serial No. 42972	Inst.Sn 75809	
Reviewed Raht Ghungh	β  Factor	Eff. 10 %/0	
	Bockgrand 4 MR/	Bkg. 40 cpm	cpm
AREA FOXTSTOR, STAT	E ROCIM S		
STAR BOARD & + 1	offices A	DECK	
COMPONENT			

ROOM THREE DE 1. DOON ALJS Brin 2000 -3 Fir 1/2 - 0/2 AD - 41 BATH DOOR BOOK

StR 15 FRSK 40054911 FRSK 41000 pil TOR - BKP. DR - BKC. DR - BKC. STR 3 FRSK KIDESPM DR - BHCKEJEOUNG

SMEA	R RESULTS 🦠		<del>O OM²</del>	/ ₽-	- BETA in mRA	<del>.D/hr/10</del>	<del>9 CM²</del>		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
7	< Bkgp	1	-BKGD	1	2 BKGD	/	< BRGD		6 BKGD
2	= BKGD	2	- BKGD	2	-BKGD	2	L BKGD	2	2 BRGD
3	4 BKGD	3	L BKGD	3,	- BKGD	3	LBKGD	3	-BKGD
4	L BKGP	4	CBKGD	4	LBKGP	4	< BKGD	竹	2 BKGD
Ś	< BKGD	5	2 BKGD	5	2 BKGD	3-	2 BKGD	<u> </u>	L BKG.D

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA – RADIATION CONTROL AREA AA

NSS-01 Date 3/28/85Time DOSE RATE CONTAMINATION Surveyor Lonian Scott Inst. TypeLoDMD119 Beta Alpha Beta Alpha Signature Accest Serial No. 42972 Inst. Sn 75309 Reviewed Bult Ffrmmal BFactor Eff. 10 To Backgrown HMRAR/BBG. 40 cpm cpm AREA StAR BOARD State Rains + OFFICE A PECK COMPONENT COMPONENT COMPONENT COMPONENT COMPONENT COMPONENT COMPONENT STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARPBONRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARPBONRIZ STARPBONRIZ STARPORT STARPBONRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STARBORRIZ STAR					
Surveyor Loman SCOTT Inst. Type Lo DMD 114 Beta L Alpha Beta Alpha Beta Alpha Signature Acatt Serial No. 429.72 Inst. Sn 75309 Reviewed Relating Bractor Eff. 10 To Com com com Com Com State Ray ML Bkg. 40 com com com com com com com com State Ray MS + 0 FOICE A DECK COMPONENT COMPONENT COMPONE				1	
Signature Connent Aciett Serial No. 42972 Inst. Sn 75809 Reviewed But Grand B Factor Eff. 10 To Background HMM MAKBER. 40 cpm cpm AREA_STAR BOARD STATE ROWALS + OFFICE A DECK COMPONENT	· · · · · · · · · · · · · · · · · · ·	50 the			
Reviewed Balt Frinnal BFactor Background HMM MR/BBG. 40 cpm cpm AREA <u>3tar</u> B. At D State Rains + OFNCE A DECK COMPONENT COMPONENT GTAP BOARD GTAP BOARD					
ROOM THRESH LOCAL AREA <u>3tar Board</u> + MARKEBKS 40 cpm cpm AREA <u>3tar Board</u> State Rooms + office A PECK COMPONENT COMPONENT GTAP BOARD GTAP BOARD GTAP BOARD GTAP BOARD GTAP BOARD Star - CIE AN INB ROOM I. THRESH LOCAL POUR KNOB J. JIODR J. JIODR J. JIODR J. JIODR J. JIODR J. JIN R J. JIN BOARD GTAP BOARD GTAP BOARD GTAP BOARD GTAP BOARD					
AREA <u>3tar BOARD</u> <u>state Rooms to FARE A DECK</u> COMPONENT <i>GTAR BOARD</i> <i>GTAR BOARD</i>	Reviewed Jack 9	Num -			
ROOM THREsh LOCA STAR BURR GTAR GTAR GTAR	AREA STAR				A PECK
ROOM TAREAL ROLL ROOM TAREAL ROLL POUR KNOG 3 BAHLI FLOOV 4 DOOR KNOG 4 DOOR KNOG 5 THR BOARD 5 THR BOARD	COMPONENT				
	2 POUR K 3 BAth	Floor		1. Thresh Z. Floor Z. SINK	old
	5. BAth	DOOR	KNr 6	STAR L STAR L I DOOR 2 TH ROSE 3. FLOOR 4 OPE 5 VA (VS	RBOARD INEN Lacker Krab Roca
STR 27 KEREW WRST CLEANIN ROOM FRSK -100 KERE 33 CLEANIN ROOM DR & BKG DR & BKG DR & BKG	5. BAth	DOOR	KNr 6	STAR L STAR L I DOOR 2 TH ROSE 3. FLOOR 4 OPE 5 VA (VS	RBOARD INEN LOCKER KNOB ROCO
SMEAR RESULTS HIP DPM/100 CM ²	SHR 27 FRSK 2100 DR 2 BKCy SMEAR RESULTS #100	DOOR GREW KS-FR 53 FRSK DR 4	KNOBER CLEANING LIOD FRSK LIE BKC DR. LB B-BETIKAMRAN	STAR L 1 DOOR 2 TH ROSE 3. Floor 4 OPE 5 VA IVS POOM 20 KG	R BOARD INEN Lacker Krab Aolo N HATCH & HANDHES
SMEAR RESULTS     M DPM/100 CM²     B = BET/// mRAD/III/100 GM²       NO.     RESULTS     N O.     RESULTS     NO.     R	SHR 27 FRSK -100 DR & BKC, SMEAR RESULTS HOP NO. RESULTS N	DOOR GREW BAR 33 FRSK DR 3 NHOO CM ² O. RESULTS	KNOB NURSTE CIEDNIKA CIOTO FRSK LIG IBKE DR. LB B-BETNEMMRAT NO. RESULTS	STAR STAR STAR STAR DOOR 2-TINDOOR 3. JIOO 4 OPE 5 VA (VS SVA (VS CON RG NO. RESULTS	R BOARD INEN Lacker Krab Aolo N HATCH & HANDHES
SMEAR RESULTS $H = BET / K = mRAD / 117 / 100 GM^2$ NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS / CBEGD /	SHR 27 FRSK - 100 DR & BKG NO. RESULTS HOP I - BKGD	DOOR GREW KSFR 33 FRSK DR 2 DR 2 DR 2 DR 2 DR 2 DR 2 DR 2 DR 2	KNOB NURSTE CIEDNIKI CIOTO FREKLIC IBKI DR. LB B-BETAKA-MRAT NO. RESULTS I LBKGD	STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR	R BOARD INEN Lacker Krab Aolo N HATCH & HANDHES
SMEAR RESULTS $H = BET / mRAD / 117 / 100 GM^2$ NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS / $CBKGD$ / $CBKGD$ / $CBKGD$ 2 $CBKGD$ 2 $CBKGD$ 3 $CBKD$	SHR 27 FRSK ~ 100 DR ~ BKG SMEAR RESULTS N / ~ BKGD 2 ~ BKGD	DOBR GREW KSFR 33 FRSK DR O NHOOCON O RESULTS I Z SKGD 2 < BKGD 3 ~ BKGD	KNZG NURSTE CIEANIKA ISTC FRSK LIE ISTC FRSK LIE DR LB B-BETIKA-MRAT NO. RESULTS I - BKGD 3 - BKGD	STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR	R BOARD INEN Lacker Krab Aolo N HATCH & HANDHES
SMEAR RESULTS $\Theta - BET/KA - mRAD/III/100 GM^2$ NO.RESULTSNO.RESULTSNO.RESULTSNO.RESULTS128KGD128KGD128KGD128KGD228KGD238KGD226KGD328KGD328KGD326KGD448KGD468KGD48KGD	SHEAR RESULTS NO C BKGD C C C BKGD C C C C C C C C C C C C C C C C C C C	DOBR GREW KSFR 33 FRSK DR 3 DR 4 DR 4 DR 4 DR 4 DR 4 DR 4 DR 4 DR 4	KNZG NURSTE CIED IBKI B-BETIKAMRAT NO. RESULTS I - BKGD 3 - BKGD 4 - BKGD	STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR	R BOARD INEN Lacker Krab Aolo N HATCH & HANDHES
SMEAR RESULTS $H = BET / K = mRAD / 117 / 100 GM^2$ NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS / CBEGD /	SHEAR RESULTS NO C BKGD C C C BKGD C C C C C C C C C C C C C C C C C C C	DOBR GREW KSFR 33 FRSK DR 3 DR 4 DR 4 DR 4 DR 4 DR 4 DR 4 DR 4 DR 4	KNZG NURSTE CIED IBKI B-BETIKAMRAT NO. RESULTS I - BKGD 3 - BKGD 4 - BKGD	STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR STAR	R BOARD INEN Lacker Krab Aolo N HATCH & HANDHES

RA - RADIATION AREA

CA – CONTAMINATION AREA

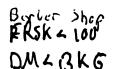
ALL DOSE RATES IN µrem/hr

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RCA – RADIATION CONTROL AREA AA – AIRBORNE AREA

NSS-01		SURVEY NO. <u>//</u> .	<u>55-0005</u>
Date 3/28/05 Time 12.10	DOSE RATE	CONTAMIN	IATION
Surveyor Laman Sugt	Inst. Type Ludlum 19	Beta_YAlpha	BetaAlpha
Signature onew Aul	Serial No. 42972	Inst.Sn 75909	
Reviewed Rah France	β  Factor	Eff. 10%	
P.F.	BK6 4.0 MR/m	Bkg. <b>40</b> cpm	cpm
AREA B DEC FARS	ATRA	· > · > to t <	1
/	H, DECK	BARDEN 3	1073
COMPONENT			1

- 1 Docr Threshold
- 2 Door Handle
- 3 Inna Airvent
- 4 ontor Airvent
- 5 Forward S.M.K.
- 6 AFT SINK
- 7 Floor (Aft (mir)



SMEA		N DPM/TO	TOU CM ² . D-BETA in mRAD/hr/100 ¹ CM ²						
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	LBKGD LBKGD								
2	-BKGD								
3	~BKGD								
4	< BKGD								
5	ABRGD								
Ġ.	< BKGD								
7	2 BKGD								

**RA - RADIATION AREA** 

CA – CONTAMINATION AREA

PACE

NSS-01		SURVEY NO. <u>//</u>	55-0006
Date3 28 05 Time 1210	DOSE RATE	CONTAMIN	NATION
Surveyor LOMAN SCOTT	Inst. Type Ludhum	Beta Alpha	BetaAlpha
Signature anine Searce	Serial No. 42972	Inst.Sn 75809	
Reviewed Reliterump	β  Factor	Eff. 10 %	
	BKG 40 MR/m	Bkg. 40 cpm	cpm
AREA B DECK	CREW STATRO	orng	
STARBONRO S	inr	,	
COMPONENT			

1- Threshold 2- Door Knob 3 - Bath Floor 4- Bath Krob 5- Air vent 6- Floor in front of 60th B-29 8-23 KSK ( 180 B-11 B-17 FRSK L 180 GRSK LIDO 100 25K L 100 DMZBKE DA KBKG DM4 BKG DM ZBKG i3K(-= BETA in mRAØ/hr/100 CM² SMEAR RESULTS H-DPM/100 CM² + RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO ~BKGD -BKGD LBKGD CBKGD 7 CBRGD 1 - BKGD 2 - BKGD 2 -BKQD < BKGD -BRGD 3 4 BKGD BEGD < BKG0 < BKGD 3 3 ろ L BKGD BKGD < BKGP -BKai) -BKGD < BEGD L BKGD 2 BKGD <u>< Brgd</u> < BKGD -BKGD 2 BKGD L BKGD < BKGD

**RA - RADIATION AREA** 

**CA - CONTAMINATION AREA** 

<

BKGD

RCA - RADIATION CONTROL AREA

AA – AIRBORNE AREA

NSS-01	SURVEY NO. <u>//</u>	<u>55-0007</u>				
Date 3/28/65 Time // 60/	DOSE RATE	CONTAMIN	NATION			
Surveyor Log AN SECT	Inst. Type/uph D/19	Beta Alpha	BetaAlpha			
Signature aquile fort	Serial No. 42972	Inst.Sn 75809				
Reviewed Kolefer unoch	$\beta$ Factor	Eff. 100/0				
/ V.*	BRC-4.0MM	Bkg. 40 cpm	cpm			
AREA B DECK (	peer + off	ICEN QUA	ster			
STARBOARd SIDE 00 1						
COMPONENT	r -					

1 - THRESHOLID 2 - Dour Knows 3 - BATH FLOOK 4 - BATH Doonkrons 5 - AIR VIENT 6 - F-LOOR IN FROMTOF BISTIT OF QUMPTER NE! I CEREDAY UNREADY B-45 B-B-49 B - 35B.5 Lest LIa 25K ~ 100 FRSK C100 DM Z BKG BM<BKG-PM<BKE DMLBK SMEAR RESULTS HH-DPM/100-CM³ Sector Secto RESULTS NO NO. RESULTS RESULTS NO. NO. RESULTS NO. RESULTS CBKGD < BKGD < BKGD 1 4BKGD < BKGD 1 - BKGP 2 BKGD z ~ BKGD 2 < BKGD <BKGD < BKGD L BKGD L BKGD ろ 3 < BKID < BKGD - BKGD 2 BRGD 2 BKGD 11 < BKQ0 L <BKGD - BKGD -BKGD < BKGD - BKGD < Brgd 5

-BKGD

**RA - RADIATION AREA** 

- BKGD

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

∠ BKad

-BKGD

**RCA – RADIATION CONTROL AREA** 

AA – AIRBORNE AREA

-BKGD

NSS-01	SURVEY NO. NSS - 0008					
Date 3/28/05Time 1:00 Pm	DOSE RATE	CONTAMINATION				
Surveyor Craddock	Inst. Type LODLUM	Beta Alpha	BetaAlpha			
Signature Signature	Serial No. 95499	Inst.Sn 97416				
Reviewed Auto Munuch	β-Factor 1000	Eff. 10%				
	BKG JuR/h	Bkg. <b>30</b> cpm	cpm			
AREA UNIVERSITY OF SOUTH CAROLINA OFFICE SPACES B DECK PORT						

COMPONENT

USC OFFICE SPALE DEFICE OFFICE RESTRM LOUNGE ARla HALLWAY 1. REDOORI THE HOLDE SONT HALLWAY DOOR 1 2. DOORKNOB#1 3. FLOOR OF HALLWAY 7. ROOR KNOB OFFICE INA 4. DECK RESTRM 8. DECK OFFICE 2 N/A 5. DOOR KNOB RM 9. DOOR KNOB OFFICE 2NA 10 THRESHOLD DOOR 2 11. DOOR KNOB Dock 12. VENT IN LOUNGE 13. VENT OFFICE # 14. VENT OFFICE # 15. VENT RESTRA

USC CFFICE SPACES DR < BRGD FRIGK < 100 (PM

SMEA	R RESULTS 🚽	IN DPM/46	<del>0-CM²-</del>	•B-1	- BETA in mR/	D/hr/100	<del>) CM</del> ²		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	-BKGD	6	2 BKGD	11	-BKGD				
:2	2 BKGD	7	NA	12	LBRGD				
3	L BKGD	8	NA	13	LBKGP				
4	< BKGP	9	NA	<u> </u>	< BKGD				
5	< BKGD	10	-BKGD	15	< BKGD				
-									

**RA – RADIATION AREA** 

CA -- CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA

NSS-01	SURVEY NO. <u>NSS-000</u> 9					
Date 3/28/05 Time 1: 30 PM	DOSE RATE	CONTAMINATION				
Surveyor CRADBOCK	Inst. Type LUDLUM	Beta Alpha BetaAlpha				
Signature Caddade	Serial No. 95 499	Inst.Sn 97416,				
Reviewed Row Eleman	$\beta$ -Factor $10^{a}$	Eff. 10000				
	BKG 4uR/m	Bk				
AREA CREW PANTY	B DECK	PORT				

## COMPONENT_____

< BKGD < 100 CPM

SMEA	R RESULTS +	N-DPM/40	0-CM ² *	-B-BETA in mRAD/hr/100 CM2-					
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
	< BKGD								
2	< BKGD								
3	< BKGD								
4	L BKGD								
5	<bkgd< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></bkgd<>								

RA - RADIATION AREA

CA – CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

360

NSS-01	SURVEY NO. <u>NSS-80010</u>				
Date 3/29/05 Time 8:00 AM	DOSE RATE	CONTAMI	NATION		
Surveyor CRADDOLIC	Inst. Type LUDLUM	Beta Alpha	BetaAlpha		
Signature A arthur	Serial No. 95499	Inst.Sn 97416			
Reviewed Ry atghmmed	β-Factor jp of TE NA	Eff. 10%			
	4 MR/HR BKGD	Bkg. 30 cpm	cpm		
AREA STATE ROOM 34	PORT & A	DELK			

#### COMPONENT_

1 - THRESHOLD of DooR WAY 2 - DOORKNOB & SRDOOR 3 - VENTILATION DUCK 4. BATH RUCOM DECK 5. BATH ROOM DOOR KNOB

# DOSE RATE - < BKGD FOR COUNTRATE < 100 CPM (30-40 CPM)

SMEA	R RESULTS +	N-DPM/10	<del>D-OM</del> 2	<del>-8-</del>	BETAinmRA	D/hr/100	<del>CM²</del>		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
i	*BKG								
2	<brg< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></brg<>								
3	CBKG-								
4	SBKG-								
5	<bk6< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></bk6<>								

RA – RADIATION AREA

CA – CONTAMINATION AREA

NSS-01	SURVEY NO. <u><i>NSS-0011</i></u>					
Date 3/29/05 Time 5:30 Am	DOSE RATE	CONTAMI	NATION			
Surveyor CRANNER	Inst. Type Lun	Beta Alpha	BetaAlpha			
Signature andreak	Serial No. 93499	Inst.Sn				
Reviewed Roll Himmen	$\beta^{-}$ Factor $\beta_{0}^{2}$	Eff. 10497416				
	Bite 4 uR/h	Bkg. 30 cpm	cpm			
AREA "B" DECK CERT. MESS ROOM & CERT. LOUNGE						

#### COMPONENT

DORK FWD	Fork ²	Door 3
#1	# 2	# 3
30 CFM	30 cpm	30 Crm
CERT. MESS RM	CERT. MESS RM	CERT. LOUNGE
3UR/Hz	3u R/H/R	2uR/HR
#1 1. THRESHOLD 2. DOOR KNOB 3. WENTICATION 4. WATER FOUNTMEN	# 2 1. THRESHOLD 2. DECR KNORS 3. VETWTILATION	# 3 1. TARESHOUD 2. DOOR KOUB 3. VENT. LATION 4 WATER FOUNT.AN
Messka BACKGOUND 3 WR/HA	30 CPM	
MESSRM BACKGOUND 34R/HR	30 CPM	
LOUNGE BACKGOUND ZURHA #1 MESSRM. #2 MESS RI	30 CPM	
AT MESSKM. 177 MESS KI	n/ + SLOUNGE	

	hE35KM. RRESULTS		•		<u>#3200</u> - BETA in mR#		D CM ²		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BEGD	ĺ	- BKGD	i	< BKGD				
2	L BKGD	2	-BEGD	2	LBKGD				
53	< BKGP	3	L BKGD	3	- BKGD 2 BKGD				
Ч	L BKGP		_	4	2 BKO				
	•			•					

**RA – RADIATION AREA** 

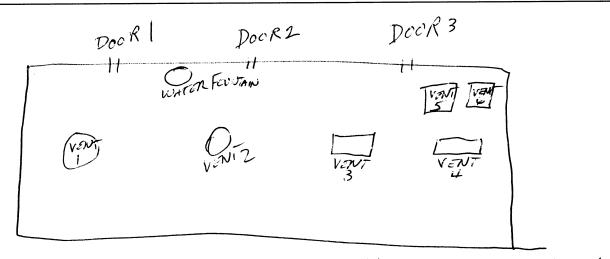
CA – CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA – RADIATION CONTROL AREA

NSS-01		SURVEY NO. <u>NS</u>	<u>15-00/2</u>
Date 3/29/05Time 9:00 HM	DOSE RATE	CONTAMI	NATION
Surveyor PAMOCIC	Inst. Type LUDLum	Beta Alpha	BetaAlpha
Signature and addade	Serial No. 95499	Inst.Sn 97416	
Reviewed The art firman	β ⁻ Factor 10 %	Eff. 10 %7	
	BHG QUR/HR	Bkg. 30 cpm	cpm
AREA BDECK PORT	OFFICERS 11	hess	

#### COMPONENT_



1- TARESHOLD DOURI 2- DOOR KNEB DOORI 3- VENT 1 4- WATER FOUNTAIN 5- VENT 2 6. TALESHOUD DOK 2 7 DOORKNOB DOOR 2 8-VENT 3 9-VENT 4 10-VENT-5

11. THRE HOLD DOORS 12. DOUR KNOBDOORS 13. VENT 6

DR < 2UR/HR FAISH < 30 CPAN	BKGD
FRISH < 30 CPM	

SMEA	R RESULTS H	N-DPM/10	<del>O CM[®]</del>	• <del>B</del> -=	BETA in mR/	BETA in mRAD/hr/100 CM ²				
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
1	< BKGD	9	< BKGD							
2	< BKGD	10	< BKGD							
3	2 BKGD	11	< BKGD							
Ц	< BKGD	12	1 BEGD							
5	~ BKSU	13	L BRGD							
6	< BKGO									
1	L BKGD									
8	~ BRCD								·····	

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

NSS-01	SURVEY NO. <u><i>NSS - 001.</i>3</u>					
Date 3/29/95 Time 9:20	DOSE RATE	CONTAMINATION				
Surveyor CRADDOCIC	Inst. Type Lun	Beta Alpha	BetaAlpha			
Signature Saddale	Serial No. 95 499	Inst.Sn 97416				
Reviewed Luly Forman	β  Factor	Eff. 10%				
	@ JuR/Hr	Bkg. 30 cpm	cpm			
AREA B DECK PORT B-8		BIHSTATERA, BIS	STATERM			
CLEANING GOAR LUCK	IK, OFFICE	/	·			
COMPONENT						

THRESHOLD 1 2 DOOR KNUB 3 VONTILATION 4 DECK BATH RAS BATHRON DOORKNOB 5

CLEANING GOAR LOCKER 1. THRESHOLD 2. DOOR KNOB 3- Deck 4 - VENT

OFFICE 1. THESHOLD 2. DOOR KNOB 3 VENT

FRISHEZOCEPM FRISH ZOCEPM FRISH ZOCEPM DR-2 UR/HR DR-3 UR/HA BKGD DR-2 UR/HE DR <2 UR/HE FRISKEZOCEPM FRISK ZOCEPM STRT. P.R.S. C3 UR/HA BRUT DRCZUK/HE DR <2 UN/HT FHISKE J---STATERABS STATERABILI STATEROUMBIS (LIANANG GRLacker OFFICE D=RETAIN MRADINI/100 CM² NORT TO CUSHIGG SMEAR RESULTS HN DPM/100 CM2 RESULTS RESULTS RESULTS RESULTS RESULTS NO. NO. NO. NO. NO. 2 BKGD 2 BKGD 4 BKGD 1 < BKGD ~BKGD 2 - BKGD - BKGD -BKGD -BKGD L BKGD < BKGD 2 2 3 - BKSP 3 < BKGD < BKGD 3 LBKGD 3

LBRGD

L BKGD

**RA - RADIATION AREA** 

- BKGO

< BKGD

**CA - CONTAMINATION AREA** 

Ÿ

ら

ALL DOSE RATES IN µrem/hr

- BKGD

- BKCP

RCA - RADIATION CONTROL AREA

'¥

5

L BEGD

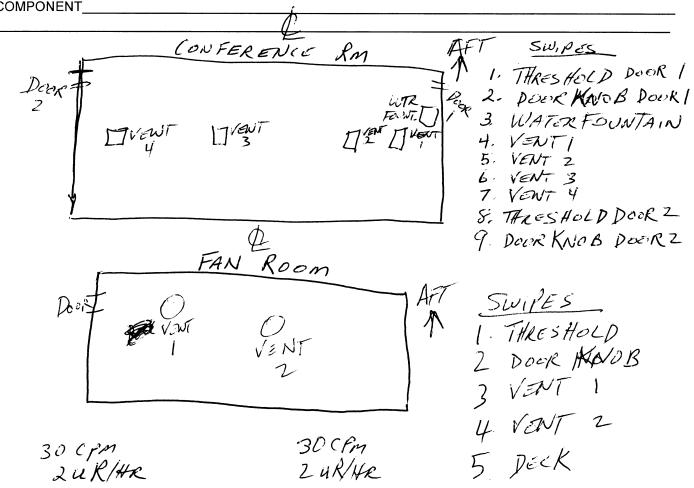
-BKGD

AA - AIRBORNE AREA

4

NSS-01	SURVEY NO. <u>NSS - 0014</u>			
Date 3 - 29-05 Time	DOSE RATE	CONTAMI	NATION	
Surveyor Condock	Inst. Type LUDLUM	Beta Alpha	BetaAlpha	
Signature added	Serial No. 95499	Inst.Sn 97416		
Reviewed Routerung	β  Factor 10 %	Eff. 10%		
• )=	2uR/H	Bkg. 30 cpm	cpm	
AREA B DECKER LONFER	ENCE RM FAN	ROOM LENTOR	LINE RIMS	

COMPONENT



CONFORMER RM

ZURAR

	CONFER	ENCE	ERM.	FA	IN RM				11 #11
SMEA	R RESULTS 🖣	N-DPM/40	<del>vo em²∽</del>	-B-	= BETA in mRA	<del>.D/hr/10</del>	<del>) CM²</del>		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
Ì	<bkgd< td=""><td>9</td><td><bkgd< td=""><td>1</td><td>LBKGD</td><td></td><td></td><td></td><td></td></bkgd<></td></bkgd<>	9	<bkgd< td=""><td>1</td><td>LBKGD</td><td></td><td></td><td></td><td></td></bkgd<>	1	LBKGD				
2	< BKGD			2	L BKGD				
3	< BKGD			3	L BKGD				
4	< BKQD			4	< BKGD				
5	LBKGD			5	LBKGD		·····		
6	<bkgd< td=""><td></td><td></td><td></td><td></td><td></td><td>a sa a dataman a</td><td></td><td></td></bkgd<>						a sa a dataman a		
2	<bkgd< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></bkgd<>								
8	LBKGD								

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

**RCA – RADIATION CONTROL AREA** 

AA – AIRBORNE AREA

NSS-01		SURVEY NO. <u>// 2</u>	<u>ss-00/s</u>				
Date 3/29/05 Time	DOSE RATE	CONTAMI	ATION				
Surveyor Craddock	Inst. Type LUDLUM	Beta Alpha	BetaAlpha				
Signature Gaddard	Serial No. 95 4 99	Inst.Sn 97416					
Reviewed Rah VER unnot	β-Factor Huk/A	Eff. 10%					
	4uR/1+ BKG	Bkg. 3 O cpm	cpm				
AREA B DECK CENTER	LINE MAIN	GALLEY					

COMPONENT

DOOR2 FWD DUORI H SWIPES 19. DUMBWAITOR Dour THESHOLD DOORI 20 VENT 1 1. KNOB 11 2. 2 ۰, 21. 3 DOOR 2 THRESHELD 3 KNOB 22. 4 11 4 4 DOOR 3 THROSHOLD 23. 11 5 5 24-١. KNOB 11 Ĺ. STBD 6PORT THRESHOLD 23 DOOR 4 DOOR 4 7. 7 11 بالر KNOB 8. 17 8 27. " THRESHOLD DOOR 5 9. 9 28, N1 21 KNOB 11 29, 10. 11 10 Der THRESHOLD 30 11 11 DOORG 11, KNOB 12. 11 THRESHOLD DOOR 7 13 11 KNOB Dock 14. Deig DOOR & THRESHELD 15 AFT KNUB 16. THESHELD DOOR9 17-KNOB 18 11 ENTIRE MN. GALLEY D.R. < BKGD FAISK & 100 CPM FOR

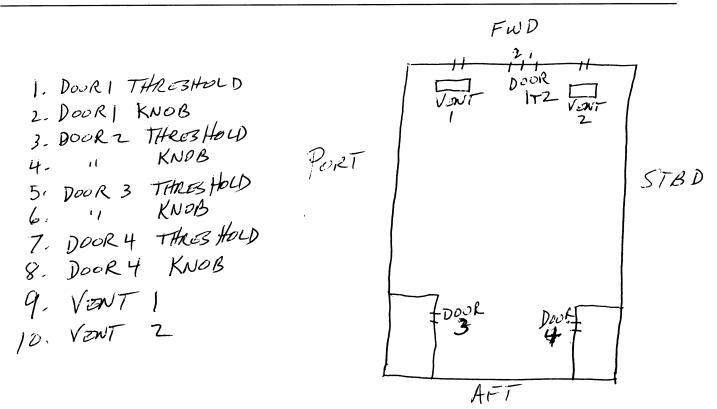
SMEA	R RESULTS +	N-DPM/18	<del>0-0M</del> 2	8-	BETA in mRA	<del>.D/hr/10</del>	<del>) CM²</del>		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	L BKGD	্র	< BKGD	17	< BKG D	25	 BKGD		
2	LBKGD	10	2 BRGD	18	2 BKGD	26	< BKGD		
3	LBKGD	il 🗌	LBKGD	19	2 BKGD	27	< BKGD		
Ц	2 BKGD	12	L BKGD	20	< BRGD	28	LBRGD		
5	< BKGD	13	< BKSD	21	< BKGD	29_	-BKGD		
b	< BKGD	14	-BKGD	22	< BKGD	30	LBKGD		
2	~BKGD	15	~ BKGD	23	< BKG D				
8	LBKGD	16	L BKGD	24	C BKGD				

**RA - RADIATION AREA** 

CA – CONTAMINATION AREA

NSS-01		SURVEY NO. <u>NSS - 00/6</u>					
Date 3/29/05Time	DOSE RATE	CONTAMIN	VATION				
Surveyor CRADDOCK	Inst. Type LUDLUM	Beta Alpha	BetaAlpha				
Signature Middacle	Serial No. <i>95</i> 4 99	Inst.Sn 97416					
Reviewed Kall Firman	β-Factor HMR/H	Eff. 10%					
	HUR/H BKG	Bkg. 30 cpm	cpm				
AREA BDECK (E.	NTER LINE DIA	ING Room					

COMPONENT_



SMEAR RESULTS 11 DPM/100 CM ²			-B = BETA in mRAD/hr/100 CM ²						
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
	LBKGD	9	-BKGD						
2	< BKG0	10	< Brad						
3	2 BKGP								
_4_	LBKGP								
	~BKGD								
<u> </u>	- BRGD								
	< BKGD								
<u> </u>	LBKGD								

**RA - RADIATION AREA** 

CA – CONTAMINATION AREA

NSS-01		SURVEY NO. NO.	<u>55-0017</u>
Date 3-24-05 Time 1355	DOSE RATE	CONTAMIN	IATION
Surveyor Craildock	Inst. Type Lucillum	Beta Alpha	BetaAlpha
Signature Ginddock	Serial No. 95499	Inst.Sn 97416	
Reviewed Row Hermon	β-Factor 4uf /H π	Eff. 10%	
. ,	4uR/H	Bkg. جر) cpm	cpm
AREA Bleck Inboard Por	tside Stewa	rd Laundry	

COMPONENT_____

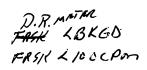
## DR LBKGD FRISK & 100 CPM

SIVIEA	R RESULTS 4	PEDT-M/10		-0-	-BETA in mR/	- anin'i toe			
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	-BKGD								
2	                                                                                                                                                                                                                                                                                                                                                     								
3	LBKGD								
4	LBKGD								

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

NSS-01		SURVEY NO. 1/55-0018					
Date 3 29-05 Time 1345	DOSE RATE	CONTAMI	NATION				
Surveyor CRASDOCIC	Inst. Type Lodlum	Beta Alpha	BetaAlpha				
Signature fraildede	Serial No. 95499	Inst.Sn (17416					
Reviewed to Willingh	Bre R/H	Eff. 10 %					
	J\$/TG-	Bkg. جي cpm	cpm				
AREA B Deck CE,	RT BARBER Shup	(CRRW)					

## COMPONENT_____



SMEAR RESULTS IN DPM/100 OM2				BETA in mR/					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	NA								
2	NA								
3	L BKCID								
4_	LBKGP								
5	< BKGD								

RA – RADIATION AREA

NSS-01	SURVEY NO. <u>NSS-0019</u>				
Date 3:29-05 Time 0800 090	DOSE RATE	CONTAMINATION			
Surveyor LAMAN SCATT	Inst. Type LUD/UM	Beta Alpha	BetaAlpha		
Signature Laman Scott	Serial No. 42972	Inst.Sn 9/037			
Reviewed Calitermoch	-β  Factor	Eff. 10°/0			
•	BKG 4.0 MP/h	Bkg. 40 cpm	cpm		
AREA Promenade Dec	i. , , , , , , , , , , , , , , , , , , ,	MAIN LOUNGE			

#### COMPONENT

| SWIMMING POOL DOOR HANDLE PORTSIDE 2 MIDDIE OF DANCE FLOOR 3 CLENING ROOM LOCKER PORTSIDE THROCKER 5 MIENS BAHrown PORTSIDE HANDSINK 6 PROMENADE THREShold STARBOARD 7 LADIES POWDER ROOM HAND SINK 8 PROjection ROOM PORT EXIT DOOR HANDLE 9 FAN ROOM STARBOARD FLOOR 10 FAN ROOM PORT FLOOR

FSKR	- 2	100	/
DM-	6	BKG	./

SMEA	R RESULTS	IN-DPM/10	<del>o cm²</del> /	-B - BETA in mRAD/hr/100 CM ³					
NO.	RESULTS	NO.	FESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	4BKGD	9	1-BKGD				· · · · · · · · · · · · · · · · · · ·		·····
み	LBKGD	10	1-BKGD						
3	LBKGD								
4	LBKGD								
5	~BKGD					~			
6	LBKGD								
7	LBKGD								
8	< BKGD								

**RA – RADIATION AREA** 

**CA – CONTAMINATION AREA** 

ALL DOSE RATES IN µrem/hr

**RCA – RADIATION CONTROL AREA** 

NSS-01	SURVEY NO. <u>NS 3-002</u> 0						
Date 3-29-05 Time 0900	DOSE RATE	CONTAMINATION					
Surveyor LEMAN SCOT	Inst. Type Lub Lum 19	Beta Alpha	BetaAlpha				
Signature Laman Scott	Serial No. 4,2972	Inst.Sn 91037					
Reviewed Rale Minmont	β ⁻ Factor	Eff. 10%					
	PHG 44Mm	Bkg. 40 cpm	cpm				
AREA BOAT DEC	ck .	<u></u>					

COMPONENT_

1. OFFICERS LOUNGE THREShold 2 OFFICERS LOUNGE TARESADID 3. OFFICERS LOUNDE DOOR KNOB 4. OFFICERS LOUNDE VENT 5 OFFICERS LOUNGE FOOR 1. OFFICERS LAUNDRY FLOOR 2 OFFICERS LAUNDRY SINK STATEROOMS (OFFICERS 1 threshold 2 DOOR KNOD 3 BAHH FLOOR 4 BATH DOOR F טאצט 6 F/80 FRSKE 100cpm DM 2 BKG

SMEA	SMEAR RESULTS IN DPM/100 CM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
1	< BKGP	1	- BKGP	1	2 BKGD	1	LBKGD	/	C BKGD	
2	< BKGD	2	~ BKGD	2	2 BKGD	Z	LBKGD	2	< BKGD	
3.	< BKGD			3	< BKGD	3	-Brgo	3	2 BKGD	
4	2 BKGD			4	< BKGD	4	LBKGO	4	- BKGD	
5	< BKGD			5	~ BKGD	5	2 BKGD	5	-BKGD	
				6	L BKGD	6	2BKGD	6	- BKGD	
								·		

**RA - RADIATION AREA** 

**CA - CONTAMINATION AREA** 

**RCA - RADIATION CONTROL AREA** 

NSS-01	SURVEY NO. <u>NSS - 00</u> 2/								
Date 3-29 Time 1010	DOSE RATE	CONTAMINATION							
Surveyor LomAN Scott	Inst. Type Luplum 19	Beta Alpha	BetaAlpha						
Signature Jonas Scott	Serial No. 429 72	Inst.Sn 91037							
Reviewed Reliteruna h	β ⁻ Factor	Eff. 10°/6							
	BKG 40 MAM	Bkg. 40 cpm	cpm						
AREA OFFICERS	DECKI	BOATDA	ECK						
		-							

COMPONENT

OFFICERS STATEROOMS 1 threshold 2 DOOR KNOB 3 Bitth Floor 4 BATH DOOR KNO b 5 AIR VENT 6 FLOOR No Gene 1 7 Sink FRSK 2 100 cpm DM & BKG SMEAR RESULTS 1N DPM/160-CM in mRAD/hr/100 CM² RESULTS NO. RESULTS RESULTS NO. RESULTS NO. RESULTS NO. Т NO. Т 

7	LBKGP	1	<u> - BKGD</u>	/	4 BKGD	/	< BKGD	2	<bkgd< th=""></bkgd<>
ス	-BKGD	2	L BKGD	ン	- BKGP	ん	- BKGD	1	SKIP,
3	< BKGD	3	< BKOD	3	L BKGD	3	- BKGP	6	- BKGD
4	LBKGD	4	L BKGD	4	- BKGP	4	< BKGD	7	< BKGD
5	~ BKGD	5	< BKGD	5	~ BKGD	5	~ BKGD		•
6	L BKGD	12	< BKGD	4	< Bkgp	U	< BKGP		
		Y	•						

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA

AA – AIRBORNE AREA

page 1 of 2

NSS-01		SURVEY NO. <u>NSS -00</u> 22				
Date 3 - 29-05 ime 1300	DOSE RATE	CONTAMINATION				
Surveyor LOBAN Scott	Inst. Type/up/um/9	BetaAlpha	BetaAlpha			
Signature Line foot	Serial No. 4297>	Inst.Sn 91037				
Reviewed Ma Willimon	β  Factor	Eff. 10%0				
	BKG 40 MR/m	Bkg. 40 cpm	cpm			
AREA NAULGATION	BRIDGE D	ECK				
	7					

COMPONENT

1. threshold 2. Door KNOB VOT ALL LOCATIONS THREN' IN EACH ROOM 3, BAthroom Hoor 4, Bathroom Door KNOB 5. AIR Vent 6 Floor 7. SINK 7. SINK 8 Elevator Equiptment platform RIGHT 9 Elevator Equiptment platform Left N. SI FRSK<100000 BPO FRSK 10000 V FRSK DM<BKG DW/EKI LAN FRSK 100 V FRSK

SMEA	R RESULTS I	N-BPM/49	o.chr ^a	-B-BETA in mRAB/br/100 CM2				P	0
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	~ DKGD	7	< BKGD	1	< BKGD	1	< BKGD	2	< BKGD
2	4 BKGD	1	L BKGD	2	4 BKGD	2	< BKGD	6	LBKGD
7	c BKGD	3	< BKGD	3	< BKGD	3	< BKGD	8	< BKGD
				4	- BKGD	4	< BKGD	9	< BKGD
				5	< BKGD	5	< BKGD	· · · · · · · · · · · · · · · · · · ·	
				4	2 BKGD	6	2 BKGD		

**RA - RADIATION AREA** 

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA -

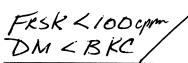
AA – AIRBORNE AREA

page 2 of 2

NSS-01		SURVEY NO. <u>NSS-0022</u>				
Date 3-29-05 Time /300	DOSE RATE	CONTAMINATION				
Surveyor Loman Scott	Inst. TypeLuDlum	BetaAlpha	BetaAlpha			
Signature fonder front	Serial No. 42972	Inst.Sn91037				
Reviewed Naw Human	β ⁻ Factor	Eff. 10%0				
	BKG 48 uR/m	Bkg. 40 cpm	cpm			
AREA NAVIGATION	BRIDGE	DECK (Pi)	lot House)			
•						

COMPONENT

BRIDGE 1. STARboARd Threashold 2. STARbOARd DOOR KNOD 3 port threashold 4 Port DoorKNob 5. Bridge CENTER Floor 6. BRIDGE GIAG RAIL STARBOMRSIDE FRONT GLASS.



SMEA	SMEAR RESULTS TH DFM/100 CM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
1	< BKGD									
2	L BKGD									
3	~ BROD									
_ 4_	- BKGD								· · · · · · · · · · · · · · · · · · ·	
5	< BKGD									
6	L BKGD									
*										

**RA - RADIATION AREA** 

PAGE LOTA

NSS-01		SURVEY NO. <u>NSS-002</u> 3				
Date 3-30-05Time 0830	DOSE RATE 50 V	CONTAMINATION				
Surveyor LOMAN SCOTT	Inst. Type DURATEC	Beta	BetaAlpha			
Signature Laman Scatt	Serial No. 95499	Inst.Sn 97499				
Reviewed Rob 75 Pennon	BFactor NA	Eff. 100/0				
	4/4R/Ha	Bkg. 30 cpm	cpm			
AREA C-DECK	CREW CABINS		· · · · · · · · · · · · · · · · · · ·			

COMPONENT

1. Threshold 2, DOORKNOB B, BAth Floor BAth Door KNOb 4 5 Vent 6 Room Floor ZINK PRINT ROOM 7 SXAR 30 FR5K < 100 DM < BKG FRSK LIOC SMEAR RESULTS

SMEAR RESULTS HEDDM/100 CM									
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	- BKGD	1	< BRGD	1	LBKGD	7	L BKCD	1	< BKGD
2	< BKGO	2	< BKGD	6	- BKGD	V	< BKGD	2	< BKG D
3	- BKGD	3	< BKGD	7	-BKGD	3	< BKGD	3	- BKGD
4	-BKGD	4	- BLGP			4	~ BKGD	4	< BRGD
5	-BKGD	5	- BKGD			5	4 BKGD	5	- BRGD
6	- BKGD	6	L BKGD			6	< BKGD	6	< BKGD

**RA - RADIATION AREA** 

**CA - CONTAMINATION AREA** 

ALL DOSE RATES IN µrem/hr

**RCA – RADIATION CONTROL AREA** 

AA – AIRBORNE AREA

PACE 2002

NSS-01							
Date 3-300 STime 1100	DOSE RATE	CONTAMINATION					
Surveyor LOMAN SCOTT	Inst. TypeDURA HER	Beta 🖌 Alpha	BetaAlpha				
Signature amail kar	Serial No. 95499	Inst.Sn97499					
Reviewed Ral All unnor	B-Factor NA	Eff. 10%0					
	4 MR/Ita	Bkg. 30 cpm	cpm				
AREA C- DECK CI	REW CADINS	•					

#### COMPONENT

1. threshold 2. DOOR KNOB 3. BATH Floor 4. BATH DOOR KNOG 5. VENT 6. ROOM FLOOR

FRSK & 100 DM-BKG

SMEA			0-CM ² -	B = BETA in mRAD/hr/100 CM ²					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BKGD								
2	< BKGD				ALTA BOLL TO REASON				
3	< BKG P								
4	L BKGD								
5	LBKGD								
U	< BKGD								

**RA - RADIATION AREA** 

CA – CONTAMINATION AREA

NSS-01	SURVEY NO. <u>NSS-002</u> 4						
Date 3-30-05 Time	DOSE RATE	CONTAMINATION					
Surveyor La IMAN' Scott	Inst. TypeDuk'A The	Beta 🖌 🛛 Alpha	BetaAlpha				
Signature our an Scatt	Serial No.95499	Inst.Sn 97416					
Reviewed La lite Perman	B-Factor NA-	Eff. 10 %					
	4 MR 1HA	Bkg. 30 cpm	cpm				
AREA C DECK - MI	ACHINE LOAD.	INC PASSAGE	E				

COMPONENT

#8 PORT- MACHINE LOADING (CREW) AREA 1 #9 FLOOR ENGINE ROOM ACCESS #10 ELEVATOR FLOOR Bow # 11 Floor ENGINE ROOM Access #12 Floor BAT Rom TO ENG STARBOARD 13 YOR! 6

13 - FLOOR 14 - Door HAMDLAR BATRM

FRSK < 100 DM < BKG

SMEA	R RESULTS +	N DPM/18	<del>- CM²</del>						
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
8	 < BKGD								
9	< BKGD								
10	< BRGD								
	- BKGD								
/2	2 BKGD								
13	< BKGD								
14	~ BKGD								

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

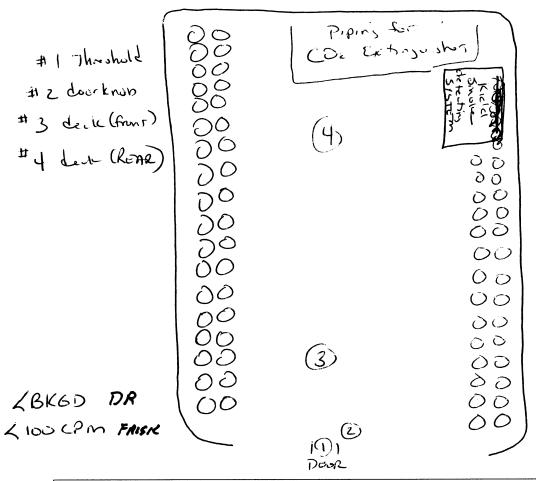
ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA - AI

AA – AIRBORNE AREA

NSS-01		SURVEY NO. <u>NSS-002</u> 5				
Date 3 30 05 Time 10.45	CONTAMINATION					
Surveyor Craddock	Inst. Type Ludium	Beta Alpha	BetaAlpha			
Signature hoode	Serial No. 95439	Inst.Sn 974/6				
Reviewed Ralit & unach	& Factor JuR/11 BKG	Eff. 10%				
		Bkg. <i>30</i> cpm	cpm			
AREA C DECK STOR	LAURD SIDE	COL Room (FI	RE EXTINGUISTR			

#### COMPONENT

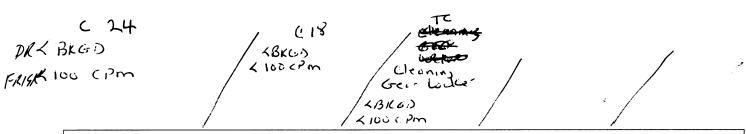


SMEA	R RESULTS	N-DPM/100	CIM [®]	- <del>B = BETA in mRAD/hr/100 CM²</del> •					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	~BKGD								
a	LBKGD								
3	< BKGD < BKGD								
4	2 BKGD								

RA - RADIATION AREA

	DOSE RATE nst. Type رودانی	CONTAMIN Beta 🗸 Alpha	IATION
	nst. Type /	Poto V Alpha	
		Beta Alpha	BetaAlpha
Signature Valacek Se	Serial No. વડ પલ ૬	Inst.Sn Gyyle	
Reviewed Rulit France B	Factor HAR NA	Eff. 10"70	
B	3KG 4 NR/pa	Bkg. ദ്യ cpm	cpm
AREA C DECK PORTS	SIDE		
	AFT OF MACHIN	TE LOHPING PASSAG	Ł
COMPONENT			

- 2. Deer Hundle
- 3. Buth Floor
- 4. Bath Door Handle
- 5. Air Vent
- 6 Main Floor
- 7. sink



SMEA	R RESULTS +	N-DPM/4	00-CM ²	•B = BETA in mRAD/hr/100 CM ² •					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
	L BKG D	I	< BKGD	1	-BKGD				
2	- BKGD	2	2 BKGP	4	- BKOD				
3	- BKGD	3	~ BKGD	۲ ۲	<bkgd< td=""><td></td><td></td><td></td><td></td></bkgd<>				
	LBKGD	4	< BKGD						
5	< BKGD	Ś	2 BKGD						
6	< BKGD	ų	4 BKGD						

**RCA – RADIATION CONTROL AREA** 

NSS-01	SURVEY NO. <u>NSS-002</u> 7							
Date 3/70/05 Time 11:00	DOSE RATE							
Surveyor ( Kaddock	Inst. Type Ludlum	BetaAlpha	BetaAlpha					
Signature Luclolate	Serial No. 95499	Inst.Sn 9741						
Reviewed Kath Wurnich	β  Factor	Eff. 10%						
	BKG 4 NR	Bkg. <b>30</b> cpm	cpm					
AREA C-DECK STARBOARD SIDE								
AFT OF MACH	LOADING PASSAGE.							

COMPONENT

1. THRESholD 2, DOOR HANDLE 100 AC 3. BAth Floor 4. BATH DEDI HANDLE SIAIRVENT 6. MAIN CADIN Floor 7. SINK MOM Xar XX ERNE DR 2 BAC ろ FRISKL 2 BKG < BKG Z BKG L 100 LPM LIUDCFM IDDEFM SMEAR RESULTS IN DOM

SIVILA	IN RESULTS			5					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
	< BKGD	/	< BKGD	1	< OKGD		~ BKGD		
2	-BKGD	2	L BKGD	ン	4 BKGD	2	L BKGD		
3	< BKGD	3	LBKGD	3	-BKGD	6	- BKGD		
4	< BKGD	4	LBKGD	4	CORGO				
5	< BRGD	3	CBKGD	5	- BKGD				
0	< Brad	6	LBKGD	6	< BKGD				1

RA - RADIATION AREA

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA – RADIATION CONTROL AREA

AA – AIRBORNE AREA

NSS-01		SURVEY NO. <u>NSS-00</u> 28			
Date 3-30-65 Time	DOSE RATE	CONTAMIN	NATION		
Surveyor R PANNAN/ J-STOURY	Inst. Type ul meter	Beta Alpha	BetaAlpha		
Signature Ro WYRumh	Serial No. 95469	Inst.Sn 91039			
Reviewed Malar St	β ⁻ Factor —	Eff. 10%			
	D.R. BKG 24 NAIM	Bkg. <b>230</b> cpm	cpm		
AREA ENGINA Room L	prode transming To M.				

#### COMPONENT_____

SIER ATTACITARIO DRAWING

DR L BKG TRISH Z BKG

SMEAR RESULTS THE DEM/100 CM ² B = BETA in mRAD/hr/100 CM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	LBKG								
2	LOKG LBKG								
3	    								
4	< BKG								
3	L BKG								
6	L BKG								
						i			

RA -- RADIATION AREA

CA – CONTAMINATION AREA

mach Prost Ky Ul EPRILO Fise Piping (1) lo.a) Ð suppa) noie 5) h-0 hes 6 vert hasing

٠

NSS-01	SURVEY NO. <u>NSS-002</u> 9						
Date 3-30-05 Time	DOSE RATE	CONTAMIN	ATION				
Surveyor B PIENMAN / J STUARY	Inst. Type MA MATKI	Beta Alpha	BetaAlpha				
Signature Rel Telemont	Serial No. 95469	Inst. Sn FRISKILL 91039					
Reviewed	β  Factor	Eff. ~ 10 ^c h					
	D. R. BAG. ~ 4 MR/hr	Bkg. <i>∡ 30</i> cpm	cpm				
AREA ENGINE Room Upp	ir hieval	· · · · · · · · · · · · · · · · · · ·					

#### COMPONENT_

SEE ATTACHAN DRAWING

DR 2 BKG FRISK 2 BKG

SMEA		H-BRM/10	o GM ²	~B-BETA in mRAD/hr/100 CM ²					
NO.	RESULTS	N 0.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	LBKG	Ŷ	LBKG	17	~ BKG	25	< BKG		
L	- BKG	10	∠ BKG	18	2 BKG	26	~ BKG		
3	< BKG	_//	~ BKG	19	2 BKG	87	< AKG		
4	~ BKG	12	2 BKG	10	<u>CBKG</u>	28	< BKG		
3	~ BKq		< BKG	21	LBKG	- 1-1	LBKG		
6	L BKG	14	LBKG	22	2 BKG				
8	LBKG LBKG	16	- BKG	24	LBKG				

RA - RADIATION AREA

CA – CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA

AA – AIRBORNE AREA

3/3/05 ENGINE ROOM- UPPER FORT  $\int$ T EN Minshan 1-6- $\overline{\mathbb{C}}$ porti BLULS WWW 5 (13) Mrs B (6) 7 14 9 WC D D AIR OWNE (7) 10 HP FURP FURP  $\bigcirc$ 22) 2 1  $\left( L \right)$ (ID 61 LP 28 (72) E T 76 2 76 25 2  $\overline{(1)}$ E9 CYCLO THERM H REACTOR CONTROL

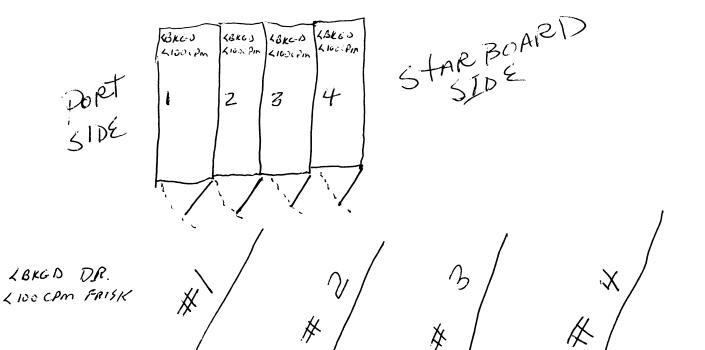
ROOM

. .

NSS-01		SURVEY NO. N.	<u>55-003</u> 0		
Date 3. 3005 ime //30	CONTAMINATION				
Surveyor LOMAN SFOTT	Inst. Type Luplum	Beta Alpha	BetaAlpha		
Signature Jamas Scatt	Serial No. 42972	Inst.Sn G7416			
Reviewed Ra LAPPinnoch	$\beta$ Factor ///	Eff. 10 %			
	BKG HUR/H	Bkg. <i>30</i> cpm	cpm		
AREA C DECK HI BREATHING TH	All WAY LO PARATUS	CKERS FOR	2		

COMPONENT

1. DOOR HANDLE 2. INSIDE LOCKER



SMEAR RESULTS					B - BETA in mRAD/hr/100-GM ²				,	
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
1	~ BKGD	1	< BKGD	7	<bkgd< td=""><td>/</td><td>&lt; BKG</td><td></td><td></td></bkgd<>	/	< BKG			
2	LBKGP	Z	< BROD	2	4 BKGD	2	< BKG			

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

NSS-01		SURVEY NO. <u><i>NSS-003</i></u> /				
Date 3-30-05 Time 9:20 AN	DOSE RATE	CONTAMI	NATION			
Surveyor Rons E PRMARK	Inst. Type	Beta Alpha	BetaAlpha			
Signature Role Frank	Serial No.	Inst.Sn <b>75869</b>				
Reviewed Man &	β  Factor	Eff. 16%				
		Bkg. <b>30</b> cpm	cpm			
AREA BOTTOM DANIA	OF EXHAUST VEA	TO TOP OF M.	451			
"A" DECIL IM FRO.	NTOF #4 HOLD C	COURR				

COMPONENT

FRISKAR 2 BRG

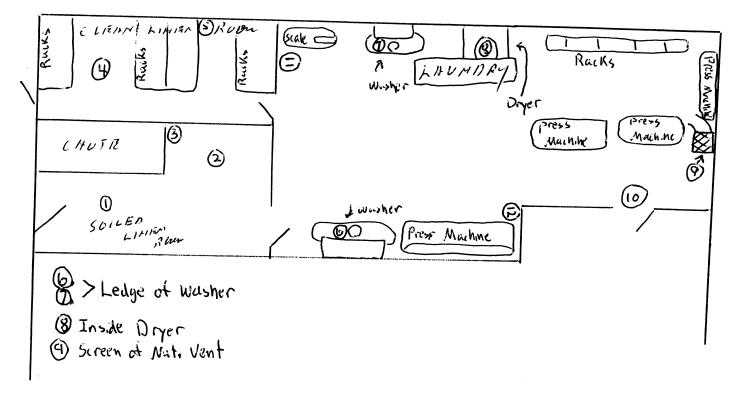
1 VALUR RRESPACETOR (INSIMA) 2 VALUR PLATAS 3 VALUR BODY (INSIMA)

SMEAR RESULTS IN DEM/100 OM2				● = BETA in mRAD/hr/100 CM ²					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NÔ.	RESULTS	NO.	RESULTS
1	< BKGD								
2	LBKGD								
3	< BKGP								

RA - RADIATION AREA

NSS-01		SURVEY NO. <u>// /</u>	<u>55-0032</u>
Date 3-3/05 Time 1045	DOSE RATE	CONTAMIN	JATION
Surveyor LOMAN SEOT	Inst. Type/up/um/19	Beta Alpha	BetaAlpha
Signature any and Scatt	Serial No. 42972	Inst.Sn91037	
Reviewed Kall Humah	B-Factor	Eff. 10%/0	
	BKG4/ AH	Bkg. 40 cpm	cpm
AREA Laundy + Line	in Reams - (D	eck	
COMPONENT			

PORT



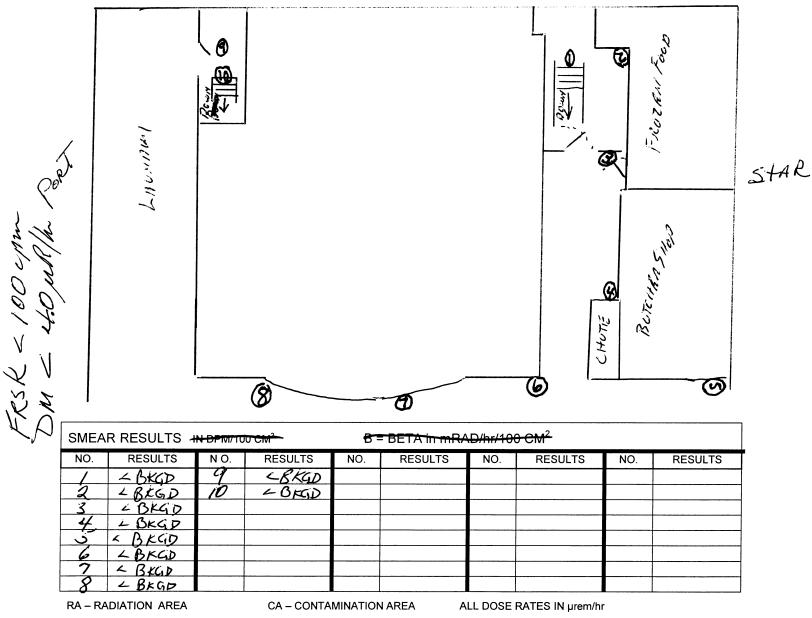
FRISTER 100 cpm DR 2 4 pell/m

SMEAR RESULTS IN DPM/100 CM ²						D/hr/10			
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	-BKGD	4	< BRGD						/
2	< BKGD	10	-BKGP						
3	< BKGD	ίl	< BKGD						
4	< BKGD	12	2 BRED						
5	~ BKGD								
6	LRKUD								/
1	< BKGD								
8	4BKGD			/					
RA – RADIATION AREA CA – CONTAMINATION AREA ALL DOSE RATES IN µrem/hr									

NSS-01		SURVEY NO. N	<u> 55-0033</u>
Date 3-31 Time 0.800	DOSE RATE	CONTAMIN	IATION
Surveyor CAMAN SGOTT	Inst. Type Lud / 19	Beta Alpha	BetaAlpha
Signature entru feat	-Serial No.42972	Inst.Sn 91037	
Reviewed Ka WTEL unoch	β ⁻ Factor	Eff. 10%	
	BKG4/hR/h	Bkg. 40 cpm	cpm
AREA <u>C-DECK PORT</u>	& STANAONAD PASSAO	· u 11 4 5	
		/	

COMPONENT

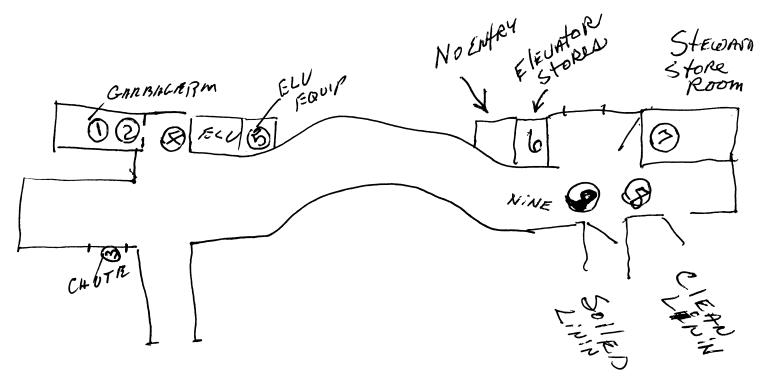
Bow



RCA - RADIATION CONTROL AREA

	NSS-01		SURVEY NO.	55-0034
	Date 3-3/05 Time 0800	DOSE RATE	CONTAMI	NATION
:	Surveyor aman Acatt	Inst. Type Duratec	Beta Alpha	BetaAlpha
	Signature Coman Scatt	Serial No G 5499	Inst. Sn G7416	
	Reviewed Ralifer unach	- <del>βFactor-</del>	Eff. 10%0	
	, , , ,	BKO- 4MR/h	Bkg 40 cpm	cpm
Pas	AREAD DECK C	- [HAllwA	HI & LAUN	IDRY
		ENTRA	wele	
	COMPONENT STORES	LOADING PI	ASSA6E	

0 = 7100R



SMEA	R RESULTS +	N DPM/10	<del>0 CM² -</del>	<b>B</b> -	- DETA in mR4	D/hr/100	- <del>CM²-</del>		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	2 BKGO	9	<bkgd< td=""><td></td><td></td><td></td><td></td><td></td><td></td></bkgd<>						
2	2 BKGD								
3	LBKGD								
4	< BKGD								
5	< BKGD								
6	< BKGD								
7	<bkgd< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></bkgd<>								
8	< BKOD								

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

NSS-01	SURVEY NO. <u>NSS-0035</u>				
Date 3-31-05 Time 11:00	DOSE RATE	CONTAMINATION			
Surveyor BOB PANMOCK	Inst. Type MR MIETAK	Beta Alpha BetaAlp	oha		
Signature RolyTE Purnoch	Serial No. 95469	Inst.Sn 91037			
Reviewed Thu,	β ⁻ Factor —	Eff. ~ 10%			
	BKG 2 MR/In	Bkg. 30 cpm	cpm		

AREA

COMPONENT SOURCE RECEIPT

SMEARS

DR S BIRG FASK S BRG

- 1 Soundal CAM

- 2 TE 99 CASIE 3 Th 230 CASIE 4 TE 99 SOUNCE
  - 5 TH230 Sounce

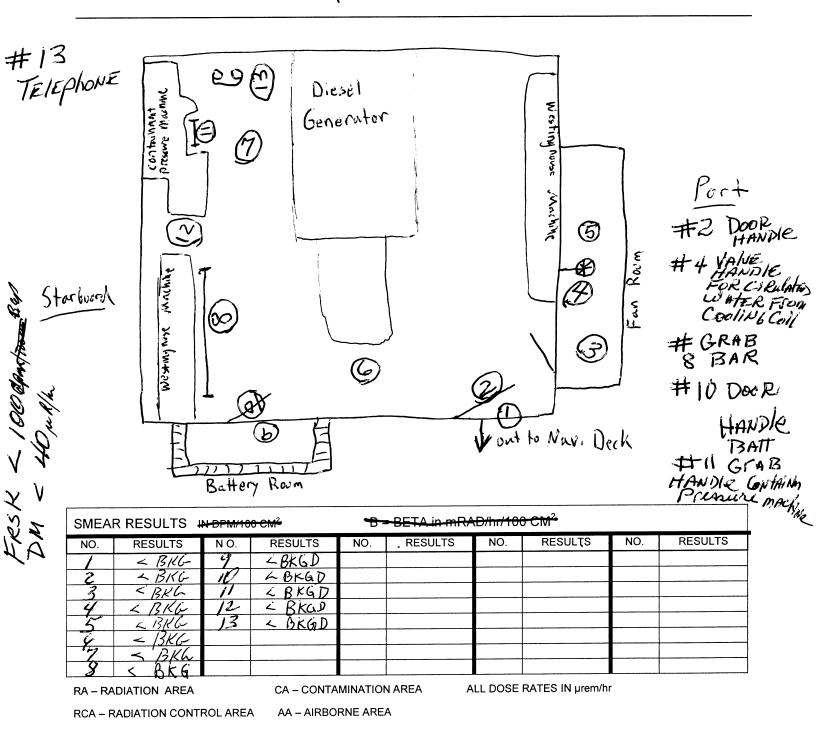
SMEA	R RESULTS	IN DPM/100	- <del>CM²</del>	<del>8-</del>	BETA in mR/	D/hr/100	<del>CM²</del>		
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	K BKG								
ん	< MDA								
3	L BRG								
4	L BKG								
5	S BKG								

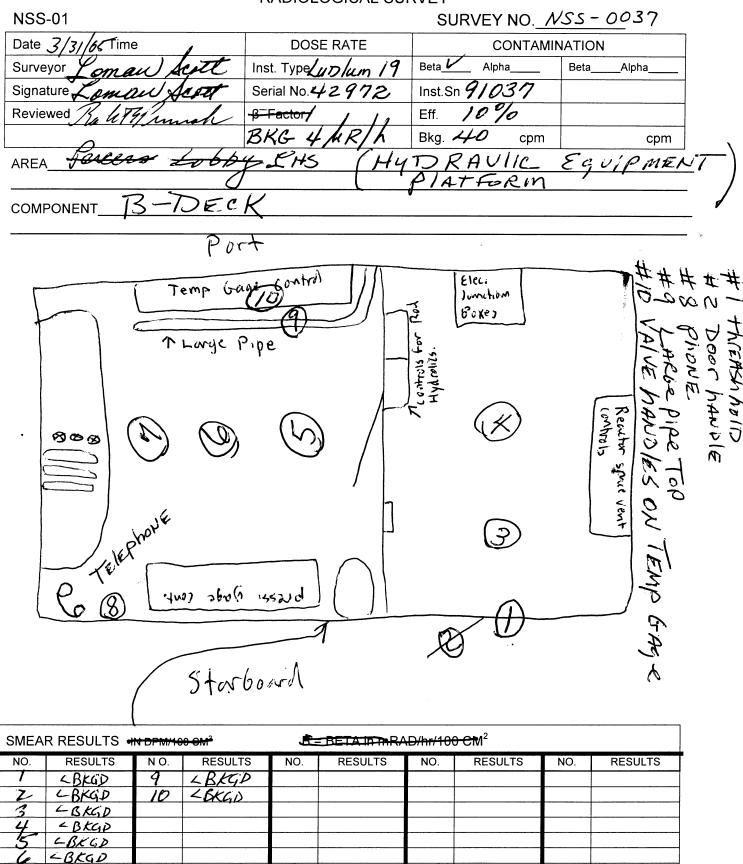
RA - RADIATION AREA

CA - CONTAMINATION AREA

NSS-01		SURVEY NO. N.	55-0036
Date 33125Time 0810	DOSE RATE	ATION	
Surveyor Comput Acatt	Inst. Type/up/une 19	Beta_i⁄ Alpha	BetaAlpha
Signature amou feat	Serial No. 42972	Inst.Sn91037	
Reviewed Ralif Rumon	8-Factor	Eff. 10%/0	
0	BKG/AR/hr	Bkg. <b>40</b> cpm	cpm
AREA NAVIGATION D.	ieck /		

COMPONENT EMERGENEY GENERATOR ROOM





RA - RADIATION AREA

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA – RADIATION CONTROL AREA

<u>-BKG13</u> < BKGD

AA – AIRBORNE AREA

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	NSS-01		SURVEY NO.	55-0038
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Date 3-31-05 Time 0945	DOSE RATE	CONTAMI	NATION
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Surveyor LOMAN SCOTT	Inst. Type/up/um 19		BetaAlpha
AREA B DECK AREA B DECK COMPONENT CREW CAUNDRC( COMPONENT CREW CAUNDRC( DM 240, MR/A PARTY Lighting Louid Catter PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY PARTY	Signature Lamar Scott		Inst.Sn 7/8.37	
AREA B DECK COMPONENT CREW CAUNDRY COMPONENT CREW CAUNDRY TO PUTE LINGTH LOW CONTENT PUTE LINGTH CONTENT PUTE LINGTH CONTENT PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUTE PUT	Reviewed Hall & unach	β. Eactor	Eff. 10°/5	
$\begin{array}{c} \hline FRSK \leq 100 \text{ eps.} \\ \hline COMPONENT CREW LAUNDRY DM = 440 \mu R/h \\ \hline Front for the part of the second		BKG 4/4R/hr	Bkg. 40 cpm	cpm
$\begin{array}{c} \begin{array}{c} \text{COMPONENT} \hline CREW \ LAUNDRY \\ \hline DM \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	AREA B DECK			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		1.1.1.2011		
Lighting Load Center Panel G Panel G	COMPONENT CREW CA	TUNDRY	DM 240	uK/m
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	ならっても	+12.24		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Lighting Loud Certer	Crew Laundry	(leaning) be	LAV
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		۶		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Trave	A G	7 43)	
$\frac{3}{K}$ $\frac{1}{K}$ $\frac{1}$	to: The first firs			1
$\frac{1}{2}$ $\frac{1}$				Y EI
FRSK = 100  cm / 1 Floor The short with the should the shoul			7	MIZ
FRSK = 100  em  ff - 1 Floore DM = 40 KRP/m # 1 Floore # 2 SINK BASIN # 2 Door KND # 2 Door KND # 2 Door KND # 3 INSIDE # 2 Door KND # 3 SINK # 2 Door KND # 3 SINK # 3 SINK # 3 SINK # 4 INSIDE # 3 SINK # 4 INSIDE # 3 SINK # 4 INSIDE # 4 INSIDE # 5 Door # 5 Door # 5 ShElF DM = 40 NAPK SMEAR RESULTS NO. RESU		() 大	24	(3) 12
# 2 Floor # 2 Floor # 3 Door HANDLY # 3 DOOR HANDLY # 4 TOP MIDDLE # 4 TOP MIDDLE # 5 DOOR # 5 DAWNEL # 5 DAWNEL # 5 ShELF DM 2400 MALK SMEAR RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS I < BKGD 2 < GKGD 3 < BKGD 4 < BKGD	AN C	$\sim 0$	$)     \qquad (1)$	AYY
# 2. FlooR     # 4 INSIDE       # 3 DOOR HANDLY     # 4 INSIDE       # 3 DOOR HANDLY     DRYER       # 4 TOP MIDDLE     # 5 DOOR       # 4 TOP MIDDLE     # 5 DOOR       # 5 PANNEL     FRSK<100 cpm		× ×		×
# 2. FlooR     # 4 INSIDE       # 3 Door HANDLY     # 4 INSIDE       # 3 Door HANDLY     DRYER       # 4 Top MIDDLE     # 5 Door       # 4 Top MIDDLE     # 5 Door       # 5 PANNEL     FRSK<100 cpm		distortion 6	K - K	
# 2. Floor # 2. Floor # 3 Door HANDLY # 3 DOOR HANDLY # 4 TOP MIDDLE # 4 TOP MIDDLE # 5 DOOR # 5 DANNEL # 5 DANNEL # 5 ShELF DM 2400 MALK SMEAR RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS I < BKGD 2 < GKGD 3 < BKGD 4 < BKGD	FRSK / poemy			
# 2 Floor # 2 Floor # 3 Door HANDLY # 3 DOOR HANDLY # 4 TOP MIDDLE # 4 TOP MIDDLE # 5 DOOR # 5 DAWNEL # 5 DAWNEL # 5 ShELF DM 2400 MALK SMEAR RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS I < BKGD 2 < GKGD 3 < BKGD 4 < BKGD	DM < 40 KR/m 1	FI Floor	#14	preshoeld
# 2 Floor # 2 Floor # 3 Door HANDLY # 3 DOOR HANDLY # 4 TOP MIDDLE # 4 TOP MIDDLE # 5 DOOR # 5 DAWNEL # 5 DAWNEL # 5 ShELF DM 2400 MALK SMEAR RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS I < BKGD 2 < GKGD 3 < BKGD 4 < BKGD	the state of the s	FZ JINA BAJIN	42	DOOR KNOK
# 2 Flook # 4 INSIDE # 3 DOOR HANDLE # 4 INSIDE # 3 DOOR HANDLE # 4 INSIDE # 4 TOP MIDDLE # 5 DOOR # 5 PANNEL FRSK / DOOR # 5 ShELF MITHIN DM 240 MR/L SMEAR RESULTS INDERMINITOOCM ² NO. RESULTS NO. RESULTS NO. RESULTS NO. RESULTS I < BKGD I < BKGD I < BKGD 2 < GKGD 3 < BKGD J < BKGD	# [ threshold ) +	UAShER.		
SMEAR RESULTS     IN OPPM/100 CM     B = BETA in mRAD/III/100 CM ² NO.     RESULTS     NO. <t< td=""><td>#2 Floor , / =</td><td>+ 4 INSIDE</td><td>#3.</td><td>SINK</td></t<>	#2 Floor , / =	+ 4 INSIDE	#3.	SINK
SMEAR RESULTS     IN DPM/100 CM     B = BETA in mRAD/III/100 CM ² NO.     RESULTS     NO. <td< td=""><td>H3 DOOR HANDLY</td><td>DRYER</td><td>#4</td><td>HOOR</td></td<>	H3 DOOR HANDLY	DRYER	#4	HOOR
SMEAR RESULTS     IN DPM/100 CM     B = BETA in mRAD/III/100 CM ² NO.     RESULTS     NO. <td< td=""><td>+4 TOPMIDDLe/ \$</td><td>+5 Door</td><td>7.</td><td></td></td<>	+4 TOPMIDDLe/ \$	+5 Door	7.	
SMEAR RESULTS     IN DPM/100 CM     B = BETA in mRAD/III/100 CM ² NO.     RESULTS     NO. <td< td=""><td>#5 PANNEL ERS</td><td>KNOD</td><td># 5</td><td>ShElF</td></td<>	#5 PANNEL ERS	KNOD	# 5	ShElF
SMEAR RESULTS     IN DPM/100 CM     B = BETA in mRAD/III/100 CM ² NO.     RESULTS     NO. <td< td=""><td>(MAIN) DM</td><td>240 MAR/A</td><td>1</td><td><b>N</b></td></td<>	(MAIN) DM	240 MAR/A	1	<b>N</b>
NO.RESULTSNO.RESULTSNO.RESULTSNO.RESULTS1 <bkgd< td="">1<bkgd< td="">1<bkgd< td="">2<bkgd< td="">2<bkgd< td="">2<bkgd< td="">3<bkgd< td="">3<bkgd< td="">3<bkgd< td="">4<bkgd< td="">4<bkgd< td="">4<bkgd< td=""></bkgd<></bkgd<></bkgd<></bkgd<></bkgd<></bkgd<></bkgd<></bkgd<></bkgd<></bkgd<></bkgd<></bkgd<>		$\underline{D} = \underline{DETA \text{ in } mD+}$		
1 LBKGD 2 LBKGD 3 LBKGD 4 LBKGD 1 LBKGD 2 LBKGD 3 LBKGD 4 L				NO. RESULTS
3 -BKGD 3 -BKGD 3 -BKGD 4 -BKGD 4 -BKGD 4 -BKGD	1 <bkgd< td=""><td>-BKGD</td><td></td><td></td></bkgd<>	-BKGD		
4 CBKGD 4 CBKGD 4 CBKGD 5 CBKGD 5 CBKGD 5 CBKGD	ISKGD 3 -BKGD			
2 - DKW $2 - DKW$ $3 - DKW$	4 < BKGD	4 - BKGD	4 <bkgd< td=""><td></td></bkgd<>	
	- 15KGP	2 - 0 k G V	5 CORUD	
RA – RADIATION AREA CA – CONTAMINATION AREA ALL DOSE RATES IN µrem/hr	RA - RADIATION AREA		L DOSE RATES IN urem/hr	

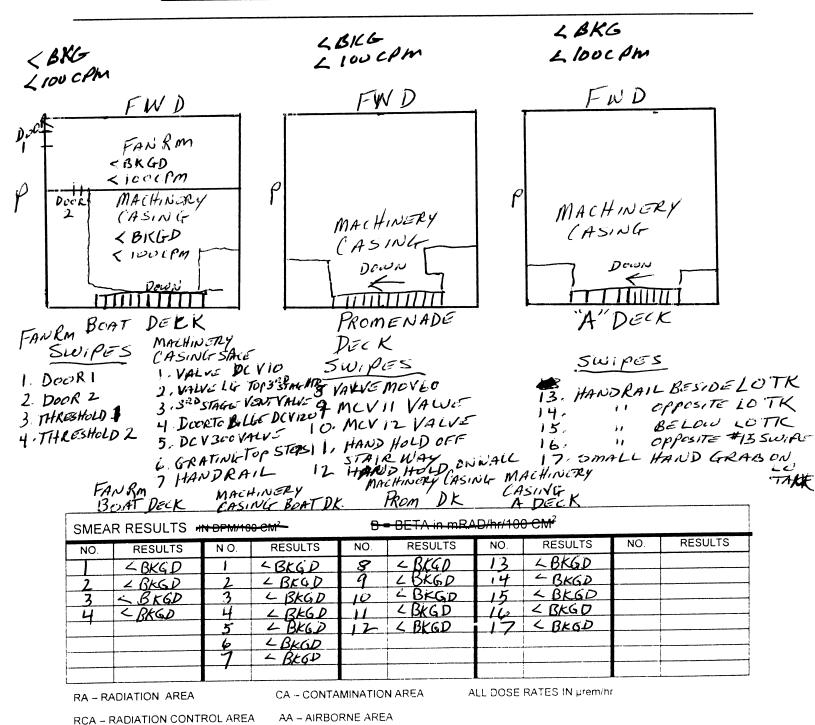
RCA – RADIATION CONTROL AREA AA – AIRBORNE AREA

page 1 of 2

N.S. SAVANNAH RADIOLOGICAL SURVEY

NSS-01	SURVEY NO. <u>NSS - 0039</u>				
Date 3/31/05 Time	DOSE RATE	CONTAMI	NATION		
Surveyor Craddeck	Inst. Type LUDLUM	Beta Alpha	BetaAlpha		
Signature Woldock	Serial No. 95499	Inst.Sn 97416			
Reviewed	β ⁻ Factor	Eff. 10%			
	2,52.5 mR/HR	Bkg. 30 cpm	cpm		
AREA FAN ROOM BOA	T DECK				

COMPONENT



page 2 of 2

RM

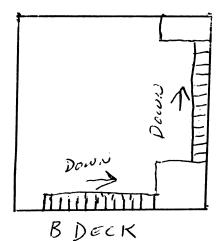
N.S. SAVANNAH RADIOLOGICAL SURVEY

NSS-01	SURVEY NO. <u><i>NSS-003</i>9</u>			
Date 3/31/05 Time	DOSE RATE	CONTAMI	NATION	
Surveyor Craddock	Inst. Type LUDLUM	Beta Alpha	BetaAlpha	
Signature and doct	Serial No. 95499	Inst.Sn 97416		
Reviewed	β ⁻ Factor	Eff. 10%0		
	2.5 25 mR/MR	Bkg. <i>30</i> cpm	cpm	
AREA BDECK TO CI	ECK ACCESS ST	AUDINELL TOR	AT DELK	

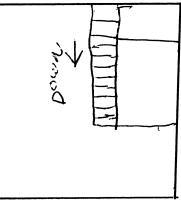
THRU MACHINERY CASING SPACE FROM MAIN MACHINERY

COMPONENT

LOKG LIUUCPM



LBKG LIOU CPM



C DECK

Sw. PES 18, Top STOP \$0 GRV. TK 19, 38 STOP FROM BOTTOMOFBDK. 20, LANDING B DECK 21, DOV TVALVE

Swipas 22- HANDRAIL STRB 23. HANDRAIL PORT 24- BOTTOM STEP C'D'

5	TAIRWAY
B	DECK

STAIR WAY CDECK

SMEAR RESULTS IN DPM/100 CM ² B = BETA in mRAD/hr/100 CM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
18	~BKGD			22	-BKGD				
19	< BKGD			23	< BKGD				
20	L BKGD			24	< BKGP				
<u>a</u> )	- RKGD								
		$- \wedge$							
		Z				)			
RA – RA	DIATION AREA		CA – CONTA	MINATION	AREA A	LL DOSE F	RATES IN µrem/h	r	

**RA - RADIATION AREA** 

RCA - RADIATION CONTROL AREA AA – AIRBORNE AREA

NSS	-01		·		JOICAL SU		RVEY NO	NSS-	0040
Date	3- <i>31-05</i> Time	0930		DOSI	ERATE			MINATIC	
	yor Com AN		// Ins	t. Type	i Dlum 19	Beta_	_ Alpha	Beta	Alpha
	ture Coma				-2972	Inst.Sn	91037		
Revie	wed Rilly	P.	8	Factor	- 1	Eff. /	0%		
		10 m m	B	KGA	I P /ha	Bkg. 4		n	cpm
AREA	BEhir	DB	RIDO	FE					
COM		ORON	Du	mp	CONTR	Eøll	Room	57	
RS.	threshold ADDER P K < K < K < K < K < K < K < K < K < K <	- F#S 100 10			Dimp contr	rol Room			These extension
	vent suff	NY Pipe			- F				A A A A A A A A A A A A A A A A A A A
				1. Threi	iold of door				
				2. Ruma	of stairs de	ium to			
				Sera	of stairs do nd Level of c	mtro I			
				Room					
	, TO NON Dec	k Stairs		#6	HONEHW	ul m Toils	ACLINE	24	
·	R RESULTS	N-DPM/100 CM	2	• <del>9</del>	BETA in mR/	\D/hr/100	<del>CM²</del>		
NO.	RESULTS	NO.R	ESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	LBKGD								
2	- BKGD - BKGD								
1									
4	-BKGD								
450	- BRGD - BRGD - BRGD								

RA - RADIATION AREA

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA – RADIATION CONTROL AREA AA – A

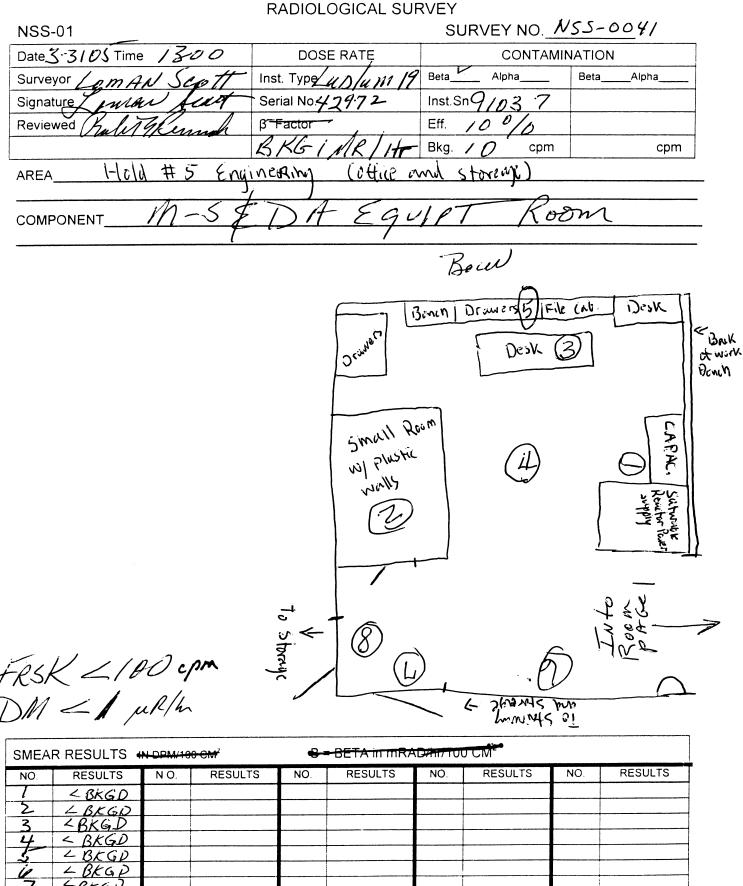
NSS-01	N.S. SAV RADIOLOGIC		VEY NO. NS	s-0041#	/
Date 33/05 Time / 300	DOSE RATI	Ε	CONTAMINA	TION	]
Surveyor LOMAN SCOTT	Inst. Type in /	lin 19 Beta 1	Alpha 8	BetaAlpha	
Signature anini Actit.	Serial No. 429	72 Inst.Sn 4	1037		
Reviewed Rolo 747 unor	B-Factor	Eff. /	0%0		
	BRG-MAK		0 cpm	cpm	
AREA HOID #	5 ENGINE	ERING	- (Work.	stution)	
COMPONENT_ WOR	KShop				
# 4 WNDER Steps		Boio	Stuire to		
# 4 WUDER Steps # 7 iNSIDE SINK	bro O	Drawers			
	201	Bélou	y Serv Serv	ile nk D	
FFICE T 5 to check e sheet	Du Dex 3 Counter		Center Islund & Dravers	(iz)	<ul> <li>To space parts</li> </ul>
	WOOV		Dimen	(i) gro	J Room
FRSK 2 100 Chry			~		
FRSK 2 100 dpm trace					
SMEAR RESULTS NOPM/100 CM2	B-BET/	tin mRAD/hr/100-C			
NO. RESULTS N.O. RESUL		SULTS NO.	RESULTS NO	D. RESULTS	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	GD				
3 L RKGD 11 LBKG 4 LBKGD 12 LBK	5D GD				
5 < BKGD					
6 L BKGD 7 G BKGD					
g < BKGD			<b>I</b>		

RA - RADIATION AREA

CA - CONTAMINATION AREA

N.S. SAVANNAH

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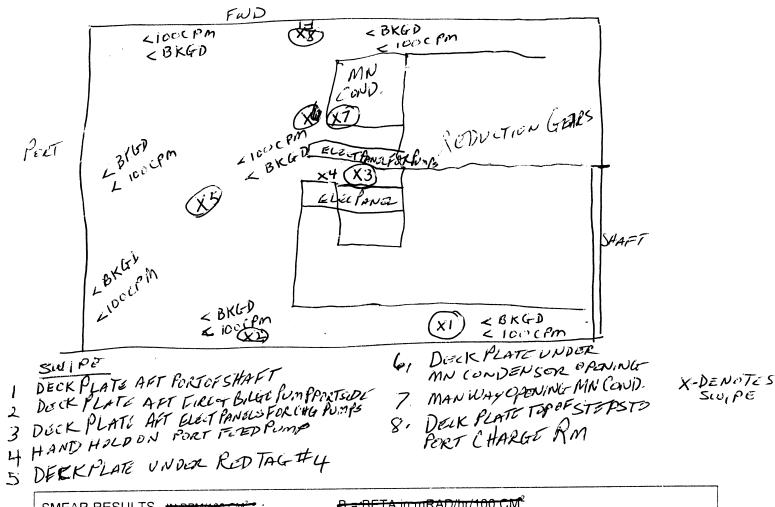
RA - RADIATION AREA

2 BKGU

CA - CONTAMINATION AREA

NSS-01		SURVEY NO. N	<u>SS-0042</u>
Date 3/31/05 Time 3:00	DOSE RATE	CONTAMIN	ATION
Surveyor Craddock	Inst. Type LUDLUM	Beta Alpha	BetaAlpha
Signature and dock	Serial No. 95499	Inst. Sn 97416	
Reviewed Ra & Tell unon	β ⁻ Factor	Eff. 10 %	
<i>i i i i i i i i i i</i>	4mR/HK	Bkg. <i>30</i> cpm	cpm
AREA LOWER LEVEL MA	N ENGINE RM. 1	PORTSIDE OF SH	HAFT

#### COMPONENT



SMEA	SMEAR RESULTS IN DPM/160 CM ²⁺ · · · · · · · · · · · · · · · · · · ·									
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
1	ZBKG									
2	2BKG									
3	CBKG									
<u>H</u>	CBKG LBKG									
5	~BKG									
4	2 BKG									
	< BKG < BKG < BKG									
5	CORA									

RA - RADIATION AREA

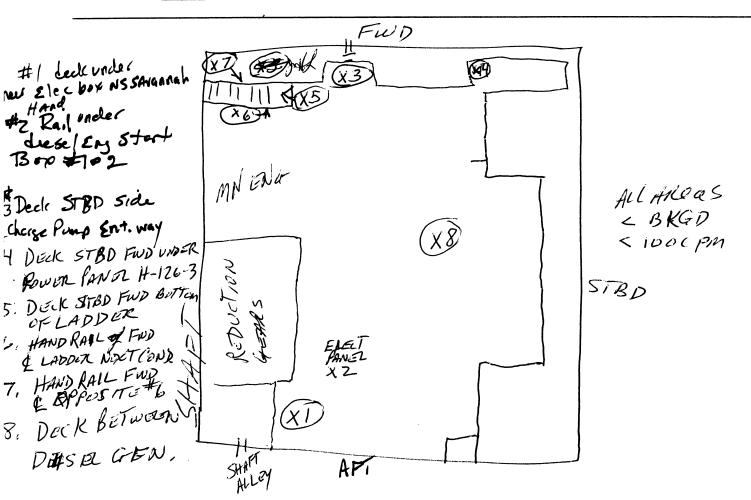
CA - CONTAMINATION AREA

100

e . . . .

NSS-01	SURVEY NO. NS 3 - 00 93							
Date 3/31/05 Time	CONTAMINATION							
Surveyor Craddock	Inst. Type LUDLUM	Beta Alpha	BetaAlpha					
Signature Anddalc	Serial No. 95499	Inst.Sn 97416						
Reviewed the le Tellungh	β-Factor + JNL	Eff. 10 %						
	4 mR/HR	Bkg. 30 cpm	cpm					
AREA LOWER LEVEL MAINENGINE RM STBD SIDE OF SHAFT								

#### COMPONENT



SMEAR RESULTS IN DPM/100 CM ²									
NO.	RESULTS	N 0.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
)	<bkg< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></bkg<>								
2	< BKG								
3	< BKG								- 4 - 0400
<u> </u>	L BKG								
	4 BKG								
7	∠ BKG ≤ BKG								
Ś	< BKG								

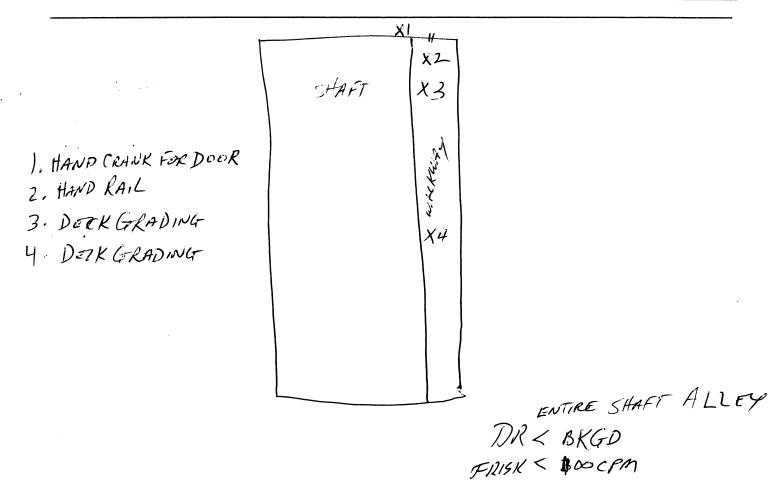
**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

. . ..

NSS-01	SURVEY NO. <u>NSS - 00</u> 44				
Date 3.31-05 Time	DOSE RATE	CONTAMI	NATION		
Surveyor CRADIOCK	Inst. Type LUDLUM	Beta Alpha	BetaAlpha		
Signature Anonak	Serial No. 95499	Inst.Sn 97416			
Reviewed Helever	β  Factor	Eff. 10 %			
	4 m R/HX	Вkg. <i>ЗО</i> срт	cpm		
AREA SHAFT ALL	ý				

#### COMPONENT_



MEAR RESULTS -IN-DPM/100 CM ²					-B = BETA in mRAD/hr/100 CM ²						
I <b>O</b> .	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS		
l	L BKG										
2	LBKG LBKG LBKG										
3	< BKG										
4	< BKG			<b>_</b>							
							L				

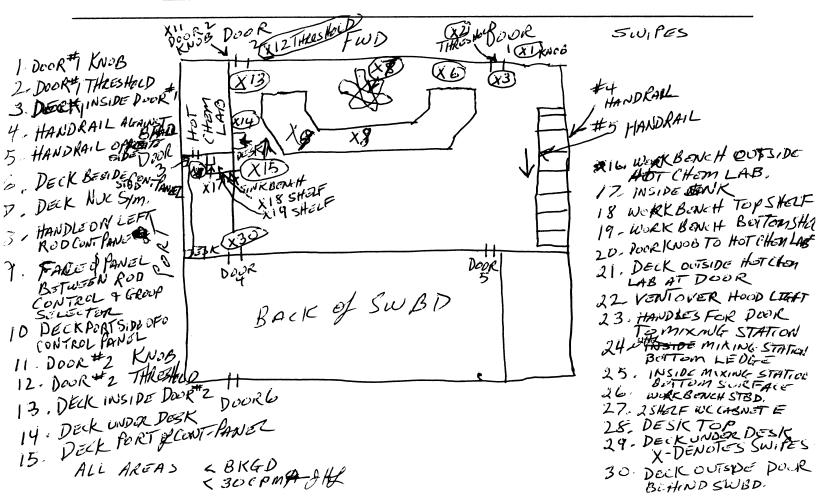
**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ICS DOUL

NSS-01	SURVEY NO. NS 3-0045										
Date 4/1/05Time	DOSE RATE	CONTAMI	NATION								
Surveyor Craddode	Inst. Type LUDLUM	Beta Alpha	BetaAlpha								
Signature and docle	Serial No. 95499	Inst.Sn 97416									
Reviewed City of Grand	β [—] Factor	Eff. 10%									
	4mR/Hr	Bkg. 30 cpm	cpm								
AREA MAINENG	$R \rightarrow T = R \rightarrow R = R = R = R = R = R = R = R = R$										

#### COMPONENT



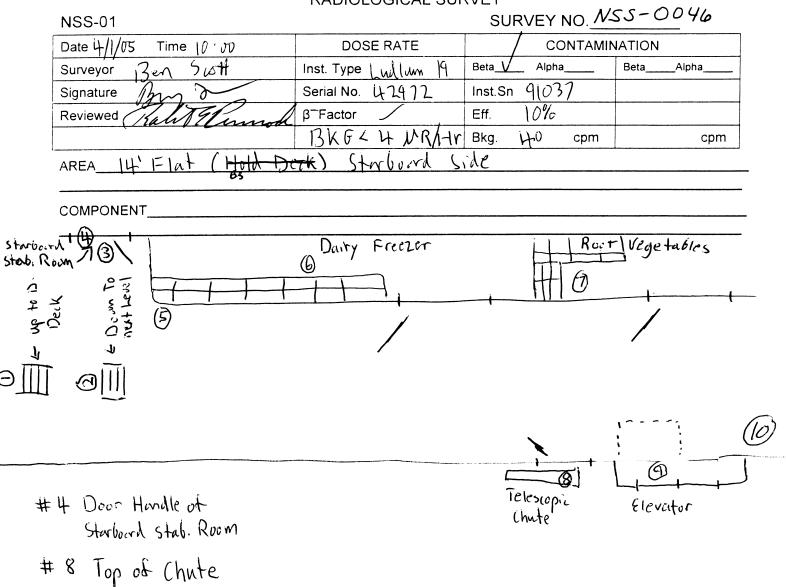
SMEA	R RESULTS +	N-DPM/TO	<del>o civi</del>	8-	- BETA in mRAD/htt/100 CM ²					
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
	~BKG	9	< BKG	17	< BKG	25	LBKG			
2	< BKG	10	~ BKG	18	< BKG	26	LBKG			
3	< BKG	11	2 BKG	19	L BKG	27	L BKG			
4	< BKG	12	2 BKG	20	<bkg< td=""><td>28</td><td>~ BKG</td><td></td><td></td></bkg<>	28	~ BKG			
3	~ BKG	13	< BKG	2	< BKG	29	< Bkg			
Ъ	2 BKG	14	4 BKG	22	< BKG	30	< BKG			
7	-BKG	15	4 BKG	23	< BKG					
R	2BKG	16	< REG	24	< BKG					

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

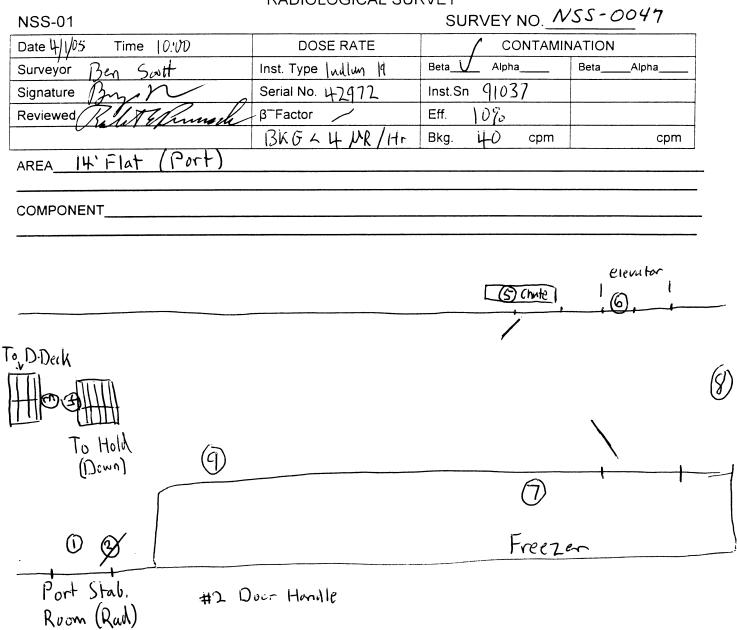
RCA - RADIATION CONTROL AREA



SMEAR RESULTS AN DPM/100 CM ² *B = BETA in mRAD/hr/100 CM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
7	<bcgd< td=""><td>9</td><td>ZBKGD</td><td></td><td></td><td></td><td></td><td></td><td></td></bcgd<>	9	ZBKGD						
2	LBKGD	10	< BKGD						
3,	LBKGD	· · · · ·							
4	<bkgd< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></bkgd<>								
_5	< BKGD								
_4	L BKGD								
	< BKGD								
<b>ð</b>	< BKGD								

RA - RADIATION AREA

CA – CONTAMINATION AREA



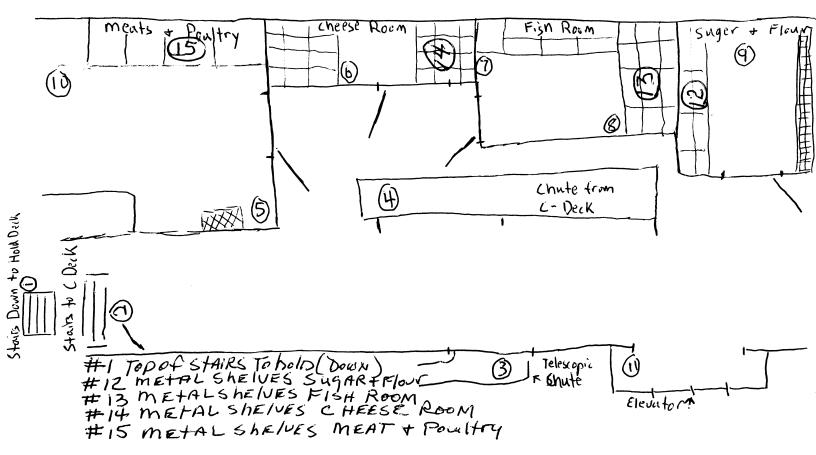
SMEA				-B - BETA in mRAD/hr/100 CM ²						
NO.	RESULTS	NO.	· RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
1	< BKGD	9	< BKGD					•		
2	LBRGD									
3	LOKGO									
4	2 BKGD									
5-	< BKGD									
6	L BKGD									
7	< BKGD									
8	- BKGD									
RA – RA	RA – RADIATION AREA CA – CONTAMINATION AREA ALL DOSE RATES IN µrem/hr									

RA - RADIATION AREA

	RADIOLOGICAL SU		58 0001/0						
NSS-01	SURVEY NO								
Date 4-105 Time 8:45	DOSE RATE	CONTAMIN	IATION						
Surveyor Lainthe Scott	Inst. Type/up/um 19	Beta Alpha	BetaAlpha						
Signature anan Scott	Serial No. 429/72	Inst.Sn 75809							
Reviewed Ralit Mumoh	· <del>βFacto</del> r	Eff. 10%							
	BKG-4/hR h	Bkg.40 cpm	cpm						
AREA D - Deck F	ood Stores								

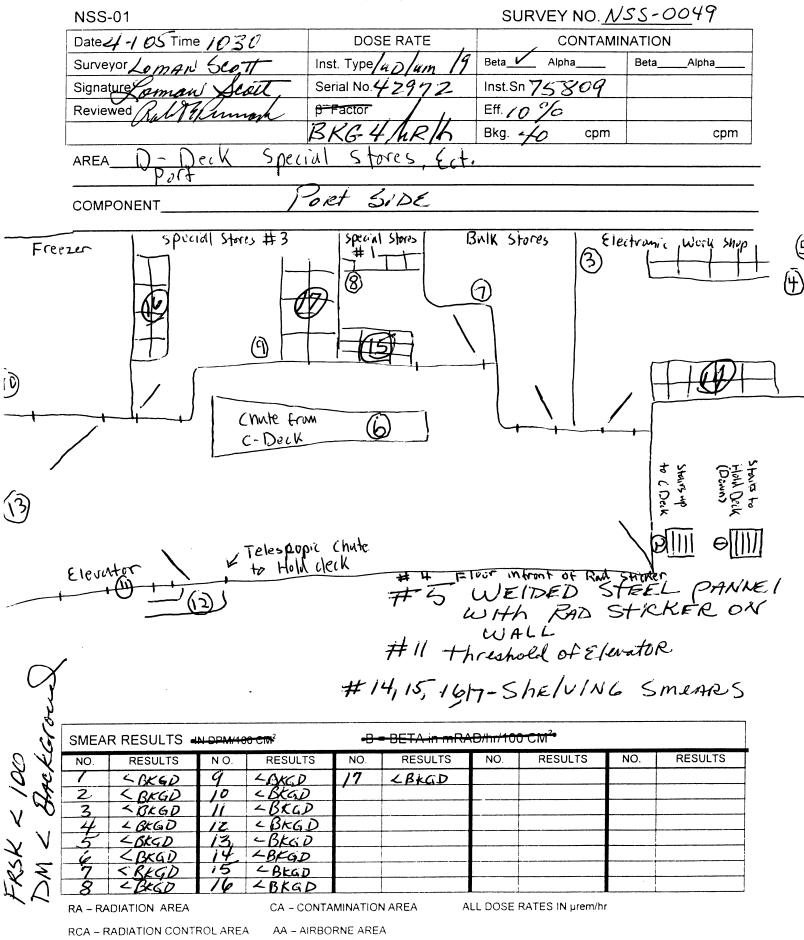
COMPONENT

STAR BOARD SIDE



	SMEA			JU CM ²	•B = BETA in mRAD/hr/100 CM ²					
	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
	7	4 BKGD	9	-BKGD						
0.5	2	CBRGD	10	-BKGD						
ñ X	3	- BKGD	11	4 BKGD						
シン	4	-BKGD	12	L BRGD						
, M	5	< BKGD	13_	- BKGD						
	4_	< BRGD	_14	L BEGD						
XN	7	L BEGD	15	< BKG)						
	8	< BKGD								
2 2	RA – RA	DIATION AREA		CA – CONTA	MINATION	AREA A	ALL DOSE	RATES IN µrem/h	r	

RCA - RADIATION CONTROL AREA



NSS-01	SURVEY NO. NSS - 0050								
Date 4. 1.05 Time	DOSE RATE	CONTAMI	NATION						
Surveyor Circles	Inst. Type LUDLUM	Beta Alpha	BetaAlpha						
Signature Conference	Serial No. 95 499	Inst. Sn 97416							
Reviewed Row Harman	β  Factor	Eff. 10%							
	4 mR/HR	Bkg. <b>3</b> <i>O</i> cpm	cpm						
AREA A DECK AFT HOUSE									

#### COMPONENT

PORT STOW F AFT BOAK STOW 1

STOW #1 STBD 1. OUTSIDE DOOR LATCHA 2. INSIDE 11 11 BAFT PEAK 3 OUBSIDE DOOR LATCHES 4 INSIDE DOOR LATCHES STOW 2 PORT 5. OUTSIDE DOOR LATCHED 6. INSIDE DOOR LATCHES DKTULET PORT 7. OUTSI DE DOER LATCH 8. INSIDE DOER LATCH SHAFT ALLEY EXIT 9. TOP RUNGONLADDER 10. EXIT DOOR LATCH I GNITT DOOR LAT-H

ALL AREA IN DIA. DRZ BIKGD FRISK< 100 CPM

MEA		IN-DRM/10	O CIVI	8-	<del>·B = BETA in mRAD/hr/100 CM³</del>				
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NÓ.	RESULTS
1	~ BKGD	9	< BKGD						
2	2 BKGD	10	- BKGD						
3	< BKG D		< BKGD						
4	2 BKGD								
5	2 BKGD		r						
4	- BKGP								
7	< BKGD								
3	L OKGD								

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

	NADIOLOGICAL OU										
NSS-01	SURVEY NO. NSS-005/										
Date 4 1 J's Time	DOSE RATE	DOSE RATE CONTAMINATION									
Surveyor Crada Ic	Inst. Type LUDLUM	Beta Alpha	BetaAlpha								
Signature G. Alerke	Serial No. 95499	Inst.Sn 97416									
Reviewed Kall Flumach	β  Factor	Eff. 10%									
	4mR/HR	Bkg. 30 cpm	cpm								
AREA BDECK STERN	J COMPARTM	ENTS									

### COMPONENT_____

BOSUM'S STORES 15. Deck INSIDE DOOR	STERN SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION SCETION	SWIPES SECTION 1 I DOORWAY 2 DOORWAY PASS 1 PASS 1 ENTER DOOR KNOB FAIT DOOR KNOB FAIT DOOR KNOB
LAMP + PAINT RM 16. DOOR HANDLE INTER 17. DOOR HANDLE ENTER AFT STOER GEAR RM 18. ENTER DOOR OPANER 19. EXIT DOOR KNOD	The second secon	B DECK OUSTDE PT. STOW. B DECK OUSTDE PT. STOW. G. HAND RAIL DECK PHINT STONAGE G. DOOR HANDLE ENTER D. DOOR HANDLE EXIT
V-RIGRE 100C1	ER GEAR RM	PASSAGE WAY 2 10: DECK BOTTOM OF LADDER 11 PORT HAND RAIL 12 STBD HAND RAIL 13 PDBCR PASS 2 STBD 14 PASS 2 HANDRAIL STBD 15 BO

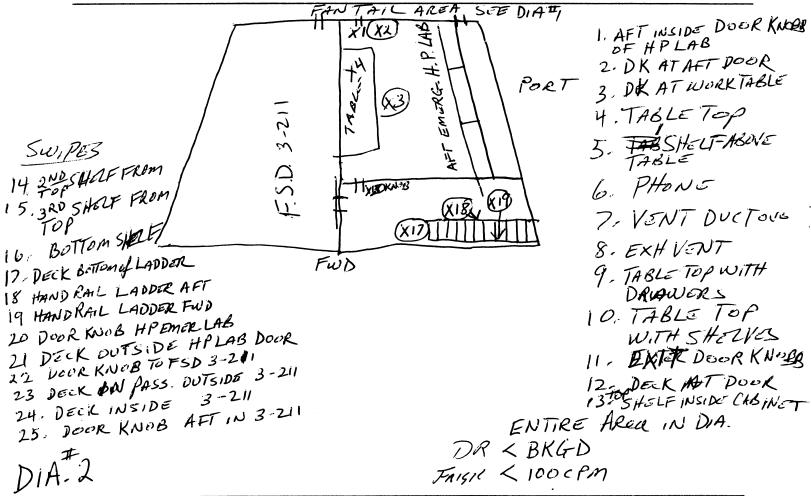
SMEA	SMEAR RESULTS IN DPM/100 CM ² NB = BETA in mRAD/hr/100 CM ³										
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS		
1	~ BKGD	9	4BKGD	[7]	CBKGD						
2	-BKGP	10	LBKGD	18	< BKGD						
3	~BKGD		- BKGD	19	L BKGD						
4	LOKGD	12	1 BKGD	20							
_5	L BKGD	13	L BKG)	21	< BKGD						
<u>b</u>	LBKAD	14	< BRGD	22	-LBKGD						
2	~ BKSD	15	-BKGP								
8	4BKGD	16	L BKGD								

RA - RADIATION AREA

CA - CONTAMINATION AREA

NSS-01	SURVEY NO. <u>NSS-003</u> 2								
Date 4/1 /85 ime	DOSE RATE	CONTAMINATION							
Surveyor Craddock	Inst. Type LUDLUM	Beta Alpha	BetaAlpha						
Signature Acather	Serial No. 95499	Inst.Sn 97416							
Reviewed Balton unoch	β  Factor	Eff. 10%0							
	4mR/HR	Bkg. 30 cpm	cpm						
AREA STERN "C" DECK FEMERC. HP LAB									

#### COMPONENT



SMEA	R RESULTS +	N-DPM/10	<del>0-CM²</del>	- BETA in mR/	D/hr/100				
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	4 BKGD			9	< BKGD	17	< BKGiD	25	LBKGD
2	2 BKGD			10	< BKGD	18	< BKGD		
3	L BKGD			11	< BKGD	19	L BKGD		
4	- BKGD			12	< BKGD	20	L BKGD		
5	L BKGD			13	L OKGD	21	< BRUD		
ŀ	LBKGD			14	LBKGD	22	2 BKGD		
7	LBKGD			15	LBKGD	23	< GRGD		
8	-BKGD	/		16	~ BKGD	24	< BRGD		

RA - RADIATION AREA

CA - CONTAMINATION AREA

NSS-01									
Date / 1/05 Time	DOSE RATE	CONTAMINATION							
Surveyor Creddad	Inst. Type LUDLUM	Beta Alpha	BetaAlpha						
Signature Under	Serial No. 95499	Inst.Sn 97416							
Reviewed RelitePunch	β ⁻ Factor	Eff. 1090							
	4mR/HR	Bkg. <i>30</i> cpm	cpm						
AREA CDECK AFT OF EMERGENCY HP LAB									

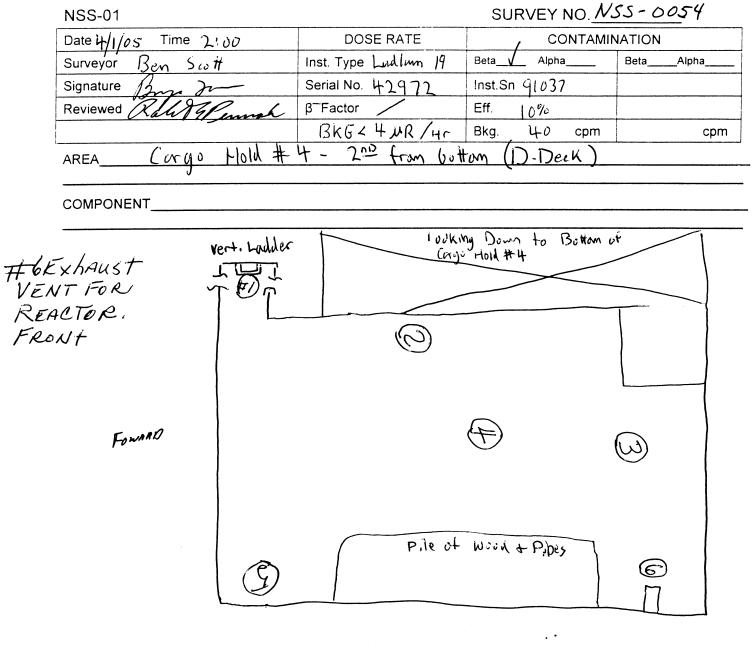
COMPONENT

STOR Swifos ANTAI 1. BASEPLT BEAM & HP LAB. 2, ACLESSRING DKEOVE 3. STBDACCESS RING SIDE 4. ACCESS ENTERING-SECTION 2 < BKGD 5. DK Section 5 6. DK Section 3 # STB; 7, DECKSELTION 7 8: Access RENG-Section 9 TION 9. ACCESS RING SECTION 8 10- DOOR KNEBOUTSIDE LAB FANTA 52 11. PASS AFT of LAB 12 DK SETTION 11 13 ACCESS RING TO SETTION Ý SECTION SECTIO R SECTION SECTION ENTIRE C DECK STERN AREAS XII de CI 10 10 ì DIAT 9 DR < BKGD EMERLIPONCY HPLAD SJE DIA FOR SPACE

SMEA	SMEAR RESULTS IN DPM/100 CM ² -D -BETA in mRAD/htt/100 CM ²								
NC.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
	< BKGD	9	LBKGD						
2	< BKGD	10	LBKGD						
3	< BRGD		< BKGD						
4	< BKGD	12	- LBKGD						
ろ	< BKGD	13	< BKGD						
le	< BKGD								
1	< BKGP								
8	- BKGD								

RA - RADIATION AREA

CA - CONTAMINATION AREA



# Frisk & 100CPM/DM & BKG

SMEAR RESULTS IN DPM/TOU CM ² B = BETA in mRAD/hr/100-CM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
7	- BKGD								
2	<u><bkgp< u=""> LBKGD ~BKGP</bkgp<></u>								
3	LBKGD								
4	~BKGP								
5	2 BKGD 2 BKGD								
6	2 BKGD								
		I					·····		

RA - RADIATION AREA

CA – CONTAMINATION AREA

NSS-01 SURVEY NO. <u>NSS-0254</u> Date 4/4/05 Time 9/40 DOSE RATE CONTAMINATION Surveyor Ben Suft Inst. Type julium 19 Beta Alpha Beta Alpha Signature Bing J. Ar Serial No. 12,972 Inst.Sn 9/037 Reviewed Contact Council B/Sk (5 < 4 JAR /Hr Bis, 40 cpm cpm AREA Corgo Hold # 4- 342 From 6 citlam (C Deck) COMPONENT #1 Hyp/0 COMPONENT #7 ON FRONT OF Explantst W D Steel Suppt H S ON FTONT Of Zy hAust (R OACTOR) Frisk & 100cpm (DML BKGVert, Ludith Fourne Frisk & 100cpm (DML BKGVert, Ludith Fourne			RADIOLO	_OGICAL SURVEY					
Surveyor Ben Scatt Inst. Type judium Ig Beta Appa Beta A	NSS-01				SURVE	Y NO. <u>/</u>	55-003	54	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Date 4/4/05 Time	9.40	DOSE	RATE	<u> </u>	CONTAMIN	ATION		
Reviewed Child Chinaman B ³ Factor Eff. 10% BK6 4 4 DR /Hr. Bkg. 40 cpm cpm AREA_Corgo Hold # 4 - 3 RD from 6 citizen (C Deck) COMPONENT	Surveyor 13en S	scott	Inst. Type 👌	Ilum 19	Beta_V_ Alp	oha	BetaAI	pha	
BKG < 4 WR /Hr     Bkg. 40 cpm     cpm       AREA     Corgo Hold # 4 - 3 RD from 6 citom (C Deck)       COMPONENT   COMPONENT       #1 Hyplo       COMPONENT   #1 Hyplo       Component   #1 T ON       FRONT OF       Explantst       Went         Vent         Vent         Vent         Vent         Vent         Vent         Vent         Vent	Signature Burn	). 500-	Serial No. Ц	2972	Inst.Sn 910	37			
AREA_Corgo Hold # 4-340 from 6 other (C Deck) COMPONENT #1 Hyplo Controll Leavers # 7 ON FRONT OF Exhaust H 8 ON Front Of Exhaust (Reactor) Unit (Reactor) Discussion Of Sympt Of Sympt	Reviewed Kang	Fund	•	/	1 - / -	,			
AREA_Corgo Hold # 4-340 from 6 other (C Deck) COMPONENT #1 Hyplo Controll Leavers # 7 ON FRONT OF Exhaust H 8 ON Front Of Exhaust (Reactor) Unit (Reactor) Discussion Of Sympt Of Sympt			BKG K	4 UR/Hr	Bkg. 40	cpm		cpm	
#1 Hydro Controll Leavers # 7 ON FRONT OF Explanst # 8 ON FTONT OF Explanst (Revactor) Work (Revactor) Work (Revactor) Work (Revactor) Work (Revactor) Work (Revactor) Work (Revactor) Work (Revactor) Work (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Revactor) (Reva	AREA Corgo	+1014 #4- 3	3RD from						
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OF EX hAusi Vent (Repactor) (Steel Steel Steel Steel Steel Steel Steel Steel Steel	# 8 ON FONT	-O.Ž					LAC RAC		
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	Vent	Hydrolics							
	(Repector)	N.	ecl. A			Steela			
Frisk & 100cpm / DM & BKGVert, Ladder Fourne			support			Osup	4		
Frisk & 100cpm / DM & BKGVert. Ladder Fourne		$\bigcirc$ $\bigcirc$ $\bigcirc$				-			
Frisk & 100cpm / DM & BKGVert, Ladder Fourne		(!	ل <del>ا</del> ر						
Frisk & 100CPM / DM & BKGVert, Ladder Fourne	L		$\overline{m}$					)	
	Frisk & loocpm /	DM2 BKgVer	t. Loudder	Fourn	D				

SMEA	R RESULTS	IN-DPM/10	<del>o cm²</del>	-B-= BETA in mRAD/hr/100 GM ²					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	~ BKGD								
2	< BKGD								
3	< BKGD								
4	L BRGD								
5	< BKGD								
6	< BKGD								
7	~BK90								
8	LBKGD								

RA - RADIATION AREA

CA – CONTAMINATION AREA

		RADIOLOGICAL SUF	RVEY	
	NSS-01		SURVEY NO. NO.	55-0054
ſ	Date 4/4/05 Time 10:00	DOSE RATE		NATION
[	Surveyor Ben Scott	Inst. Type Iudlum 19	BetaAlpha	BetaAlpha
	Signature Bury ) for	Serial No. 42972	Inst.Sn 91037	
	Reviewed Rah T4/ inmoch	β ⁻ Factor	Eff. 10%	
	· · · · ·	BKG < 4 WR/Hr	Bkg. <b>40</b> cpm	cpm
	AREA Corgo Hold # 4 -	- B Deck		
	COMPONENT			
#/	ONTOP 3	É Ferre	Deer to B Deek	iBath Roum Additions while in part, S.C.
	(H) Torgo (D) Mummy	B B	Fence	Ø

# Vert. Ladder

Frid	K Z WOLPM	/Dm	14 BKG		Four	<i>aP</i>			
SMEA		IN DPM/18	<del>o CI</del> M²	<del>8</del>	BETA in mR	<del>3-CI</del> M ²			
NO.	RESULTS	RESULTS N.O. RESULTS NO. RESULTS NO.	RESULTS	NO.	RESULTS				
7	< BKGD								
2	L BKGD								
3	< BKGD								
4	L BKGD								
5	2 BKGD								
6	< BKGD								
7	< BKGD < BKGD		·						
_8_	< BKGD								
_ <b>&amp;</b>								L!	

RA - RADIATION AREA

CA - CONTAMINATION AREA

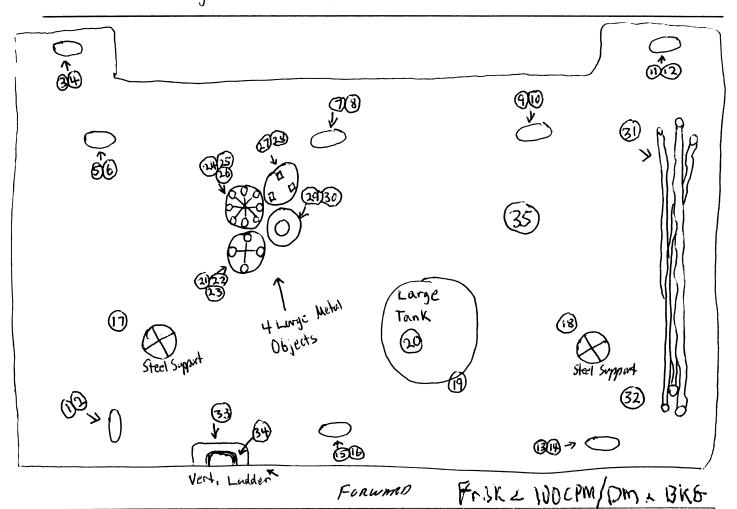
ALL DOSE RATES IN µrem/hr

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	SURVEY NO. <u>NSS-005</u> 4				
DOSE RATE	CONTAMINATION				
Inst. Type Ludlum 19	BetaAlpha BetaAlpha				
Serial No. 42972	Inst.Sn 91037				
β ⁻ Factor	Eff. 0%				
BKG < 4 NR/Hr	Bkg. 40 cpm cpm				
	Inst. Type Ludlum $\frac{1}{4}$ Serial No. 42972 $\beta$ -Factor				

#### AREA

## COMPONENT Cargo Hold #4 (Hold and 14 Flat Decks)



SMEA		IN DPM/10	<del>)0-GM</del> ²	-B = BETA in mRAD/hr/100 CM ²						
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
1	< BKGO	9	~ BKGD	17	L BKGD	25	< BEGD	35	~BKGD	
2	LBKGD	10	4 BKGD	18	2 BKGD	26	-BKGD	34	-BKGD	
3	< BKGD	ji -	4BKGD	İq	< BKGD	27	< BKGD	35	< BKGD	
4	LBKGD	12	< BKGD	20	L BKGD	28	< BKGP			
รี	LBKGD	13	< BKGD	21	L BKGD	29	- BKGD	۱ ا		
6	LBKGD	14	< BKGD	22	L BKGP	30	2 BKGD			
7	~ BKGO	15	< BKGD	23	< BKGD	31	< BKGD	L	· · · · · · · · · · · · · · · · · · ·	
Х	LBKGD	16	LBKGD	74	2 BKGD	32	CBKGD			

RA - RADIATION AREA

CA - CONTAMINATION AREA

Surve Signa Revie AREA	<i>4-1-05</i> Til eyor ture wed		Seri β [−] F	DOSI . Type al No. actor	E RATE	SUF Beta Inst.Sn	CONTAM		
Surve Signa Revie AREA COMF	yor ture wed <u>Covrgs</u>		Seri β [−] F	. Type al No.	ERATE				
Signa Revie AREA COMF	ture wed	Hold ¥	Seri β [−] F	al No.			_ Alpha	Beta_	Alpha
COM	wed Corge	Hold ¥	β ⁻ F			Inst.Sn			
AREA	<u> </u>	Hold ¥		actor					
COM	· · · · · · · · · · · · · · · · · · ·	Hold ¥	$\frac{1}{1} \left( \frac{1}{1} \right) $			Eff.	**************************************		
	· · · · · · · · · · · · · · · · · · ·	Hold ¥	LIC CLIM	·····		Bkg.	cpm		cpm
	PONENT		T 1 17010	+ 14	Flat De	eck)			
	••••••	Dresc	CHOMAINS						
+									
+									
4-	t   Top ct	-latch	#2 I		-Haten				
#	ŧ 3 "	v	# 4 "						
+	±5″	~	#6 "		"				
Ŧ	<b>t</b> 7″	~	#8 "						
Ē	ŧ9″	~	井10 mm 井12 mm		w				
	# \\ "	~	+ 14 "		*				
			+ 10 / # 10 /		N				
	<b>#13</b> "	il.							
	#15 "								
	#17 Side	of steel <	Sunnixt	#7	29 Side				
	#18 510 #18 510	of chapt C.	and		30 Top				
	#18 5.de #19 5.de #20 Valve	of Lorge To	en K	#	31 Inside	Discorded F	lex. pipe		
	# 20 Valve	on 60 thom of	Tank	#	132 Other o	end"	••		
	# 21 Top 1	-ip of object	•			outside La			
	# 22 Met		ne			inside Lado	Ver		
	# 23 Bot			*	#35 Floor	SMEN			
	# 24 51	ť.							
	# 25 Sp"	ules							
	# 26 In								
	#27 Top								
	#28 Sid	•							
MEA	R RESULTS	1N-DPM/100	CM ²	8-	BETA in ml	RAD/hr/100 (	-		
NO.	RESULTS	/ NO.	RESULTS	NO.	RESULTS		RESULTS	NO.	RESULTS
1		<u>q</u>	/	17		25 26	/	37 34	<i></i>

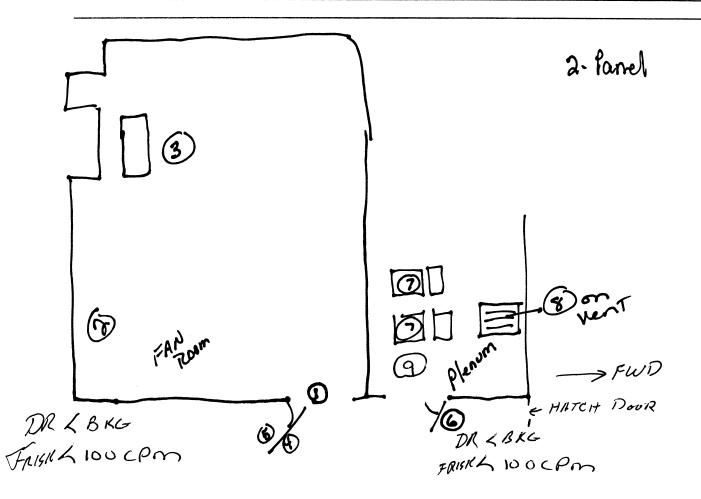
	(RESOLIO I				BETTT				
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1		q		17		25		37	
2	6	10		18		26		34	
3	O / I	11		Pi		27		35	
¥ /	Y/U	12		$\mathcal{V}$		28	/		/
5	· ·	13	/	21	/	29	/	/	
6/		14/		24		39⁄			
$\tilde{\Lambda}$		15		23		31		/	
δ		16		124		132		/	

RA - RADIATION AREA

CA – CONTAMINATION AREA

NSS-01		SURVEY NO.	155-0055
Date 4-4-05- Time	DOSE RATE	CONTAMI	NATION
Surveyor Craddack	Inst. Type Ludlon	Beta Alpha	BetaAlpha
Signature Anddorth	Serial No. 95-499	Inst.Sn 97416	
Reviewed Rolet Grenny	β ⁻ Factor	Eff. 10 70	
	4uR/HR	cpm ن Bkg.	cpm
AREA A deale FAN Rm 4	Plenum Ports	icles	

COMPONENT_



NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	2 BKG	9	< BKGD			1			
2	1 BKG								
3	2 BKG 2 BKG								
4	< BKG								
5	< BKG			1					
6	< BKG								
1	< BKG		1				* *** -** -****************************		
1	< BKG								

RA - RADIATION AREA

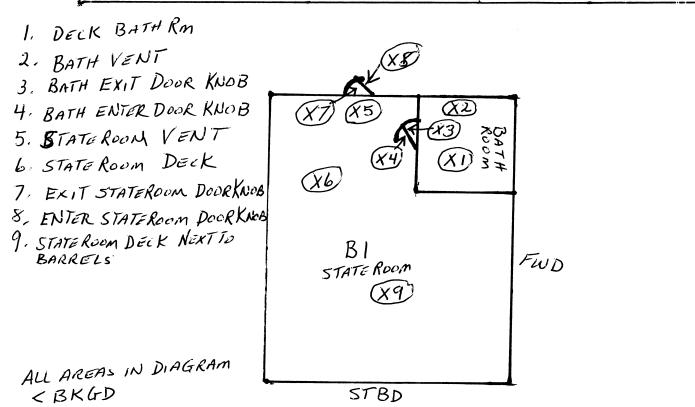
CA - CONTAMINATION AREA

1 - -

. . . /

NSS-01		SURVEY NO. <u>NSS-0056</u>				
Date 4/4/05 Time	DOSE RATE	CONTAMI	NATION			
Surveyor CRADDOCIC	Inst. Type LUDLUM	Beta Alpha	BetaAlpha			
Signature Accorde	Serial No. 95499	Inst.Sn 97416				
Reviewed Ruhter unorth	β  Factor	Eff. 10%0				
	HuR/HR/hr	Bkg. 30 cpm	cpm			
AREA B-1 STATEROOM	AND BATH "B"	DECK STBD				

COMPONENT WASTE STORAGE BOOM FOR RADWASTE



< 100Cpm

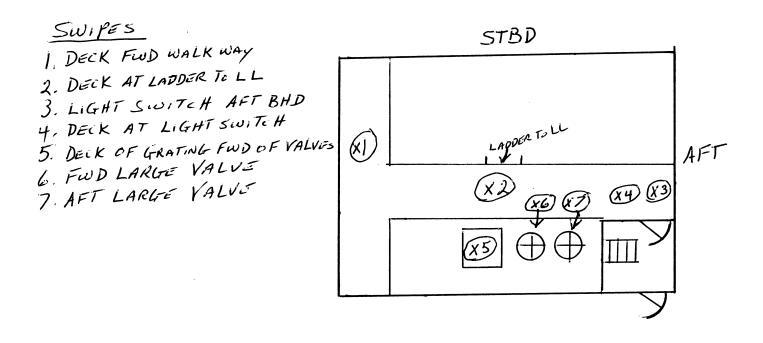
SMEAF		N-DPM/48	<del>S-CIVI²</del>	B = BETA in mBAD/hr/100 CM ²					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BKG	9	< BILG						
2	< BKG								
3	~ BKG								
4	< BKG								
5	< BKG								
b	< 8kG								
7	~ BKG								
8	< BKG								

**RA - RADIATION AREA** 

**CA - CONTAMINATION AREA** 

NSS-01		SURVEY NO. <u>NSS - 005</u> 7				
Date 4/4/05 Time	DOSE RATE	CONTAMI	NATION			
Surveyor Craddol	Inst. Type LUDLUM	Beta Alpha	BetaAlpha			
Signature Acolocic	Serial No. 95499	Inst.Sn 97416				
Reviewed Rah Finner	β  Factor	Eff. 10%				
<i></i>	HUR/HR	Bkg. 30 cpm	cpm			
AREA FWD STBD ST	TABLIZER RM.	14 FOUT FLA	IT			

#### COMPONENT_



## ALL AREAS IN DAAGRAM DR < BKGD FRISK 100 EPM

<b>SMEA</b>	R RESULTS -	IN-DPM/100	<del>) CM²</del>						
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BKG								
2	LBKG								
3	LBKG								
4	~BKG								
5	< BKG								
6	~ BKG								
7	L BKG								

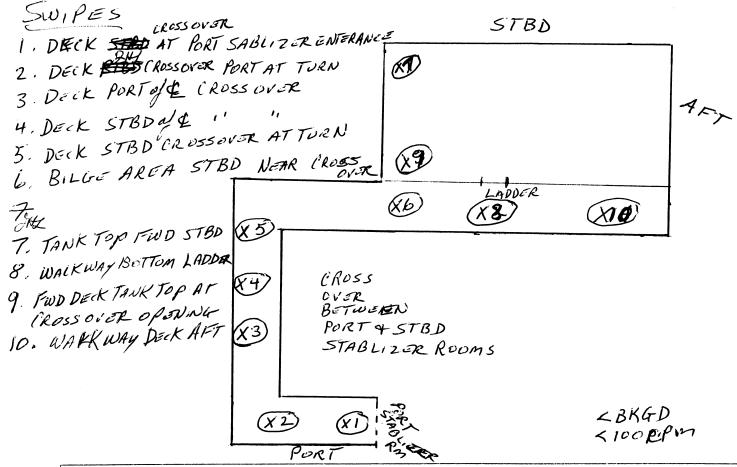
RA - RADIATION AREA

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

NSS-01	SURVEY NO. <u>NSS - 005</u> 8				
Date 4/4/05 Time	DOSE RATE	CONTAMINATION			
Surveyor Craddocle	Inst. Type LUDLUM	Beta Alpha	BetaAlpha		
Signature Avaldord	Serial No. 95499	Inst.Sn 97416			
Reviewed Rate Verman	β  Factor	Eff. 10970			
	HUR/HR	Bkg. <i>30</i> cpm	cpm		
AREA FWD STBD STAL HOLD DROK	BLIZERRM AN	D CROSS OVER	LOWAR LEVE		
COMPONENT					



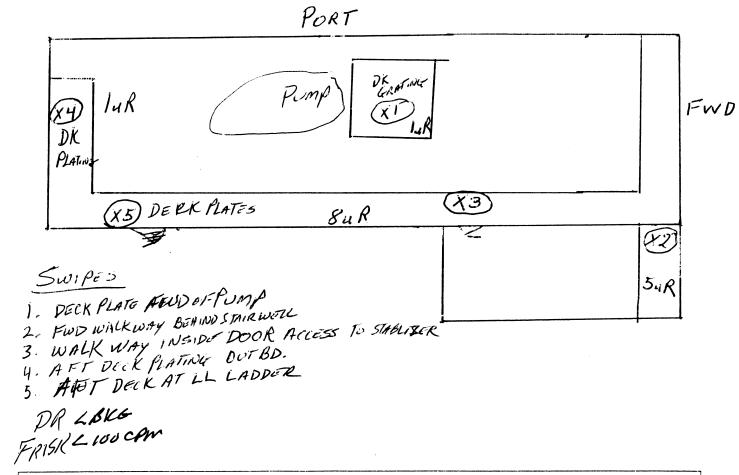
SMEAR RESULTS IN DPM/100 CM2				B = BETA in mRAD/hr/100 CM ²					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	<bkg< td=""><td>9</td><td>2 BKG</td><td></td><td></td><td></td><td></td><td></td><td></td></bkg<>	9	2 BKG						
2	LOKG	10	< BKG						
3	4 BKG								
4	2 BKG								
5	< BKG								
6	< BEG								
7	< BKG							<b> </b>	
8	CBRG							I	

RA - RADIATION AREA

CA - CONTAMINATION AREA

NSS-01	SURVEY NO. <u>NSS-005</u> 9							
Date 4/4/05 Time	DOSE RATE	CONTAMINATION						
Surveyor CRADBOCK	Inst. Type LUDLUM	Beta 🥢 Alpha	BetaAlpha					
Signature	Serial No. 95'499	Inst.Sn 97416						
Reviewed Rep Human	β  Factor	Eff. 10 %						
	HUR/HR	Bkg. 30 cpm	cpm					
AREAPORT FORD STABLIZER ROOM UPPER LEVEL								
14 FLAT								

COMPONENT_



SMEAR RESULTS IN DPM/100 CM ²									
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	L BKG								
2	~ BKG								
	< BKG								
4	< BKC								
5	4 BKG								

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

NSS-01		SURVEY NO. NSS-0060			
Date 4/4/05 Time	DOSE RATE	CONTAMIN	IATION		
Surveyor Crailched	Inst. Type LUDLUM	Beta Alpha	BetaAlpha		
Signature Authorite	Serial No. 95:499	Inst.Sn 974/6			
Reviewed Rah Ferman	β  Factor	Eff. 10%0			
	HUR/HR	Bkg. 30cpm	cpm		
AREA PORT FWD STABL	-1ZER ROOM LOW	ALENDEL			

COMPONENT_

SULIPES ow 1-46 2.UL 3. UL Y. DECK PLATES AFT END 5. DECK AT 4 LARGE VALVES 6 AFT TOP LARGE VALVE FLANGE + GLANDSEAL 7. AFT BOTTOM " 11 8- BOTTOM FWD" 11 11 PORT INBOHRD 9-TOP FWD " " 11 10. TANK TOP SURFACE FWD AT CROSS OVER ENTERANCE 11. INBOARD PORT VALUE FLANGE& GLAND SEAL 12. DECK AFT PORT OUTBOARD ONK YUNR 13, DECK TANK TUP INBOARD OF LADDER 14. DECK BETWEEN 4 LARGE VALVES 15 DECK BELOW WALK WAY INBOARD 16. DECK BELOW AIR OPERATE VALVE 17. Q. FWD DECK AREA

		n pr	177						
SMEA	AR RESULTS	IN DPM/16	<del>o cm²•</del>	-8-	BETA in mR/	\D/hr/10(	<del>) CM²</del>		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
4	< BKGD	12	LBKGD						
5	L BKGD	13	LBKGD						
6	1 BKGD	14	LAKED						
7	2 BKGD	15	< BKGD						
8	< BBGD	16	L BKGD						
9	L BKGD	17	< BKGD						
10	< BKGD								
11	< BKGD								

No FRISK DATA

RA - RADIATION AREA

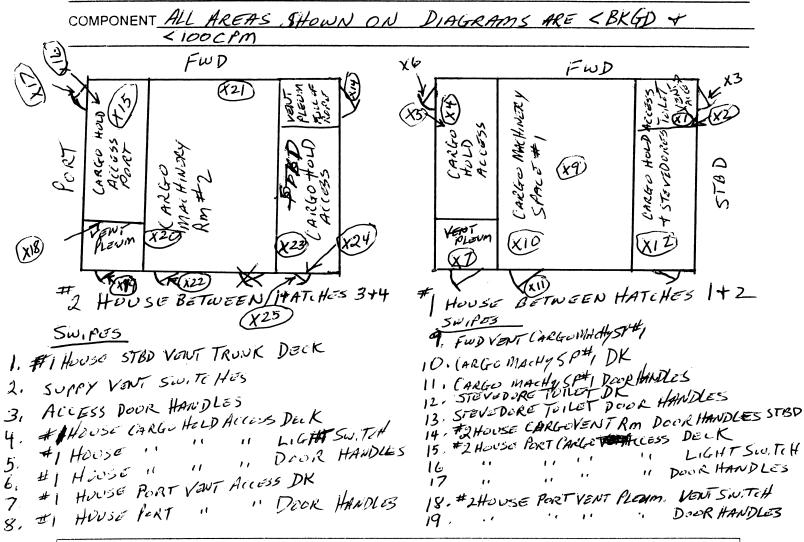
CA – CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA

AA – AIRBORNE AREA

NSS-01		SURVEY NO. <u>NSS-006</u> /				
Date 14/05 Time 8:30	DOSE RATE	CONTAMI	NATION			
Surveyor Craddock	Inst. Type LUDLUM	Beta Alpha	BetaAlpha			
Signature Andducle	Serial No. 95499	Inst.Sn 97416				
Reviewed Rah TEP unak	² β ⁻ Factor	Eff. 10%				
	HMR/HR BKG	Bkg. <b>30</b> cpm	cpm			
AREA FWD WEATHAR DEC	K HOUSES BETWEE	EN HATCHES IT	4			



SMEAR RESULTS TH BRM/100 CM					<del>B - BETA in mRAD/hr/100 CM²</del>				
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	~BKGD	9	CBKAD	17	4BKG0	20	LBKGD		
2	< BKGD	10	<bkgd< td=""><td>18</td><td>2 BKGP</td><td></td><td></td><td></td><td></td></bkgd<>	18	2 BKGP				
3	< BKGD	1	< BKGD	19	< BKGD				
4	2 BKGD	12	- BKGD	21	< BKGD				
5	1 BKGD	13	- BKGD	22	~ BKGD				
4	LBKad	14	- BKGD	23	- BKGD				
1	4 Bral	15	< BRED	24	< BKGD				
8	2 BKOD	16	< BIEGD	25	~ BKGO				

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

AA - AIRBORNE AREA

ALL DOSE RATES IN urem/hr

(OVER)

RCA - RADIATION CONTROL AREA

NSS-01	SURVEY NO. ALSS - boul						
Date 4/4/05 Time 0830	DOSE RATE	CONTAMINATION					
Surveyor	Inst. Type LUDLUM	Beta Alpha	BetaAlpha				
Signature	Serial No. 95499	Inst.Sn 97416					
Reviewed	β  Factor	Eff. 1070					
	4mR/HE BKGD	Bkg. 30 cpm	cpm				
AREA FWD WEATHOR	DECK HOUSES	BETWEEN HA.	Teltes I AND				

COMPONENT ALL AREAS SHOWN ON DIAGRAMS ARE < BRGD AND & 100 CPM CONTINUATION OF PAGE 1

20	U, PES #2H	OUSE	CARLO 1	MACHIN	ery SP. #	2 DECK VENT	
21			1 *			1 - 101	
					¥ 4	Door.	LATCH
23.	#2 Hc	USE	CARGO	HOLD	ACCESS	HAND HO	
24.				11	1 1	DOOR LA	TCH EXIT
25				11	11	· · · · · · ·	ENTERANCE

Page 20/2

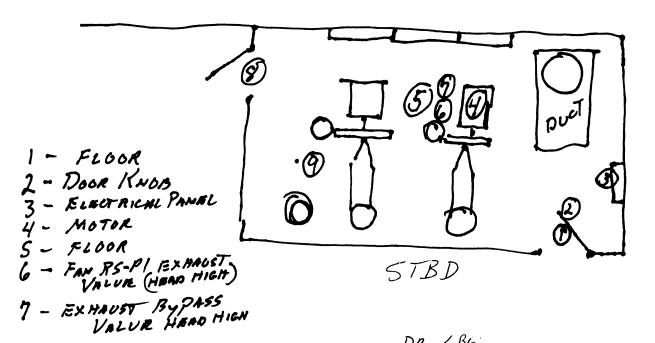
	R RESULTS				BETA in mRA				
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

NSS-01 SURVEY NO. <u>NSS-0062</u>								
Date 4-5-05 Time 9:30	DOSE RATE	CONTAMINATION						
Surveyor Craddoda	Inst. Type LUDLUM	Beta Alpha	BetaAlpha					
Signature A a. S. Just	Serial No. 95499	Inst.Sn 974/6						
Reviewed Rall Elimon	β  Factor	Eff. 10%						
	HUR/HR BKG	Bkg. <i>*30</i> cpm	cpm					
AREA B DECK FAN ROOM TO COUN CHARA LUD								

#### COMPONENT_



FWD

THANSHOLD 8

DR LBG FRISTELIUSEPM

SMEA		N-DPM/10	O CM ²	<del>B = BETA in mRAD/hr/100 CM²</del>					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BKG	9	- BKC-						
1	<bkg< td=""><td>YOR</td><td>60</td><td></td><td></td><td></td><td></td><td></td><td></td></bkg<>	YOR	60						
3	< BKG								
4	< BK6	-							
5	L BKG								
6	2 BKG								
2	2 BKG								
8	- BRG								
RA – RA	DIATION AREA		CA – CONTA	MINATION	IAREA A	LL DOSE F	RATES IN µrem/h	r	

RCA - RADIATION CONTROL AREA

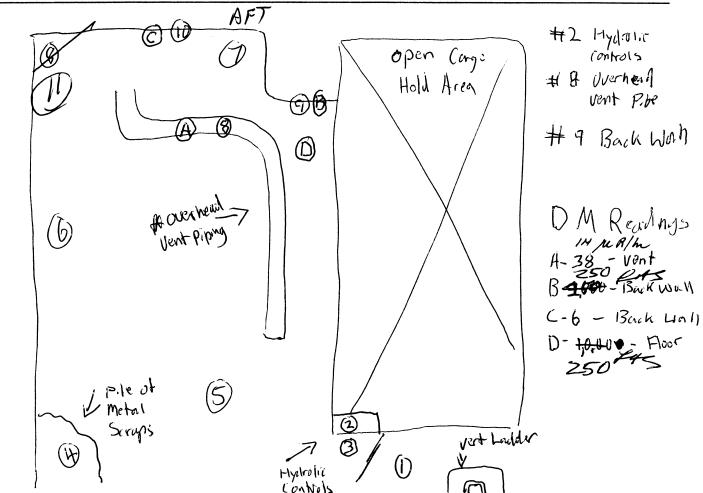
AA – AIRBORNE AREA

ALL DOSE RATES IN µrem/hr

5

NSS-01	SURVEY NO. <u>NSS - 0063</u>				
Date 4305 Time 1315	DOSE RATE	CONTAMINATION			
Surveyor Loman Scott	Inst. Type un 19	Beta Alpha	BetaAlpha		
Signature annual Acatt	Serial No. 47972	Inst.Sn 91037			
Reviewed La le Tel unon	B-Factor	Eff. 10%0			
	BRG-4 hr/h	Bkg. 440 cpm	cpm		
AREA HOIL #4 D D	eck (Storboard				

#### COMPONENT_

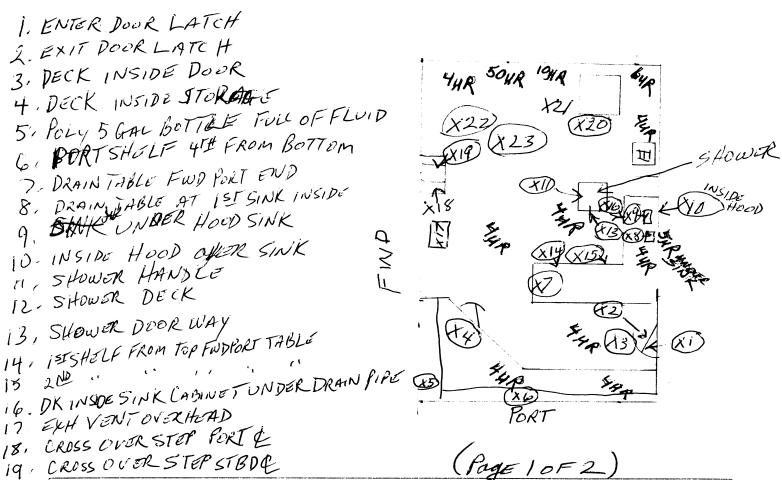


SMEAR RESULTS $\frac{1}{100 \text{ cm}^2}$ $\frac{1}{100 \text{ cm}^2}$ $\frac{1}{100 \text{ cm}^2}$										
						_			2221122	
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
1	<bkg< td=""><td>4</td><td>2 BKG</td><td></td><td></td><td></td><td></td><td></td><td></td></bkg<>	4	2 BKG							
2	2BKG	10	< BKG							
3_	< BKG	'H	<bkg< td=""><td></td><td></td><td></td><td></td><td></td><td></td></bkg<>							
4	< BKG									
15	- BKG									
6	~ BKG									
7	< BKG									
8	< BKG									

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

NSS-01	SURVEY NO. <u>NSS-0064</u>						
Date 4/5/05 Time 09:00	DOSE RATE	/ CONTAMI	NATION				
Surveyor	Inst. Type LUDLUM	Beta Alpha	BetaAlpha				
Signature Graddock	Serial No. 45 4 <b>9</b> 9	Inst.Sn 97416					
Reviewed addade	β ⁻ Factor	Eff. 10 %					
Ruhtermoch	- YUR/H& BKG	Bkg. <i>30</i> cpm	cpm				
AREA UPPER LEVEL "	C"DECK COLD 1	WATER CHEMIC	AL LABORATOR				
RADIATION MC	NITORING ROOM	FVVD					
COMPONENT							



		-									
SMEA	R RESULTS	N-DPM/46	<del>O CM²</del>	-8-	-B - BETA in mRAD/hr/100 CM ²						
NO.	RESULTS	NO.	RESULTS	NO	RESULTS	NO.	RESULTS	NO.	RESULTS		
	LBKG	9	< BFG	17	< BKG						
2	< BKG	10	L BKG	18	< BK6-						
3	- BKG	<i>i</i> 1	-BKG	19	< BKG						
4	< BKG	12	L BKG	20	SBKG						
5	-BKG	13	L BKG	21	< BKG						
6	< BKG	14	LBKG	22	< BKG						
1	< BKG	15	< BRG	23	2 BKG						
8	2 BKG	16	< BKG	2							

RA - RADIATION AREA

CA - CONTAMINATION AREA

#### IN.U. UNVMINIALI

#### RADIOLOGICAL SURVEY

**NSS-01** 

SURVEY NO 1155-19164

		0011121 110. <u>7.77 0007</u>				
Date 4/5/05 Time 0400	DOSE RATE	CONTAMINATION				
Surveyor	Inst. Type LUDLUM	Beta Alpha BetaAlpha				
Signature	Serial No. 95499	Inst.Sn 974/6				
Reviewed	β  Factor	Eff. 10%				
		Bkg. 30 cpm	cpm			

AREA UPPER LEVEL "C" DECK COLDWATER CHEMICAL LABORATORY RADIATION MONITERING ROOM

COMPONENT_____

CONT' FROM PAGEI

Swipes

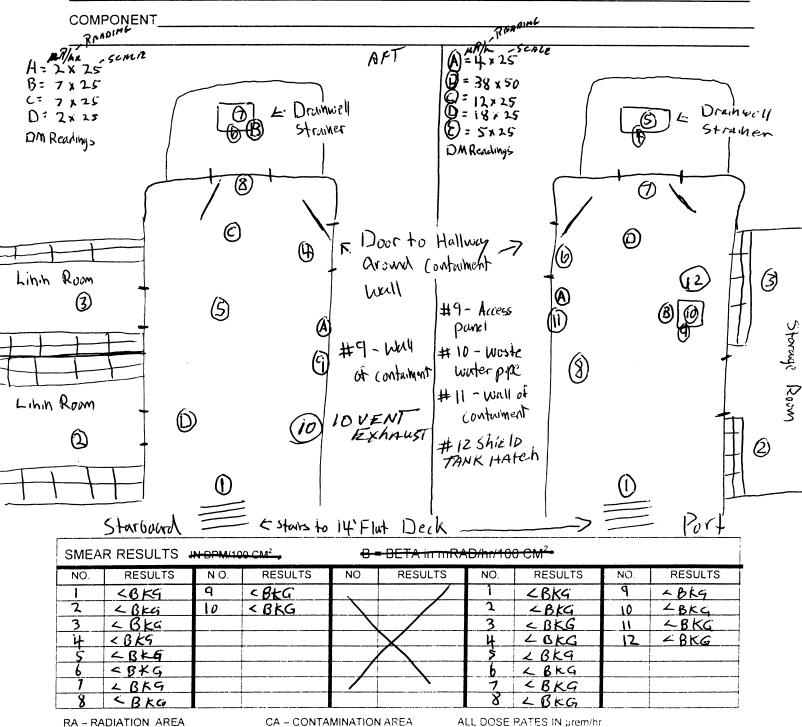
20. TOP OF LEAD BRICKS UNDER ITEM COVERED WITH LEAD 21. DECKIN FRONT OF ITEM LISTED ABOUS 22. DECK BESIDE RC VENT 23- INSIDE ORANGE VENT DUCT IN OVER HEAD

PAGE 2 of 2

SMEAR	SMEAR RESULTS WERMING CM2 BETAIN RADINITUD CM2										
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS		

CA - CONTAMINATION AREA

NSS-01	SURVEY NO. <u>7/55-0065</u>						
Date 45-05 Time /100	DOSE RATE	CONTAMI	NATION				
Surveyor on a fail	Inst. Typelin lim M	Beta Alpha	BetaAlpha				
Signature amar Acatt	Serial No. 42972	Inst.Sn 90/37					
Reviewed By UN immun	B-Factor	Eff. 10°10					
	4 MiK/m	Bkg. 🎸 cpm	cpm				
AREA HOLD Deck St	arboard & Port	/					



**RA - RADIATION AREA** 

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

Dated Server 192 DOSE RATE CONTAMINATION Surveyor guild Act inst Type Man 19 Beta Appa Beta Appa Signature emanded at the server server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of the server of t		KADIOLOGI	CALSURVET					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	NSS-01	SURVEY NO. NSS-60 66						
Signaturg emanl freet Serial No 1/29 72 Inst. Sn 90/37 Reviewed A. [1] Finnersh Preser Eff 10/0 AREA Hall Wer Indetween Port + Stribersh on Hold Jrek (Around Contentioned bills # 2 value Hould # 4 Drawed Strainer Halth # 5 track Dealwell Strainer # 10 value Hould # 10 value #	Date 4-5-05 Time / 100,	DOSE RA	TE	CONTAMI	NATION			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Surveyor Lewan Acar	Inst. Type	un 19 Beta L	Alpha	BetaAlpha			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Signature man feat	Serial No. 429	73 Inst.Sr	90137				
AREA Hall Way Inderween Port + Storbard on Hold Lak (Aromal Containment) COMPONENT #2 value Handle #4 Value Handle #4 Drawell Strawer Hatth #5 value Handle #5 value Handle #5 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Han	Reviewed La NET	<del>β</del> ≃Factor	Eff.	10%0				
AREA Hall Way Inderween Port + Storbard on Hold Lak (Aromal Containment) COMPONENT #2 value Handle #4 Value Handle #4 Drawell Strawer Hatth #5 value Handle #5 value Handle #5 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Handle #6 value Han		4MRL	Bkg	Later cpm	cpr			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	AREA 1-Lall WW In	hetween Port		evy y	1			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $								
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8	2 15 GB							

RA - RADIATION AREA

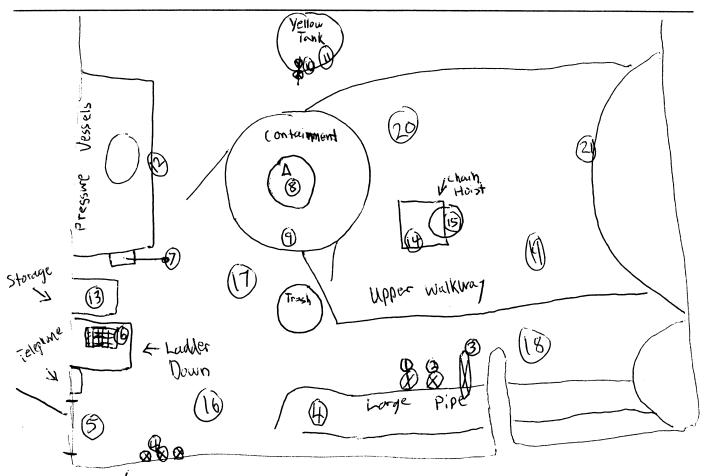
Storbourd

CA - CONTAMINATION AREA

PACKE 10F2

NSS-01	SURVEY NO. NSS-0067				
Date 4/6/05 Time 1:00	DOSE RATE	CONTAMINATION			
Surveyor Jon Scott	Inst. Type Linklym 19	Beta Alpha	BetaAlpha		
Signature Brow ) At	Serial No. 95499	Inst.Sn 42972			
Reviewed Kale Manuel	β ⁻ Factor	Eff. 0%			
	BKG 4MR/Ha	Bkg. 🕂 🗰 😘 cpm	cpm		
AREA Secondary. Containme	H-BDeck AFT	OF RIALTON			

#### COMPONENT_

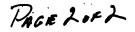


## DR< BKG/L 100 CPM FALLAR

SMEA	SMEAR RESULTS IN DPM/100 CM ² B-= BETA in mRAD/hr/100 CM ²								
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BKG	P	< BKG	17	- BKG				
2	CBKG	10	~ BKG	18	4 BKG				
ઝ	< BKG	jt	2 BKG	14	L BKG				
¥	CBKG	12	-BKG	20	~ BKG				
5	- BKG	13	L BKG	21	C BKG				
Ú	< BKG	14	< BKG						
1	< BKG	(ງົ	< BKG						
8	< GKG	16	< BKG	<u> </u>	<u> </u>				

RA - RADIATION AREA

CA - CONTAMINATION AREA



NSS-01		SUR	SURVEY NO. NSS - 0067				
Date Time	DOSE RATE		CONTAMI	NATION			
Surveyor	Inst. Type	Beta	Alpha	Beta	_Alpha		
Signature	Serial No.	Inst.Sn					
Reviewed	β [−] Factor	Eff.					
Creation		Bkg.	cpm		cpm		
AREA <u>A MAR</u>	Containment - B Deck	AFTOP	Rizacton				

COMPONENT

井1+#2 - Valve Controls #3 - Large Value Control #4 - Side of Large Pipe #6 - Ludder Down #7 - Handle for Pressure VESSE # 8- Remarker Steel Loser # 9 - Containant Housing #10- Value controls #11- Side of Large Yellow Tank #12- Side of Pressure Uesselle # 13 - Top of Storage Cal. #14- Chain on Chain Hoist #15 - Main Part of Chain Hoist # 21 Side of Reactor

NO		NO.	RESULTS	NO.	NO. RESULTS NO. RESULTS				RESULTS
NO.	RESULTS	NU.	RESULIS	NU.	RESULIS	NO.	RESULIS	NO.	RESULIS
		+							
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RA – RADIATION AREA

CONTAMINATIO

ALL DUSE RATES IN prem/n

RCA - RADIATION CONTROL AREA AA – AIRBORNE AREA

NSS-01	SURVEY NO. 1155-0068				
Date 4/6/05 Time 10:00	DOSE RATE	CONTAMINATION			
Surveyor Ban Sich	Inst. Type Indlum 19	Beta_VAlphaBetaAlpha_			
Signature Annon	Serial No.95 499	Inst.Sn 97416			
Reviewed Kull 4 ennol	β  Factor	Eff. 10%			
	BKG 2 MR/H	Bkg. 40 cpm c	pm		
AREA_ HP Lab -	ADerk				

COMPONENT

#2 - # - Upper CabinetsDM#13 - Top of Scaler- 4 MR#13 - Top of Scaler- 5 MR#14 - Counter infront of Scaler- 5 MR#1b - Top of Scaler- 5 MR#10 - Top of Scaler- 350#17 - Counter in front of Scaler- 350# 20 - Inside Reg. Sink- 350# 21 II"# 22 - Inside Hot Sink"# 23 - Top of Drain inside Hot Sink# 23 - Top of Drain inside Hot Sink# 32 - #38 - Lower Cabinets + Shelves* Sincer# 40 - Air Vent* Sincer# 41 - "* Lower

## DM Readings

- 4 MR above Hot Sink
- 5 MA inside Hot SUK
  - CPM Readings
  - 350 inside Hot sink
  - Restot the Room < 100 CPM

* Sinear No. 22 and 23 had activity levels above background but below MDA (minimum detectable activity) the dom RDR Sinear # 23 Htto dom/100000 counter # 2 Sinear # 12 Counter # 1

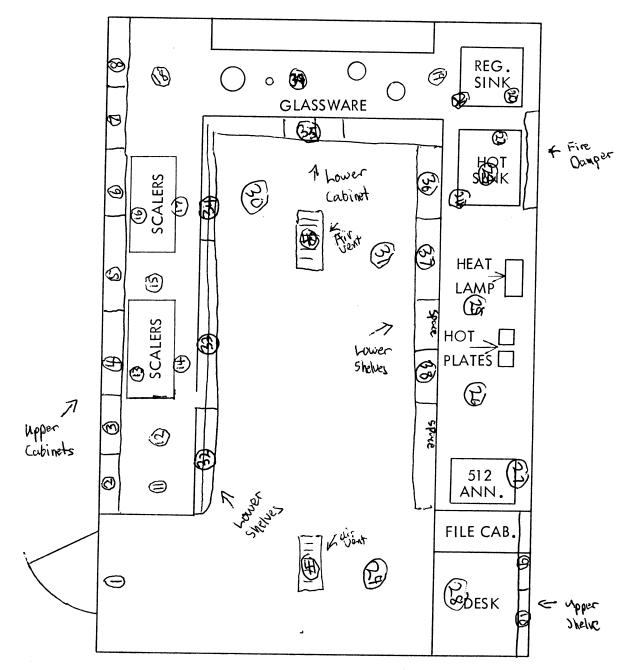
SMEA													
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS				
1	< BKG	9	LBKG	17	LBKG	25	- BKG	33	LBKG				
2	< BKG	10	L BKG	18	~ BKG	26	1 BKG	34	2 BKG				
3	- BKG	11	LBKG	19	L BKG	27	L BKG	35	L BKG				
4	< BKG	12	2 BKG	20	6BKG	28	- BKG	36	LBKG				
Ś_	< BKG	13	< BKG	21	LBKG	29	< BKG	31	-BKG				
6	-BKG	14	<bkg< td=""><td>22"</td><td>100 100</td><td>20</td><td>2 BKG</td><td>28</td><td>LBKG</td></bkg<>	22"	100 100	20	2 BKG	28	LBKG				
1	2BKG	15	< BKG	23*	148	31	~ BKG	34	~ BKG				
8_	< BKG	16	< BKG	24	<u>- Bkg</u>	32	< BKG	40	LBKG				
RA - RA	DIATION AREA		CA CONTA	RA - RADIATION AREA CA - CONTAMINATION AREA ALL DOSE RATES IN urem/h									

RA - RADIATION AREA

CA - CONTAMINATION ARE

RCA - RADIATION CONTROL AREA

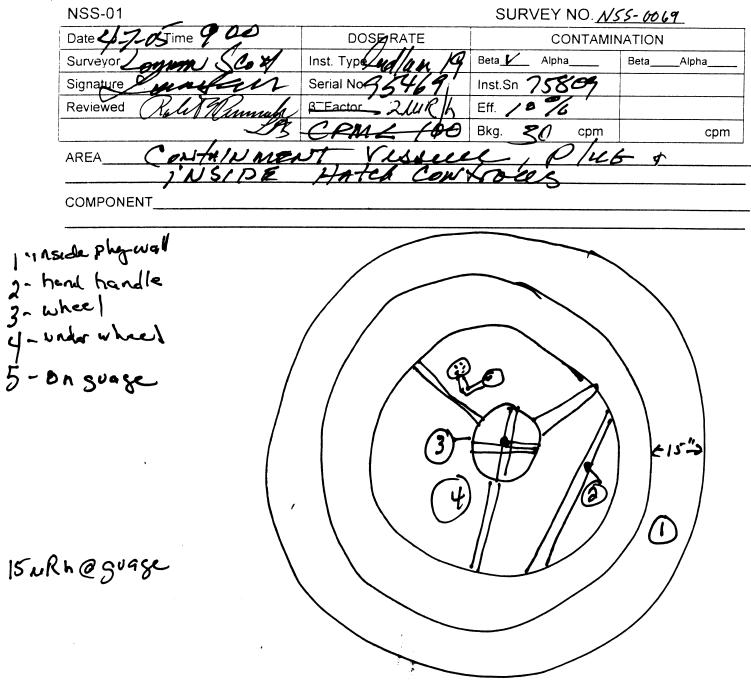
AA – AIRBORNE AREA



TSC-ND-147

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68



SMEA	SMEAR RESULTS IN DPM/400 CM ² -B - BETA in mRAD/hir/100 CM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
	< BKG									
2	L BKG L BKG L BKG									
3,	~BKG									
4	L BKG									
	< BKG									

RA - RADIATION AREA

CA – CONTAMINATION AREA

NSS-01		SURVEY NO.	SS - 170 70								
Date 4-7-05 Time	DOSE RATE	CONTAMI									
Surveyor TAMES H. LOVGDAAL	Inst. Type LUDLUM	Beta Alpha	BetaAlpha								
Signature and N. Lehren	Serial No. 95499	Inst.Sn 97416									
Reviewed Kale France	β ⁻ Factor	Eff. 10 %									
c	4uR/HR	Bkg. 30 cpm	cpm								
AREA LOWER LEVEL "D"	AREA LOWER LEVEL "D"DECK RADIATION SAMPLING RM GAS ADSORPTION										
EQU, P. RM., WASTE	STOWAGE RM										
COMPONENT ACCRESS TH	ROUGH "C" DECIC	, COLD WATMR (	HEMISTRY LAB								
			/								
Swipes		Rapia	TION SAMPLING								
1. INSIDO WASTS STORAGE DECK	STI STI	30 / Roon	1 10~ 3 min p 21100								
2. Top SHOLF 1 "		A HOL W									
3. 2ND SHOLF 11 "	2 A A	K J S S L									
	12, 3 1 × 15 30										
- · · ·	XID (XID)	10000 1000 1000 1000									
7 ENTER DOOR KNUB	(XISISINK										
8. DKRADIATION SAMPL. RM PORT	NTBD -										
9 INSIDE HANGINGVENT DU			REALTOR OPENIM								
		AU)	C NEACION OF ENING								
10: INSIDE OPOSITE FAND VENT. 11. DK AT WASTE STERAGE 12. FILTER # (ANSTOR FANGLE											
11. DK AT WASTE STERAGE	DOOR	204R (1.13)									
12 FIT NHLANSTOR FANKEDEE											
12. PICICK (III - TI AIP -	x 10)	LOOUR XIZ									
3. FILTOK #ICANISTOR FLANGE		HOOLR AD AL	WASTE								
14 TOP of AUX REACTOR PLUG 15, ELECT SWITCH PANEL STU 16 DECK UNDER SWITCH FA	X4	200 UR XD TVAL	STOWAGE								
15, ELECT SWITCH PANEL STO	SUSIDE	×11 44 h	$\langle \cdot \rangle$								
I DECK UNDER SWITCH PA	Will	83 0000	XX5KC								
	PORT	(rAS ADSO	ORPTION								
	1×	EQUIP	RM								
8. SMEAR RESULTS IN OPM/100 CM	久 B-BETA in mRAE	<del></del>									
NO. RESULTS N.O. RESULT			NO. RESULTS								
1 2 BKG 129 2 BKG	17 *										
$\frac{2}{3} \leq \frac{2}{8kg} = \frac{1}{8kg} = \frac{1}{8$	18 < BKG										
4 - BKG SK-BN- LBKG											
5 LBEG SHEHBIG LBEG											
Stor 7 L BKG St +8 5 C BKG											
SHE 8 LBKG 16 - BKG											
RA - RADIATION AREA CA - CO	ONTAMINATION AREA AL	LDOSE RATES IN urem/hr cfs cpm BK	s Eff dis/milocom								
RCA = RADIATION CONTROL AREA AA = A	IRBORNE AREA	cp.	,								
	*	427 854 42	20.5% 39 04 drum								

	NSS-01		SURVEY NO. NO.	55-6671
	Date 4/8/05 Time	DOSE RATE	CONTAMI	NATION
	Surveyor JAMES H. LOVEDAHL	Inst. Type LUDLUM	Beta Alpha	BetaAlpha
	Signature Jonus H. Loudel	Serial No. 95499	Inst.Sn 97416	
	Reviewed Kale Rumph	β ⁻ Factor	Eff. 10%	
		HuR/HR	Bkg. 30 cpm	cpm
	AREA "C" DECK LEVE	LUNDER UPPE	R LEVEL OF S.	ECONDARY
	CONTAINMENT			
(	COMPONENT			
SWIPES	<u> </u>			
A1.	DOOR HANDLIS TO COLD WI	R CHEMLAB PORT	1	~
A2-	DECK AT ALLESS DOO	R	AF!	
A3.	HAND RAIL AT DOOR			NOT Access ABLU
A4-	REACTOR COOLING VALUE FLI	ANIA PORT		Molo
	DECK FWD PORT			$\lambda$
-	PORT FWD LADDER			$\setminus$
A7.	VENT DESVING			
A8- 1	VENT OPENING VENT MOTOR	-	P	2 FORT
A9.	STBD FWD LADDER		4R	
			(A7)	
			ran	XAB /
			2NR	XA9
		XE	RA XXA9 (X	J J J JUR
		2	ur zur zu	$\mathbf{R} \xrightarrow{(A_1)} \mathbf{R} \times 5 \mathbf{A}$
		<u>1</u>	FwD	(442)
			109	ACCESS
				TO COLD.
				WATER CHEM LAB.
				- 0

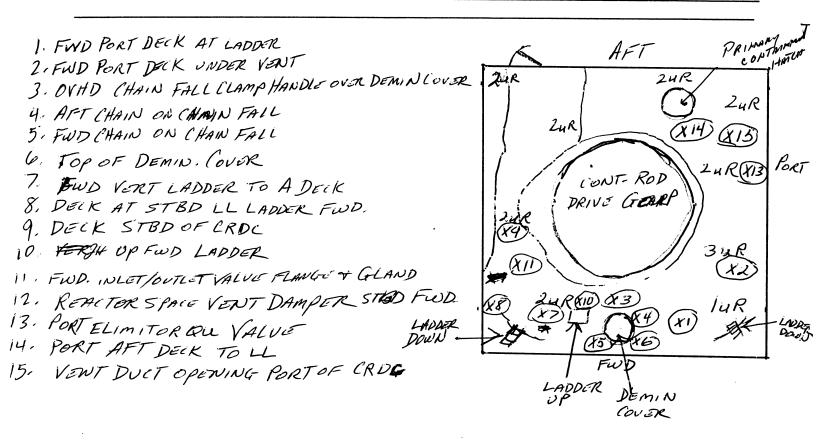
SMEAF	RESULTS -		<del>o cm,</del>	<del>8</del> -	BETA in mR/	<del>\D/hr/10(</del>	<del>) CM²</del>		
NO.	RESULTS N.O. RESULTS				RESULTS	NO.	RESULTS	NO.	RESULTS
AI	2 BKG	A9	2BKG						
AZ	4 BKG								
A3	LRKG								
A 4	L BKG								
45	- OKG	ļ							
16	-BKG								
AZ	-BKG -BKG								

RA - RADIATION AREA

CA – CONTAMINATION AREA ALL DOSE RATES IN µrem/hr

NSS-01	SURVEY NO. N55-0072								
Date 4 - 8 - 05 ime	DOSE RATE CONTAMINATION								
Surveyor JAMOS H. LOYUDA	HInst. Type LUDLUM	Beta Alpha	BetaAlpha						
Signature America N. Lorder	Serial No. 95499	Inst.Sn 97416							
Reviewed Kule Thermoch	β  Factor	Eff. 10%							
	HUR/HR	Bkg. 30cpm	cpm						
AREA "B"DECK UPPER LEVEL SEIONDARY CONTAINMENT AREA									
		TODAY COM	NONCOT MA						

COMPONENT



## NO FRISKING

SMEA	R RESULTS 🔺	N-DPM/10	<del>)0-0M²⁻</del>	- <del>B.⇒ BETA in mRAD/hr/100 CM²</del>					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
i .	2 BKG	9	~ BKG						
2	< BKG	10	-BKG						
3	- BKG	11	- BKG						
Ч	- BKG	12	2 BKG						
5	< BKG	13	< BKG						
6	-BKG	14	L BKG						
_7	< BKG	15	< BKG						
8	< BKG	L							

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

NSS-01	SURVEY NO. <u>//55 - 0073</u>					
Date 4/8/05 Time	DOSE RATE	CONTAMIN	CONTAMINATION			
Surveyor JAMES H. LOVEDAHL	Inst. Type LUDLUM	Beta Alpha	BetaAlpha			
Signature onus N. Sounder	Serial No. 95 4 99	Inst.Sn 974/6				
Reviewed	β  Factor	Eff. 10%				
	YUR/AR	Bkg. 30 cpm	cpm			
AREA <u>A DECK ABOVE</u>	SECONDARY CON	TAINMENT				

COMPONENT

Swifes B. RAIL ON FWD BABD ACCESS LADDER 2 B. DECK AT ACCESS LADDER 2uR 2uR X5B 3B. ESCAPE HATCH HANDLE 2uR 4B. DECK AT ESCAPE HATCH CONT. ROD 3B. RINGGASKET SEAL ON CRDM 6B. VENT DURK ON STRIPORT AT HATCH DRIVE MECH. 2nR III. X2B Luk HATCH LADDER Aicéss DVHD TO COMPT.

## FRISK < 100 CPM

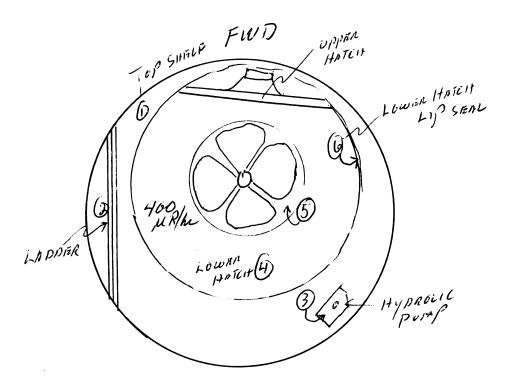
SMEAR RESULTS IN DPM/100 CM ² B=BETA-in-mRAD/hr/100 CM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
İB	LBKG								
23	LBK6								
<u>3B</u>	- BKG								
<u> 4B</u>	< BKG								
<u>56</u>	~ BKG								
6U	< BKG								

**RA - RADIATION AREA** 

CA – CONTAMINATION AREA

NSS-01	SURVEY NO. <u>//55-0074</u>			
Date 4-8-65 Time 1; 00 ,21	CONTAMINATION			
Surveyor CRADDUCK	Inst. Type LUDIUM MIR	Beta Alpha	BetaAlpha	
Signature Acoloric	Serial No. 95499	Inst.Sn 974/6		
Reviewed RuhteRumont	β [—] Factor	Eff. 10%		
	BKG. 4µR/In	Bkg. 30 cpm	cpm	
AREA PRIMAR CONTISIMIN	· · · ·			

#### COMPONENT_



SMEA	R RESULTS	H BPM/ TOU CIVI2 B BETA IN TRAB/11/ TOU CIVIS							
NO.	RESULTS NO RESULTS			NO.	RESULTS	NO. RESULTS		NO.	RESULTS
7	~ BKG								
2	× BKG								
3	~ BRG								
4	LBRG LBRG								
5	2 BKG								
Ý	< BKG								
A _ R	DIATION AREA		CA - CONTA	MINATION			RATES IN urem/h	r	

RA - RADIATION AREA

CA – CONTAMINATION AREA

NSS-01	SURVEY NO <u>NSS-0075</u>					
Date 4-8-03 Time 13.00	DOSE RATE	CONTAMINATION				
Surveyor Scott (Bowen	Inst. Type up/um/9	BetaAlpha	BetaAlpha			
Signature amou Acaff	Serial No 42972	Inst.Sn				
Reviewed Ko WEPumph H	13-Factor BKG-LTOU	Eff.				
	24R/h	Bkg. cpm	cpm			
AREA Secondary Cont. A	FT-MEZZINE	E Lower as	YA			
/	(min lave)	1				

COMPONENT_____

General Area dose TATE 3-5 MR/hr

LADDER Electric Panels -41 ~ 7 8 20 NR/hr

SMEA	R RESULTS +	N DPM710	<del>0 GM</del> 2	<del>B = BETA in mRAD/hr/180 CM² -</del>					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	LBKG	9	LBKG LBKG						
2	LBKG	10	~BKG						
3,	L BKG								
4	< BKG								
-2-	LBKG LBKG			[					
-4	= BKG								
8	~BKG								

**RA - RADIATION AREA** 

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CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

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DURATEC 28991 TRLETECTOR N.S. SAVANNAH RADIOLOGICAL SURVE **NSS-01** SURVEY NO. 1155-0076 BOWEN DOSE RATE CONTAMINATION Scot Inst. Type Surveyor Beta Alpha Beta Alpha Serial No. 42172 Signature Inst.Sn Reviewed β[−]Factor Eff. BKAL Bkq. cpm cpm Reactor LOWER AREA • untaimer COMPONENT SURVEY CRWISE Counte Demin. HANX Removed EDVALUE HANDLE 8 RIGHTENTRY 51- 8Y K3SMAI! DRAIN VALLE Containment Belly Pending Jith High READING 1 yellow) RT. SIDe DSTAR Front Annive Lower 221 mornhe AR Pipe in ornhe AR Fipe in ornhe ACE 655 12 Ľ - WILLOWSA TO LOWSA PEACTOR Ø ARENY * (3) Cover SUMP oil

SMEAR RESULTS *** BPM/100 CM*				•B-= BETA-in-mRAD/hr/100-CM ² •					
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
	L BKG	9*	- BKG						
2	< BKG	10	LOKG						
3	L BKG	112	2 BKG						
4	L BKG	12	LBKG						
5	- BKG	13	< Bkg						
6	< BKG	1/2	< BKG						
9	-BKG	13	< BKG						

RA - RADIATION AREA

CA - CONTAMINATION AREA

AA - AIRBORNE AREA

ALL DOSE RATES IN prein/hr

RCA - RADIATION CONTROL AREA

	N.S. SAVANNAH		LRATEC
	RADIOLOGICAL SUF	RVEY	FLATACTOR
NSS-01	· /	SURVEY NO. N	55-007(
Date4-805 Time 1400	DOSE RATE	CONTAMI	NATION
Surveyor SCOTT - BGODEN	Inst. Type UD/UN 19	Beta Alpha	BetaAlpha
Signa ana Acat	Serial No.42972	Inst.Sn	
Reviewed Kolo Valumoch	B-Factor WR/h	Eff.	
	BKG-LISS	Bkg. cpm	cpm
AREA SULVEY N	lotes		

Also USED

COMPONENT LOWER CONTAIN MENT AREA

ZZIMRDRAIN VAIVE RIGHTENTRY MARKET. HEAD LEVEL- 1.4 1.6 MR/Ar 1-3 TANKS 400 - 600 (LAB WASTE TAKS) STAR FRONT KALF - 400-530 MR/hr (ben. AREA) LHD WASTE TANK- 600 MR R/hr (#2 tANK) 400 MR/hr Star FORWARD POIMAry on Relief Value Contanment Vesse FORWARD READING UNDER NIS RATOR 60-80 ORT ALT GENE AFT Gen. Aren - La NRA PENERATION # 56 WALL ON PORTSIDE) - 80 NR/hr The Gen Area - 60-80 NR/

SMEAR RESULTS -IN-EPM/100 CM²

+B = BETA in mRAD/hr/1

NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS

RA - RADIATION AREA

CA – CONTAMINATION AREA

	RADIOLOGICAL SU	IKVEY	
NSS-01		SURVEY NO. N.	55-0077
Date 4/1/05 Time 8:45	DOSE RATE	CONTAMI	
Surveyor Ben Scott	Inst. Type Ludim 14	Beta Alpha	BetaAlpha
Signature Bry 2	Serial No.95499	Inst. Sn 37416	
Reviewed Role Eleman	β ⁻ Factor	Eff. 10 70	
	·	Bkg.	cpm
AREA Primary Cont.	Hatch (LowEn	e) - Jpper	hatch
to Primery containment	- Lower hut	-h STILL SERVET	) at this faint
COMPONENT	****		
	port		
1 Hundres Into Riber		DM R	ociding /
1 - Under Lip Ring		= 40	
		Inside t	Joth
		Inside r	Julich
			/
	PER		/
			/
	Ladder Down		/
	Down (2)		
	9		
		/ /	
	3		
	(3)		
			$\backslash$
			$\backslash$
	Starbourd		$\mathbf{X}$
	)TA bourn-		
SMEAR RESULTS HNDPM/100 CM2-	<del>8 = BETA in mRA</del>	D/hr/100 CM ²	
NO. RESULTS N.O. RESUL	LTS NO. RESULTS	NO. RESULTS	NO. RESULTS
j < BKG			
$\frac{2}{3} \leq BKG$			
4 4 BKG			

RCA - RADIATION CONTROL AREA

NSS-01		SURVEY NO. <u>1/55-00</u> 78				
Date 4/11/05 Time	DOSE RATE	CONTAMINATION				
Surveyor J. Bowen	Inst. Type	Beta A	Alpha	BetaAlpha		
Signature	Serial No.	Inst.Sn				
Reviewed	β  Factor	Eff.				
		Bkg.	cpm	cpm		
AREA PRIMIEN CONT	L (fre	-/iminarii)				
			(			

COMPONENT

Upon 1st Entry - General Location Smears - No MAP - Perform Rough Assessment - Detaic Survey WILL FOLLOW, JNB

#11 250 dan - 2 1000 dan / 100 cm 2 #15 96 dam - 2 1000 dan / 100 cm 2

SMEA		IN DPM/10	O-CM2	<del>8 -</del>	BETA in mRA	D/hr/100	) CM ²		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BKGD	9	LBKG						
2	4 BKGD	10	< BKG						
3	4 BKCD	11	47 cts						
4	L BKG	12	LBKG						
5	LAKG	13	< BKg						
6	LBKG	'14	4 BKG						
7	-BKG	15	total 3 tet						
Ø	< BKG								

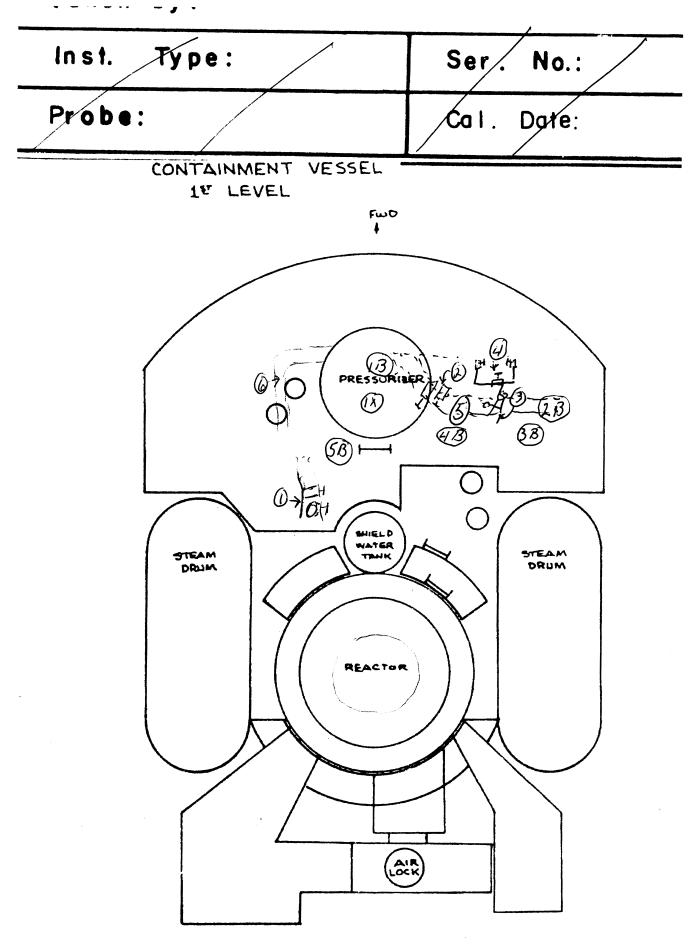
**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

NSS-01				0	URVEY NO	.,,	
Date 4-14-05	Time 9 AM	D	OSE RATE			TAMINATION	
Surveyor R. BT		Inst. Typ	be N/II	Beta_	Alpha	Beta	_Alpha
	VE Pannol-	Serial No		Inst.S	on See	Below)	
	4Blilly 2	β  Facto	ſ	Eff.			
				Bkg.	C	pm	cpm
AREA7	RR Sini				***	1127 Norran	
3 CONTAIN	- · · •	TO REDIT	PRIESSUR FLACE	Пансто.е І <b>с</b> кл	113 - Par 213 - 313 - 313 - 413	HZB BSSURIZIER II PIPA LOUR RTOF II LTOF	eff 25.2% = 160019 eff 20.8% AT PIPEUUTOF = 2 RTOF 13R5. = ComTAMIMA
FLOOR					1		
5 FLOOR 9 PRIZSSURIA Sample #	Counter	gross counts	gross (pm	BKG	Net	<u>dpm</u> 100 cm ²	
RIZSSURIS Shep		gross	gross		-		Simear # 5
9 PRIESSURIA Sample # 1 X		gross counts	gross (pm	cpm	срт	100 cm 2	1-hour Con
9 PRIESSURIA Sumple #	Counter 2 1	gross counts 52 50	<b>g</b> ross <u>Cpm</u> 104 100	<u>срт</u> 42 37	<u>срт</u> 62 63	700 cm² 298 250	1-hour Con
9 PRIESSURIA Sample # 1 X		gross counts 52	<b>g</b> ross (pm) 104	<u>срт</u> 42 37	<u>срт</u> 62 63	100 cm² 298	1-hour Con
9 PRIESSURIA Sample # 1 X	Counter 2 1	gross counts 52 50 68	<b>g</b> ross <u>Cpm</u> 104 100 136	<u>срт</u> 42 37 42	<u>срт</u> 62 63 94	700 cm² 298 250	
PRIESSURIA Sample # 1 X 3 4.	Counter 2 1 2 1	gross counts 52 50 68 171	<b>g</b> ross <u>Cpm</u> 104 100 136 342	<u>срт</u> 42 37 42 37	срт 62 63 94 305	100 cm ² 298 250 452 1210	1-hour Cou X activity 2.8 dpm/ Soucer # 4 < more
PRIESSURIA Sample # 1 X 3 4 5	Counter 2 1 2 1 2 1 3(Fleer) X	$\frac{9russ}{counts}$ $52$ $50$ $68$ $171$ $= 77.8 = 3$	<b>g</b> ross <u>Cpm</u> 104 100 136 342	<u>срт</u> 42 37 42 37 5.лест	<u>срт</u> 62 63 94 305 # 4 (ss	100 cm ² 298 250 452 1210	1-hour Cou X activity 2.8 dpm/ Soucer # 4 < more
PRIESSURIA Sample # 1 X 3 4 5	Counter 2 1 2 1 3( <i>Floor</i> ) d TS IN DPM/100 CM	$\frac{9russ}{counts}$ $52$ $50$ $68$ $171$ $= 77.8 = 3$	<b>g</b> ross <u>Cpm</u> 104 100 136 342 93067 <b>B=BETA in</b>	<u>срт</u> 42 37 42 37 <i>Smec</i> ur mRAD/hr/16	<u>срт</u> 62 63 94 305 # 4 (ss	100 cm ² 298 250 452 1210 11ncs) x = 1	1-hour Cou X activity 2.8 dpm/ Soucer # 4 < more
PRIESSURIA Sample # 1 X 3 4 5 14 Smear # 15 14 Smear # 14 SMEAR RESULT NO. RESULT 1 X 52 (	$\frac{Counter}{2}$ $i$ $j$ $j$ $f(for) d$ $TS HOPM/100 CM^{2}$ $TS NO. R$ $2^{*}) A Z$	$\frac{9ross}{counts}$ $52$ $50$ $68$ $171$ $= 77.8 = 3$ $ESULTS NC$ $BKG 77$	<b>g</b> ross <u>(pm</u> ) 104 100 136 342 03067 <b>B=BETA in</b> <b>C</b> RESULT <b>4</b> 26KG	<u>cpm</u> 42 37 42 37 5.mecur mRAD/hr/16 s NO. 7/3	<u>срт</u> 62 63 94 305 # 4 (ss <del>20 СМ²</del> <u>RESULTS</u> <u>&lt; ВКС</u>	100 cm ² 298 250 452 1210 11ncs) x = 1	1-hour Con x activity 2.8 dpm/ Smear # 4 < mon 19, B = 6701
$\frac{P_{RIZSSURIA}}{Sample} = \frac{1}{2}$ $\frac{Sample}{Sample} = \frac{1}{2}$ $\frac{1}{3}$ $\frac{4}{5}$ $\frac{4}{5}$ $\frac{14}{SMEAR RESUL}$ $\frac{NO. RESULT}{1 \times 52}$ $\frac{1}{4} \times 52$	$\frac{Counter}{2}$ $\frac{1}{2}$ $\frac{1}{3}\left(\frac{Floor}{5}\right) d$ $\frac{TS \text{ IN DPM/100 CM}}{TS \text{ IN DPM/100 CM}}$	$\frac{9russ}{counts}$ $52$ $50$ $68$ $171$ $= 77.8 = 3$ $ESULTS NC$ $BKG TT$ $BKG IO$	<b>g</b> ross <u>(pm</u> ) 104 100 136 342 23067 <b>B=BETA in</b> <b>RESULT</b> 4 2 BKG 4 2 BKG	<u>срт</u> 42 37 42 37 <i>Smear</i> mRAD/hr/16 5 NO. 7/3 <b>XY</b> 2. В	срт 62 63 94 305 # 4 (ss <del>20 СМ²</del> <u>RESULTS</u> <u>&lt; ВКС</u> <i>SKG</i>	100 cm ² 298 250 452 1210 11ncs) x = 1	1-hour Con x activity 2.8 dpm/ Smear # 4 < mon 19, B = 6701
PRIESSURIA Sample # 1 X 3 4 5 14 Smear # 15 14 Smear # 14 SMEAR RESULT NO. RESULT 1 X 52 (	$\frac{Counter}{2}$ $i$ $j$ $j$ $f(flowr) d$ $TS HOPPM/100 CM^{2}$ $TS NO. R 2^{*}) A = 2 2^{*} A = 2 3A = 2$	$\frac{9ross}{counts}$ $52$ $50$ $68$ $171$ $= 77.8 = 3$ $ESULTS NC$ $BKG 77$	<b>g</b> ross <u>(pm</u> ) 104 100 136 342 23067 <b>B=BETA in</b> <b>RESULT</b> 4 2 BKG 4 2 BKG	срт 42 37 42 37 5.meer mRAD/hr/HC 5 NO. 7.B 4.B 4.B 4.B 4.B	<u>срт</u> 62 63 94 305 # 4 (ss <del>20 CM²</del> <u>RESULTS</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u>	100 cm ² 298 250 452 1210 11nc=s) x = 1	1-hour Con x activity 2.8 dpm/ Smear # 4 < mon 19, B = 6701
PRIESSURIA Sample # Sample # X 3 4 5 4 5 4 5 4 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 14 5 14 14 5 14 14 5 14 14 5 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 1	$\frac{Counter}{2}$ $\frac{1}{2}$ $\frac{1}{3} \left(\frac{Flour}{2}\right) d$ $\frac{1}{1} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int \frac{1}{2} \int $	$\frac{gross}{counts}$ $52$ $50$ $68$ $171$ $= 77.8 = 3$ $ESULTS = 0$ $BKG = 77$ $BKG = 107$ $BKG = 107$ $BKG = 107$ $BKG = 107$	<b>g</b> ross <u>(pm</u> ) 104 100 136 342 23067 <b>B=BETA in</b> <b>RESULT</b> 4 2 BKG 4 2 BKG	срт 42 37 42 37 5ест mRAD/hr/16 5 NO. 1/3 23 Д.В ДЗ 3 В	<u>срт</u> 62 63 94 305 # 4 (ss <del>20 CM²</del> <del>КЕ</del> <u>КС</u> <i>КС</i> <i>КС</i> <i>КС</i> <i>КС</i>	100 cm ² 298 250 452 1210 11nc=s) x = 1	1-hour Con x activity 2.8 dpm/ Smear # 4 < mon 19, B = 6701
PRIZESURIA Sample # Sample # 1 X 3 4 5 14 SMEAR RESULT 1 X 5 14 SMEAR RESULT 1 X 5 14 SMEAR RESULT 1 X 5 1 4 5 1 4 5 1 4 5 1 4 5 1 4 5 1 4 5 1 4 5 1 4 5 1 4 5 1 1 5 1 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1	$\frac{Counter}{2}$ $i$ $2$ $i$ $3\left(\frac{Flowr}{2}\right) \neq 1$ $\frac{5\left(Flowr}{2}\right) \neq 2$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	$\frac{gross}{counts}$ $52$ $50$ $68$ $171$ $= 77.8 = 3$ $ESULTS = 3$ $BKG = 77$ $BKG = 101$ $BKG = 101$	<b>g</b> ross <u>(pm</u> ) 104 100 136 342 23067 <b>B=BETA in</b> <b>RESULT</b> 4 2 BKG 4 2 BKG	срт 42 37 42 37 5.meer mRAD/hr/HC 5 NO. 7.B 4.B 4.B 4.B 4.B	<u>срт</u> 62 63 94 305 # 4 (ss <del>20 CM²</del> <u>RESULTS</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u>	100 cm ² 298 250 452 1210 11nc=s) x = 1	1-hour Con x activity 2.8 dpm/ Smear # 4 < mon 19, B = 6701
PRIESSURIA Sample # Sample # X 3 4 5 4 5 4 5 4 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 5 14 14 5 14 14 5 14 14 5 14 14 5 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 1	$\frac{Counter}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{5(Floor)} \neq$ $\frac{1}{5NO.R}$ $\frac{2^{*}}{2A} \neq \frac{2}{2A}$ $\frac{1}{2A} \neq \frac{2}{2A}$	$\frac{gross}{counts}$ $52$ $50$ $68$ $171$ $= 77.8 = 3$ $ESULTS = 0$ $BKG = 77$ $BKG = 107$ $BKG = 107$ $BKG = 107$ $BKG = 107$	<b>g</b> ross <u>(pm</u> ) 104 100 136 342 23067 <b>B=BETA in</b> <b>RESULT</b> 4 2 BKG 4 2 BKG	срт 42 37 42 37 5.meer mRAD/hr/HC 5 NO. 7.B 4.B 4.B 4.B 4.B	<u>срт</u> 62 63 94 305 # 4 (ss <del>20 CM²</del> <u>RESULTS</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u> <u>&lt; ВКС</u>	100 cm ² 298 250 452 1210 11nc=s) x = 1	1-hour Con x activity 2.8 dpm/ Smear # 4 < mon 19, B = 6701



CONTAINMENT VESSEL

NSS-	01		SURVEY NO. <u>NSS - 6080</u>									
Date 🗘	4/1/05 Tim	e 2:00		DOS	SE RATE					MINATI		
Survey	or Ber	5.07	ft Ir	nst. Type	(\	Be	eta	Alp	ha	_ Bet	aAI	pha
Signatu	• .	・ ) へ		erial No.	A	In	Inst.Sn					
Review	ved		β	Factor	NIN	E	ff.	N	117			
					5 [	B	kg.		cpr	n		cpr
AREA	Steo	im Co	nd. H	atch	(Engine	Roov	n)	****				
COMPO	ONENT											
- Cros	5 Pinc											
- Flute	•											
	Kot Huten		Ø		σc		-					
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<b>`</b>												
<b>\</b>					4.950 x							
<u> </u>			ENT	<del>8</del> -	BETA in m	RAD/hr	<del>/100-C</del>	₩ ²				
SMEAR	RESULTS				RESULTS	NC		RESU	LTS	NO.	RESI	JLTS
SMEAR	RESULTS	N O.	RESULTS	NO.	RESULIS		·					
NO.	RESULTS ~ BKG		RESULTS	NO.	RESULIS		,					
NO. i	RESULTS ~BKG ~BKG		RESULTS	NO.	RESULTS		,					
NO. i 2 5	RESULTS ~BKG ~BKG ~BKG		RESULTS	NO.	RESULTS							
NO. i	RESULTS ~BKG ~BKG		RESULTS	NO.	RESULTS							
NO. i 2 5	RESULTS ~BKG ~BKG ~BKG		RESULTS	NO.								

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NSS-01		SURVEY NO.	5-0081
Date 4/11/05Time 1100 Am	te 4/11/05Time 1100 Am DOSE RATE		
Surveyor JAMES LOVEDAHL	Inst. Type LUM	Beta Alpha	BetaAlpha
Signature tome for tal	Serial No. 95469	Inst.Sn 97416	
Reviewed Rale Elemon	β ⁻ Factor	Eff. 10 70	
	HSMR JuRh	Bkg. <i>30</i> cpm	cpm
AREA D" DECK HOT	CHEM LAB	AT CONTROL	Room

COMPONENT Scal # 7603

SWIPES	Forward	
#1 Sink	×2 × 20	
# 2 Inside Collection touch (worste) (369 dam/in	$(x_1)$ $(x_1)$ $(x_2)$	
#3 Top of contertop	×23 ^3 × DF	
#4 Inside Hood	x26 x10 x12	
#5 Outside Hood Door Port	F X 10 X27 X4	Sturboard
#6 Aft counter top	x17 x13 X25-X5	
#7 12 Shelt inside Att Constator	×19 ×14 N5	
# 8 2ND Shelf inside Aft compertup	N5	
#9 Bottom shelf "	X28 X (2 X7	
# 10 Top shelt under Hod	X28 X6 X4	
## 11 Bottom" N	Aft	
#12 Hood Vent		
# 13 Ourshead Vent	# 19 Bottom Sheff Port #29 Light Sw # 20 Top Shek Forward #30 Inside Do	
# 14 Shelf Aft of Hlood (top)	#21 Middle Shek Forward	er knov
# 15 11 (Buttom)	#22 Drain under somple Shk 1712/ / 2	)
# 16 Port Top Shelt	# 22 Drain under sample Shk # 23 Bottom shelt under sink - (34/6dpm/100 cm ² ) # 24 Bottom shelt Forward	
#11 Port Top of Cabinet	# 25 Floor intront of Hood	
#18 Millle shelf Portsile	#26 Floor infront of Soumpk Sink #27 Deck Draw	
UM Readinys K BKG	# 27 Dicik Drawn # 28 Floor inbrant of Door	
	$B = \frac{BETA \text{ in mRAD/hr/100 CM}^2}{BETA \text{ in mRAD/hr/100 CM}^2}$	
SWEAR RESULTS IN DEWING ON IN COTOM		

NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BKG	9	<bkg< td=""><td>17</td><td>&lt; BKG</td><td>25</td><td>&lt; BKG</td><td></td><td></td></bkg<>	17	< BKG	25	< BKG		
2	65its	10	LBK9	18	< BKG	26	~ BKG		
3	< BKG	11	-BKG	19	< BKG	27	< BKG		
4	2BKG	12	6 BKG	20	- BKG	28	< BKG		
5	2 BKG	13	LBKG	21	2 BKG	29	< BKG		
6	LBKG	14	LBKG	22	- BKG	30	< BKG	1	
7	L BKG	15	LBKG	23	57cts				
8	-BKG	16	<bkg< td=""><td>24</td><td>~BKG</td><td></td><td></td><td></td><td></td></bkg<>	24	~BKG				
≀A – RA	DIATION AREA		CA – CONTA	MINATION	NAREA A		RATES IN µrem/h		. dpm /

RCA – RADIATION CONTROL AREA AA – AIRBORNE AREA

Smear 2

13

"pm/100 cm2 369 241

65 130 37 93

72

57 114 47

NSS-01	SURVEY NO. NSS-0082									
Date //2005Time /000	DOSE RATE	CONTAMI	NATION							
Surveyor BOLDEN SCOTT	Inst. Type/Elk	Beta Alpha	BetaAlpha							
Signature At ACTIV	Serial No. Districtor	Inst.Sn								
Reviewed Kalet Pinnan	β ⁻ Factor 28991	Eff.								
		Bkg. cpm	cpm							
AREA			D.							
PRIMARY FS										
COMPONENT CONTAIN	INENT VES	SKI 32	D / EULL							

SER DRAWING.

* SMEARS From Containment - 15 LVL AFT. DATA MOUTER TO AppropRIATA SCRUM

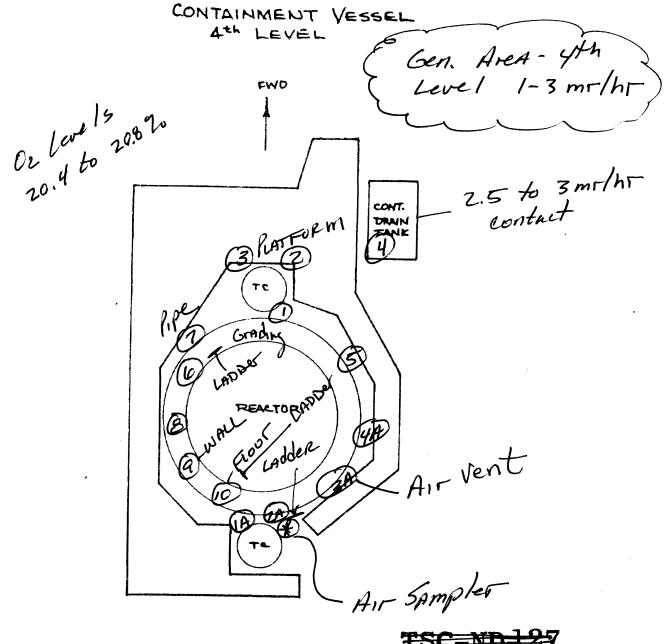
SMEA		N-DPM/10	O CM ²	-B-= BETA in mRAD/hr/100 CM ²					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
IA	LBKG	7A-	-BKG #	6	LBKG				
2A	< Bkg	i0A_	- BREAS	_7	~BKG				
3A	< BKG			8	< BKG				
HA 3A	-BKG	1	~BKG	9	L BKG				
	LBKG	2	LBKG	10	L BKG				
6A	BKG	<u> </u>	LBKG LBKG						
7A 8A	< BKG	5	          						

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA



1-4

NSS-01	01 SURVEY NO. <u>N/55- 0083</u>					
Date 4-12-05 Time 1060	DOSE RATE	CONTAMINATION				
Surveyor Bowen Scott	Inst. Type TELE	Beta Alpha_		Beta	_Alpha	
Signature Maw. S.	Serial No. Detector	Inst.Sn N/A				
Reviewed How Withermost	β ⁻ Factor 28991	Eff.				
		Bkg.	cpm		cpm	
AREA <u>Containment</u> <u>PRIMIN</u> COMPONENT	Vesse/ 1st	leve 1				

SEE ATTACHED DANWING

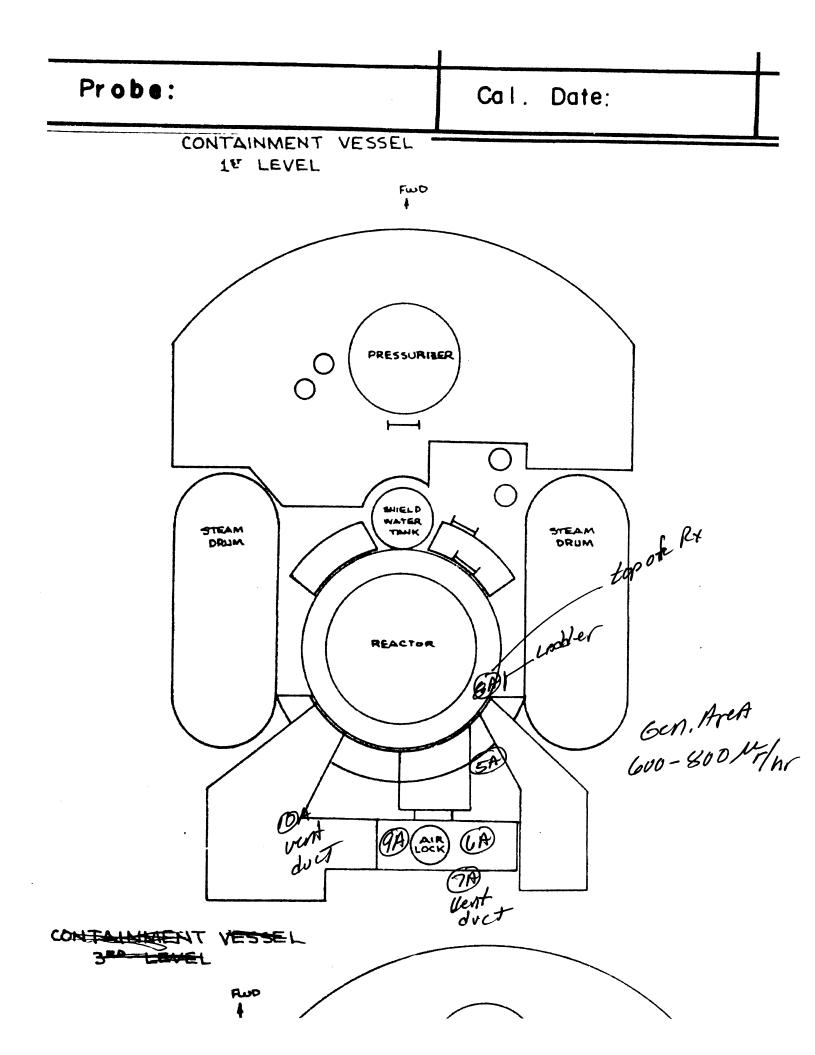
SMEA	SMEAR RESULTS IN DPM/100 CM ²										
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS		
5A	< BRC										
GA 7A	< BKG										
7A	4 BKG										
8A	< BKG										
9A	LBKG										
8A 9A 10A	LBKC LBKG										

RA - RADIATION AREA

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

MR/h METER SN 95469



NSS-01	SURVEY NO. <u>NSS-0084</u>					
Date 4-1205 Time (000 Am	DOSE RATE	CONTAMINATION				
Surveyor Scott	Inst. Type tele defector	-Beta	Alpha	Beta	_Alpha	
Signature Life Aract	Serial No. 28991	Inst.Sn				
Reviewed Rule annous	β  Factor	Eff.				
		Bkg.	cpm		cpm	
AREA Primary Containme	mt - 2nd Leve					
AREA Minary Containne	m1 - 2nd Leve					

COMPONENT_____

SIER ATTACHED PRANTING

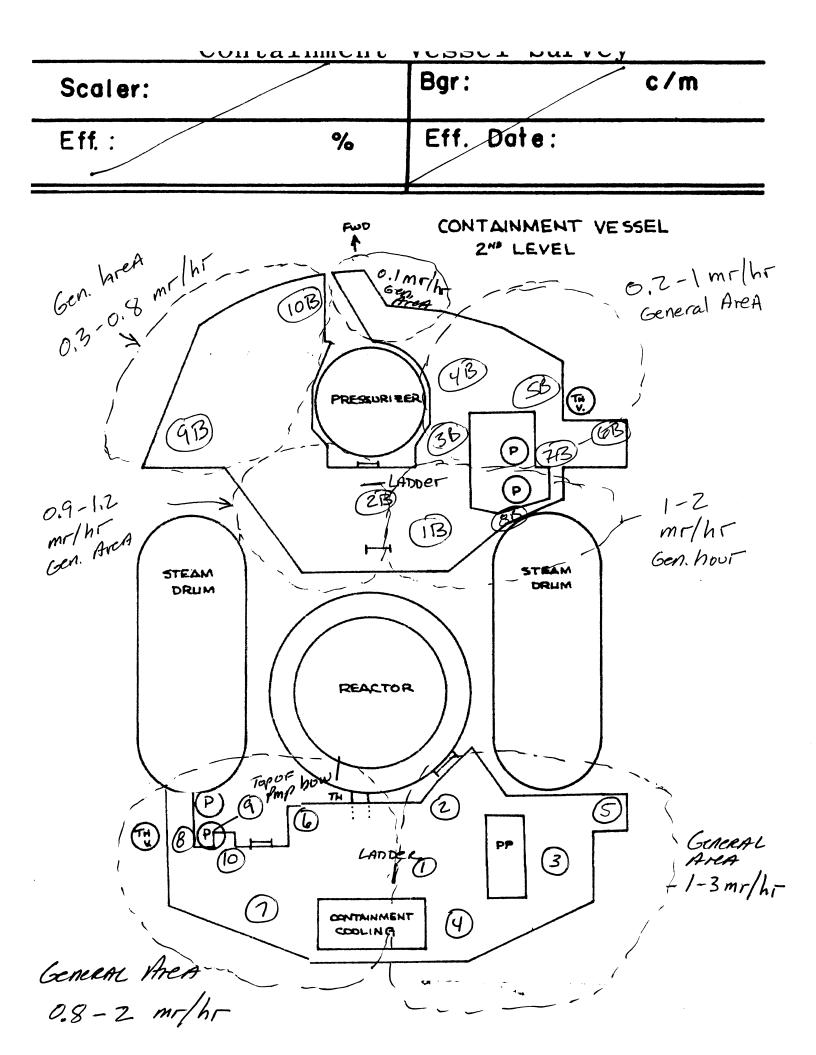
SMEAR RESULTS IN DPM/100 CM ² B = BETA in mBAD/hr/100 CM ²									
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	LBKG	9	LBKG	100 iB	< BKG	чB	∠ BKG		
2	2 BKG	10	4 BKG	2B	< BKG	10B	2BKG		
3	L BEG			<u>3</u> B	< BKG				
	2 BKG			40	- BKG				
5	L BK6			50	< BKG				
6	L BKG			<u>6</u> B	< BKG				
8	L BKG			7B 8 A	< BKG				

RA - RADIATION AREA

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA – AIRBORNE AREA



	SURVEY NO. 149	55-00 85
DOSE RATE	CONTAMI	NATION
Inst. Type deatector	Beta Alpha	BetaAlpha
Serial No. Adudo	Inst.Sn	
B-Factor 28991	Eff.	
	Bkg. cpm	cpm
IMMIEAN J		
7		
ul Ussel	Containined	, 7
	Inst. Type <u>left</u> Top Serial No. <u>Jeff</u> B-Factor 28991	DOSE RATE CONTAMI Inst. Type Clear Alpha Serial No. Serial No. S

SIEE ATTHCHEN MIDP

 $\frac{5}{10} = 273 \, dpm/100 \, cm^2}{7} = 269 \, dpm/100 \, cm^2}$ 

SMEA	R RESULTS	IN DPM/10	0 CM ²	B = BETA in mRAD/hr/100 CM ²					
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
IA	LBKG	9A	~ BKG	)	< BKG	9	< BKG		
2A	- BKG	10A	\$ 53 ct (106, pm)	え	< BKG	10	LBKG		
3A	< BKG			3	< BKG				
HA	< BKG			н	< GKG				
6A	< BKG			5	< BKG				
GA	< BKG			6	< BRG				
7A	< BKG			_'7	+49 (98 cpm)				
BA	× 8k6			5	-ORG	L			

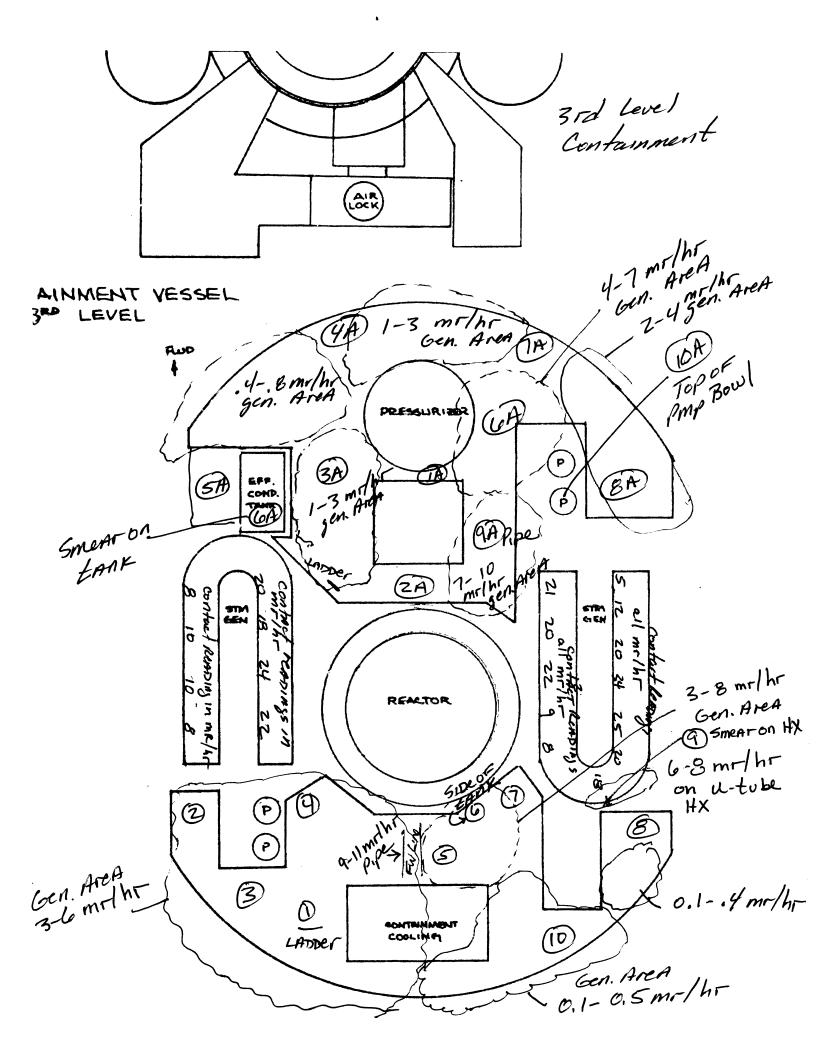
RA - RADIATION AREA

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA

AA-AIRBORNE AREA * Smears IOA + 7 retained



. Her

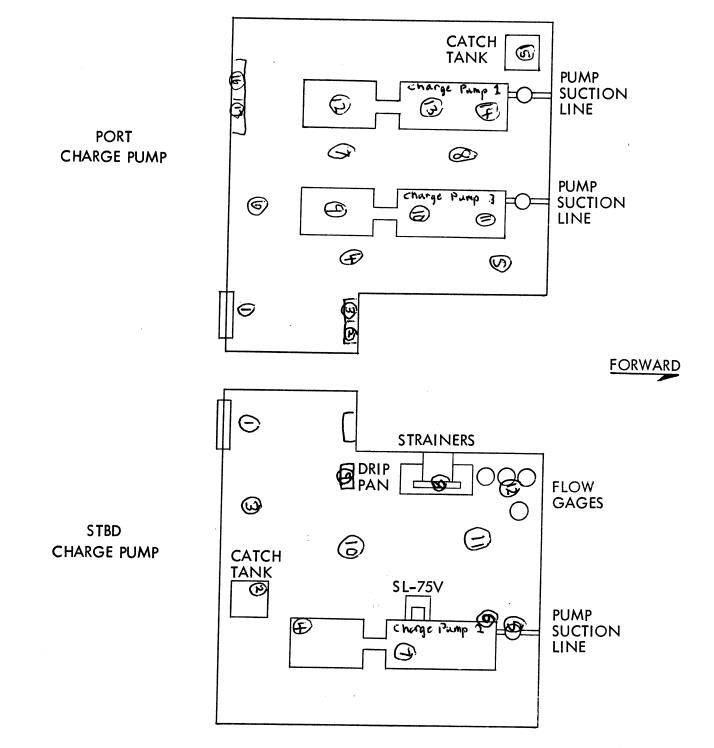
NSS-01		SURVEY NO. M	55-008X6
Date 4/12/05 Time	DOSE RATE	CONTAMIN	NATION
Surveyor Bon Scott	Inst. Type 42972	BetaAlpha	BetaAlpha
Signature Bmm )-	Serial No. Ludlum 19	Inst.Sn 91037	
Reviewed Rall GAmmon	β [−] Factor	Eff. 1070	
	BKG 4 MR/H	Bkg. 40 cpm	/ cpm
AREA Charge Pinni	os 1-3		

COMPONENT

charge Pump # 1+3 Brt. STBD. Charge Pump#2 # | Floor #) Floor 2 Primary Gate Value Control #2 Top of Catch Tunk #3 Floor 3 main feed HZo Control #4 (ontrois for Swnp Dump (Aft) 4 floor # 5 Lorge Value (Pump SL-P1 Suct. 5 floor SL-1V) le walkway decle motor #6 Lurge Machine (Worthington) 7- Floor botus motors &-floor btw eng. rumps #7 (ontrois for Sump Pump (Forward) 9 top of Elee motor chilling # 3 # 8 Large Metal Bell with Large Bolts 10 Humins Hweler molerachsonp #9 Controls for Waste Dilution Pung 11 charge from p# 3 井IO Floor 12 topof Elec motor chy Roop # 1 #11 Floor 13, Howing the motors chy Romp # 3 #12 Flow Gages 14 chy Amp# 1 & up against Charge Pump-D. Meter was 15-Catch HAnk 14-main Seech Rup controls. #2 180 MR/H / FSKR was 280CPM 17 -man feed amp antal #/ X ilp against Charge Punge - Q Meter was mond 180 MR/H/Fskkwa: 280 CPM STB ChyRunp Rm L BKG, FSKRL100CPM (General) LBKG/ FSKRL100CPM (General) /hr/100 CM SMEAR RESULTS - HN DPM/100 CM <del>BETA in mR</del> RESULTS RESULTS RESULTS RESULTS NO. RESULTS NO NO. NO. ΝO -BKG 9 < BKG 1 LBKG 9 -BKG 10 2<u>BKG</u> 4 BKG LBKG 0 L BKG < <u>BKG</u> < BKG 11 ~BKG CBKG 11 12 LBKG <u> - RKG</u> < BKG 12 15 L BKG < BKG ~ BKG 14 < 8 kG < BKG ∠BKG 75 BKG < BKG BKG -BKG 14 - BKG ~KK( 11 < BKG **RA - RADIATION AREA** CA - CONTAMINATION AREA ALL DOSE RATES IN µrem/hr

RCA – RADIATION CONTROL AREA AA

AA – AIRBORNE AREA



TSC-ND-126

NSS-01		SUF	VEY NO.	<u>55-0087</u>		
Date 4-13-04 Time 4:14	DOSE RATE					
Surveyor ROAT Pienmail	Inst. Type µ Rn	rtin Beta	Alpha	BetaAlpha		
Signature Ral Perum	mby Serial No. 4546		NA (se	e Bilow)		
Reviewed K Salar	β ⁻ Factor	Eff.				
	BKh 2 MK	h Bkg.	cpm	cpn		
AREA Primary (	ntainment -	1st Le	ve/			
OUTA SILIENCY	FOR & FOUND					
SOMPONENT KURLUM	2929 #2	SN 16000	9 A	FF ,208		
BILG 42 com	30 Sec Counts					

SEE DITTACITÀP DRAWING

TELFTIECTOR 2899/

 $\begin{array}{l} 4 = 173 \ dpm / 100 \ cm^{2} \\ 6 = 615 \ dpm / 100 \ cm^{2} \\ 6A = 4/40 \ dpm / 100 \ cm^{2} \\ 8A = 327 \ dpm / 100 \ cm^{2} \\ 9A = 8840 \ dpm / 100 \ cm^{2} \\ 10A = 106 \ dpm / 100 \ cm^{2} \end{array}$ 

RECOUNT FOR AUDMA	
4-14-05 10 min count (ctr #2)	dpm/100cm ²
G & = 2 c+ (0.2cpm) B = 1838(184)	683
6A K = 2 c+ (0.2 cpm) B = 1153(115)	351
8A & = 1 ct (0.1cpm) B = 1140(114)	346
9AX = 1 ct (0.1cpm) B = 2061 (206)	788
All count Rates < MDA	
< 3.81 dpm	

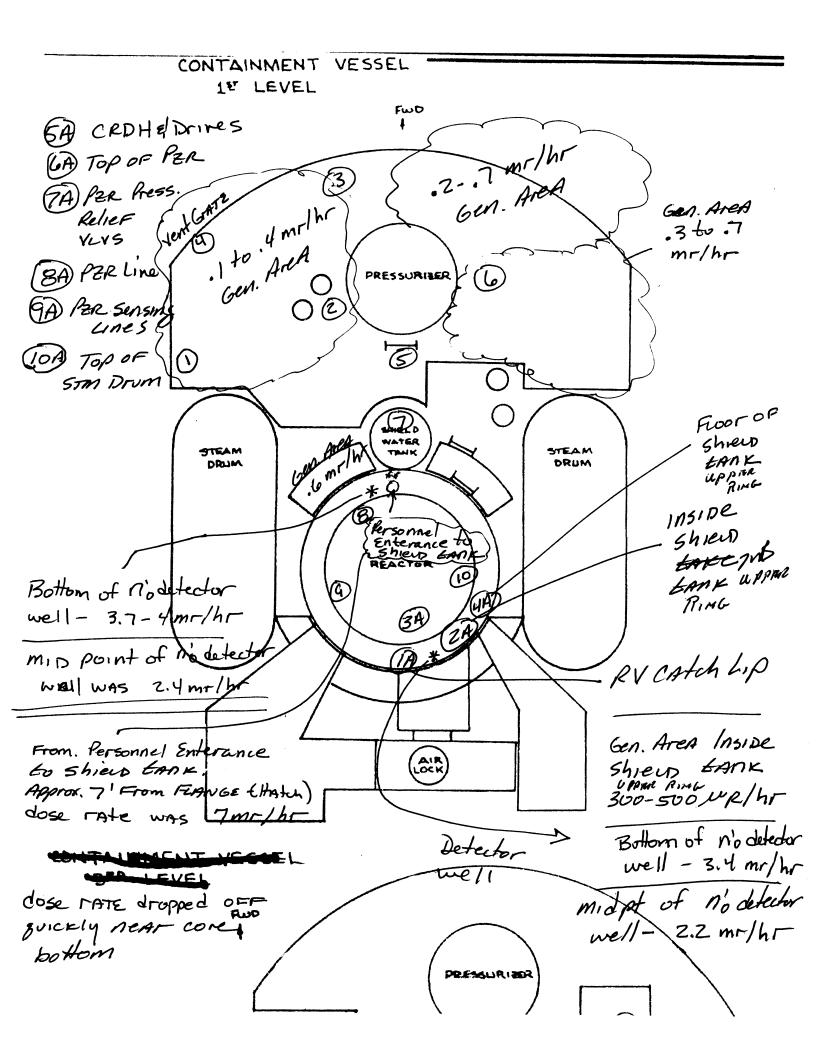
	6.94	ss Co	mts/30	Sec			- 3 31	apire	
SMEA	R RESULTS				BETA in mR/	AD/In/190	- CM ²		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	L'BKG	Ŷ	4 BKG	1A	< BKG	9A	113		
2	< BKG	10	< BKG	2A	-BKG	IDA	32		
3	K BKG			3A	- BKG	Ľ			
4	39			4A 5A	LBKG				
5	< BKG			5A	- BKG				
6	85			6A_	_72				
	L BKG			7A	< BKG		****	ļ	
B	LBKG	L		BA	55				L

**RA-RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA



NSS-01		SURVEY NO. 📈	55-0088		
Date 4-14-65 Time 9:30 Am	DOSE RATE	CONTAMINATION			
Surveyor ROBT & PENNOLII	Inst. Type TELFTACTON	Beta Alpha	BetaAlpha		
Signature Ray Telemanh	Serial No. 28991	Inst.Sn			
Reviewed MW	β ⁻ Factor	Eff.			
	BKG-2.1mR/m	Bkg. cpm	cpm		
AREA SECOMPANY CON	TAIMINANT LOWFR	LIEVEL			

COMPONENT DOGR PATR THROUGHOUT LOWRA LIEURI OF SACONDAM VARINES FROM is MR/h TO ~20 MR/h GRAVERAL ARAA. HOT GROTS OF ~ 2 50 MR/h ON CONTACT WITH PIDING (YELLOW) ON STARBOARD GIAR WAS FOUND.

1B - COMR BORK SANDJUR # SITH # | PORT SING 2B - 1. 1. #3 PONT SIDA 1. # 3 POAT SIDA 1. # 4 AFT 3B -.. n 1. " #2 PORT SIDE 4B -1 1e n n in in #5 STARBOARDSing 11 11 11 11 11 H/o FOURD ノス " #GFLOOR ٤. 11

Sample	3	(Counter #2)	gross rts 32	gross cpm 64	BKG (pm 42	Net cpm 22	100 m
--------	---	--------------	-----------------	-----------------	---------------	---------------	-------

SMEAR RESULTS IN DPM/100 GM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1B	4 BKG	1	2016						·
23	LBKG	2	LBKG						
3 <i>1</i> 3	L BKG	3	32		·				
41B	2 BKG	4	Not taken						-
		5	Not Falen						
		<b> </b>							9
		<u>I</u>							

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

1 ....

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

NSS-01		SUR	VEY NO. N	55-0089
Date 4-14-05 Time 10:00	DOSE RATE		CONTAMIN	NATION
Surveyor JONN BOWEN BORREN	Inst. Type TELIFT.ECTU.2	Beta	Alpha	BetaAlpha
Signature Role Telemah	Serial No. 2 8991	Inst.Sn	See Belon	<u>ب</u>
Reviewed GBUL	β  Factor	Eff.		
-		Bkg.	cpm	cpm
AREA USHNARN STERM	GRINFICATORS IN F	RIMIE	COMTAIN	MAKE NOT
COMPONENT Snews C	onited w/Luck 2929	· (#)	SN:102001	(#2)5N:1600

SIERATTACHEN DANNING

STURBONNO STERM GRAN. DOST RATH BRITICHAR DOWN COMME 24 m R/be Minx Port " " " " " " " " " " " " " " " " " 35 m R/be Minx

Smear No.	Counter	gross counts	gross cpm	BKG cpm	Net cpm	dpm 100cm2
i -	(2)	52	104	42	62	298
6	(1)	49	4 <i>8</i>	37	61	242
7	(2)	87	174	42	132	635
8	(1)	64	128	37	91	361
9	(2)	38	76	\$42	34	163
10	(1)	60	120	37	83	329

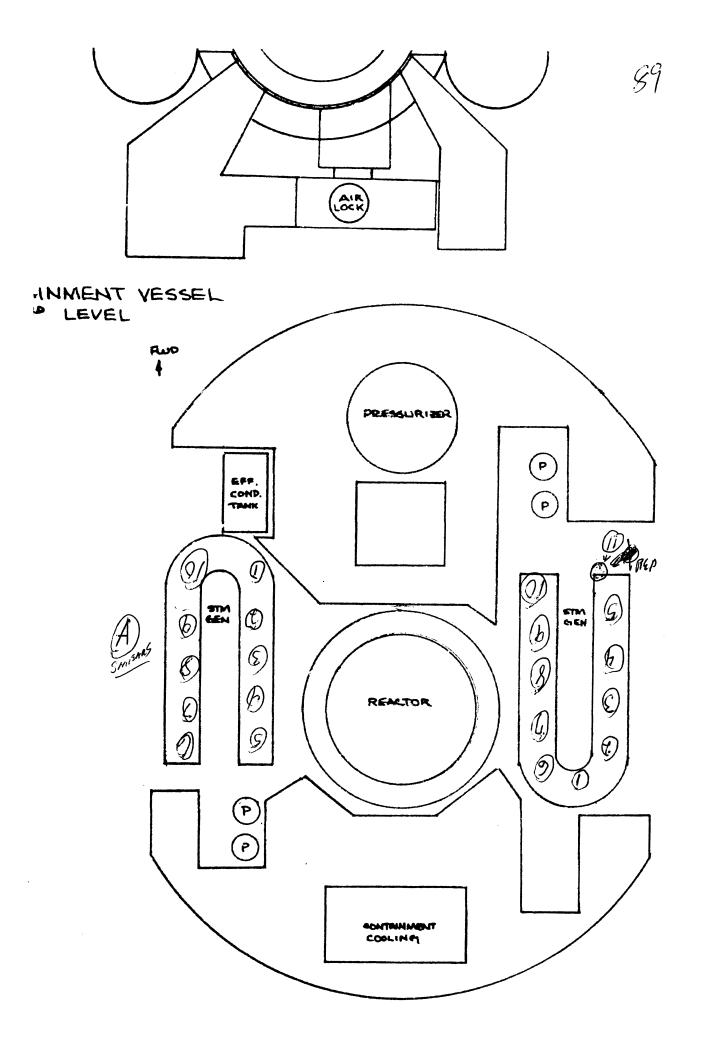
					In Second	\$			
SMEA	SMEAR RESULTS IN DPM/100 CM ² C. 055 (bmt = BETA in mRAD/hr/100 CM ²								
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	5.2 (2)	9	38 (2)	A1	< BKG	19	-BKG		
ス	< BKG	10	60 (1)	A2	- BKG	A10	-BKG		
3	~ BKG	#	the run	A 3	-BIG				
4	< BKG	<u> </u>	<bkg< td=""><td>A4</td><td>&lt; BKG</td><td></td><td></td><td></td><td></td></bkg<>	A4	< BKG				
5	- BKG			AS	L BKC				
4	49 W			A6	LBK,				
7	87(1)			A7	< BKC				
&	(14 (1)			A8	-BKG				

**RA - RADIATION AREA** 

CA – CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

RCA - RADIATION CONTROL AREA



NSS-01	SURVEY NO. <u>NS5-0090</u>				
Date 4/19/05Time 10:30AM	DOSE RATE	CONTAMINATION			
Surveyor SAMES LOVEDAHL	Inst. Type · N/H	Beta Alpha	BetaAlpha		
Signature James Jenally	Serial No.	Inst.Sn			
Reviewed Toht Manuah	β [–] Factor	Eff.			
		Bkg. cpm	cpm		
AREA TOP OF CUPOLI	A STBD N.TR.	OGEN VALVE.	FLANGE		

COMPONENT_

STBD 1. OUTBD BETERNA FLANGE 2. INBEARD BETWEEN FAANGE 3. FLANGE GASKET AFT 4-INSIDE FLANGE AREA. KE) NOTRO VALVES FWD NITROGENVALVES PORT DECK Ά."

SMEA	R RESULTS +	N DPM/10	9-GM ²	-BBETA in mRAD/hr/100 CM ² -					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BKG-D < BKG-D < BKG-D								
2	< BKGD								
3	< BKGD								
4	< BKGD								

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

	RADIOLOGICAL SU		
NSS-01		SURVEY NO. 1	155-0091
Date 4/ 905 Time 14:00	DOSE RATE	CONTAMI	NATION
Surveyor T. Bouren	Inst. Type NA	Beta Alpha	BetaAlpha
Signature	Serial No. NA	Inst.Sn 1/A	
Reviewed Walt Runnah	$\beta^{-}$ Factor $N/A$	Eff.	
		Bkg. cpm	cpm
AREA SMEAR SAMPLE	es From in	SIDE SURFAC	es
of RIMARY WAR	R Shreld tAN	IK_	
COMPONENT PRIMAY WA			
ALL Samples U	rere EAKEN	d	1
SMINT ALL SAMPLES IN # INSIDE the	DRIMARY WATE	R ShIELD	EANK
#			r -
o-Outer Wall	۴ ⁽	FRMARY Shieun	NATER
DUTER Wall		FRIMACY	00
7 - Inner WALL		- Chrid E	HANK
MALL WALL		Silieon	cover/
2 1	By		
3 - TOP OF EANK -	(1)	Access	WAY
Buth SIDESOF		110000	1
		,	
MANhole Accessionay	$\overline{\mathbb{O}}$	ADDES	
		ADDer NSS	
r = r 4r			
1. Top surfaces of	2		
2 LADDER RUN	75°C	_	Record
	02	SURVEY	Personne 1
		dialog	t enter
. Top of inner	WALL		.11-
100-01-01-01-		the PR	EANK.
		Shiers	tANK
		Jrians	

SMEA	R RESULTS	IN-DPM/10	TCM ² BETA in mRAD/hr/100 GM ²						
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
6	< BKG								
1	4 BKG								
8	< BKG	_							
G	< KKG	-							
10	< BKG	-							

RA - RADIATION AREA

CA – CONTAMINATION AREA

NSS-01		SURVEY NO. <u>// S</u>	5-0092		
Date 4/19/05 Time 14:00	DOSE RATE CONTAMINATION				
Surveyor T. Bawen	Inst. Type NA	Beta Alpha	BetaAlpha		
Signature Mr. B.	Serial No.	Inst.Sn NA			
Reviewed Jour Ermoch	β [–] Factor	Eff.			
		Bkg. cpm	cpm		
AREA SMEAT OF 10	ocations for	- lead sam	ples		

#### COMPONENT_____

	(SnueAr-1) mple A ShiELD or outside of
Top View	outside forward
	Ventrithon Smert Z Ventrithon Smert Z Sipe View Leas Shield
	1 THE DEB
	14.74 14.74 (smears 1 f Z)

SMEAR RESULTS - IN DPM/100 GM ²				Ø	BETA in mRAD/hr/100 CM ²				
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	LBKG LBKG							1	
2	L BEC;								
				ļ					
			· · · · · · · · · · · · · · · · · · ·						

RA - RADIATION AREA

CA - CONTAMINATION AREA ALL DOSE RATES IN prem/hr

NSS-01 SURVEY NO. <u>NSS-0093</u> Date 4-21-05 Time DOSE RATE CONTAMINATION Surveyor <u>Ropsile</u> <u>Freenerger</u> Inst. Type <u>N/A</u> Beta_Alpha_ Beta_Alpha_ Signature <u>Row IT for an and Serial No.</u> Inst. Sn <u>N/A</u> Reviewed <u>Minden 1000</u> <u>B</u> ^F Factor Eff. Bkg. cpm cpm cpm AREA_ <u>PRIMARY</u> <u>Contrainmant</u> <u>FW12-STBD</u> <u>V</u> ^T UBJIE STRAMA GOSM. <u>HOT KEG</u> <u>WOXK MARGE</u> COMPONENT - SS PLUG & Rimn 2- HOT KEG <u>PLENUM</u> 1- HOT KEG <u>PLENUM</u> 1- HOT KEG <u>NEAT</u> TO <u>VILUA</u> <u>BRACA</u> By ACCRESS PORT <u>FLOOR</u> <u>FIREDOW</u> <u>WORK MARGE</u> <u>G</u> <u>G</u> <u>G</u> <u>G</u> <u>G</u> <u>G</u> <u>G</u> <u>G</u>					
Surveyor $R_{0,B,T}$ is $P_{ENNACH}$ Inst. Type $H/h$ BetaAlphaBetaAlpha Signature $R_{a}$ if $F_{Larrange}$ Serial No. Inst. Sn $H/h$ Reviewed $MT_{Max}$ $B^{-}$ Factor Eff. Bkg. cpm cpm AREA_ <u>ACM_APA</u> Company ANAMA_F COMPONENT I- SS PLUG & RIMA 2- HOT KAG PLANUMA 3- II IN NEAT TO PLISNUM I- HOT KAG NAAT TO VALUR BAACA Ry ACCRSS POAT -FLOOR RIMELOW WORK IRAAA - YALLOW FLASH HIGHT - BLACK FLASH HIGHT - BLACK FLASH HIGHT	NSS-01		SURVEY	NO. <u>N55-</u>	<u>0093</u>
Surveyor $R_{0,R,T} \neq P_{ENN,GCH}$ Inst. Type $H/H$ BetaAlphaBetaAlpha Signature $R_{0}/[E/G_{G}, C_{0,R}]$ Serial No. Inst. Sn $H/A$ Reviewed $MT_{Max}$ $B^{-}Factor$ Eff. Bkg. cpm cpm AREA_ <u>PRIMARY</u> Contrainmant FW12 - STBD $VTVR_{12}$ STHEMA GUENI, HOT WALL WOXH ARAGE COMPONENT COMPONENT I - SS PLUG & RIMN 2 - HOT KAG PLANUMA 3 - 11 IN NEAT TO PLIENUM I - HOT KAG NIEAT TO VALUR $BRACR BY ACCRASS POAT- FLOOR PIRLOW WORK ARAA - YALLOW FLASH HIGHT - BLHCH FLASH HIGHT$	Date 4-21-05 Time	DOSE RATE	co		ON
Signature Rali TEPurport Serial No. Inst. Sn K/A Reviewed Mr. Manultone B ⁻ Factor Eff. Bkg. cpm cpm AREA <u>PRIMARY CONTAINMANT</u> FW12-STBD VIVATE STRAM GOBMI, 1407 LAGE WORK ARAA COMPONENT - HOT LAGE PLANUM 1- HOT LAGE NEXT TO PLIENUM 1- HOT LAGE NEXT TO VALUE · BRACE By ACCESS PORT · FLOOR BRIDDW WORK NRAA - YALLOW FLINGTH LIGHT - BLINCH FLINGTH LIGHT		Inst. Type // /	Beta Alpha	a Bet	aAlpha
Reviewed MMullon B ^T Factor Eff. Bkg. cpm cpn AREA <u>PRIMAR</u> CONTAINMANT FWID-STRD VTUBIL STRAM GIBMI. HOT KAG WOXK MARAGE COMPONENT - HOT KAG PLANUM - HOT KAG PLANUM - HOT KAG PLANUM - HOT KAG NIENT TO PLISNUM - HOT KAG NIENT TO VALUR · BRACA BY ACCRSS PORT · FLOOR PRELOW WORK NARAA - YALLOW FLASH KIGHT - BLACK FLASH KIGHT - BLACK FLASH KIGHT	- 11 1	- 1 <u>4</u> / 1.	Inst.Sn /		
Bkg.     cpm     cpm       AREA     PRIMMAN CONTAINMANT FWD - STBD UTUBIL STRAM GIBMI.       HOT WALL WORN MANT     FWD - STBD UTUBIL STRAM GIBMI.       HOT WALL WORN MANT     FWD - STBD UTUBIL STRAM GIBMI.       COMPONENT	h-1 Al	β  Factor	Eff.		
AREA PRIMARY CONTAINMANT FWID-STBD VIUMIZ STRAMA GORMI, HOT LAG WORK ARAGE COMPONENT - SS PLUG & RIMI - HOT LAG PLANUM - HOT LAG PLANUM - HOT LAG NEAT TO PLIENUM - HOT LAG NEAT TO VALUR - BRACA BY ACCRESS PORT - FLOOR PRISLOW WORK ARAA - YALLOW FLASH LIGHT - BLACK FLASH LIGHT - BLACK FLASH LIGHT			Bkg.	cpm	срп
- HOT KAG WORK MARA COMPONENT - SS PLUG & RIMI - HOT KAG PLANUM 3 - II IN NEAT TO PLIENUM - HOT KAG NEAT TO VALUR - BAACA BY ACCASS POAT - JALLOW KORK NAAA - JALLOW FLASH KIGHT - BLACK FLASH KIGHT - BLACK FLASH KIGHT	ADEA PALAANAA CANTAK	MARIAND FINID - CTR			
COMPONENT - SS PLUG & RIMA - HOT KAG PLANUMA - HOT KAG PLANUMA - HOT KAG NIENT TO VALUA - BLACA BY ACCASS PORT - JSCHOW FLASH KIGHT - BLACK FLASH KIGHT - BLACK FLASH KIGHT					
	•				
	- Hot Lieg NEXT TO VAL · BRACK By ACCRESS F · FLOOR PIELOW WORK - YELLOW FLASH LIGHT - BLACK FLASH LIGHT · END OF WOODEN RO - BOTH SCHEW DRIVE - OUT SIDE OF BAG	NR PORT NRAA LNDPAR 50 LICK LNDPAR 50 LICK CONTRINING BASTICK	28		0 [
- HOT HEG SAMPLING, " - YOULOW HIMMAR ACTIVITY BOTTOM NUTSY BOLTS 1= 1060pm	- Hot Lieg NEXT TO VAL · BRACK By ACCRESS F · T-LOON BITLOW WORK - YELLOW FLASH LIGHT - BLACK FLASH LIGHT · END OF WOODEN RU - BOTH SCREW DRIVE - OCT SIDE OF BAG C - HOT LEC SAMPLE, TOP	NR PORT NRAA LINDDAR SO LICR CONTRIMING BASTIRA	ЭВ () () () () () () () () () ()		0
- Unition Himman Activity Rep Hottom NUTS& Bouts 1= 1660pm	- Hot Lieg NEXT TO VAL - BRACK By ACCRESS F - T-LOON PIELOW WORK - YELLOW FLASH LIGHT - BLACK FLASH LIGHT - END OF WOODEN RO - BOTH SCHEW DRIVE - OUT SIDE OF BAG C - HOT LEG SAMPLIE, TOP - YELLOW HAMMER BOTTOM NUTS& BOUTS	NRAA NRAA LNDDAN 50 LICK CONTAINING BASTICK	28 28 13 Астирити 1060 рт		0
- 4 & ULOW HIMMAR ACTIVITY ACTIVITY ACTIVITY ACTIVITY BOTTOM NUTSY BOUTS I= 1660pm BOTTOM 2 RUNGS OF LINDARIZ 2= 154 dpm	- Hot Lieg NEXT TO VAL BRACE By ACCRESS F -T-LOOR BRELOW WORK - YELLOW FLASH LIGHT BLACK FLASH LIGHT - BLACK FLASH LIGHT - ROTH SCHRW DRIVA - OUT SIDE OF BAG - HOT LEC SAMPLIE, TOP - YELLOW HAMMER BOTTOM L RUNGS OF LA	UR PORT NRAA LNDPAL 50 1 1 1 1 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3	28 28 3 13 ACTIVITY 1660pm 154 dpm		0
- You Himman Activity Horton NUTS& Bouts 1= 1660pm BITTOM 2 RUNGS OF LINDARIZ 2= 1541 dpm	- Hot Lieg NEXT TO VAL BRACE By ACCRESS F -T-LOOR BRELOW WORK - YELLOW FLASH LIGHT BLACK FLASH LIGHT - BLACK FLASH LIGHT - ROTH SCHRW DRIVA - OUT SIDE OF BAG - HOT LEC SAMPLIE, TOP - YELLOW HAMMER BOTTOM L RUNGS OF LA	UR PORT NRAA LNDDAL LNDDAL SO CICR $CONTRIPUTEDE DDRL^2L = 4 = 1$	28 (1) (1) ACTIVITY 1060 pm 1541 dym 135 dpm		0
- Yocum Himmar Activity Horton Nutsy Bouts 1= 1660pm Borton 2 RUNGS OF LINDRAL 2= 154 dpm Rungs 586 of LINDRAL 4= 135 Jpm	- Hot Lieg NEXT TO VAL BRACE By ACCRESS F -T-LOOR BRELOW WORK - YELLOW FLASH LIGHT BLACK FLASH LIGHT - BLACK FLASH LIGHT - ROTH SCHRW DRIVA - OUT SIDE OF BAG - HOT LEC SAMPLIE, TOP - YELLOW HAMMER BOTTOM L RUNGS OF LA	$   \begin{array}{c}         V R \\         PO R T \\         VRAA         \\         INRAA         \\         LNDDARK          \\         SS         \\         $	28 () () () () () () () () () ()		0

SMEAR RESULTS WERMINDUCM2 BETAIL MRAB/11/100 CM2									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	32 cts	9	BKG	1B	4 BNG				
2	37 J	10	BKL	28	< BKG				
3	L BICG		BKC	30	413KG				
4	35 24			418	4BKG				
S	70 cts	ļ		5B	- 13KG				
6	2 B166					<b> </b>			
7	47 075							<b> </b>	
8	34 675			L	l			I	

RA - RADIATION AREA

CA - CONTAMINATION AREA

NSS-01	SURVEY NO. 1/55-6094							
Date 4 21 OSTIME OGUO	DOSE RATE	CONTAMIN	NATION					
Surveyor J. Bowen	Inst. Type W/A	Beta	BetaAlpha					
Signature VWW.	Serial No.	Inst.Sn						
Reviewed Ralet & Sungh	β  Factor	Eff.						
	I	Bkg. cpm	cpm					
AREA FOTWATO 15	IVJ 205 LVL	- PRIMARN	Containment					
COMPONENT								

Pressurizer 2nd LVL PZT LADDER EU 3rd Lever LADDER TO IStLVL Shieup WTR TANK 31 15t LYL 'UA

SMEAR RESULTS WERMINDUCM									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
IA	4 BKG								
ZA	< BKC								
3A	< BKG								
4A	< BKG								
		-							
RA – RADIATION AREA CA – CONTAMINATION AREA ALL DOSE RATES IN µrem/hr									

NSS-01		SUR\	/EY NO. <u>//</u> .	<u>55-00</u> 95
Date 4.21 -05 Time / . 100 - 711	DOSE RATE		CONTAMI	NATION
Surveyor Rast IS PRIVING H	Inst. Type Trector	Beta	Alpha	BetaAlpha
Signature Raly Frannah	Serial No. 28991	Inst.Sn		
Reviewed M Manslow	β  Factor	Eff.		
		Bkg.	cpm	cpm
AREA PRIMINU CONTINUE	MAM Port U.	TUAR 5	TRANK (JEAN	A Accriss
Course	, • •			
COMPONENT				
1-COURL & NOTS				
1-0014211				
2 - Coura Cap	a CUARNER			
2 - COURA GAP 3 PLEAUM OUTSIN	on Surpher			
2 - COURA GAP 3 PLEAUM OUTSIN	n SURFACT			
2 - COURA GAP 3 PLEAUM OUTSIN	on Surface			
2 - Coura Cap	or Surpher	Ø	13	
2 - COURA GAP 3 PLEAUM OUTSIN	OR SURFACT	3 63	2 23	e/hr
2 - COURA GAP 3 PLEAUM OUTSIN	on Surfact	3	2 ² 3	e/hr
2- COURA GAP 3 PLISAUM OUTSIN 4 RAIL, FLAT 5 TOP OF P.PR	PR SURFACT	3	2 ¹ 3	e/hr
2 - COURA GAP 3 PLEAUM OUTSIN	on Surpher	3	2 120 200	e/hr
2- COURA GAP 3 PLISAUM OUTSIN 4 RAIL, FLAT 5 TOP OF P.PR	-Surpher -Smr	80	220 ⁷³ an 220 00 60	e/hr

1. 67 dpm/100 cm² 3. 356 dpm/100 cm²

SMEA	SMEAR RESULTS IN DPM/100 CM ²									
NO.	RESULTS	N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
1	28									
2	< BKG									
3	53									
4	< BKG									
5	< BKG									
•	1			I	·····					

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

DOSE RATE nst. Type TELETISCTON Serial No. 3 Factor 3KL 3 MA/M T - STBD STEAN ACCIESS COUTER	Beta Inst.Sn Eff. Bkg.	cpm	NATION BetaAlpha
nst. Type TELIETECTON Serial No. 3 Factor 3KL 3 mR/hr 5 - 5TBD STEAN	Inst.Sn Eff. Bkg.	_ Alpha cpm	BetaAlpha
Serial No. 3 Factor 3KL 3 m/ / Im $\overline{\gamma} - 5TBD 5TRAJ ACCIESS$	Inst.Sn Eff. Bkg.	cpm	cpm
BFactor BKG . 3 mR/m T- STBD STRAN	Eff. Bkg.		
SKG . 3 mA/m T- STBD STRAN ALLIESS	Bkg.		
M- STBD STRAJ			
M- STBD STRAJ		PRIVATINA 5	YSTAM RANUM
ALCIESS			
ALLIESS COURD			
3 OCO D WATER LEUR		I I TUBE SHIER	ĩ
Cours SAAL ANK Optemine HIERT	3 4	n TUBR SH	
	COURA SAAL	LATER LEVAL COURA SAAC ANA Oppaning 3 HARAT 4	COURA SARC I INMER LIDA PLA Depressional 1 INMER LIDA PLA 1 INSIDA P

SMEAR RESULTS IN DPM/100 CM ² B = BETA in mRAD/hr/100 CM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1B	1683	_							
2 B	1560								
3 B	1392								
4 13	17,361								
513	5396								
		- <b>I</b>							

RA - RADIATION AREA

CA - CONTAMINATION AREA

NSS-01		SURVEY NO. <u>NSS-0097</u>			
Date 4-21-05 Time 1,45	DOSE RATE	DOSE RATE CONTAMINATION			
Surveyor JOHN BOWEN	Inst. Type THELETROTOR	Beta Alpha	BetaAlpha		
Signature M.W.	Serial No. 28991	Inst.Sn N//			
Reviewed Roht El unon h	β  Factor	Eff.			
· · · ·	1-2 MA/M BRG	Bkg. cpm	cpm		

AREA

COMPONENT CART SIDE MUD Drum (hear Exchanger) Hur les Primary SIDE 1- INSIDE Top of PLENUM 2 - INISING AFT OF ACCRESS 34 mille AT 55 cover 3- " FWD OF " 4- PLANUM TUBRE SHRET 5 - IMSIDE SURFACE OF SS COVER FOR ACCESS OPENING JURE SHINKJ -SIZ mille AT TUBR SN RAT 344 mille NID PLEMUM dpm/100 2 22000 WATER COVERING Approx. 1/3 OF TUBE 2. 6096 Sheet 3. 4144

1.

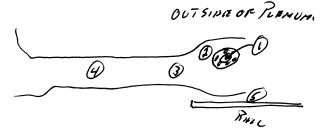
- 4. 378,673
- 5. 7654

SMEA	R RESULTS	IN OPINITU			-DETA				
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	2309								
2	655								
3	452								
4	39403								
5	817								
					· · · · · · · · · · · · · · · · · · ·				
RA – RA	DIATION AREA		CA - CONTA	MINATION	AREA A	LL DOSE	RATES IN µrem/h	r	

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

NSS-01			SUR	VEY NO.	55-609	<u> </u>
Date 4-22-05 Time 9:00 AM	DOS	ERATE		CONTAMI	NATION	
Surveyor ROBART E PENMOLK	Inst. Type	N/A	Beta	Alpha	Beta	Alpha
Signature Polite Punah	Serial No.	/	Inst.Sn	N/D		
Reviewed	β  Factor		Eff.	/*		
			Bkg.	cpm		cpm
AREA PRIMARY CONT AIM.	M ring	Pont U	TUBA	STIERM (	PRM	AU155
PONT, POST JOBS	onver					
COMPONENT	/					

13 YELLOW HAMMARER 23 SLUG WRIENCH 2" 3B SLUG WRIENCH 24" 4B SOCKAT & WRATCHET SB PILLE WRENCH



dpm/100 cm² 231 2.

5. 135

SMEAR RESULTS HEPM/100 CM ² BEETA III III AB/III/100 CM ²								
RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
< BKG	13	3 9 < BKL						
45	2B	715 < BKG						
< BKG	313	3 5 < BHG						
- BNG	4B	BackBille						
35	50	13 2 < BNG						
		* 61 2						
	< BKG 45	< BKG 13 45 2B < BKG 3B < BKG 4B	< BKG 13 \$ 9 < 8K 45 2B 75 < 8KG < BKG 3B 36 - 8KG < BKG 4B \$ 2 < 8KG	< BKG 1B \$9 <bk 45 2B 75<bk &lt; BKG 3B 75<bk &lt; BKG 4B 5 &lt; BKG 35 50 B 2<bkg< td=""><td>&lt; BKG 1B \$ 9 &lt; BKG 45 2B 75 &lt; BKG &lt; BKG 3B 75 &lt; BKG &lt; BKG 4B 5 &lt; BKG &lt; BKG 4B 5 &lt; BKG 35 50 B 2 &lt; BKG</td><td>&lt; BKG 1B \$9<bk 45 2B 75<bk &lt; BKG 3B 75<bk &lt; BKG 3B 75<bk &lt; BKG 4B 52<bk 35 50 B 2-<bkg< td=""><td>&lt; BKG 1B \$9<bkc 45 2B 75<bkg &lt; BKG 3B 75<bkg &lt; BKG 3B 75<bkg &lt; BKG 4B 5 <bkg 35 50 B 2-8KG</bkg </bkg </bkg </bkg </bkc </td><td></td></bkg<></bk </bk </bk </bk </bk </td></bkg<></bk </bk </bk 	< BKG 1B \$ 9 < BKG 45 2B 75 < BKG < BKG 3B 75 < BKG < BKG 4B 5 < BKG < BKG 4B 5 < BKG 35 50 B 2 < BKG	< BKG 1B \$9 <bk 45 2B 75<bk &lt; BKG 3B 75<bk &lt; BKG 3B 75<bk &lt; BKG 4B 52<bk 35 50 B 2-<bkg< td=""><td>&lt; BKG 1B \$9<bkc 45 2B 75<bkg &lt; BKG 3B 75<bkg &lt; BKG 3B 75<bkg &lt; BKG 4B 5 <bkg 35 50 B 2-8KG</bkg </bkg </bkg </bkg </bkc </td><td></td></bkg<></bk </bk </bk </bk </bk 	< BKG 1B \$9 <bkc 45 2B 75<bkg &lt; BKG 3B 75<bkg &lt; BKG 3B 75<bkg &lt; BKG 4B 5 <bkg 35 50 B 2-8KG</bkg </bkg </bkg </bkg </bkc 	

* SMIERR COUNTER CONTEMINATIES / CLEANED

**RA - RADIATION AREA** 

CA - CONTAMINATION AREA

ALL DOSE RATES IN µrem/hr

**RCA - RADIATION CONTROL AREA** AA - AIRBORNE AREA

NSS-01		SURVEY NO. <u>N55-0099</u>								
Date 4-25-65 Time 11:15 PM	CONTAMINATION									
Surveyor ROBT E Pannocli	Inst. Type N/A	Beta Alpha	BetaAlpha							
Signature Role Remon	Serial No.	Inst.Sn X/1								
Reviewed ANN	β [—] Factor	Eff.								
		Bkg. cpm	cpm							
AREA MICRO R MIETRAS	AREA MICRO R MIETERS & FRISKERS									

COMPONENT

FRISKERS ALPHA METIER 6 - 197766 MR MIETERS 4-75809 1-95499 7-127385 PROBR 5 - 91037 12 - 97416 2 - 42972 3 95469 8 - 94954 29295

13-162001 with PROBAS

15217 TRETON 28991 9 - PROBLE 10 EXTRACTION 11 Benny

CN#2

SMEA	RRESULTS			B-BETATIN MRABHIN TOU CIVIS					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BKG	9	< BKG						
2	< BK6	10	< BKG		·····				
3	< BKG	11	< 8KG						
4	< BKG	12	X BKG						
	< BKG	13	< BKL						
6	< BKG	14	~ BKG						
_7	2 BKG	<b></b>							
8	< BKG	J							

RA - RADIATION AREA

CA - CONTAMINATION AREA

	RADIOLOGICAL SUI	RVET	
NSS-01		SURVEY NO. 🖊	155-0100
Date \$ 25 0 Fime	DOSE RATE	CONTAMI	NATION
Surveyor J. Bowen	Inst. Type MR MATAN	Beta Alpha	BetaAlpha
Signature Mr. B.	Serial No. 95469	Inst.Sn V/A	
Reviewed Keli Miluma	β ⁻ Factor	Eff.	
	BXG 3 MR/h	Bkg. cpm	cpm
AREA ORT STEAM			······
<u>`</u>			
COMPONENT BRT S	team (senera)	TOR (STEAM	Drum
Secondar	JSIDE	0	
		ORT STEAM Drum	2
() TOP OF STM Drug	M TOPOF		PORT
	(3)		STEAM
Near opening			Drum
2 Top-Further bay	E down come (2)	N	Aucoss
	Cou		Cover
(3) LEFT 51DE /			
(1) Bottom	(A ( 10 0) ()	$ \mathcal{S} $	1
	$3(\mathbb{P})$		ALL SMEARS
(5) Right Side	$(\bigcirc)$	, )	are from Insi
( Incide Murda	semply (4)	/	PORT STEAM Drun
6 Inside - Hinge As	Semply U		
(D LEFT Down C	mmer	/	
J (		$\int \overline{L}$	DR INSIDE
8 Top - Furthest }	t. bACK		60-80 ju R/m
			00 00 100 1
(9) Inside surface	of ilus		· _
		for D	R OUTSILIE
19 Inside-on R	us mating sur	TACE.	400-500 prR/h
	0 0		

SMEA	RRESULTS			÷	B- DETALIA-INRADIM/100 CIVI					
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	
1	<bkg< td=""><td>9</td><td>LBKG</td><td></td><td></td><td></td><td></td><td></td><td></td></bkg<>	9	LBKG							
2	< BKG	10	< BKG							
3	< BKG	<u> </u>								
4	< BKG									
5	< BKG	<u>i</u>								
-k	< BKG	1	1							
	< BKG									
8 < BKG										
RA – RADIATION AREA CA – CONTAMINATION AREA ALL DOSE RATES IN µrem/hr										

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

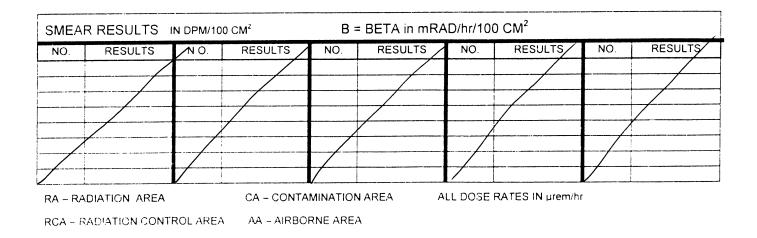
NSS-01		SURVEY NO. //	55-0101
Date 4-26-05 Time 8 111	DOSE RATE	CONTAMI	NATION
Surveyor Ro BIERT ERAININGOL	lnst. Type N/1	Beta Alpha	BetaAlpha
Signature Sa ( Puf unal	Serial No.	Inst.Sn N/n	
Reviewed Alt Marsela-	β ⁻ Factor	Eff.	
		Bkg. cpm	cpm
AREA PIPIE FROM	YITROGAN LINK		

COMPONENT_____

SMEAR RESULTS HANDPM/100 CM ² B = BETA in mRAD/hr/100 CM ²									
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
1	< BKG								
2	LBKG	_							
		_							
		-							
RA - RA	RA - RADIATION AREA CA - CONTAMINATION AREA ALL DOSE RATES IN µrem/hr								

				AIP (	Se nel	50	IRVEY NO.	N33-C	<i><b>୭</b>//1</i>	
Date	4-5-05 Tim	ne		DOS	EAMPLIER ERATE			AMINATI		
	eyor Rost 1		🧹 Ins		RANECU	Beta	Alpha	_ Bet		
1	ature Rali	141 inno	L Ser	ial No.	08641	Inst.Sr	n x//A			
Revie	ewed Richan	1 Rins 110.		-actor -		Eff.	V			
	NO Mare	12n				Bkg.	ср	m	cr	om
AREA	A CULI	CHIEM LA						L	······································	
			<u> </u>		10 CuFT	SAMPLA	e			
COM	PONENT	SN 1		2929		•	72 <i>30 14</i> 11	y Cour	i.T	
	Court B 13	· · · · · · · · · · · · · · · · · · ·	+15	- 1357. 1357.	GROSS C	701175 15 1	<del>S-BKC</del> <del>S-BKC</del>	(mg) (430)		
6-05 30 MI	r Courto MM 4	0 16/05	v 6 3 1320	(0)	),2 cpm) 44 cjpm)					
	- <i>jon</i>	ß	x 5 398		0. 5 срт 40 срт	2 L. 2 L.L	LD (17 .D (506	gross gross (	Gunts) cants)	(2 DAC) (< 25%
	or 10513 19 ret cpm .312	3.81 dpm 2.22 EG								
$\mathcal{O}$ .										
$\mathcal{O}$ .	,(; 	7 E ⁻¹² M(1) - 2 DAC)	ilac		1.8 10(28.32)	3E ^{-S} uli 1,000	= 6.462		G/0C (22	SPO DAC
ن 72 = - 44 28,32) 100 Spmg1	10: = 6,0 - = 6,0 (n 12 Rep	7 Е ⁻¹² м() - 2 ДАС) eated <b>(</b>	i/cc 1/carg	er Va	June -	See	SAugle #	= - 11 = - 11 = MSS -	Gi/ic (22 -0/17	SPO DAC
0. 72 E - 4 28,32) 100 SANGI SMEA	$\frac{1}{2} = 6,07$ $(n)$ $\frac{1}{2} \qquad (n)$ $R RESULTS$ $\frac{1}{2} \qquad R RESULTS$		1	- 0	BETA in mR	See AD/hr/100	SAngle # CM ²	= NSS -	-0/17	Spb DAC
0 .72 = - 4 28,32) 100 Spmg1	10: 10: 10: 10: 10: 10: 10: 10:		V/CC V/LANG RESULTS	er Va B =	June -	See	SAugle #	= - 11 = NSS -	Gi/CC (~2 - 0/17 RESULTS	Spo DAC
0. 72 E - 4 28,32) 100 SANGI SMEA	K KESUEIS		1	- 0	BETA in mR	See AD/hr/100	SAngle # CM ²	= NSS -	-0/17	Spb DAC
0. .72 E - 6. 28,32) 100 SANGI SMEA	K KESUEIS		1	- 0	BETA in mR	See AD/hr/100	SAngle # CM ²	= NSS -	-0/17	500 040
0. .72 E - 6 M 28,32) 1000 SAMEA SMEA	K KESUEIS		1	- 0	BETA in mR	See AD/hr/100	SAngle # CM ²	= NSS -	-0/17	Søb DAC
0. .72 E - 6 M 28,32) 1000 SAMEA SMEA	K KESUEIS		1	- 0	BETA in mR	See AD/hr/100	SAngle # CM ²	= NSS -	-0/17	5,06 2.4 4

NSS-01	AIR SAMPLIE	SURVEY NO. M	55-0112								
Date 4-6-05 Time 10:58	-DOSE RATE	CONTAMINATION									
Surveyor ROBIE PENMOUL	Inst. Type RADIECO	Beta Alpha	BetaAlpha								
Signature Rale Hermon	Serial No. 0864	Inst.Sn									
Reviewed Richard Ranellon		Eff.									
M Mandlon~		Bkg. cpm	cpm								
AREA A CLESS TO SECO	MISAPAI COMTISINIM	1EN17									
	/										
COMPONENT RAPON IEXOR	CTIAD, MULTIPLE C	ounts To Be TAXA	9								
COUNTED ON LUTION 2	COMPONENT RADON EXPRETIAN, MULTIPLE COUNTS TO BE TAKAM COUNTION ON LUNUM 2929 #2 SN 160019										
VALUE 100 FT3 h	Variant 100 FT3										
VOLUNIC ( 184.	$z = \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} $										
		ns) on More Brime.	AN COUNTS								
15 COUNT - IMIM - 3362	· p 141 30MI	is on Mork The are									
1 COURT - MAIN PSON											
2nd COUNT - 1min - B 245	. / 80										
~ CC / R 105	1. 30										
3 counts - 1 min - 13 105	Jun 1										
	N II										
4th count - 1 min - B 62			N								
		1	1GTE-BACifec)X								
1/105 5th count - 30 min - B146	29 (48cpm) (X33 (n1	(pm) (MDA)									
Ings of count south price			NIMDAX								
$I \mu = G \Lambda_{max} = K$	2148116cpm) (16	S(o(1(pm)))									
4/8/05 the count - 60min - B	NIGC(11) N S	$2(14\pi)$	h a h h								
-118/65 11 caunt - 60min - 13	2715 (72cpm) N8	of (1. repm) (C	ounter (hänge) H								
in count	B Activity < m	DA / 3.4 = -12 MC:									
4-11-05 Rocount (#2)	-	C C	/								
4-11-05 VLOCOUNT ( C)	(ma) a 2/an	(ma) < MOA (	$3(E^{-13})$								
30 min 13 131	1 (44cp.) × 3 (0.1		side active)								
	4 (45.4 cpm) × 6 (0,6										
10 15 13		インジ									



Recounts of Arr Single for & activity Initial entry to Secondary Containment SAMPle Taken 4-6-05/1050 100 ft³ = 2.832 E^b cc Instral One-Monste Court (~) 141 cpm 6th Count Conter #2 7th 4-8-05 60 min 82 courts -> 1.04 ret cp.n Cont Counter #1 1.04 = 3.1 aprix 2.22E6 = 1.397 E ...C. 0.336 1.397 E' = 4.93 E - 13 Mile (25% DAC) 2.832 E 6

B- Activity

7th 4-8.05 60 min 2495/60 = 41.58 cpm Gross Count BKg = 42.15 cpm Count SAMPLE < MOA (3.4 E-12 Mei/cc) LLD for 60 min count = 2673 gros counts = 3,4 E-12 mis/ce (for 100 ft 3 SAmple)

					RADIO	LOGICAL	SURVEY			
	NSS-01				A	112 SIMM-ALIZ	S	URVEY NO.	V55-C	0/13
	Date 47	-05 Time	= /2.	45		IN SIMM PLAZ		CONTA	MINATI	N
	Surveyor	ROBTE	PIENN	IOUN	Inst. Type	RANGEO	Beta_	Alpha	Bet	aAlpha
	Signature	Rolit	Hen	nh	Serial No.		Inst.S	Sn		
	Reviewed	14	nli	L	β ⁻ Factor		Eff.			
							Bkg.	срп	n	cpm
	AREA	CHA	RGAT	Purp R.	aom	STAR BOA	RD			
								,		
	COMPONE	INT		60 eu	FT	Co	UNTRA 7	12 SN 160	6619	
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0	10 MIM	Coum		$\alpha$	905		(map)	Sand ?	non	ed with l
				ß	2837	(28	4 Cjim)	Simple 15	que	
								AIR	Valar	ni - Sel
						(		Sur	щ#	N55-011 6
_	~ ~	c, C	-+	X	81	(2.7 C) (49.90)	pm)			
50	امر 30	IN COUM	ν	R	1496	(49.94)	nm)			
				Ρ						
7,3	36 10	min (	our	ß	X 2ct 400		2 срт U срт	< LLD (	474 ý	ross courts) Co
A	for 60	ft ³ Saw	ple							
	,997 net c			= 1.376 E	al:	B-	8.2 net	2.22E 6	pm =	1.466E Sali
		-	17	,	>	. /			12	/cc (< 25%)
336	E-6 M(: )1000 =	7,87E		1. (2	(14. DAC)	7,4	LEE MI.	= 8,63E	- All	/cc (2 2500 D
8.32,	)1000	-				60/2	5,32)1000			
ſ	SMEAR RE	SULTS I	N DPM/10	0 CM ²	8	s = BETA in n	nRAD/hr/10	0 CM ²		
		ESULTS 📝	NO.	RESULT		RESULTS		RESULTS /	NO.	RESULTS
						/				
-				/						
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1			/			/				/
F					/	/				
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NSS-01		SURVEY NO. 1/5	55-6114
Date 4-8-05 Time 8:30 Am	DOSE RAIE	CONTAMI	NATION
Surveyor ROBART & PANHOUN	Inst. Type AIR SAMPLER	Beta Alpha	BetaAlpha
Signature Rahtefunnoh	Serial No. 865	Inst.Sn	
Reviewed inodure	β  Factor	Eff.	
		Bkg. cpm	cpm
AREA AIR LOCK FOR	PRIMARY CONTAI	NMAM	
COMPONENT 100 F7 ³ 	GROSS COUNT		
	а 2683 (89 В 7868 (26	J	
12:14 3rd count - 30 min	X 793 (26) В 3250 (108)	)	
14:06 4th count - 10 mi	n 178 (7.8) B 670 (67	)	

4-11-05 Conter # 1		(0.34 net Cpm) (<2.99E ⁻¹³ (c/ec) <0.104c
12:23 30 min Court	X20	(0.34 net CPM) (2 21112 2 die Co.104c
	\$ 1257	(2.7 ret (pm) (<3.8 E ⁻¹² MG/cc) <0.1040

NO.	RESULTS	∠N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
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		/							
A - RA	DIATION AREA		CA – CONTA	MINATION	NAREA A	LL DOSE F	RATES IN µrem/h	r	

 $\frac{0.342}{\text{eff. } 0.336} = 1.017 \, dpm \times 2.72 E^{6} \, dpn = 4.58 E^{-7} \, nci$ 

$$\frac{100 \text{ cuff Sample}}{f_{i}^{3}} = 28.32 \frac{1}{f_{i}^{3}} \times 100 \text{ ft}^{3} \times \frac{1000 \text{ ml}}{l} = 2.832 \text{ E}^{6} \text{ cc}$$

$$\frac{4.58 \text{ E}^{-7} \text{ Mei}}{2.832 \text{ E}^{6} \text{ cc}} = 1.62 \text{ E}^{-13} \frac{\text{ l}}{\text{ ml}/\text{cc}} (< \text{mDA})$$

$$\frac{B^{-} Calculation}{1257/30} = 41.9 - 39.2 = 2.7 \text{ ret Cpm}$$

$$\frac{MDA \text{ for 30 min Count} = 1357 \text{ Gross Counts} (3.8 \text{ E}^{-12} \text{ aClose})}{Count} = 15 < MDA$$

	RADIULUGIUAL SUI	KVET .	
NSS-01	AIR SAMPLIT	SURVEY NO. <u>N</u> .	55-80115
Date 1/- 8-05 Time 2:00 3n	DOSE RATE	CONTAMI	NATION
Surveyor RE PENNOCK	Inst. Type RADIECO	Beta Alpha	BetaAlpha
Signature Rolo Telemoch	Serial No. Refer 865	Inst.Sn	
Reviewed 19 Bohn	β  Factor	Eff.	
,		Bkg. cpm	cpm
AREA PRIMAR CONTRIMM	Arts IST LIGUNC		
COMPONENT 100 CUF	-	LOUMTRA #2	
~			
4/11/05 COUNTRAFT 858 Din 10 14110 COUNT 4/12/05 Counter#2 8:54 AM 10 Min Count			
8.57AN 7000 K Br	Octs	0 срт < MDF 44 срт < 1710 А	$f\left(6.07 \in -13 \text{ m}^{1/2} \text{ m}^{1/2} \right)$
			225 fo D

NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
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RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

NSS-01	AIR SUM JUS	SUF		55-0116
Date 4/-9-05 Time	AIR Surveyers DOSE RATE Rall		CONTAMIN	
Surveyor RE PENNOUN	Inst. Type RADIECO	Beta	Alpha	BetaAlpha
Signature Role Tikermoh	Serial No. 804	Inst.Sn		
Reviewed 193 Culi	β ⁻ Factor	Eff.	-	
· -		Bkg.	cpm	cpm
AREA <u>CHARGE PUMP</u>	Room STHAR.	ORD		
COMPONENT 277 Cu	FT 2459 min	м		
4-8-05	- (	 ۱	an ya mata an an an an an an an an an an an an an	
8:46AM 30 MIM COUNT	CTR # (SNIO2601)	)		
X 308 (10.	3 cpm) 3 1870	(62.30	·pm)	· · ·
10:13 Am 2 h Com O	/			)
4-11-05 10 min ct x				~
4-12-05 10 min ct X counter #2	3 c H 3 gm) (3 41)	1 (410	pm) [< 1	LLD B 506 Gross
MDA for 277 Cuft Sample		·		
× 1.19 opmart 3.81 dpm 0.312 2.72EC				40,625 don = 1.83E - 5 2.22EC = 1.83E M.
$\frac{1.72E^{-6}}{277(28.32)1000} = 2.19E^{-13}NG$	/cc (20,10Ac) 2-	.83 E - 9 77(28.32)1	$\frac{1}{2000} = 2.33$	E-12 M Cifec (4.10 DAC)

NO.	RESULTS	/ N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
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RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

	N.S. SAVANNAI	4	
	RADIOLOGICAL SU	RVEY	
NSS-01	AIR SAMPLE	SURVEY NO.	55-0117
Date 4/11/05 Time	DOSE RATE RADO	co CONTAMI	NATION
Surveyor JAMES LOVEDAHL	Inst. Type AIR SAMPLO	Beta Alpha	BetaAlpha
Signature fime for Earl	Serial No. 🖁 💪 H	Inst.Sn	
Reviewed 14211	β  Factor	Eff.	
	100 FT3 - 1 HR	Bkg. cpm	cpm
AREA "C" DECK - Co	DLD WATER (HEM	LAB	1:10 PM

COMPONENT_

$$\frac{4}{12-05} = 10 \text{ min count } \neq 1$$

$$\frac{1}{12-05} = 10 \text{ min count } \neq 1$$

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$$\frac{1}{12-05} = 12 \text{ cfs} = 1.2 \text{ cpm}$$

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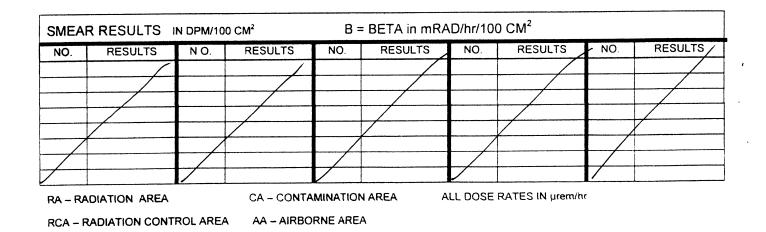
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NSS-01	ALL SANDLA	SUF		5-011	8
Date 4-11-05 Time 12:00 Pm	DOSE RATE		CONTAMI	NATION	
Surveyor Roist PENNOUL	Inst. Type Runnico	Beta	_ Alpha	Beta	Alpha
Signature Rafit Cumat	Serial No. 865	Inst.Sn			
Reviewed Black	β ⁻ Factor	Eff.			
		Bkg.	cpm	1	cpm
AREA PRIMARY CONT.	AIMINIAM 2nd hor	vil			
COMPONENT	=				
<i>f_</i> <del></del>					
4-11-05			ي. ت		
2:11-104 Count & 11	12DETS (112cpm)	3 2349	- (25 <b>5</b> cp	m)	
4-12-05					
			N		
8:51 10 min count \$ 13	(1.3cpm) /3 393	(39)	(pm)		
	· ·				
t					
10:03 30 min count	<b>`</b>	<i>r</i>			
#2 A 36(	1.2 cpm) B 11921	40 cpr	n )		
$\mu c$	•		~		
30 min LLD X = 3			247=	-13	nelec
30 mW LLD X = 3	39 gross counts h	fc7, <	-S.IIE		• 7
30 MIN LLD B = 14	15) marce counts	A.L	4.79E	-12 N	10/0C
30 MIN LLD D = 1	452 gross come	1701, -			1
					< 2500 DI

SMEA	R RESULTS	N DPM/10	0 CM ²	B =	BETA in mRA	D/hr/10	) CM ²		
NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
	/								
				/					
		-7							
1		/				/		/	
RA - RA	DIATION AREA	· ·	CA - CONTA	MINATIO	NAREA A	LL DOSE	RATES IN prem/h	r	

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RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

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	AIR SHINYIUM	<i>F</i> -+	155-0119
Date 4-11-05 Time 9:30 AIN	DOSE RATE	CONTAM	IINATION
Surveyor ROBT PIEMMOCIL	Inst. Type Rinia Reo	Beta Alpha	BetaAlpha
Signature Raliterungh	Serial No. 864	Inst.Sn	
Reviewed 1637m	β ⁻ Factor	Eff.	
		Bkg. cpm	cpm
· · · · · · · · · · · · · · · · · · ·	TAINMENT LOWK	L h fi l/ 4 //	
COMPONENT	T		
	2		
4-11-05 Солтал #2 12:16 10 минст X 30 1-12-05 8:141 10 минст Д	04 cTs (31 gm)	В 1153 сто (11 В 419 сто (41	. ,

SMEA	R RESULTS	N DPM/10	0 CM ²	B =	$B = BETA in mRAD/hr/100 CM^2$							
NO.	RESULTS	, NO.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS			
			/		/		/		/			
	/		/	/				/				
						/		-/				
/		/		/				L				
RA – RADIATION AREA CA – CONTAMINATION AREA ALL DOSE RATES IN µrem/hr												

RCA - RADIATION CONTROL AREA AA - AIRBORNE AREA

NSS-01	ALL SAFAAL	SURVEY NO.	155-0120
Date 4-12.05 Time 9:10 1M	DOSE RATE	CONTAN	<b>MINATION</b>
Surveyor Ro. 37 12 PERMICIA	Inst. Type RANGECO	Beta Alpha	BetaAlpha
Signature Na (17)	Serial No. 864	Inst.Sn	
Reviewed 15 Put	β  Factor	Eff.	
		Bkg. cpm	cpm
AREA PRIMANY CONTAIN	MIENE HTTLIEVIEL	(LOWHET LINUAL	)
COMPONENT 160 FT	3		
Ci.	INTER # 1 5N 10	2001	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
4-12-05 11:03 157 Count 10min cT 0 2nd count 30 Min cT X	× 1393 (139cpm) 70 (2.3cpm)	B 3186 (3 B 256 (8	190,000) 50 pm)
41-13-05 9:13 301711M COUNT X 5	6 (1.9 cpm) B	1308 (440)	urm)
12:08 60 MIN ( VUM X 8)	3 (1.4 cpm) 3.	2540 ( <b>42</b> c)	12m)
4-14-05			
9:21 30 min count &	$27(0.9) \beta 12$	212 (40 cpm)	
< MDA [2	$(9) \mathcal{E}^{-13} \mathcal{M}^{(1)}_{\mu c} $	2 MOA (38E	-12 May (cc)
	il DAC		

SMEAR RESULTS IN DPM/100 CM ² B = BETA in mRAD/hr/100 CM ²									
NO.	RESULTS	, N O.	RESULTS	NO.	RESULTS	NO.	RESULTS	NO.	RESULTS
									/
							/		/
							/		
				/		/			
RA – RADIATION AREA CA – CONTAMINATION AREA ALL DOSE RATES IN µrem/hr									
RCA – RADIATION CONTROL AREA AA – AIRBORNE AREA									

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NSS-01	AIR SAMPLAR	AIR SAMPLUAR SURVEY NO. NSS U/2/							
Date 4-21-05 Time	DOSE RATE	CONTAMINATION							
Surveyor ROBART E PENHOCK	Inst. Type RAPKCO	Beta Alpha	BetaAlpha						
Signature Rolf Permak	Serial No. 864	Inst.Sn 1/1							
Reviewed Aw	β  Factor	Eff.							
1000		Bkg. cpm	cpm						
AREA PRIMING CONTRIMMENT AT PORT V TUBE STRAM GEN, ACCRESS COURS. DURING BAMOUAL ASSOF COURS AND SAMPLING OF SYSTEM.									
COMPONENT 100 Cuft									

SMEAR RESULTS IN DEMITTOU CM ²										
NO.	RESULTS /	NO.	RESULTS	NO.	RESULTS	NO.		NO.	RESULTS	
							/		/	
			/			/				
						/		/		
				/		<u> </u>		<		
RA – RADIATION AREA CA – CONTAMINATION AREA ALL DOSE RATES IN µrem/hr										
RCA – F	RADIATION CONT	ROL ARE	A AA – AIRBOI	RNE ARE	A					

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

#### Certificate of Analysis Report

for

#### WPIA001 WPI

#### Client SDG: 135938 GEL Work Order: 135938

#### The Qualifiers in this report are defined as follows:

- ** Indicates the analyte is a surrogate compound.
- < Result is less than amount reported.
- > Result is greater than amount reported.
- B Target analyte was detected in the sample as well as the associated blank.
- BD Results below the MDC or low tracer recovery.
- E Concentration of the target analyte exceeds the instrument calibration range.
- H Analytical holding time exceeded.
- J Indicates an estimated value.
- P The response between the confirmation and the primary columns is >40% Different.
- R Sample results are rejected.
- U Target analyte was analyzed for but not detected above the MDL or LOD.
- UI Uncertain identification for gamma spectroscopy.
- X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- Z Paint Filter qualifier: Particulates passed through the filter. No free liquids were observed.
- h Sample preparation or preservation holding time exceeded.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis. ** Indicates the analyte is a surrogate compound.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Jake Crook.

# AL Ealle & Church

Reviewed by

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## **Certificate of Analysis**

Company :	WPI
Address :	11 S. 12th Street
	Suite 210
	Richmond, Virginia 23219
Contact:	Mr. John Bowen
Project:	<b>Radiochemistry Analytical</b>

Report Date: May 25, 2005

	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector:	D:	Metal Sample 135938001 Misc Solid 21–APR–05 05–MAY–05 Client	09:10		Proj Clie	ect: nt ID:	WPIA00105 WPIA001		
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time Batch	n Metho
Rad Gamma Spec An	alysis									
Gammaspec, Gamma	a, Solid (Long List)									
Actinium-228	U	-0.11	+/-2.32	3.83	0.800	pCi/g		AKB 05/18/05	1814 423794	1
Americium-241	U	-2.31	+/-2.86	3.80	0.200	pCi/g				
Antimony-124	U	0.424	+/-0.838	1.35	0.100	pCi/g				
Antimony-125	U	1.12	+/-1.60	2.59	0.200	pCi/g				
Barium-133	U	-0.333	+/-0.886	1.16	0.100	pCi/g				
Barium–140	U	2.94	+/-8.46	13.5	0.500	pCi/g				
Beryllium-7	U	1.15	+/-6.97	11.0	0.700	pCi/g				
Bismuth-212	U	0.351	+/-4.91	7.80	0.500	pCi/g				
Bismuth-214	U	1.06	+/-1.35	2.20	0.200	pCi/g				
Cerium-139	U	0.0914	+/-0.541	0.776	0.050	pCi/g				
Cerium-141	U	0.366	+/-1.30	1.87	0.100	pCi/g				
Cerium-144	U	-1.18	+/-3.31	4.63	0.500	pCi/g				
Cesium-134	U	0.524	+/-0.709	1.22	0.100	pCi/g				
Cesium-136	U	1.76	+/-3.15	5.35	0.300	pCi/g				
Cesium-137	U	0.199	+/-0.628	1.01	0.100	pCi/g				
Chromium-51	U	-3.09	+/-8.76	13.3	0.600	pCi/g				
Cobalt-56	U	-0.238	+/-0.744	1.21	0.100	pCi/g				
Cobalt-57	U	-0.0225	+/-0.429	0.605	0.050	pCi/g				
Cobalt-58	Ŭ	0.158	+/-0.745	1.25	0.100	pCi/g				
Cobalt-60	U	0.659	+/-1.18	1.41	0.100	pCi/g				
Europium-152	U	1.02	+/-1.61	2.56	0.200	pCi/g				
Europium-154	U	-1.41	+/-1.96	3.05	0.500	pCi/g				
Europium-155	U	-0.24	+/-1.70	2.38	0.500	pCi/g				
Iridium–192	U	0.050	+/-0.681	1.05	0.100	pCi/g				
Iron-59	U	1.54	+/-1.77	3.15	0.300	pCi/g				
Lead-210	U	101	+/-81.0	113	4.00	pCi/g				
Lead-212	UUI	0.00	+/-2.03	1.41	0.100	pCi/g				
Lead-214	U	1.71	+/-1.63	2.05	0.100	pCi/g				
Manganese-54	U	0.308	+/-0.631	1.08	0.100	pCi/g				
Mercury-203	U	0.549	+/-0.858	1.34	0.100	pCi/g				
Neodymium-147	U	5.35	+/-20.7	33.0	1000	pCi/g				
Neptunium-239	U	-2.36	+/-3.16	4.32	2.00	pCi/g				
Niobium-94	U	0.0352	+/-0.600	0.947	1.00	pCi/g				
Niobium-95	U	0.132	+/-0.921	1.54	0.050	pCi/g				
Potassium-40	U	6.62	+/-7.14	13.0	1.00	pCi/g				
Promethium-144	U	-0.236	+/-0.759	0.996	0.080	pCi/g				
Promethium-146	U	-0.0625	+/-0.773	1.20	1.00	pCi/g				
Radium–228	U	-0.11	+/-2.32	3.83	0.500	pCi/g				

### **Certificate of Analysis**

Company :	WPI
Address :	11 S. 12th Street
	Suite 210
	Richmond, Virginia 23219
Contact:	Mr. John Bowen
Project:	Radiochemistry Analytical

Report Date: May 25, 2005

	Client Sampl Sample ID:	e ID:	Metal Sample 135938001	#6		Project: Client ID		A00105 A001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units I	OF Anal	ystDate	Time	Batch	Method
Rad Gamma Spec Analy	sis			ant							
Gammaspec, Gamma, Se	olid (Long List)										
Ruthenium-106	U	4.16	+/-9.19	9.00	0.800	pCi/g					
Silver-110m	U	-0.0321	+/-0.616	0.968	0.080	pCi/g					
Sodium-22	U	-0.502	+/-0.704	1.10	0.080	pCi/g					
Thallium–208	U	0.453	+/-1.02	1.16	0.080	pCi/g					
Thorium-230	U	1.06	+/-1.35	2.20	1.00	pCi/g					
Thorium-234	U	20.6	+/-36.0	33.3	5.00	pCi/g					
Tin-113	U	-0.452	+/-0.835	1.26	0.100	pCi/g					
Uranium–235	U	1.26	+/-3.34	4.80	0.500	pCi/g					
Uranium–238	U	20.6	+/-36.0	28.3	1.00	pCi/g					
Yttrium–88	U	0.743	+/-0.764	1.50	0.100	pCi/g					
Zinc-65	U	-1.14	+/-1.45	2.25	0.300	pCi/g					
Zirconium–95	U	0.223	+/-1.33	2.23	0.200	pCi/g					
Rad Gas Flow Proportior	nal Counting										
GFPC, Gross A/B, solid											
Alpha	U	-0.0666	+/-0.961	1.82	4.00	pCi/g	SXEL	05/24/05	2034 4	23840	2
Beta	U	0.197	+/-1.52	2.63	10.0	pCi/g	SALI	05/24/05	2034 4	25049	2
The following Analytical	Methods were	performed									
Method	Description	•			A	nalyst Comments					

1 EML HASL 300, 4.5.2.3 2 EPA 900.0 Modified

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### **Certificate of Analysis**

Company : WPI

Address :

Contact:

Project:

11 S. 12th Street

Mr. John Bowen

Richmond, Virginia 23219

**Radiochemistry Analytical** 

Suite 210

Replacement Pages INB 6/10/2005

Report Date: June 6, 2005

Page 1 of 3

	Client Sample II Sample ID: Matrix: Collect Date: Receive Date: Collector:	D:	Metal Sample 135938002 Misc Solid 22-APR-05 08 05-MAY-05 Client			Proie Clier	ect: nt ID:	WPIA00105 WPIA001		
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time Batch	Method
Rad Gamma Spec Anal	ysis									
Gammaspec, Gamma, S	Solid (Long List)									
Actinium-228	Ū	ND	+/-2.77	4.92	0.800	pCi/g		AKB 05/18/05	5 1814 423794	1
Americium-241	U	ND	+/-2.95	4.02	0.200	pCi/g				
Antimony-124	U	ND	+/-1.00	1.59	0.100	pCi/g				
Antimony-125	U	ND	+/-2.06	3.38	0.200	pCi/g				
Barium-133	U	ND	+/-1.07	1.38	0.100	pCi/g				
Barium-140	U	ND	+/-10.6	16.4	0.500	pCi/g				
Beryllium-7	U	ND	+/-8.21	12.6	0.700	pCi/g				
Bismuth-212	U	ND	+/-6.40	10.1	0.500	pCi/g				
Bismuth-214	U	ND	+/-3.06	2.41	0.200	pCi/g				
Cerium-139	U	ND	+/-0.784	0.972	0.050	pCi/g				
Cerium-141	U	ND	+/-1.78	2.50	0.100	pCi/g				
Cerium-144	U	ND	+/-4.55	6.33	0.500	pCi/g				
Cesium-134	U	ND	+/-0.818	1.41	0.100	pCi/g				
Cesium-136	U	ND	+/-3.70	6.16	0.300	pCi/g				
Cesium-137	U	ND	+/-0.754	1.19	0.100	pCi/g				
Chromium-51	U	ND	+/-12.1	16.5	0.600	pCi/g				
Cobalt-56	U	ND	+/-0.946	1.63	0.100	pCi/g				
Cobalt-57	U	ND	+/-0.555	0.782	0.050	pCi/g				
Cobalt-58	U	ND	+/-0.863	1.38	0.100	pCi/g				
Cobalt-60	U	ND	+/-0.788	1.36	0.100	pCi/g				
Europium-152	U	ND	+/-2.11	3.41	0.200	pCi/g				
Europium-154	U	ND	+/-2.19	3.72	0.500	pCi/g				
Europium-155	U	ND	+/-2.22	3.13	0.500	pCi/g				
Iridium-192	U	ND	+/-0.825	1.26	0.100	pCi/g				
Iron-59	U	ND	+/-1.90	3.37	0.300	pCi/g				
Lead-210	U	ND	+/-136	99.3	4.00	pCi/g				
Lead-212	UUI	ND	+/-2.94	2.29	0.100	pCi/g				
Lead-214	UUI	ND	+/-3.39	2.78	0.100	pCi/g				
Manganese-54	U	ND	+/-0.743	1.24	0.100	pCi/g				
Mercury-203	U	ND	+/-1.06	1.63	0.100	pCi/g				
Neodymium-147	U	ND	+/-23.3	38.3	1000	pCi/g				
Neptunium-239	U	ND	+/-3.89	5.50	2.00	pCi/g				
Niobium-94	U	ND	+/-0.723	1.15	1.00	pCi/g				
Niobium-95	U	ND	+/-1.24	2.02	0.050	pCi/g				
Potassium-40	U	ND	+/-16.8	13.4	1.00	pCi/g				
Promethium-144	U	ND	+/-0.766	1.22	0.080	pCi/g				
Promethium-146	U	ND	+/-0.975	1.59	1.00	pCi/g				
Radium-228	U	ND	+/-2.77	4.92	0.500	pCi/g				

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#### **Certificate of Analysis**

Replacement Pages JUB 6/10/2005

Report Date: June 6, 2005

Page 2 of 3

 Company :
 WPI

 Address :
 11 S. 12th Street

 Suite 210
 Richmond, Virginia 23219

 Contact:
 Mr. John Bowen

 Project:
 Radiochemistry Analytical

	Client Sample II Sample ID:	D:	Metal Sample a 135938002	#11		Proie Clien		WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec Analy	sis										
Gammaspec, Gamma, Se	olid (Long List)										
Ruthenium-106	U	ND	+/-7.36	11.8	0.800	pCi/g					
Silver-110m	U	ND	+/-0.765	1.19	0.080	pCi/g					
Sodium-22	U	ND	+/-0.787	1.34	0.080	pCi/g					
Thallium-208	U	ND	+/-1.47	1.47	0.080	pCi/g					
Thorium-230	U	ND	+/-3.06	2.41	1.00	pCi/g					
Thorium-234	U	ND	+/-47.4	41.5	5.00	pCi/g					
Tin-113	U	ND	+/-1.06	1.62	0.100	pCi/g					
Uranium-235	U	ND	+/-4.63	6.65	0.500	pCi/g					
Uranium-238	U	ND	+/-47.4	34.4	1.00	pCi/g					
Yttrium-88	U	ND	+/-0.779	1.44	0.100	pCi/g					
Zinc-65	U	ND	+/-1.75	2.87	0.300	pCi/g					
Zirconium-95	UUI	ND	+/-2.58	2.70	0.200	pCi/g					
Rad Gas Flow Proportion	nal Counting										
GFPC, Gross A/B, solid											
Alpha	U	ND	+/-1.18	1.90	4.00	pCi/g		SXE1 05/24/05	5 2034 4	423849	2
Beta		3.40	+/-1.82	2.90	10.0	pCi/g					

The following Analytical Methods were performed							
Method	Description						
1	EML HASL 300, 4.5.2.3						
2	EPA 900.0 Modified						

**Analyst Comments** 

Notes:

The Qualifiers in this report are defined as follows :

** Indicates the analyte is a surrogate compound.

B Target analyte was detected in the sample as well as the associated blank.

BD Results below the MDC or low tracer recovery.

E Concentration of the target analyte exceeds the instrument calibration range.

H Analytical holding time exceeded.

J Indicates an estimated value.

U Target analyte was analyzed for but not detected above the MDL or LOD.

UI Uncertain identification for gamma spectroscopy.

X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.

h Sample preparation or preservation holding time exceeded.

The above sample is reported on a dry weight basis except where prohibited by the analytical procedure.

192 continued on 192A

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### **Certificate of Analysis**

Replacement Pages Jurs 6/10/2005

Company : WPI Address : 11 S. 12th Street Suite 210 Richmond, Virginia 23219 Contact: Mr. John Bowen Project: Radiochemistry Analytical

Report Date: June 6, 2005

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	Client Sample II Sample ID:		Metal Sample 135938002	#11		Proje Clier	ect: nt ID:	WPIA00105 WPIA001	
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time Batch Method

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Jake Crook.

Jan M. U. Reviewed by

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Company : Address : Contact: Project:	WPI 11 S. 12th Stree Suite 210 Richmond, Vir Mr. John Bowe Radiochemista	ginia 23219 en					R	eport Date: Ma	y 25, 20	05	
	Client Sample Sample ID: Matrix: Collect Date: Receive Date Collector:		Metal Sample 135938003 Misc Solid 25–APR–05 05–MAY–05 Client	11:18		Proi Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec Anal	ysis										
Gammaspec, Gamma, S	Solid (Long List)										
Actinium-228	ŬŬĬ	0.00	+/0.766	0.688	0.800	pCi/g		AKB 05/18/0	5 1815	423794	1
Americium-241	U	-0.0281	+/-0.294	0.425	0.200	pCi/g					•
Antimony-124	Ū	0.137	+/-0.125	0.207	0.100	pCi/g					
Antimony–125	U	-0.118	+/-0.256	0.384	0.200	pCi/g					
Barium-133	U	-0.0266	+/-0.131	0.174	0.100	pCi/g					
Barium-140	U	1.40	+/-1.10	1.71	0.500	pCi/g					
Beryllium–7	U	0.223	+/-0.942	1.46	0.700	pCi/g					
Bismuth-212	U	0.0178	+/-0.711	1.14	0.500	pCi/g					
Bismuth-214	U	0.230	+/-0.204	0.338	0.200	pCi/g					
Cerium-139	UUI	0.00	+/-0.168	0.123	0.050	pCi/g					
Cerium-141	U	0.0681	+/-0.212	0.308	0.100	pCi/g					
Cerium–144	U	0.0462	+/-0.579	0.839	0.500	pCi/g					
Cesium-134	U	0.023	+/-0.107	0.172	0.100	pCi/g					
Cesium-136	U	0.327	+/-0.930	0.712	0.300	pCi/g					
Cesium-137	U	0.111	+/-0.124	0.133	0.100	pCi/g					
Chromium-51	U	-0.864	+/-1.27	1.91	0.600	pCi/g					
Cobalt-56	U	0.00107	+/-0.117	0.186	0.100	pCi/g					
Cobalt-57	U	0.00287	+/-0.0698	0.101	0.050	pCi/g					
Cobalt-58	U	-0.0358	+/-0.116	0.181	0.100	pCi/g					
Cobalt-60	UUI	0.00	+/0.175	0.326	0.100	pCi/g					
Europium–152	U	0.0685	+/-0.257	0.398	0.200	pCi/g					
Europium–154	U	0.0749	+/-0.259	0.439	0.500	pCi/g					
Europium-155	U	0.336	+/-0.275	0.412	0.500	pCi/g					
Iridium–192	U	0.0706	+/-0.103	0.162	0.100	pCi/g					
Iron-59	U	0.0663	+/-0.257	0.431	0.300	pCi/g					
Lead-210	U	6.12	+/-11.9	8.19	4.00	pCi/g					
Lead-212	U	0.0252	+/-0.334	0.229	0.100	pCi/g					
Lead-214	U	0.122	+/-0.305	0.322	0.100	pCi/g					
Manganese–54	U	0.0141	+/0.0958	0.154	0.100	pCi/g					
Mercury–203	U	0.143 2.14	+/-0.243	0.189	0.100	pCi/g					
Neodymium–147 Neptunium–239	U U	2.14 -0.136	+/-2.35 +/-0.502	3.91 0.721	1000 2.00	pCi/g pCi/g					
Niobium–239	U	-0.136	+/-0.302	0.121	2.00	pCi/g pCi/g					
Niobium–94 Niobium–95	U	0.0943	+/-0.109	0.143	0.050	pCi/g pCi/g					
Potassium–40	U	2.97	+/-1.22	2.11	1.00	pCi/g pCi/g					
Potassium=40 Promethium=144	U	0.0712	+/-0.109	0.157	0.080	pCi/g pCi/g					
Promethium-146	U	0.0712	+/-0.117	0.137	1.00	pCi/g pCi/g					
Radium–228	บบเ	0.013	+/0.766	0.688	0.500	pCi/g pCi/g					

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### **<u>Certificate of Analysis</u>**

Company : WPI 11 S. 12th Street Address : Suite 210 Richmond, Virginia 23219 Contact: Mr. John Bowen Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Sample Sample ID:	e ID:	Metal Sample 135938003	#13		Proje Clier	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time Ba	tch	Metho
Rad Gamma Spec Analys	sis		//////////////////////////////////////								
Gammaspec, Gamma, So	olid (Long List)										
Ruthenium-106	U	-0.773	+/-0.890	1.36	0.800	pCi/g					
Silver-110m	U	-0.0862	+/-0.0887	0.135	0.080	pCi/g					
Sodium-22	U	0.031	+/-0.0929	0.158	0.080	pCi/g					
Thallium–208	U	0.0396	+/-0.198	0.180	0.080	pCi/g					
Thorium-230	U	0.230	+/-0.204	0.338	1.00	pCi/g					
Thorium-234	U	1.23	+/-4.96	3.62	5.00	pCi/g					
Tin-113	U	0.0411	+/-0.123	0.191	0.100	pCi/g					
Uranium–235	U	0.656	+/-0.605	0.887	0.500	pCi/g					
Uranium–238	U	1.23	+/-4.96	3.62	1.00	pCi/g					
Yttrium–88	U	0.0335	+/-0.0965	0.172	0.100	pCi/g					
Zinc-65	U	0.00536	+/-0.213	0.353	0.300	pCi/g					
Zirconium-95	U	-0.0248	+/-0.196	0.311	0.200	pCi/g					
<b>Rad Gas Flow Proportion</b>	nal Counting										
GFPC, Gross A/B, solid											
Alpha	U	-1.02	+/-1.05	2.76	4.00	pCi/g		SXE1 05/24/05	1940 4238	349	2
Beta	U	-0.385	+/-1.27	2.68	10.0	pCi/g					
The following Analytical	l Methods were	performed									
Method	Description	· · · · · · · · · · · · · · · · · · ·			A	nalyst Comme	ents				
1	EML HASL 3	00, 4.5.2.3									

2

EPA 900.0 Modified

## **Certificate of Analysis**

Company : WPI 11 S. 12th Street Address : Suite 210 Richmond, Virginia 23219 Contact: Mr. John Bowen Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector:	D:	Metal Sample 135938004 Misc Solid 25–APR–05 05–MAY–05 Client	11:12		Proj Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time B	atch	Metho
Rad Gamma Spec An	alysis										
Gammaspec, Gamma	a, Solid (Long List)										
Actinium–228	U	0.184	+/-0.0996	0.188	0.800	pCi/g		AKB 05/18/05	5 1815 423	3794	1
Americium–241	U	0.0141	+/-0.170	0.277	0.200	pCi/g					
Antimony-124	Ū	0.00315	+/-0.0325	0.0548	0.100	pCi/g					
Antimony-125	U	0.00982	+/-0.0661	0.113	0.200	pCi/g					
Barium–133	Ū	0.0246	+/-0.035	0.052	0.100	pCi/g					
Barium–140	Ū	0.178	+/-0.295	0.515	0.500	pCi/g					
Beryllium-7	U	0.0244	+/0.261	0.444	0.700	pCi/g					
Bismuth-212	Ū	0.0865	+/-0.197	0.341	0.500	pCi/g					
Bismuth-214	Ū	0.0445	+/-0.119	0.112	0.200	pCi/g					
Cerium-139	Ū	-0.0074	+/-0.0217	0.0342	0.050	pCi/g					
Cerium–141	U	-0.0247	+/-0.0513	0.0807	0.100	pCi/g					
Cerium–144	U	0.0415	+/-0.143	0.233	0.500	pCi/g					
Cesium-134	U	0.00758	+/0.0289	0.0494	0.100	pCi/g					
Cesium-136	U	0.00842	+/-0.108	0.183	0.300	pCi/g					
Cesium-137	UUI	0.00	+/-0.0304	0.0582	0.100	pCi/g					
Chromium-51	U	0.0269	+/-0.366	0.581	0.600	pCi/g					
Cobalt-56	U	-0.00736	+/-0.039	0.0557	0.100	pCi/g					
Cobalt-57	U	-0.00324	+/-0.0178	0.0285	0.050	pCi/g					
Cobalt-58	U	0.00275	+/-0.0291	0.0493	0.100	pCi/g					
Cobalt-60	U	0.0198	+/-0.046	0.0582	0.100	pCi/g					
Europium-152	U	-0.00816	+/-0.0725	0.114	0.200	pCi/g					
Europium-154	U	-0.00194	+/-0.069	0.122	0.500	pCi/g					
Europium-155	U	0.00157	+/-0.0742	0.120	0.500	pCi/g					
Iridium–192	U	-0.0101	+/-0.0299	0.0465	0.100	pCi/g					
Iron-59	U	0.0446	+/-0.0613	0.115	0.300	pCi/g					
Lead-210	U	5.94	+/-8.67	12.3	4.00	pCi/g					
Lead-212	U	0.0258	+/-0.0828	0.0645	0.100	pCi/g					
Lead-214	U	0.0494	+/-0.100	0.101	0.100	pCi/g					
Manganese-54	U	0.0124	+/-0.0269	0.0465	0.100	pCi/g					
Mercury–203	U	0.0192	+/-0.0347	0.0564	0.100	pCi/g					
Neodymium-147	U	-0.0276	+/-0.668	1.13	1000	pCi/g					
Neptunium-239	U	-0.00098	+/-0.136	0.219	2.00	pCi/g					
Niobium–94	U	0.00408	+/0.0244	0.0413	1.00	pCi/g					
Niobium–95	U	-0.0127	+/-0.0367	0.060	0.050	pCi/g					
Potassium-40	U	0.364	+/-0.523	0.513	1.00	pCi/g					
Promethium-144	U	0.0158	+/-0.0268	0.0464	0.080	pCi/g					
Promethium-146	U	0.00377	+/-0.0321	0.0546	1.00	pCi/g					
Radium–228	U	0.184	+/-0.0996	0.188	0.500	pCi/g					

### **Certificate of Analysis**

Company : WPI Address : 11 S. 12th Street Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Samp Sample ID:	le ID:	Metal Sample 135938004	e #12A		Project Client		WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time B	Batch	Metho
Rad Gamma Spec Analy	/sis										
Gammaspec, Gamma, S	Solid (Long List)										
Ruthenium-106	Ū	0.0796	+/-0.241	0.413	0.800	pCi/g					
Silver-110m	U	-0.0279	+/-0.0261	0.0406	0.080	pCi/g					
Sodium-22	U	-0.000697	+/-0.0248	0.044	0.080	pCi/g					
Thallium–208	U	0.0194	+/-0.0286	0.0498	0.080	pCi/g					
Thorium-230	U	0.0444	+/-0.119	0.0854	1.00	pCi/g					
Thorium-234	U	1.70	+/-1.31	2.22	5.00	pCi/g					
Tin-113	U	0.000478	+/-0.0371	0.0585	0.100	pCi/g					
Uranium–235	U	0.130	+/-0.146	0.242	0.500	pCi/g					
Uranium–238	U	1.70	+/-1.31	2.22	1.00	pCi/g					
Yttrium–88	U	0.0149	+/-0.0336	0.062	0.100	pCi/g					
Zinc-65	U	-0.0385	+/-0.0541	0.0897	0.300	pCi/g					
Zirconium-95	U	-0.00402	+/-0.0528	0.0883	0.200	pCi/g					
<b>Rad Gas Flow Proportio</b>	nal Counting										
GFPC, Gross A/B, solia	!										
Alpha	U	-0.424	+/-1.02	2.42	4.00	pCi/g		SXE1 05/24/05	1940 423	3849	2
Beta	U	-0.815	+/-1.02	2.27	10.0	pCi/g					
The following Analytica	al Methods wer	e performed									
Method	Description				Α	nalyst Comment:	S				

1 EML HASL 300, 4.5.2.3 2 EPA 900.0 Modified

### **Certificate of Analysis**

Company : WPI 11 S. 12th Street Address : Suite 210 Richmond, Virginia 23219 Contact: Mr. John Bowen Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector:		Paint Sample # 135938005 Misc Solid 22–APR–05 0 05–MAY–05 Client			Proi Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time Ba	atch Me	thod
Rad Gamma Spec Ana	alysis										
Gammaspec, Gamma	, Solid (Long List)										
Actinium–228	ŬŬĬ	0.00	+/-1.59	2.86	0.800	pCi/g		AKB 05/18/05	1900 423	794 1	
Americium-241	U	-0.993	+/-2.25	2.66	0.200	pCi/g					
Antimony–124	Ū	0.473	+/-0.824	0.901	0.100	pCi/g					
Antimony-125	Ū	-1.27	+/-1.74	2.49	0.200	pCi/g					
Barium–133	Ŭ	-0.0767	+/-0.744	1.09	0.100	pCi/g					
Barium–140	Ŭ	-3.03	+/-6.86	10.6	0.500	pCi/g					
Beryllium–7	Ŭ	1.77	+/-6.68	10.7	0.700	pCi/g					
Bismuth–212	Ŭ	3.68	+/-3.06	5.27	0.500	pCi/g					
Bismuth–214	Ŭ	0.706	+/-1.84	1.41	0.200	pCi/g					
Cerium–139	Ŭ	-0.285	+/-0.425	0.615	0.050	pCi/g					
Cerium-141	Ŭ	0.604	+/-1.15	1.50	0.100	pCi/g					
Cerium-144	Ŭ	-0.452	+/-2.70	3.95	0.500	pCi/g					
Cesium-134	Ŭ	0.533	+/-0.410	0.720	0.100	pCi/g					
Cesium-136	Ŭ	-0.87	+/-1.89	2.93	0.300	pCi/g					
Cesium-137	0	164	+/-10.6	0.706	0.100	pCi/g					
Chromium–51	U	0.428	+/-8.02	11.9	0.600	pCi/g					
Cobalt-56	Ŭ	0.0301	+/-0.478	0.774	0.100	pCi/g					
Cobalt-57	Ŭ	-0.0183	+/-0.329	0.482	0.050	pCi/g					
Cobalt-58	Ŭ	-0.261	+/-0.455	0.704	0.100	pCi/g					
Cobalt–60	C C	2.61	+/-0.856	0.628	0.100	pCi/g					
Europium–152	U	-0.654	+/-1.60	2.33	0.200	pCi/g					
Europium-152 Europium-154	Ŭ	0.215	+/-1.12	1.73	0.500	pCi/g					
Europium–154 Europium–155	Ŭ	-0.186	+/-1.28	1.87	0.500	pCi/g					
Iridium–192	Ŭ	-0.147	+/-0.622	0.913	0.100	pCi/g					
Iron–59	Ŭ	-0.506	+/-1.30	1.85	0.300	pCi/g					
Lead-210	Ŭ	58.2	+/-63.2	78.2	4.00	pCi/g					
Lead-210 Lead-212	0	1.81	+/-1.60	1.27	0.100	pCi/g					
Lead-212 Lead-214	U	1.04	+/-1.19	1.81	0.100	pCi/g					
Manganese–54	Ŭ	0.200	+/-0.422	0.595	0.100	pCi/g					
Mercury-203	Ŭ	0.806	+/-0.789	1.03	0.100	pCi/g					
Neodymium-147	Ŭ	9.65	+/-17.0	27.6	1000	pCi/g					
Neptunium-239	Ŭ	1.16	+/-2.35	3.49	2.00	pCi/g					
Niobium-94	Ŭ	0.143	+/-0.327	0.544	1.00	pCi/g					
Niobium–95	Ŭ	-0.0514	+/-0.593	0.953	0.050	pCi/g					
Potassium-40	UUI	0.00	+/-4.98	9.70	1.00	pCi/g					
Promethium-144	U	0.0638	+/-0.415	0.596	0.080	pCi/g					
Promethium-144	Ŭ	0.324	+/0.951	1.34	1.00	pCi/g					
Radium-228	UUI	0.00	+/-1.59	2.86	0.500	pCi/g					

### **Certificate of Analysis**

Company : WPI Address : 11 S. 12th Street Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Sample Sample ID:	ID:	Paint Sample 135938005	#8		Proje Clien		WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec Analys	sis										
Gammaspec, Gamma, Se	olid (Long List)										
Ruthenium-106	U	1.24	+/-4.08	6.63	0.800	pCi/g					
Silver-110m	U	0.267	+/-0.561	0.810	0.080	pCi/g					
Sodium-22	U	0.0757	+/-0.401	0.621	0.080	pCi/g					
Thallium–208	U	0.459	+/-0.507	0.837	0.080	pCi/g					
Thorium-230	U	0.706	+/-1.84	1.69	1.00	pCi/g					
Thorium-234	UUI	0.00	+/-19.2	23.5	5.00	pCi/g					
Tin-113	U	-0.384	+/-0.825	1.20	0.100	pCi/g					
Uranium–235	U	1.58	+/-3.02	4.00	0.500	pCi/g					
Uranium–238	UUI	0.00	+/-19.2	23.5	1.00	pCi/g					
Yttrium–88	U	0.276	+/-0.435	0.821	0.100	pCi/g					
Zinc-65	U	-0.319	+/-0.793	1.32	0.300	pCi/g					
Zirconium–95	U	0.860	+/-0.778	1.35	0.200	pCi/g					
Rad Gas Flow Proportion	nal Counting										
GFPC, Gross A/B, solid											
Alpha		4.23	+/-2.43	3.84	4.00	pCi/g		SXE1 05/24/05	1940 42	23849	2
Beta		160	+/-5.45	1.87	10.0	pCi/g					
The following Analytical	Methods were	performed									
Method	Description				Aı	nalyst Commen	its				
1	EML HASL 30	0, 4.5.2.3		······							

2 EPA 900.0 Modified

## **Certificate of Analysis**

Company : Address : Contact:	WPI 11 S. 12th Stre Suite 210 Richmond, Vir Mr. John Bowe	ginia 23219	)				R	eport Date: Ma	y 25, 20	05	
Project:	Radiochemistr		al								
	Client Sampl Sample ID: Matrix: Collect Date: Receive Date Collector:		Paint Sample 135938006 Misc Solid 22–APR–05 ( 05–MAY–05 Client			Proj Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec Anal	ysis										
Gammaspec, Gamma, .	Solid (Long List)										
Actinium-228	U	0.197	+/-0.922	1.43	0.800	pCi/g		AKB 05/18/03	5 1902 4	423794	1
Americium-241	U	0.130	+/-0.685	0.918	0.200	pCi/g					
Antimony-124	U	-0.0715	+/-0.196	0.306	0.100	pCi/g					
Antimony-125	U	-0.173	+/-0.370	0.580	0.200	pCi/g					
Barium-133	U	-0.0401	+/-0.160	0.252	0.100	pCi/g					
Barium–140	U	1.92	+/2.19	3.35	0.500	pCi/g					
Beryllium–7	U	-0.727	+/-1.55	2.43	0.700	pCi/g					
Bismuth-212	U	0.154	+/-1.58	2.29	0.500	pCi/g					
Bismuth-214	U	0.269	+/-0.305	0.485	0.200	pCi/g					
Cerium-139	U	0.0405	+/-0.0979	0.147	0.050	pCi/g					
Cerium-141	U	0.270	+/-0.240	0.362	0.100	pCi/g					
Cerium–144	U	0.349	+/-0.750	0.939	0.500	pCi/g					
Cesium-134	U	-0.0179	+/0.232	0.359	0.100	pCi/g					
Cesium-136	U	0.0843	+/-1.23	2.01	0.300	pCi/g					
Cesium-137		2.58	+/-0.370	0.286	0.100	pCi/g					
Chromium-51	U	0.389	+/-1.96	2.90	0.600	pCi/g					
Cobalt-56	U	0.0497	+/-0.269	0.418	0.100	pCi/g					
Cobalt-57	U	-0.0208	+/-0.0899	0.119	0.050	pCi/g					
Cobalt-58	U	-0.0932	+/-0.260	0.400	0.100	pCi/g					
Cobalt-60		109	+/-6.61	0.195	0.100	pCi/g					
Europium–152	U	0.404	+/-0.546	0.570	0.200	pCi/g					
Europium–154	U	0.011	+/-0.340	0.559	0.500	pCi/g					
Europium–155	U	-0.144	+/-0.354	0.469	0.500	pCi/g					
Iridium–192	U	-0.0602	+/-0.153	0.225	0.100	pCi/g					
Iron-59	U	0.0374	+/-0.692	1.12	0.300	pCi/g					
Lead-210	U	28.5	+/-25.9	34.8	4.00	pCi/g					
Lead-212	U	0.0179	+/-0.284	0.312	0.100	pCi/g					
Lead–214 Manganese–54	U U	0.188 0.0674	+/-0.260 +/-0.225	0.415 0.351	0.100 0.100	pCi/g					
Manganese–54 Mercury–203	U	0.0074	+/-0.180	0.351	0.100	pCi/g pCi/g					
Neodymium–147	U	2.11	+/-4.98	7.89	1000	pCi/g pCi/g					
Neptunium-239	U	-0.299	+/-0.649	0.858	2.00	pCi/g pCi/g					
Niobium–94	Ŭ	-0.107	+/-0.164	0.252	1.00	pCi/g pCi/g					
Niobium–95	Ŭ	0.297	+/-0.311	0.491	0.050	pCi/g					
Potassium-40	Ũ	2.76	+/-1.51	1.44	1.00	pCi/g					
Promethium-144	U	-0.0367	+/-0.171	0.265	0.080	pCi/g					
Promethium-146	Ŭ	-0.0595	+/-0.177	0.205	1.00	pCi/g					
Radium–228	Ŭ	0.197	+/-0.922	1.43	0.500	pCi/g					

### **Certificate of Analysis**

Company : WPI 11 S. 12th Street Address : Suite 210 Richmond, Virginia 23219 Contact: Mr. John Bowen Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Sample Sample ID:	e ID:	Paint Sample	#14		Proie Clien		WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec Analy	sis										
Gammaspec, Gamma, Se	olid (Long List)										
Ruthenium-106	U	1.03	+/-1.52	2.40	0.800	pCi/g					
Silver-110m	U	0.0449	+/-0.197	0.271	0.080	pCi/g					
Sodium-22	U	0.00206	+/-0.122	0.201	0.080	pCi/g					
Thallium–208	U	0.0994	+/-0.161	0.256	0.080	pCi/g					
Thorium-230	U	0.269	+/-0.305	0.485	1.00	pCi/g					
Thorium-234	U	2.12	+/-5.19	6.97	5.00	pCi/g					
Tin-113	U	0.136	+/-0.183	0.293	0.100	pCi/g					
Uranium–235	U	0.270	+/-0.634	0.948	0.500	pCi/g					
Uranium–238	U	2.12	+/-5.19	6.97	1.00	pCi/g					
Yttrium–88	U	0.0483	+/-0.0995	0.179	0.100	pCi/g					
Zinc-65	U	0.400	+/-0.545	0.893	0.300	pCi/g					
Zirconium–95	U	-0.0509	+/-0.428	0.665	0.200	pCi/g					
<b>Rad Gas Flow Proportion</b>	nal Counting										
GFPC, Gross A/B, solid											
Alpha		11.9	+/-3.17	2.54	4.00	pCi/g		SXE1 05/24/05	1940 4	23849	2
Beta		135	+/-5.18	2.25	10.0	pCi/g					-
The following Analytical	l Methods were	performed									
Method	Description				A	nalyst Commer	nts				
1	EML HASL 30	0, 4.5.2.3									·····
2	EPA 900.0 Mo	dified									

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Comp: Addre: Contac	ss :	WPI 11 S. 12th Stree Suite 210 Richmond, Virg Mr. John Bower	inia 23219	)				R	eport Date: May	/ 25, 20	05	
Projec	t:	Radiochemistry	y Analytica	al								
		Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector:		Paint Sample 135938007 Misc Solid 22–APR–05 05–MAY–05 Client	10:07		Proi Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter		Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec A	Analys	sis										
Gammaspec, Gam	ma, So	olid (Long List)										
Actinium-228		U	1.49	+/-2.01	3.08	0.800	pCi/g		AKB 05/18/05	5 1903	423794	1
Americium-241		U	-0.203	+/-0.538	0.718	0.200	pCi/g					
Antimony-124		U	-0.421	+/-0.602	0.876	0.100	pCi/g					
Antimony-125		U	0.116	+/-1.30	1.99	0.200	pCi/g					
Barium-133		U	0.854	+/-0.742	0.897	0.100	pCi/g					
Barium–140		U	1.25	+/-6.66	10.3	0.500	pCi/g					
Beryllium–7		U	-1.07	+/-5.69	8.58	0.700	pCi/g					
Bismuth-212		U	-1.14	+/-3.76	6.05	0.500	pCi/g					
Bismuth-214		U	0.584	+/-1.47	1.64	0.200	pCi/g					
Cerium-139		U	0.0314	+/-0.294	0.449	0.050	pCi/g					
Cerium–141		U	0.696	+/-0.844	1.19	0.100	pCi/g					
Cerium-144		U	1.17	+/-2.06	2.89	0.500	pCi/g					
Cesium-134		U	0.0305	+/-0.554	0.910	0.100	pCi/g					
Cesium-136		U	0.0629	+/-2.57	4.22	0.300	pCi/g					
Cesium-137		•••	51.0	+/-1.98	0.807	0.100	pCi/g					
Chromium-51		U	1.85	+/-6.03	9.32	0.600	pCi/g					
Cobalt-56		U	-0.338	+/-0.585	0.923	0.100	pCi/g					
Cobalt-57		U	0.0908	+/-0.252	0.350	0.050	pCi/g					
Cobalt–58		U	0.296	+/-0.558	0.950	0.100	pCi/g					
Cobalt-60			11.6	+/-1.28	0.850	0.100	pCi/g					
Europium–152		U	0.0469	+/-1.34	1.83	0.200	pCi/g					
Europium-154		U	0.180 0.565	+/-1.34	2.24	0.500	pCi/g					
Europium–155		U U	-0.363 0.0807	+/-0.964 +/-0.474	1.29	0.500 0.100	pCi/g					
Iridium–192		U	0.0807 0.497	+/-0.474	0.728 2.34	0.300	pCi/g					
Iron–59 Lead–210		U	2.46	+/-1.59 +/-11.0	2.34 5.79	4.00	pCi/g pCi/g					
Lead-210 Lead-212		U	0.140	+/-1.02	0.881	0.100	pCi/g pCi/g					
Lead-212 Lead-214		U	0.140	+/-1.46	1.41	0.100	pCi/g pCi/g					
Manganese–54		Ŭ	-0.0286	+/-0.506	0.825	0.100	pCi/g					
Mercury-203		Ŭ	0.618	+/0.537	0.856	0.100	pCi/g					
Neodymium-147		Ŭ	13.4	+/-15.8	25.3	1000	pCi/g					
Neptunium-239		Ŭ	0.716	+/-1.83	2.55	2.00	pCi/g					
Niobium–94		Ŭ	-0.137	+/-0.429	0.691	1.00	pCi/g					
Niobium–95		Ū	0.323	+/-0.750	1.26	0.050	pCi/g					
Potassium-40		Ū	3.47	+/-8.76	6.87	1.00	pCi/g					
Promethium-144		Ū	0.192	+/-0.453	0.760	0.080	pCi/g					
Promethium-146		U	0.608	+/-0.690	1.09	1.00	pCi/g					
Radium-228		U	1.49	+/-2.01	3.08	0.500	pCi/g					

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### **Certificate of Analysis**

Company :WPIAddress :11 S. 12th Street<br/>Suite 210<br/>Richmond, Virginia 23219Contact:Mr. John BowenProject:Radiochemistry Analytical

Report Date: May 25, 2005

	Client Sampl Sample ID:	e ID:	Paint Sample = 135938007	#19		Proj Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time B	atch	Metho
Rad Gamma Spec Analys	sis										
Gammaspec, Gamma, Se	olid (Long List)										
Ruthenium-106	Ū	-1.25	+/-4.06	6.57	0.800	pCi/g					
Silver-110m	U	-3.98	+/-0.654	0.763	0.080	pCi/g					
Sodium-22	U	0.0694	+/-0.482	0.807	0.080	pCi/g					
Thallium–208	UUI	0.00	+/-1.04	0.932	0.080	pCi/g					
Thorium-230	U	0.584	+/-1.47	1.41	1.00	pCi/g					
Thorium-234	U	3.80	+/-12.1	11.7	5.00	pCi/g					
Tin-113	U	-0.0137	+/-0.621	0.947	0.100	pCi/g					
Uranium–235	UUI	0.00	+/-2.20	3.18	0.500	pCi/g					
Uranium–238	U	3.80	+/-12.1	7.00	1.00	pCi/g					
Yttrium–88	U	0.0243	+/-0.457	0.831	0.100	pCi/g					
Zinc-65	U	0.681	+/-1.13	1.93	0.300	pCi/g					
Zirconium–95	U	-0.529	+/-1.07	1.70	0.200	pCi/g					
Rad Gas Flow Proportion	nal Counting										
GFPC, Gross A/B, solid											
Alpha		3.25	+/-2.10	2.71	4.00	pCi/g		SXE1 05/24/05	1940 423	849	2
Beta		69.1	+/-3.76	2.37	10.0	pCi/g					
The following Analytical	l Methods were	performed									
Method	Description	•			A	nalyst Comme	nts				
1	EML HASL 30	00, 4.5.2.3	********								

1	EML HASL 300, 4.5.2.
2	EPA 900.0 Modified

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### **Certificate of Analysis**

Company : WPI Address : 11 S. 12th Street Suite 210 Richmond, Virginia 23219 Contact: Mr. John Bowen Project: Radiochemistry Analytical

Report Date: May 25, 2005

	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector:	ID:	Paint Sample = 135938008 Misc Solid 22–APR–05 I 05–MAY–05 Client			Proj Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec An	alysis										
Gammaspec, Gamma	a, Solid (Long List)										
Actinium–228	U	2.16	+/-3.29	5.56	0.800	pCi/g		AKB 05/18/05	5 1906	423794	1
Americium-241	U	3.21	+/-3.52	4.69	0.200	pCi/g					
Antimony-124	U	0.302	+/-1.19	1.64	0.100	pCi/g					
Antimony-125	U	-2.6	+/-3.04	4.53	0.200	pCi/g					
Barium–133	U	-0.952	+/-1.26	1.88	0.100	pCi/g					
Barium–140	U	9.99	+/-14.5	20.3	0.500	pCi/g					
Beryllium-7	U	2.94	+/-12.8	19.7	0.700	pCi/g					
Bismuth-212	U	2.78	+/-6.27	10.0	0.500	pCi/g					
Bismuth-214	U	2.36	+/-3.52	2.83	0.200	pCi/g					
Cerium-139	U	-0.708	+/-0.787	1.07	0.050	pCi/g					
Cerium–141	U	0.0367	+/-1.87	2.59	0.100	pCi/g					
Cerium–144	U	-4.6	+/-4.90	6.60	0.500	pCi/g					
Cesium-134	U	0.0825	+/-0.928	1.45	0.100	pCi/g					
Cesium-136	U	0.864	+/-4.41	7.37	0.300	pCi/g					
Cesium-137		342	+/-5.67	1.38	0.100	pCi/g					
Chromium-51	U	1.73	+/-13.9	21.2	0.600	pCi/g					
Cobalt-56	U	0.399	+/-1.06	1.68	0.100	pCi/g					
Cobalt-57	U	0.824	+/0.996	0.846	0.050	pCi/g					
Cobalt-58	U	0.429	+/-1.03	1.65	0.100	pCi/g					
Cobalt-60		84.6	+/-3.74	1.00	0.100	pCi/g					
Europium-152	U	-0.226	+/-2.81	4.26	0.200	pCi/g					
Europium–154	U	0.768	+/-1.78	2.81	0.500	pCi/g					
Europium-155	U	1.12	+/-2.36	3.28	0.500	pCi/g					
Iridium-192	U	0.0901	+/-1.08	1.64	0.100	pCi/g					
Iron-59	U	0.585	+/-2.37	3.97	0.300	pCi/g					
Lead-210	U	-49.9	+/-105	122	4.00	pCi/g					
Lead-212	U	1.54	+/-1.49	2.29	0.100	pCi/g					
Lead-214	U	1.17	+/-2.05	3.16	0.100	pCi/g					
Manganese–54	U	0.285	+/-0.848	1.35	0.100	pCi/g					
Mercury-203	U	1.11	+/-1.26	1.94	0.100	pCi/g					
Neodymium-147	U	-21.6	+/31.7	47.6	1000	pCi/g					
Neptunium-239	U	0.740	+/-4.51	6.22	2.00	pCi/g					
Niobium–94	U	0.0713	+/-0.710	1.11	1.00	pCi/g					
Niobium-95	U	1.15	+/-1.19	1.97	0.050	pCi/g					
Potassium-40	UUI	0.00	+/6.91	13.5	1.00	pCi/g					
Promethium-144	U	-0.0423	+/-0.735	1.14	0.080	pCi/g					
Promethium-146	U	-0.61	+/-1.56	2.36	1.00	pCi/g					
Radium–228	U	2.16	+/-3.29	5.56	0.500	pCi/g					

## **Certificate of Analysis**

Company : WPI 11 S. 12th Street Address : Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Sample Sample ID:	ID:	Paint Sample # 135938008	\$27		Proje Clier	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec Analys	sis										
Gammaspec, Gamma, So	olid (Long List)										
Ruthenium-106	U	-3.49	+/-8.16	12.4	0.800	pCi/g					
Silver-110m	UUI	0.00	+/-1.55	2.91	0.080	pCi/g					
Sodium-22	U	0.277	+/-0.641	1.01	0.080	pCi/g					
Thallium–208	U	1.35	+/-1.29	1.40	0.080	pCi/g					
Thorium-230	U	2.36	+/-3.52	2.83	1.00	pCi/g					
Thorium-234	U	22.2	+/29.8	36.7	5.00	pCi/g					
Tin-113	U	-0.311	+/-1.45	2.20	0.100	pCi/g					
Uranium–235	U	3.27	+/-5.48	6.88	0.500	pCi/g					
Uranium–238	U	22.2	+/-29.8	36.7	1.00	pCi/g					
Yttrium–88	U	0.211	+/-0.658	1.20	0.100	pCi/g					
Zinc-65	U	-0.929	+/-1.93	3.10	0.300	pCi/g					
Zirconium–95	U	0.425	+/-1.74	2.76	0.200	pCi/g					
Rad Gas Flow Proportion	nal Counting										
GFPC, Gross A/B, solid											
Alpha		3.71	+/-2.87	2.38	4.00	pCi/g		SXE1 05/24/05	5 1940 4	23849	2
Beta		480	+/-9.44	2.02	10.0	pCi/g					
The following Analytical	I Methods were	performed									
Method	Description				A	nalyst Comme	nts				
]	EML HASL 30	0, 4.5.2.3					<u>,</u>				

EPA 900.0 Modified 2

	Company : Address : Contact:	WPI 11 S. 12th Stre Suite 210 Richmond, Vir Mr. John Bowe	ginia 23219	)				R	eport Date: Ma	y 25, 20	05	
	Project:	Radiochemist		al								
		Client Sampl Sample ID: Matrix: Collect Date: Receive Date Collector:		Paint Sample = 135938009 Misc Solid 20-APR-05 0 05-MAY-05 Client			Proi Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter		Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma	Spec Analy	sis										
Gammaspec,	, Gamma, S	olid (Long List)										
Actinium-22		ັບ໌	5.02	+/-5.42	7.72	0.800	pCi/g		AKB 05/19/0	5 1224 -	423794	1
Americium-	-241	U	-5.89	+/-8.21	9.74	0.200	pCi/g					-
Antimony-1		U	0.789	+/-1.31	2.29	0.100	pCi/g					
Antimony-1	25	U	-0.685	+/-2.58	3.94	0.200	pCi/g					
Barium-133		U	-0.776	+/-1.72	2.20	0.100	pCi/g					
Barium-140		U	6.18	+/-16.4	26.6	0.500	pCi/g					
Beryllium-7	,	U	-6.13	+/-11.4	17.0	0.700	pCi/g					
Bismuth-212	2	U	3.43	+/-6.88	12.4	0.500	pCi/g					
Bismuth-214	4	U	0.556	+/-3.00	3.92	0.200	pCi/g					
Cerium-139		U	0.193	+/-0.936	1.41	0.050	pCi/g					
Cerium-141		U	-0.062	+/-2.50	3.69	0.100	pCi/g					
Cerium-144		U	2.23	+/-6.73	8.93	0.500	pCi/g					
Cesium-134		U	0.0677	+/-1.03	1.78	0.100	pCi/g					
Cesium-136		U	0.0964	+/-5.53	9.68	0.300	pCi/g					
Cesium-137		U	1.16	+/-1.59	1.80	0.100	pCi/g					
Chromium-5	51	U	-5.59	+/-15.7	23.4	0.600	pCi/g					
Cobalt-56		U	-0.185	+/-1.22	2.05	0.100	pCi/g					
Cobalt-57		U	0.300	+/-0.773	1.16	0.050	pCi/g					
Cobalt-58		U	1.38	+/-1.00	1.93	0.100	pCi/g					
Cobalt-60			8.62	+/-2.13	1.71	0.100	pCi/g					
Europium-1		U	0.754	+/-3.40	4.68	0.200	pCi/g					
Europium-1		U	0.167	+/-2.50	4.55	0.500	pCi/g					
Europium-1	55	U	-1.66	+/-3.22	4.56	0.500	pCi/g					
Iridium–192		U	-0.0439	+/-1.16	1.78	0.100	pCi/g					
Iron–59		U	0.820	+/-2.69	4.90	0.300	pCi/g					
Lead-210		U	234	+/-308	400	4.00	pCi/g					
Lead-212		U	1.06	+/-1.89	2.92	0.100	pCi/g					
Lead-214	51	U	2.74	+/-2.44	3.99	0.100	pCi/g					
Manganese-: Mercury-203		U	0.161 -0.52	+/-0.939	1.65	0.100	pCi/g					
Neodymium-		U U	-0.52 -5.18	+/-1.55	2.30 68.9	0.100	pCi/g					
Neptunium-2		U	-0.324	+/-44.4 +/-5.89	08.9 8.59	1000 2.00	pCi/g pCi/g					
Niobium-94		U	-0.324 -0.248	+/-0.960	1.57	1.00						
Niobium-95		U	0.322	+/-1.59	2.76	0.050	pCi/g pCi/g					
Potassium-40	0	U	0.322	+/-16.8	17.5	1.00	pCi/g pCi/g					
Promethium-		U	-0.0639	+/-1.15	1.66	0.080	pCi/g pCi/g					
Promethium-		U	0.956	+/-1.15	2.10	1.00	pCi/g pCi/g					
Radium-228		U	5.02	+/-5.42	7.72	0.500	pCi/g pCi/g					

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

### **<u>Certificate of Analysis</u>**

Company : WPI Address : 11 S. 12th Street Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Sample Sample ID:	e ID:	Paint Sample # 135938009	ŧ2		Project Client I		WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time B	atch	Method
Rad Gamma Spec Analys	sis										
Gammaspec, Gamma, Se	olid (Long List)										
Ruthenium-106	U	-0.617	+/-8.55	14.3	0.800	pCi/g					
Silver-110m	U	-0.0199	+/-1.09	1.60	0.080	pCi/g					
Sodium-22	U	0.0567	+/-0.901	1.64	0.080	pCi/g					
Thallium–208	U	1.49	+/-1.18	2.13	0.080	pCi/g					
Thorium-230	U	0.556	+/-3.00	3.92	1.00	pCi/g					
Thorium-234	U	56.5	+/-60.3	78.9	5.00	pCi/g					
Tin-113	U	-0.88	+/-1.43	2.10	0.100	pCi/g					
Uranium–235	U	4.13	+/-6.28	9.49	0.500	pCi/g					
Uranium–238	U	56.5	+/-60.3	78.9	1.00	pCi/g					
Yttrium–88	U	0.377	+/-0.979	2.08	0.100	pCi/g					
Zinc-65	U	0.0904	+/-2.17	3.80	0.300	pCi/g					
Zirconium-95	U	0.575	+/-2.14	3.75	0.200	pCi/g					
<b>Rad Gas Flow Proportion</b>	nal Counting										
GFPC, Gross A/B, solid											
Alpha	U	0.293	+/-1.31	2.66	4.00	pCi/g		SXE1 05/24/05	1940 423	849	2
Beta		11.0	+/-1.81	2.32	10.0	pCi/g		51121 00121100	1,5 125	0.7	-
The following Analytical	Methods were	performed									
Method	Description				A	nalyst Comments					

1 EML HASL 300, 4.5.2.3 2

EPA 900.0 Modified

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### **Certificate of Analysis**

Company : WPI Address : 11 S. 12th Street Suite 210 Richmond, Virginia 23219 Contact: Mr. John Bowen Project: Radiochemistry Analytical

Report Date: May 25, 2005

	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector:		Paint Sample 135938010 Misc Solid 20-APR-05 05-MAY-05 Client			Proi Clie	ect: nt ID:	WPIA00105 WPIA001		
Parameter	Qualifier	Result		DL	RL	Units	DF	AnalystDate	Time Ba	tch Metho
Rad Gamma Spec An	alysis									
Gammaspec, Gamma	a, Solid (Long List)									
Actinium-228	ŬŪI	0.00	+/-2.31	2.47	0.800	pCi/g		AKB 05/19/05	1226 4237	94 1
Americium-241	U	-0.184	+/-1.15	1.11	0.200	pCi/g				
Antimony-124	Ū	0.177	+/-0.501	0.835	0.100	pCi/g				
Antimony-125	U	-0.451	+/-0.961	1.48	0.200	pCi/g				
Barium–133	Ū	0.108	+/-0.554	0.782	0.100	pCi/g				
Barium-140	Ū	-0.90	+/-6.55	10.4	0.500	pCi/g				
Beryllium-7	U	-0.856	+/-3.78	5.99	0.700	pCi/g				
Bismuth-212	U	3.32	+/-4.02	4.60	0.500	pCi/g				
Bismuth-214	U	1.36	+/-0.895	1.58	0.200	pCi/g				
Cerium-139	Ū	-0.12	+/-0.358	0.444	0.050	pCi/g				
Cerium-141	U	0.818	+/-0.861	1.29	0.100	pCi/g				
Cerium-144	Ŭ	-1.13	+/-2.15	2.96	0.500	pCi/g				
Cesium-134	U	0.113	+/-0.442	0.780	0.100	pCi/g				
Cesium-136	U	-2.03	+/-2.14	3.26	0.300	pCi/g				
Cesium-137	U	0.0559	+/-0.783	0.664	0.100	pCi/g				
Chromium-51	U	1.18	+/-5.70	9.10	0.600	pCi/g				
Cobalt-56	U	-0.0373	+/-0.474	0.813	0.100	pCi/g				
Cobalt-57	U	-0.184	+/-0.267	0.365	0.050	pCi/g				
Cobalt-58	U	0.225	+/-0.429	0.792	0.100	pCi/g				
Cobalt-60	U	0.108	+/-0.384	0.717	0.100	pCi/g				
Europium-152	U	0.461	+/-1.03	1.67	0.200	pCi/g				
Europium–154	U	0.495	+/-1.10	2.08	0.500	pCi/g				
Europium-155	U	0.199	+/-0.978	1.40	0.500	pCi/g				
Iridium–192	U	-0.168	+/-0.437	0.670	0.100	pCi/g				
Iron-59	U	-0.152	+/-1.04	1.79	0.300	pCi/g				
Lead-210	U	13.7	+/-10.6	14.1	4.00	pCi/g				
Lead-212	UUI	0.00	+/-1.38	0.874	0.100	pCi/g				
Lead-214	U	0.251	+/-1.32	1.37	0.100	pCi/g				
Manganese–54	U	-0.138	+/-0.361	0.602	0.100	pCi/g				
Mercury-203	U	0.530	+/-1.21	0.762	0.100	pCi/g				
Neodymium-147	U	-1.4	+/-15.2	24.3	1000	pCi/g				
Neptunium-239	U	-0.951	+/-1.82	2.52	2.00	pCi/g				
Niobium–94	U	0.143	+/-0.394	0.658	1.00	pCi/g				
Niobium-95	U	0.655	+/-1.34	1.13	0.050	pCi/g				
Potassium-40	U	8.18	+/-4.14	9.21	1.00	pCi/g				
Promethium-144	U	0.496	+/-0.418	0.747	0.080	pCi/g				
Promethium-146	U	-0.0315	+/-0.456	0.728	1.00	pCi/g				
Radium–228	UUI	0.00	+/-2.31	2.47	0.500	pCi/g				

### **Certificate of Analysis**

Company : WPI Address : 11 S. 12th Street Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Sample Sample ID:	ID:	Paint Sample = 135938010	#1		Proje Clier	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec Analy	sis	· / · · · · ·									
Gammaspec, Gamma, So	olid (Long List)										
Ruthenium-106	Ū	0.0973	+/-3.61	5.87	0.800	pCi/g					
Silver-110m	U	0.235	+/-0.436	0.668	0.080	pCi/g					
Sodium-22	U	0.177	+/-0.395	0.748	0.080	pCi/g					
Thallium–208	U	0.069	+/-0.593	0.697	0.080	pCi/g					
Thorium-230	U	1.36	+/-0.895	1.58	1.00	pCi/g					
Thorium–234	U	1.84	+/-13.9	9.25	5.00	pCi/g					
Tin-113	U	0.063	+/-0.491	0.791	0.100	pCi/g					
Uranium–235	U	0.323	+/-2.19	3.14	0.500	pCi/g					
Uranium–238	U	1.84	+/-13.9	9.25	1.00	pCi/g					
Yttrium–88	U	0.159	+/0.469	0.954	0.100	pCi/g					
Zinc-65	U	-0.093	+/-0.913	1.37	0.300	pCi/g					
Zirconium–95	U	-0.166	+/-0.785	1.33	0.200	pCi/g					
<b>Rad Gas Flow Proportion</b>	nal Counting										
GFPC, Gross A/B, solid											
Alpha	U	0.588	+/-1.37	2.56	4.00	pCi/g		SXE1 05/24/05	1941 4	23849	2
Beta	U	2.86	+/-1.58	2.90	10.0	pCi/g					
The following Analytical	Methods were	performed									
Method	Description	·			Aı	nalyst Comme	nts				
1	EML HASL 30	0, 4.5.2.3	······································								

2 EPA 900.0 Modified

Company : Address : Contact:	WPI 11 S. 12th Street Suite 210 Richmond, Virgin Mr. John Bowen	nia 23219					R	eport Date: Ma	y 25, 20	005	
Project:	Radiochemistry	Analytica	1								
	Client Sample I Sample ID: Matrix: Collect Date: Receive Date: Collector:		Core bore San 135938011 Misc Solid 21–APR–05 1 05–MAY–05 Client			Proi Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Liquid Scintillation	Analysis										
LSC, Tritium Dist, Solia	!										
Tritium	U	-2.06	+/-2.84	5.12	6.00	pCi/g		ATH1 05/18/05	5 0700	425676	1
The following Analytics	al Methods were p	erformed									
Method	Description				A	nalyst Comm	ents	-			
1	EPA 906.0 Mod	ified									

Company : Address : Contact:	WPI 11 S. 12th Street Suite 210 Richmond, Virgin Mr. John Bowen	nia 23219					R	eport Date: Ma	y 25, 20	005	
Project:	Radiochemistry	Analytica	ો								
	Client Sample I Sample ID: Matrix: Collect Date: Receive Date: Collector:	D:	Core bore San 135938012 Misc Solid 21–APR–05 1 05–MAY–05 Client			Proi Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Liquid Scintillation	Analysis										
LSC, Tritium Dist, Solid	1										
Tritium	U	0.683	+/-2.90	4.99	6.00	pCi/g		ATH1 05/18/03	5 0732	425676	1
The following Analytic	al Methods were p	erformed									
Method	Description				A	nalyst Comm	ents				
1	EPA 906.0 Mod	ified									

Company : Address : Contact: Project:	WPI 11 S. 12th Street Suite 210 Richmond, Virgin Mr. John Bowen Radiochemistry						R	eport Date: Ma	y 25, 20	005	
	Client Sample I		Core bore Sam	ple #5 O	outside	Proj		WPIA00105			
	Sample ID: Matrix: Collect Date: Receive Date: Collector:		135938013 Misc Solid 21–APR–05 1 05–MAY–05 Client	1:00		Clie	nt ID:	WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Liquid Scintillation	Analysis										
LSC, Tritium Dist, Solia	l										
Tritium	U	0.628	+/-2.92	5.05	6.00	pCi/g		ATH1 05/18/05	5 0803	425676	1
The following Analytica	al Methods were pe	erformed									
Method	Description				A	nalyst Comm	ents				
1	EPA 906.0 Modi	fied									

Company : Address : Contact:	WPI 11 S. 12th Street Suite 210 Richmond, Virgi Mr. John Bowen	inia 23219	)				R	eport Date: Ma	y 25, 20	005	
Project:	Radiochemistry	Analytica	al								
	Client Sample Sample ID: Matrix: Collect Date: Receive Date: Collector:	ID:	Core bore San 135938014 Misc Solid 21–APR–05 1 05–MAY–05 Client		utside	Proj Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Rad Liquid Scintillation</b>	Analysis										
LSC, Tritium Dist, Solia	!										
Tritium	U	-0.738	+/-2.97	5.23	6.00	pCi/g		ATH1 05/18/0	5 0835	425676	1
The following Analytica	al Methods were p	erformed									
Method	Description				A	nalyst Comm	ents				
1	EPA 906.0 Mod	lified	<u></u>								

# **Certificate of Analysis**

Project:         Radiochemistry Analytical           Client Sample ID: Sample ID: Matrix: Collect Date:         Core bore Sample #5 Middle IS-MAY-05         Project: Client ID:         WPIA0010           Project:         Client Date:         21-APR-05 11:00 Receive Date:         Solid         WPIA0010           Rad         Collect Date:         21-APR-05 11:00 Receive Date:         No         No         No           Collector:         Client         Client         District Client         District Client         No           Radiomaspec, Gamma, Solid (Long Lst)         Actinium-224         0.497         +/-0.143         0.131         0.800         pCig         AKB         0/11/05 1730 424563         1           Antimony-124         U         -0.025         +/-0.0183         0.037         0.100         pCig         AKB         0/11/05 1730 424563         1           Barium-133         U         0.0497         +/-0.182         0.0370         0.100         pCig         AKB         0/11/05 1730 424563         1           Barium-133         U         0.0497         +/-0.0180         0.0370         0.100         pCig         AKB         0/11/05 1730 424563         1           Germany-124         U         -0.0287         +/-0.0180         0.0370	Company : Address : Contact:	WPI 11 S. 12th Str Suite 210 Richmond, V Mr. John Bow	irginia 23219	)				R	Report Date: Maj	y 25, 20	05	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Project:	Radiochemis	try Analytic	al								
Act Gamma Spec Analysis           Gammaspec, Gamma, Solid (Long List)           Actinium=241         0.497         +/-0.143         0.131         0.800         pCi/g         AKB         05/11/05 1730 424563         1           Americium=241         U         0.0697         +/-0.024         0.0391         0.100         pCi/g         AKB         05/11/05 1730 424563         1           Antimony=124         U         -0.0252         +/-0.0245         0.0377         0.100         pCi/g           Barium=133         U         0.00492         +/-0.0235         0.3377         0.100         pCi/g           Beryllium-7         U         0.222         +/-0.0180         0.000         pCi/g           Cerium=140         U         -0.0266         +/-0.021         0.220         0.500         pCi/g           Cerium=141         U         0.0224         +/-0.015         0.0266         0.050         pCi/g           Cerium=141         U         0.0224         +/-0.0165         0.181         0.500         pCi/g           Cerium=141         U         -0.0234         +/-0.0165         0.300         pCi/g           Cerium=141         U         -0.0244         +/-0.0216		Sample ID: Matrix: Collect Date Receive Dat	2:	135938015 Misc Solid 21-APR-05 05-MAY-05	11:00	Middle						
Gammapec, Gamma, Solid (Long List)         Actinium-228       0.497       +/-0.143       0.131       0.800       pC/ig       AKB       05/11/05       1730       424563       1         Americium-241       U       -0.0252       +/-0.024       0.0391       0.100       pC/ig         Antimony-125       U       0.00409       +/-0.0244       0.084       0.200       pC/ig         Barium-133       U       0.00492       +/-0.0245       0.0377       0.100       pC/ig         Barium-140       U       -0.0876       +/-0.0235       0.377       0.100       pC/ig         Bismuth-212       U       0.143       +/-0.217       0.292       0.500       pC/ig         Cerium-139       U       0.0013       +/-0.015       0.0266       0.050       pC/ig         Cerium-144       U       -0.0294       +/-0.015       0.0266       0.050       pC/ig         Cesium-136       U       0.0439       +/-0.0149       0.0333       0.100       pC/ig         Cesium-136       U       -0.0294       +/-0.0126       0.181       0.500       pC/ig         Cesium-136       U       -0.0232       +/-0.0350       0.0414       0.100	Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Actinum-228 $0.497$ $+/-0.133$ $0.131$ $0.800$ $pCyg$ AKB $05/11/05$ $1730$ $424563$ $1$ Americium-241U $-0.0232$ $+/-0.024$ $0.391$ $0.100$ $pCyg$ $AKB$ $05/11/05$ $1730$ $424563$ $1$ Antimony-124U $-0.0232$ $+/-0.024$ $0.0391$ $0.100$ $pCyg$ $AKB$ $05/11/05$ $1730$ $424563$ $1$ Barium-133U $0.00492$ $+/-0.0235$ $0.307$ $0.100$ $pCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ Barium-133U $0.00492$ $+/-0.0235$ $0.300$ $pCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ Bismuth-212U $0.143$ $+/-0.271$ $0.292$ $0.500$ $pCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $PCyg$ $P$	Rad Gamma Spec Analy	ysis										
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Potassium-40         13.8         +/-1.33         0.225         1.00         pCi/g           Promethium-144         U         -0.00153         +/-0.0186         0.0324         0.080         pCi/g           Promethium-146         U         0.00226         +/-0.0236         0.0425         1.00         pCi/g												
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Promethium-146 U 0.00226 +/-0.0236 0.0425 1.00 pCi/g		TT										
$\mathbf{r}_{a01011} = 220 \qquad \qquad 0.477  \mathbf{r}_{1} = 0.143  0.151  0.500 \qquad \mathbf{p}_{C}/\mathbf{g}$		U										
	Kaulum-220		0.47/	T/-0.14J	0.131	0.500	hen R					

# **Certificate of Analysis**

Company : WPI 11 S. 12th Street Address : Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

	Client Sample ID Sample ID:	<b>)</b> :	Core bore Sar 135938015	nple #5	Middle	Proj Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Metho
Rad Gamma Spec An	alysis										
Gammaspec, Gamma	a, Solid (Long List)										
Ruthenium-106	U	0.0363	+/-0.180	0.321	0.800	pCi/g					
Silver-110m	U 0.	.00555	+/-0.0178	0.0323	0.080	pCi/g					
Sodium-22	U -(	0.0187	+/-0.0252	0.0416	0.080	pCi/g					
Thallium–208	(	0.0996	+/-0.0463	0.0349	0.080	pCi/g					
Thorium-230		0.266	+/-0.0816	0.062	1.00	pCi/g					
Thorium-234	U	0.247	+/-0.860	1.16	5.00	pCi/g					
Tin-113	U -	-0.014	+/-0.025	0.0436	0.100	pCi/g					
Uranium-235	U (	0.0729	+/-0.134	0.174	0.500	pCi/g					
Uranium–238	U	0.247	+/-0.860	1.16	1.00	pCi/g					
Yttrium–88	U (	0.0217	+/-0.0189	0.0418	0.100	pCi/g					
Zinc-65	U -(	0.0121	+/-0.0599	0.0893	0.300	pCi/g					
Zirconium-95	U	0.029	+/-0.0395	0.0759	0.200	pCi/g					
The following Prep N	Aethods were performe	ed									
Method	Description				Analyst	Date	Time	Prep Batch			
Dry Soil Prep	Dry Soil Prep GL-	-RAD-	A-021		TCI	05/10/05	1412	423806			
The following Analyt	tical Methods were per	formed									
Method	Description				A	Analyst Comme	ents				
1	EML HASL 300, 4	4.5.2.3	·····								

# **Certificate of Analysis**

Company Address :	11 S. 12th Stre Suite 210						-			~ <b>-</b>	
Quitant	Richmond, Vi		)				R	eport Date: Ma	y 25, 20	05	
Contact:	Mr. John Bow										
Project:	Radiochemist	ry Analytic	al								
	Client Sampl Sample ID: Matrix: Collect Date: Receive Date Collector:	:	Core bore Sat 135938016 Misc Solid 21–APR–05 05–MAY–05 Client	11:48	Middle	Proje Clier	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec Anal											
Gammaspec, Gamma,	Solid (Long List)										
Actinium-228		0.451	+/0.0835	0.056	0.800	pCi/g		AKB 05/11/0	5 1928	424563	1
Americium-241	U	0.0262	+/-0.036	0.0648	0.200	pCi/g					
Antimony-124	U	-0.00521	+/0.0104	0.0185	0.100	pCi/g					
Antimony-125	U	0.00475	+/-0.0228	0.041	0.200	pCi/g					
Barium-133	U	-0.00066	+/-0.0117	0.0186	0.100	pCi/g					
Barium-140	U	-0.00973	+/-0.0887	0.154	0.500	pCi/g					
Beryllium-7	U	-0.0833	+/0.0849	0.143	0.700	pCi/g					
Bismuth-212		0.261	+/-0.116	0.122	0.500	pCi/g					
Bismuth-214		0.139	+/-0.0419	0.0313	0.200	pCi/g					
Cerium-139	U	0.000945	+/-0.00737	0.0133	0.050	pCi/g					
Cerium-141	Ū	-0.00436	+/-0.0162	0.0293	0.100	pCi/g					
Cerium–144	Ū	0.00552	+/-0.0526	0.0867	0.500	pCi/g					
Cesium-134	Ū	0.0158	+/-0.0158	0.0215	0.100	pCi/g					
Cesium-136	Ŭ	0.0245	+/-0.0398	0.0712	0.300	pCi/g					
Cesium-137	Ū	-0.00994	+/-0.00979	0.0168	0.100	pCi/g					
Chromium-51	Ŭ	0.0752	+/-0.103	0.193	0.600	pCi/g					
Cobalt-56	Ŭ	-0.0106	+/-0.0109	0.0182	0.100	pCi/g					
Cobalt-57	Ŭ	-0.00274	+/-0.00575	0.0102	0.050	pCi/g					
Cobalt–58	Ŭ	-0.00904	+/-0.0108	0.0105	0.100	pCi/g					
Cobalt–60	Ŭ	-0.0107	+/-0.0108	0.0102	0.100	pCi/g					
Europium–152	Ŭ	-0.0163	+/-0.0237	0.042	0.200	pCi/g					
Europium–152	Ŭ	0.00324	+/-0.0349	0.0619	0.500	pCi/g					
Europium–155	Ŭ	0.00324	+/-0.0238	0.0458	0.500	pCi/g					
Iridium–192	U	-0.00895	+/-0.00872	0.0154	0.100	pCi/g					
Iron–59	U	-0.00726	+/-0.0281	0.0496	0.300	pCi/g					
Lead-210	U	-0.00720	+/-1.04	1.75	4.00	pCi/g					
Lead-212	0	0.447	+/-0.0459	0.024	0.100	pCi/g					
Lead-212 Lead-214		0.172	+/-0.0409	0.0303	0.100	pCi/g					
Manganese–54	U	0.0101	+/-0.0167	0.0303	0.100	pCi/g pCi/g					
Manganese–34 Mercury–203	U	0.0101	+/-0.0119	0.0206	0.100	pCi/g pCi/g					
Neodymium-147	U	-0.154	+/-0.206	0.345	1000	pCi/g					
Neptunium-239	U	0.0381	+/-0.0437	0.0828	2.00	pCi/g pCi/g					
Niobium–94	U	0.00053	+/-0.00883	0.0159	1.00	pCi/g					
Niobium–94	U	-0.00657	+/-0.0156	0.0233	0.050	pCi/g pCi/g					
Potassium-40	U	-0.00057	+/-0.902	0.148	1.00	pCi/g pCi/g					
Potassium-40 Promethium-144	U	-0.00143	+/-0.00938	0.0143	0.080	pCi/g pCi/g					
Promethium–144 Promethium–146	U	-0.00143	+/-0.011	0.0186	1.00	pCi/g pCi/g					
Radium–228	U	-0.00933	+/-0.0835	0.0180	0.500	pCi/g pCi/g					
Kaululli–228		0.451	TI-0.0033	0.050	0.500	peng					

### **Certificate of Analysis**

Company : WPI Address : 11 S. 12th Street Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

	Client Sample ID: Sample ID:	Core bore Sat 135938016	mple #6	Middle	Proj Clie	ect: nt ID:	WPIA00105 WPIA001			
Parameter	Qualifier R	esult Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Methoo
Rad Gamma Spec An	alysis									
Gammaspec, Gamma	ı, Solid (Long List)									
Ruthenium–106	U 0.0	727 +/-0.0826	0.155	0.800	pCi/g					
Silver-110m	U 0.00	342 +/-0.0103	0.0166	0.080	pCi/g					
Sodium-22	U 0.00	122 +/0.0125	0.0222	0.080	pCi/g					
Thallium–208	0.	157 +/-0.0251	0.0152	0.080	pCi/g					
Thorium-230	0.	139 +/-0.0419	0.0313	1.00	pCi/g					
Thorium-234	U 0.	163 +/-0.513	0.529	5.00	pCi/g					
Tin-113	U –0.00	775 +/-0.0112	0.0197	0.100	pCi/g					
Uranium–235	U –0.0	072 +/-0.0486	0.0882	0.500	pCi/g					
Uranium-238	U 0.	163 +/-0.513	0.529	1.00	pCi/g					
Yttrium-88	U 0.00	011 +/-0.00967	0.0179	0.100	pCi/g					
Zinc-65	U –0.0	128 +/-0.0278	0.0414	0.300	pCi/g					
Zirconium-95	U 0.000	678 +/-0.0206	0.0372	0.200	pCi/g					
The following Prep N	Aethods were performed									
Method	Description			Analyst	Date	Time	e Prep Batch			
Dry Soil Prep	Dry Soil Prep GL-R.	AD-A-021		TCI	05/10/05	1412	423806			
The following Analyt	tical Methods were perfor	med								
Method	Description			I	Analyst Commo	ents				
1	EML HASL 300, 4.5.	.2.3								

# **Certificate of Analysis**

Company : WPI 11 S. 12th Street Address : Suite 210 Richmond, Virginia 23219 Contact: Mr. John Bowen Project: **Radiochemistry Analytical** 

Project:	Radiochemist	try Analytica	al								
	Client Samp Sample ID: Matrix: Collect Date Receive Date Collector:	:	Steel Disk #5 135938017 Misc Solid 21–APR–05 05–MAY–05	11:00		Proie Clien		WPIA00105 WPIA001			
Parameter	Qualifier	Result	Client Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec Ana											
Gammaspec, Gamma,											
Actinium–228	U	0.033	+/-0.0502	0.0438	0.800	pCi/g		AKB 05/19/05	1544 4	423794	1
	U	-0.00563	+/-0.0156	0.0257	0.200	pCi/g					
Americium–241	U	0.00355	+/-0.00761	0.0129	0.100	pCi/g					
Antimony–124			+/-0.0139	0.0223	0.200	pCi/g					
Antimony–125	U	-0.00388		0.0223	0.200	pCi/g pCi/g					
Barium–133	U	0.000399	+/-0.00704	0.129	0.500	pCi/g					
Barium–140	U	0.0502	+/-0.0765		0.300	pCi/g pCi/g					
Beryllium-7	U	-0.0209	+/-0.0577	0.0913							
Bismuth-212	U	0.0255	+/-0.0443	0.075	0.500	pCi/g					
Bismuth-214	UUI	0.00	+/-0.0129	0.022	0.200	pCi/g					
Cerium-139	U	-0.00291	+/-0.00457	0.00708	0.050	pCi/g					
Cerium-141	U	0.00369	+/-0.012	0.0193	0.100	pCi/g					
Cerium-144	U	0.0132	+/-0.0284	0.0459	0.500	pCi/g					
Cesium-134	U	0.00112	+/-0.00615	0.0102	0.100	pCi/g					
Cesium-136	U	0.0164	+/-0.0359	0.062	0.300	pCi/g					
Cesium-137	U	0.00294	+/-0.00551	0.00937	0.100	pCi/g					
Chromium-51	U	-0.00265	+/-0.0746	0.122	0.600	pCi/g					
Cobalt-56	U	-0.000924	+/-0.00772	0.0126	0.100	pCi/g					
Cobalt-57	U	0.000374	+/-0.0037	0.00595	0.050	pCi/g					
Cobalt-58	U	-0.00456	+/-0.00721	0.0114	0.100	pCi/g					
Cobalt-60	U	0.0054	+/0.00677	0.0119	0.100	pCi/g					
Europium-152	U	-0.00592	+/-0.0138	0.0222	0.200	pCi/g					
Europium-154	U	0.0179	+/-0.0251	0.0293	0.500	pCi/g					
Europium-155	U	-0.000213	+/-0.014	0.0227	0.500	pCi/g					
Iridium–192	Ū	0.00165	+/-0.0057	0.00945	0.100	pCi/g					
Iron-59	Ū	-0.00282	+/-0.0165	0.0277	0.300	pCi/g					
Lead-210	Ŭ	0.247	+/0.634	0.590	4.00	pCi/g					
Lead-212	UUI	0.00	+/-0.00939	0.0162	0.100	pCi/g					
Lead-212	U	0.00159	+/-0.0181	0.0184	0.100	pCi/g					
Manganese–54	Ŭ	-0.000482	+/-0.00608	0.00993	0.100	pCi/g					
Mercury–203	Ŭ	0.00168	+/-0.00686	0.0114	0.100	pCi/g					
Neodymium-147	Ŭ	-0.0813	+/-0.180	0.298	1000	pCi/g					
Neptunium-239	U	0.00148	+/-0.0263	0.0425	2.00	pCi/g					
Niobium–94	U	0.00133	+/-0.00552	0.00921	1.00	pCi/g					
	U	-0.00133	+/-0.009946	0.0154	0.050	pCi/g					
Niobium-95	U	0.0834	+/-0.159	0.111	1.00	pCi/g					
Potassium-40			+/-0.00593	0.00975	0.080	pCi/g					
Promethium-144	U	-0.000817	+/-0.00595	0.00973	1.00	pCi/g pCi/g					
Promethium-146	U	0.00395		0.0103	0.500	pCi/g pCi/g					
Radium–228	U	0.033	+/-0.0502	0.0430	0.500	hcn8					

### **<u>Certificate of Analysis</u>**

Company: WPI 11 S. 12th Street Address : Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Sampl Sample ID:	e ID:	Steel Disk #5 135938017	i		Project: Client II	):	WPIA00105 WPIA001			
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Gamma Spec An	alysis										· · · · · · · · · · · · · · · · · · ·
Gammaspec, Gamma	a, Solid (Long List)										
Ruthenium-106	U	0.00139	+/0.0518	0.0866	0.800	pCi/g					
Silver-110m	U	-0.00136	+/-0.00508	0.00838	0.080	pCi/g					
Sodium-22	U	0.00644	+/-0.00902	0.0103	0.080	pCi/g					
Thallium–208	UUI	0.00	+/0.016	0.0117	0.080	pCi/g					
Thorium-230	UUI	0.00	+/-0.0129	0.022	1.00	pCi/g					
Thorium-234	UUI	0.00	+/-0.244	0.297	5.00	pCi/g					
Tin-113	U	-0.0026	+/-0.00705	0.0113	0.100	pCi/g					
Uranium–235	UUI	0.00	+/-0.032	0.0511	0.500	pCi/g					
Uranium–238	UUI	0.00	+/-0.244	0.297	1.00	pCi/g					
Yttrium-88	U	-0.00398	+/-0.00735	0.0121	0.100	pCi/g					
Zinc-65	U	-0.00397	+/-0.0141	0.0234	0.300	pCi/g					
Zirconium-95	U	-0.00297	+/-0.0122	0.0199	0.200	pCi/g					
The following Analy	tical Methods were	e performed									
Method	Description				A	nalyst Comments					

1

EML HASL 300, 4.5.2.3

### **GENERAL ENGINEERING LABORATORIES, LLC**

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# **Certificate of Analysis**

Company : Address :							Report Date: May 25, 2005						
Project:	Radiochemis		al										
	Client Samp Sample ID: Matrix: Collect Date Receive Dat Collector:	::	Steel Disk #6 135938018 Misc Solid 21–APR–05 05–MAY–05 Client	11:48		Proie Clier	ect: nt ID:	WPIA00105 WPIA001					
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method		
Rad Gamma Spec Anal	ysis												
Gammaspec, Gamma, S		1											
Actinium–228	U	0.0303	+/-0.0176	0.0325	0.800	pCi/g		AKB 05/19/0	5 1703 -	423794	1		
Americium-241	U	0.0136	+/-0.0195	0.0353	0.200	pCi/g							
Antimony-124	U	-0.00315	+/-0.00565	0.00937	0.100	pCi/g							
Antimony–125	U	0.00716	+/-0.0103	0.0186	0.200	pCi/g							
Barium-133	U	-0.00118	+/-0.00486	0.00745	0.100	pCi/g							
Barium–140	U	0.0314	+/-0.0574	0.102	0.500	pCi/g							
Beryllium-7	U	0.0042	+/-0.0396	0.0696	0.700	pCi/g							
Bismuth-212	U	0.0211	+/-0.0351	0.062	0.500	pCi/g							
Bismuth-214	UUI	0.00	+/-0.020	0.0151	0.200	pCi/g							
Cerium-139	U	-0.00157	+/-0.0029	0.00481	0.050	pCi/g							
Cerium-141	U	0.00194	+/-0.0125	0.0122	0.100	pCi/g							
Cerium-144	U	-0.00227	+/-0.0182	0.031	0.500	pCi/g							
Cesium-134	U	0.000293	+/-0.00475	0.00814	0.100	pCi/g							
Cesium-136	U	-0.0159	+/-0.0248	0.0419	0.300	pCi/g							
Cesium-137	U	0.00315	+/-0.00463	0.00711	0.100	pCi/g							
Chromium-51	U	-0.00631	+/-0.0549	0.0899	0.600	pCi/g							
Cobalt-56	U	0.00501	+/0.00529	0.00959	0.100	pCi/g							
Cobalt-57	U	0.00165	+/-0.0023	0.00407	0.050	pCi/g							
Cobalt-58	U	-0.0026	+/-0.0053	0.00867	0.100	pCi/g							
Cobalt-60	U	0.00638	+/-0.00547	0.0105	0.100	pCi/g							
Europium-152	U	0.00178	+/-0.0101	0.0179	0.200	pCi/g							
Europium–154	U	0.00978	+/-0.0107	0.0213	0.500	pCi/g							
Europium–155	U	-0.00528	+/-0.00919	0.0156	0.500	pCi/g							
Iridium-192	U	0.0022	+/-0.00413	0.00699	0.100	pCi/g							
Iron–59	U	-0.00936	+/-0.0128	0.018	0.300	pCi/g							
Lead-210	U	0.112	+/-1.37	1.27	4.00	pCi/g							
Lead-212	U	0.00717	+/-0.0108	0.00939	0.100	pCi/g							
Lead-214	U	0.00742	+/-0.0185	0.0122	0.100	pCi/g							
Manganese–54	U	0.00231	+/-0.00439	0.00775	0.100	pCi/g pCi/g							
Mercury–203	U	-0.000779	+/-0.00502 +/-0.135	0.00826 0.231	0.100 1000	pCi/g pCi/g							
Neodymium-147	U U	-0.0415 0.00758	+/-0.133 +/-0.0171	0.231	2.00	pCi/g pCi/g							
Neptunium–239	U U	-0.00738	+/-0.00416	0.00694	1.00	pCi/g pCi/g							
Niobium-94	U U	0.00463	+/-0.00410	0.00094	0.050	pCi/g pCi/g							
Niobium-95 Potossium 40	U	0.00403	+/-0.105	0.0647	1.00	pCi/g pCi/g							
Potassium–40 Promethium–144		-2.010E-06	+/-0.00448	0.00764	0.080	pCi/g pCi/g							
Promethium-144 Promethium-146	U - U	0.00399	+/-0.00505	0.00704	1.00	pCi/g pCi/g							
Radium–228	U	0.0303	+/-0.0176	0.0325	0.500	pCi/g							

# **Certificate of Analysis**

Company : WPI 11 S. 12th Street Address : Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

Report Date: May 25, 2005

	Client Samp Sample ID:	ole ID:	Steel Disk #6 135938018	5		Projec Client		WPIA00105 WPIA001		
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch Method
Rad Gamma Spec An	alysis									
Gammaspec, Gamma	a, Solid (Long List)	1								
Ruthenium-106	U	0.0257	+/-0.0565	0.0638	0.800	pCi/g				
Silver-110m	U	0.00138	+/-0.0039	0.00687	0.080	pCi/g				
Sodium-22	U	0.00349	+/-0.00386	0.00766	0.080	pCi/g				
Thallium–208	U	0.00215	+/-0.00967	0.00869	0.080	pCi/g				
Thorium-230	UUI	0.00	+/-0.020	0.0151	1.00	pCi/g				
Thorium-234	U	0.159	+/-0.286	0.260	5.00	pCi/g				
Tin-113	U	0.000649	+/-0.00499	0.00882	0.100	pCi/g				
Uranium–235	U	0.00547	+/-0.0332	0.0341	0.500	pCi/g				
Uranium–238	U	0.159	+/-0.286	0.260	1.00	pCi/g				
Yttrium-88	U	0.00183	+/-0.00619	0.0104	0.100	pCi/g				
Zinc-65	U	-0.000652	+/-0.00973	0.0172	0.300	pCi/g				
Zirconium-95	U	-0.000399	+/-0.00966	0.0164	0.200	pCi/g				
The following Analyt	ical Methods wer	e performed								
Method	Description			-	A	Analyst Comment	s			

1

EML HASL 300, 4.5.2.3

# **Certificate of Analysis**

Company : WPI 11 S. 12th Street Address : Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

	Client Sample ID: Sample ID: Matrix: Collect Date: Receive Date: Collector:	Water Samp 135938019 Waste Water 20–APR–05 05–MAY–03 Client	14:06		Proi Clier	ect: nt ID:	WPIA00105 WPIA001		
Parameter	Qualifier Re	sult Uncertainty	DL	RL	Units	DF	AnalystDate	Time Batch	Metho
Rad Gamma Spec An	alysis								
Gammaspec, Gamma	ı, Liquid (Long List)								
Actinium–228	U I	03 +/-182	238	20.0	pCi/L		AKB 05/20/03	5 0734 424558	1
Americium-241	U 5	6.4 +/-101	185	25.0	pCi/L				
Antimony-124	U -	-51 +/-90.1	153	5.00	pCi/L				
Antimony-125	U 4	1.8 +/-92.9	163	10.0	pCi/L				
Barium–133	U 2.	5.3 +/-44.6	71.0	5.00	pCi/L				
Barium–140	U 2	+/-533	969	30.0	pCi/L				
Beryllium-7	U –1	28 +/-374	619	50.0	pCi/L				
Bismuth–212	UI	73 +/-273	499	50.0	pCi/L				
Bismuth-214	U 6	0.6 +/-306	115	10.0	pCi/L				
Cerium-139		.88 +/-31.8	53.9	5.00	pCi/L				
Cerium-141		.17 +/-137	140	10.0	pCi/L				
Cerium-144	U -72	2.1 +/-203	339	50.0	pCi/L				
Cesium-134	U 5.	90 +/-35.4	62.8	5.00	pCi/L				
Cesium-136	U 9'	7.5 +/-196	367	15.0	pCi/L				
Cesium-137	UUI 0.	.00 +/-53.2	54.5	5.00	pCi/L				
Chromium-51	U 7	35 +/-869	920	50.0	pCi/L				
Cobalt-56	U 8.	.08 +/-43.8	76.8	5.00	pCi/L				
Cobalt-57	U -	-22 +/-25.7	42.0	5.00	pCi/L				
Cobalt-58	U 2	1.2 +/-41.0	74.6	10.0	pCi/L				
Cobalt-60	U 50	0.1 +/-37.2	74.5	5.00	pCi/L				
Europium-152	U -8	1.4 +/-88.8	145	20.0	pCi/L				
Europium-154	U 1'	7.5 +/-74.6	141	20.0	pCi/L				
Europium–155	U 3	1.8 +/-97.0	170	20.0	pCi/L				
Iridium–192	U -5.	69 +/-45.0	67.9	10.0	pCi/L				
Iron-59		4.7 +/-92.6	177	10.0	pCi/L				
Lead-210	U 30	30 +/-4150	3510	750	pCi/L				
Lead-212	U 44	4.5 +/-101	118	15.0	pCi/L				
Lead-214	U 3.	3.9 +/-91.9	127	10.0	pCi/L				
Manganese-54	U -0.5	55 +/-33.5	58.0	5.00	pCi/L				
Mercury-203	U 9.	27 +/-49.2	86.8	5.00	pCi/L				
Neodymium-147	U -5.		2270	100	pCi/L				
Neptunium-239	U -1		300	25.0	pCi/L				
Niobium–94		).7 +/-30.4	57.0	5.00	pCi/L				
Niobium-95		5.9 +/-116	89.8	5.00	pCi/L				
Potassium-40		00 +/-779	547	100	pCi/L				
Promethium-144	U -6.		58.8	5.00	pCi/L				
Promethium-146	U -3		64.9	5.00	pCi/L				
Radium–228	U 1	03 +/-182	238	20.0	pCi/L				

### **Certificate of Analysis**

Company : WPI Address : 11 S. 12th Street Suite 210 Richmond, Virginia 23219 Mr. John Bowen Contact: Project: **Radiochemistry Analytical** 

	Client Sample Sample ID:	ID:	Water Sample 135938019	#1		Proje Clier	ect: nt ID:	WPIA00105 WPIA001		
Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch Method
Rad Gamma Spec An	alysis				·····					
Gammaspec, Gamma	a, Liquid (Long List)									
Ruthenium-106	U	6.09	+/294	521	50.0	pCi/L				
Silver-110m	U	-20.7	+/-35.4	50.5	5.00	pCi/L				
Sodium-22	U	0.0791	+/-27.8	50.7	5.00	pCi/L				
Thallium–208	U	13.5	+/58.8	70.0	10.0	pCi/L				
Thorium-230	U	60.6	+/-306	115	20.0	pCi/L				
Thorium-234	UUI	0.00	+/-1250	2120	250	pCi/L				
Tin-113	U	-34.4	+/-45.4	73.9	10.0	pCi/L				
Uranium–235	U	2.86	+/-335	349	50.0	pCi/L				
Uranium–238	UUI	0.00	+/-1250	2120	250	pCi/L				
Yttrium-88	U	2.98	+/-39.3	70.3	10.0	pCi/L				
Zinc-65	U	-21.2	+/-80.3	119	10.0	pCi/L				
Zirconium-95	U	74.4	+/-63.2	134	10.0	pCi/L				
The following Analyt	tical Methods were p	erformed								
Method	Description				A	nalyst Comme	ents			
1	EPA 901.1						e al danisî er dan bêker rar an			



# Appendix D

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#### Appendix E Project Exposure

The NSS Characterization Project required personnel monitoring for those individuals involved in the project. MARAD provided the RADOS DBR-1 System reader (Serial number 230011) and a supply of DIS-1 dosimeters.

The manufacturer provided a device called a Calibration Plug (Serial number 204024) to permit calibration of the reader, thereby ensuring accuracy of dosimeter readings.

Initial calibration was performed using the Calibration Plug, and results were entered in the project log book. Thereafter, the Calibration Plug was used each morning to verify correct operation of the reader.

Individual members of the project wore a dosimeter when entering an area controlled by an RWP. Individuals would select a dosimeter, log on to a Daily Personnel Exposure Record, zero the dosimeter using the RADOS DBR-1 reader, and fasten the dosimeter to the front of the body between the waist and neck with the dosimeter facing out. At the end of the work period, individuals would insert their dosimeter into the RADOS DBR-1 reader and record the reading on the Daily Personnel Exposure Record.

Summary of individual exposures for the project:

ourninary or individual	exposures for t	ne project.
Name	µ sievert	milliRem
Thomas E. Craddock	139	13.9
Benjamin J. Scott	182	18.2
Loman H. Scott	162	16.2
James H. Lovedahl	44	4.4
Robert E. Pennock	84	8.4
Jon Stouky	54	5.4
John Bowen	217	21.7
Richard Ranellone	0	0
Keith Welch	73	7.3
Matt Baxter	46	4.6
Brent Williams	43	4.3
Rob Schoennagel	0	0
Pat Madden	1	0.1
Alexander Adams Jr.	0	0
Erhard Koehler	1	0.1
John C. Wiegand	0	0
James P. Bruff	0	0



Appendix F

### Appendix F Radiation Work Permits

Radiation Work Permits (RWPs) are used to control radiological work by specifying dress requirements for a job, respiratory protection requirements, dosimetry requirements, and work restrictions. Special work instructions may be added to protect members of the project.

RWPs were written for a specific function, such as entering primary containment when radiological conditions were unknown. Other RWPs were written more generally once the radiological conditions were determined.

RWPs were closed when they no longer applied or an area was cleared of any radiological restrictions. Several RWPs were modified to reflect changing radiological conditions.

All active RWPs were posted near the instrument storage area to permit easy access for project members. A briefing was conducted whenever a RWP was created or modified. Project members signed onto the RWP after they were briefed.

The thirteen RWPs written to control the various phases of radiological work during this project include the following:

- Stateroom B-1, Rad Waste Storage
- Health Physics Lab at Hospital
- Port and Starboard Stabilizer Rooms
- Fan Room, B Deck, across from Stateroom B-1
- Port and Starboard Charge Pump Rooms, lower level of engine room
- Hot Chemistry Lab next to Control Room
- Cold Chemistry Lab, Port side "C" Deck
- Entry into Secondary Containment from Hatch on "B" Deck
- Lower level of Secondary Containment
- Entry into Primary Containment from Secondary Containment
- Lower levels of Primary Containment
- Primary and Secondary Containment, all levels
- Opening of steam generators, primary side

Form F-1	U.S. MARITIME ADM N/S SAVAN Work Authorizati	NAH	Date: 4+12-05
	REQUEST FOR WORK AUT	HORIZATION	-1-12-05
To: RADIATION SAF	AND ENTRY INTO RADIATION ETY OFFICER	From: R. Jons Stoulcy	
A. Compartment or spa Lowka hrevals or (Brecow 1 ^{md} hrev	- PHIMMA CONTHINMARM	B. Date(s) to be entered	
_	e work or inspection to be performed + //11/5 TIL SHAMPLAS	1, etc):	
5470pla5	, machinery, parts, components, etc. t		
F. Identification of Perso	required to perform work or inspection on submitting request (name, title, ph M, ぎっそ そろえ.i こし	÷	
Permission for Work Au subject to the following o	thorization and Entry is approved bas conditions: As INDIGNTRY OM	ed on information submitt I-nm F-2 Fentry I	
Signature: Roll Hel	unnech	Date: 4/-1/2	-05
5-05 RWP	CLOSKA Allamud		

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

4-12-05

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

A Work Authorization Request (Form F-1) must be submitted and approved prior to entry into any Radiation Control Areas aboard the N/S SAVANNAH. Control Areas are defined as any space, compartment, or area designated as a Radiation Area due to the presence of radioactivity, radiation sources, residual radioactivity, or radioactive contamination in the space or on equipment, in systems, etc. These areas are posted with the appropriate radiation caution signs. Entry into Control Areas should be made with the minimum number of persons required to perform the work or inspection. Time required to perform work or inspections should be as short as possible to prevent unnecessary radiation exposure to personnel.

A. Compartment or space to be entered: Lowren Lieure is or Primary Constanting //-13-65 5,30 AM (Brelow 1st Lieure)

C. Protective Clothing Shall be worn as follow	VS:
1. Anti-C Suits (coveralls)	2. Shoe Covers
3. Gloves	4. Respirators
5. Hoods (head cover)	
D. Personnel Dosimeters Shall be worn by each	n worker: YES NO
E, Record of Personnel Exposure Shall be mai	ntained : YES NO
(Maintain Personne	el Exposure Record on form C-1)
F. Record of Numbered Security Seals:	
Number on seal removed:	Removed By:
•••••	Installed By:
C. Other Information:	

G. Other Information: FRISK HARNING & FIERT AT SOP UPON EXIT,

RNP REPLACED 4-12-55 AIVIDUT-15-05 RHUTAMIN PERSONIATEL SIGN ON: Rol Manual

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

Date:

4-14-05

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

A Work Authorization Request (Form F-1) must be submitted and approved prior to entry into any Radiation Control Areas aboard the N/S SAVANNAH. Control Areas are defined as any space, compartment, or area designated as a Radiation Area due to the presence of radioactivity, radiation sources, residual radioactivity, or radioactive contamination in the space or on equipment, in systems, etc. These areas are posted with the appropriate radiation caution signs. Entry into Control Areas should be made with the minimum number of persons required to perform the work or inspection. Time required to perform work or inspections should be as short as possible to prevent unnecessary radiation exposure to personnel.

A. Compartment or space to be entered: Oprivering 60= Stream Gam.	B. Date and time entered: 4-20-05 4-22-05 4-22-05 - $4477$
3. Gloves	e Covers
D. Personnel Dosimeters Shall be worn by each worker:	YES NO
E, Record of Personnel Exposure Shall be maintained : (Maintain Personnel Exposure	YES NO e Record on form C-1)
F. Record of Numbered Security Seals:	
Number on seal removed:/// Removed	By:
Number on seal installed: Installed B	y:
01-000	1RAFULIJ & WITH GOOD CONTANIMATER 102K HRIAN DISTRA CUMPLICATION -25-05 WORK Pone SysTAM CLOSIAD. RUP CLOSER Nally MANUE

Form F-1	U.S. MARITIME ADN N/S SAVAN	NNAH	Date:
	Work Authorizat	tion Request	4-19-05
	REQUEST FOR WORK AU AND ENTRY INTO RADIATIO		
To: RADIATION SA	FETY OFFICER	From: John W. Bow	'en S
A. Compartment or sp Opizmina o	Dace to be entered: F STIEAM GIEMMANTON	B. Date(s) to be entered $4/-20 \cdot 05^{-1}$ $4/-21 - 05^{-1}$ $4/-22 - 05^{-1}$	:
INSPACTION,	ype work or inspection to be perform Smann Sunuty Dosie Rat		
	it, machinery, parts, components, etc.	to be removed:	
<i>/</i> /	el required to perform work or inspec		
بر/ E. Number of personne	el required to perform work or inspect son submitting request (name, title, p wear) incert ychnw m ychnw m ychnw m	rtion: 3 phone, fax, email, etc.):	
E. Number of personne F. Identification of Per John JSon Chier Engli 804, 615, 111 804, 785, 15	el required to perform work or inspect son submitting request (name, title, p wea is $\frac{\sqrt{ahnw}}{\sqrt{bhn}}$ is $\frac{\sqrt{ahnw}}{\sqrt{bhn}}$ is $\frac{\sqrt{ahnw}}{\sqrt{bhn}}$ wea is $\frac{\sqrt{ahnw}}{\sqrt{bhn}}$ wea is approved base	etion: 3 phone, fax, email, etc.): $3 \frac{4}{16} \sqrt{5}$ $2 \frac{6}{16} \sqrt{5}$	

# U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

Date:

4-4-05

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

A Work Authorization Request (Form F-1) must be submitted and approved prior to entry into any Radiation Control Areas aboard the N/S SAVANNAH. Control Areas are defined as any space,
compariment, or area designated as a Radiation Area due to the presence of radioactivity, radiation sources, residual radioactivity, or radioactive contamination in the space or on equipment, in systems, etc. These areas are posted with the appropriate radiation caution signs. Entry into Control Areas should be
inade with the minimum number of persons required to perform the work or inspection. Time required to perform work or inspections should be as short as possible to prevent unnecessary radiation exposure to personnel.
A. Compartment or space to be entered: STATR Room B1 B DieciC 4-4-05 9:30 AM
RAD WASTR STORAGE ARAR
C. Protective Clothing Shall be worn as follows:
1. Anti-C Suits (coveralls)       2. Shoe Covers
3. Gloves       4. Respirators
5. Hoods (head cover)
D. Personnel Dosimeters Shall be worm by each worker. Mill / NO
E, Record of Personnel Exposure Shall be maintained : TES / NO (Maintain Personnel Exposure Record on form C-1)
F. Record of Numbered Security Seals:         Number on seal removed:       Number on seal installed:         Installed By:
G. Other Information: FRISK HAMINS & FRET UPOM EXIT No STEP OFF PAD Rizquinne.
PERSONAFIL SIGN ON
Reliterungh (4-15-05 ARRI CLEARAD
Reliterunde 4-15-05 ARRI CLEARAD NoTHIMG RAGVIRIAN FOR
Jame H. Jackell 4/1/2 4/1/2 ARRA CLANARD
NoTHIMG Raquirian For

	U.S. MARITIME ADM		Date:
Form F-1	N/S SAVANI Work Authorizati		
	Work Authorizati	on Request	61-4-05
<u>P</u>	REQUEST FOR WORK AUT AND ENTRY INTO RADIATION		
To: RADIATION SAFI	ETY OFFICER	From:	
		John W. Be	nuen)
A. Compartment or space	ce to be entered:	B. Date(s) to be entered:	
B DECK	STATEROOM B-1	4-4-05	
RADIOACTIVIZ	WASTOR STORAGE ARAA	, , , ,	
	e work or inspection to be performed		
	INSPECTION, SMAIL SULVEY		1 (\$A11)
FRISK UF R.	AN WAGTA STORAGE ARA	\$A	
D. Material, equipment,	machinery, parts, components, etc. to	o be removed:	
NOME			
E. Number of personnel	required to perform work or inspecti	on: 3	
John W. 1500 Proj. Engineer Ph 804. 615.11. F 804 789 19 emmil: john-L	18 176 nowen@wpi.b1z		
subject to the following co	norization and Entry is approved bases originations: $A = \mathcal{L}_{1} + \mathcal{L}_{1} + \mathcal{L}_{2} = \mathcal{L}_{2}$	ed on information submitter $V = \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}{E} \frac{1}$	
Signature: Roli	Funnal	Date: 2/. 4	-65

# U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

These areas are posted with the appropriate radiat made with the minimum number of persons requir	NAH. Control Areas are defined as any space,
A. Compartment or space to be entered:	B. Date and time entered:
RISURGE PUMP ROOM 5 PONT & STI CHARGE	4-8-05
CHARGE	
C. Protective Clothing Shall be worn as follows:	
	2. Shoe Covers
	Respirators
D. Personnel Dosimeters Shall be worn by each w	orker: YESNO
E, Record of Personnel Exposure Shall be mainta	ined : YES NO
(Maintain Personnel E	xposure Record on form C-1)
F. Record of Numbered Security Seals:	
	moved By:
Number on seal installed: Inst	talled By:
G. Other Information: FRISK WHOLK BOW No ENTRY UNTIL CLENRIED WITH AI	N SAMPLA PA AIRBOAME RADIOACTIVITY
PERSONNEL SIGN ON:	4-14-05 CHARGE PUMP Rooms CLIEBRAND - DOSIMANT Rep GHLY
Benjan John Stor	F-a 12MITAY Rapanach
1/ Malile	4.25-05 PROJECT COMPlete RWP CLOSED REPENDE
17 U Uuu ~ ~	11 Curin July Male

Form F-1	U.S. MARITIME ADM N/S SAVANN		Date:
	Work Authorization	on Request	4-8-05
	REQUEST FOR WORK AUT AND ENTRY INTO RADIATION		
To: RADIATION SAF		From: R, JON St	suky
A. Compartment or spa SURGA PUM CHARCIE	ice to be entered: 2) Room Port & STARIS.	B. Date(s) to be entered 4-8-05	
B. Reason for entry (typ INSPIEC TION	be work or inspection to be performed , SMEAR SURVEY, FRIGE	l, etc): 2 Sunung, Amp Doga A	DUTH SURVAY
D. Material, equipment	, machinery, parts, components, etc. to	o be removed:	
None			
E. Number of personne	l required to perform work or inspecti	on: 2	
F. Identification of Pers	on submitting request (name, title, ph	one, fax, email, etc.):	
R. Jo 2 F	ouldy, Projed Mong	5 ^N , 817 938	1261
Permission for Work Au subject to the following	thorization and Entry is approved bas conditions: SFE Form F-2 Em.	ed on information submitter The Requirements Fo	ed above. Deress coo
Signature: NoUTA	Sumoh	Date: 2/~8	-05

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

Date:

4-11-05

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

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	U.S. MARITIME ADM N/S SAVANI		Date:
Form F-1	Work Authorizati		4-11-05
L	REQUEST FOR WORK AUT	•	1 11 05
	AND ENTRY INTO RADIATION		
To: RADIATION SAF	FETY OFFICER	From:	,
		R.JUN Sto	aky
			ŕ
A. Compartment or spa Hot Curen Las	ace to be entered: - NISXT TO CONSTROL Room	B. Date(s) to be entered $4 - 11 - 05$	:
,,, e, e,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		1 1 03	
B. Reason for entry (ty	pe work or inspection to be performed on OFARAA, Smizar SURUKA/	l, etc): , Frisil Suxum, Па	SE RATH SURIDA
1213/1000110		/ // //	
D. Material, equipment	t, machinery, parts, components, etc. t	o be removed:	
Nom			
/			
E. Number of personne	l required to perform work or inspecti	on:	
	son submitting request (name, title, ph		
R.Jun	Stoulay, Project h	VONNOW, 207	978 1261
Permission for Work A	thorization and Entry is approved bas	ed on information submitte	ad above
subject to the following			eu above,
		///////	
Signature: Raut	F1 Sermont	Date: 4/-,	11-65

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

Date:

4-5-05

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

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A. Compartment or space to be entered: CBLD CHEM LAB CDECK, PONT B. Date and time entered: 4-5-05 10:35 AM 4-7-05 1:35 PM 4-11-05 1:10 PM
C. Protective Clothing Shall be worn as follows:
1. Anti-C Suits (coveralls)       2. Shoe Covers
3. Gloves
5. Hoods (head cover)
D. Personnel Dosimeters Shall be worn by each worker: YES NO
E, Record of Personnel Exposure Shall be maintained : YES <u>V</u> NO (Maintain Personnel Exposure Record on form C-1)
F. Record of Numbered Security Seals:
Number on seal removed: 7700 Removed By:
Number on seal installed:     Installed By:
G. Other Information: SHOR COURS 4 GLOURS FRISK Upon ExiT NT SOP
PERSONNAL SIGN ON: Brigin S. St
Kohl much
and A fuller 4-12-05
ARRA CUERRAD - POSIMATY GALY
KREELK 44105 Fa ENTRY. KI Imus
4-25-05 PROJECT Complete, RUP
CLUSSED Rolith/Servicell

Form F-1	U.S. MARITIME ADM N/S SAVANN		Date:
	Work Authorization	on Request	4-5-05
	REQUEST FOR WORK AUT		
To: RADIATION SAF	ETY OFFICER	From: R. Jors St.	ouky
A. Compartment or space COLD CHE	ce to be entered: MANB C DIECIC, PORT	B. Date(s) to be entered	d:
B. Reason for entry (typ	e work or inspection to be performed , FRISH SURVEY, SMIERR	l, etc): Surury, AND DOER IT,	NTR SUNOM
D. Material, equipment, Nome	machinery, parts, components, etc. to	o be removed:	
E. Number of personnel	required to perform work or inspecti	on: 3	
F. Identification of Perso	on submitting request (name, title, ph	one, fax, email, etc.):	
Project M	ONNGER (804) 938.	1261/jstou	lup Oasl. On
subject to the following c	horization and Entry is approved bas onditions: 51401E Course & C & FIERT UPON EXIT		tted above. <i>F-a (= × 1</i> )
Signature: Rohten	innoch	Date: 4/-	5-05

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

4-15-05

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

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4-25-05 PRWALT Complete RWP CLOSEP Roliterumoul

Work Authorization Request       44-15-000         REQUEST FOR WORK AUTHORIZATION AND ENTRY INTO RADIATION CONTROL AREA         To: RADIATION SAFETY OFFICER       From: IC. Jow Houldy         A. Compartment or space to be entered: PRIMARY & SECONDRAY CONTRIMMENT All LEVIELS       B. Date(s) to be entered: 4-15-05 To CLOSE OF CONTRIMMENT         B. Reason for entry (type work or inspection to be performed, etc): CORE BOAR SAMPLINE, INSPECTION AND POSTDAE       Contrainment         D. Material, equipment, machinery, parts, components, etc. to be removed: Material, equipment, equipment, parts, components, etc. to be removed: Material, equipment, parts, equipment, etc.): Tow Stowley PM (SUY) 938-1751	Form F-1	N/S SAVAN	NAH	Date:
AND ENTRY INTO RADIATION CONTROL AREA         To: RADIATION SAFETY OFFICER       From: IC. Jow Howley         A. Compartment or space to be entered: Paimanay & Srecombany Comtain marks       B. Date(s) to be entered: 4-15-05 To CLOSR of Contains marks         All LIEVIELS       B. Reason for entry (type work or inspection to be performed, etc): Contains Sampling, 1NSpritting, 1NSpriting, 1NSpriting, 1NSpritting, 1NSpritting, 1NSpritting,		Work Authorizati	on Request	4-15-05
R. Jow Howley         A. Compartment or space to be entered:         PRIMARY & SECONDARY CONTRIMMENT         B. Date(s) to be entered:         4-15-05 To CLOSE OF         CONTAIN MENT         B. Reason for entry (type work or inspection to be performed, etc):         CORE BOAR SUMPLIME, INSPECTION AND POSTULE         D. Material, equipment, machinery, parts, components, etc. to be removed:         MATERIALS TAXAM INTO CONTRIMMENT:         E. Number of personnel required to perform work or inspection:         g         F. Identification of Person submitting request (name, title, phone, fax, email, etc.):	A			
PAIMARY & SECONDARY CONTAINMARY       4-15-05 To CLOSEOF         All LEVIELS       CONTAINMART         B. Reason for entry (type work or inspection to be performed, etc):       CONTAINMART         CONT BOAR SUMPLINE, INSPECTION AND POSTING         D. Material, equipment, machinery, parts, components, etc. to be removed:         MATERAINES TAKAM INTO CONTAINMART         E. Number of personnel required to perform work or inspection:         S         F. Identification of Person submitting request (name, title, phone, fax, email, etc.):	To: RADIATION SAFE	ETY OFFICER		lay
Сока Вола бытрыта, Інбрасіїют амп Робін. D. Material, equipment, machinery, parts, components, etc. to be removed: Матались Такам исто Сомтанимами ! E. Number of personnel required to perform work or inspection: g F. Identification of Person submitting request (name, title, phone, fax, email, etc.):	A. Compartment or space Paimary & Ste All LIEVIELS	coniDARY COMTAIN MARTY	B. Date(s) to be entered 4-15-05 To CLO CONTHIN MANT	: SROF
F. Identification of Person submitting request (name, title, phone, fax, email, etc.):	Сока Вола С,		MIT POSTING	
	D. Material, equipment, MATRAINLS TA	machinery, parts, components, etc. 1 machinery, parts, components, etc. 1 machinery parts ComTRINM RMS	o be removed:	
	D. Material, equipment, MATRAINUS TA E. Number of personnel	machinery, parts, components, etc. 1 MAM INTO CONTAINMANT required to perform work or inspect	to be removed:	
Permission for Work Authorization and Entry is approved based on information submitted above. subject to the following conditions: Dosimitary Requires	<ul> <li>D. Material, equipment, <i>MATRAINUS TA</i></li> <li>E. Number of personnel</li> <li>F. Identification of Person</li> </ul>	machinery, parts, components, etc. 1 machinery, etc. 1 machinery, etc. 1 machinery, e	to be removed:	

Form F-1	U.S. MARITIME ADI N/S SAVAI Work Authoriza	NNAH	Date: 4-4-65
A	REQUEST FOR WORK AU AND ENTRY INTO RADIATIO		
To: RADIATION SAFE	ETY OFFICER	From: John W. Bou	ven)
A. Compartment or space B DECK ACROS STAR BOTARD STA	ce to be entered: FAN Room 55 FROM STAM B-1 DR	B. Date(s) to be entered $4/-4/-05$	:
B. Reason for entry (typ Inspirection,	e work or inspection to be perform Smissing Gunung, D.R. Sund	ned, etc): (Reg., FRISKING.	
Nonre	machinery, parts, components, etc		
F. Identification of Perso	6 CF)	00	
subject to the following c	horization and Entry is approved b onditions: Grounds & Short Ca Paguian ranking "Form F-2	pased on information submit	ted above. "Entry
Signature Koh Mile	mode	Date: 4-4-	05
-15-05 RW1		m	

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

Date:

1-4-65

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

A Work Authorization Request (Form F-1) must be submitted and approved prior to entry into any Radiation Control Areas aboard the N/S SAVANNAH. Control Areas are defined as any space, compartment, or area designated as a Radiation Area due to the presence of radioactivity, radiation sources, residual radioactivity, or radioactive contamination in the space or on equipment, in systems, etc. These areas are posted with the appropriate radiation caution signs. Entry into Control Areas should be made with the minimum number of persons required to perform the work or inspection. Time required to perform work or inspections should be as short as possible to prevent unnecessary radiation exposure to personnel. A. Compartment or space to be entered: B. Date and time entered: FAN Room B DECK ACROSS FROM 4-5-65 8:50 AM STRM B-1 STARBOARD SINE C. Protective Clothing Shall be worn as follows: 2. Shoe Covers .....  $\nu$ 1. Anti-C Suits (coveralls)..... 4. Respirators ..... 5. Hoods (head cover) ..... 6. . ..... D. Personnel Dosimeters Shall be worn by each worker: YES 🗸 NO YES / E, Record of Personnel Exposure Shall be maintained : NO (Maintain Personnel Exposure Record on form C-1) F. Record of Numbered Security Seals: Number on seal removed: _____ Removed By: Number on seal installed: Installed By: FRISK HANDS & FEAT Upon EXITING AT STIED aff PHD. G. Other Information: Room CLUTIORAN NOTHING PERSONNEL SIGNION Riequiran Fa ENTRY, 1-15-05 Relimm Role TI Pennock The Sulit 4/11/05

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

Date:

4.4-65

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

A Work Authorization Request (Form F-1) must be subm Radiation Control Areas aboard the N/S SAVANNAH. C compartment, or area designated as a Radiation Area due sources, residual radioactivity, or radioactive contamination These areas are posted with the appropriate radiation cause made with the minimum number of persons required to per- perform work or inspections should be as short as possible personnel.	Control Areas are defined as any space, to the presence of radioactivity, radiation on in the space or on equipment, in systems, etc. tion signs. Entry into Control Areas should be erform the work or inspection. Time required to
A. Compartment or space to be entered: HPLAB A DIECIC AT HOSPITAL	B. Date and time entered: 4/-6-05
3. Gloves       4. Respi         5. Hoods (head cover)       6	Covers
<ul> <li>D. Personnel Dosimeters Shall be worn by each worker:</li> <li>E, Record of Personnel Exposure Shall be maintained : (Maintain Personnel Exposure)</li> </ul>	YES NO
Number on seal installed. Installed B	By:
G. Other Information: FAISK Upon ExiTing - 4-7-05 LAB CLEARAP Fa	HANDS & FRAT AT SOP. FATRY WITHOUT DRIESS
BOT a DOSIMIRTM - CONT PERSONNEL SIGN ON DO	HANNOS & FRAT AT SOP. FATRY WITHOW DRIESS TAMIMATIAN SIAIK BAILY NOT OFFAT COURT
OCT a DOSIANATAJ - CONT PERSONNA SIGN ON DO Rich Holumah Buy I Sut	AMIMATION SINIK ONLY

Form F-1	U.S. MARITIME AD N/S SAVA Work Authoriza	NNAH	Date: 4-4.05
	REQUEST FOR WORK AI		
To: RADIATION SAF	ETY OFFICER	From: John Bowe	N
A. Compartment or spa HP LAB	ce to be entered: A Dreck AT Hospithic	B. Date(s) to be entered $4-4-05$	:
B. Reason for entry (typ Inspacement, F	e work or inspection to be perform	ned, etc): O Posse Rotte Scaure	
D. Material, equipment, None	machinery, parts, components, etc	c. to be removed:	
E. Number of personnel	required to perform work or inspe-	ection: 2	
John Bowen (Ph) 804. 789-15 (E) 804. 789-15 John-bowen	e wpi.biz		
Permission for Work Aut subject to the following c <i>Form</i> F-2	horization and Entry is approved I onditions: AS PRTAILAD	oased on information submitted on <i>"IENTRY INSTRUCTIONS M</i>	red above, ) M Regunnande
Signature: Role 14	Pennich	Date: 4-4-	05

;

Form F-1	U.S. MARITIME ADMINISTRATION N/S SAVANNAH Work Authorization Request		Date: 2/-4-05
<i>P</i>	REQUEST FOR WORK AU AND ENTRY INTO RADIATION	THORIZATION	, , ,
To: RADIATION SAFE	ETY OFFICER	From: John W. Boo	wen
	Ce to be entered: J. BONRID STHUSILIZER 14 FLAT DRCK	B. Date(s) to be entered $4-4-65$	:
	e work or inspection to be performed NGPTECTION, SMITHING SUPPORT	ed, etc): =	13, 7 FRISK
NOME	machinery, parts, components, etc.		
E. Number of personnel	required to perform work or inspec	tion: 3	
F. Identification of Person John Bower 100 pect Eng. 804.615.1118 804.785.1576	(PG.)	ven Q mpi boz	
Permission for Work Aut subject to the following c Riequinity MANTS	10 11 11 11 11 11	ased on information submit ⁽⁴ E47Ry INISTRUCTIO)	
Signature: Koli (	Funnah	Date: 4/-	4-05
SRWP CLO	STEP Doster 2250 pc. Rawtermach	RATIE ON CONTACT R- NOT A. RASI,	Fauth Pir

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

Date:

4-4-05

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

A Work Authorization Request (Form F-1) must be submitted and approved prior to entry into any Radiation Control Areas aboard the N/S SAVANNAH. Control Areas are defined as any space, compartment, or area designated as a Radiation Area due to the presence of radioactivity, radiation sources, residual radioactivity, or radioactive contamination in the space or on equipment, in systems, etc. These areas are posted with the appropriate radiation caution signs. Entry into Control Areas should be made with the minimum number of persons required to perform the work or inspection. Time required to perform work or inspections should be as short as possible to prevent unnecessary radiation exposure to personnel.

A. Compartment or space to be entered:	B. Date and time entered:
PORT 4 STARROURP STABLIZAN	4-4-05 /4-5-05 th
	9:55 AM / 12:15
Rm 14 FLAT DIECK	
C. Protective Clothing Shall be worn as follows:	1
1. Anti-C Suits (coveralls)   2. Shoe	Covers $// PR$
	rators
5. Hoods (head cover)         6	
D. Personnel Dosimeters Shall be worn by each worker:	YES NO
E, Record of Personnel Exposure Shall be maintained :	
(Maintain Personnel Exposure	e Record on form C-1)
F. Record of Numbered Security Seals:	
Number on seal removed: $\frac{7602}{7604}$ Removed	Ву:
Number on seal installed: / Installed B	y:
G. Other Information:	
SIET UP STIEPOFF PAD & FRISKI	ER TO PIENMA, T CONTROLLED
EXIT OF Room, FRISK FER	T & HANDS UPON EXIT
PERSONNIEL SIGNOM ROOMS FIR	ISKAD & SMHARAD CLIENN. SHOTE COUR No LONGER REQUIRED 4-4-05 1:07PM
Ro WElinnoch 4 - Lovas	Ref.
- Home E Condele 11 M.W.	Aanellone Soft
4-5-05 Rooms CLIEIARIS,	I FG FERITRI WITHHOUT
ARESS OUT. DOSIMITIN	REQUIRMAN FA Louis
LIEURL OF PIRT STABILIO	ZON. REfimon

4-12

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

Date: 2/ - 6-65

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

A Work Authorization Request (Form F-1) must be submitted and approved prior to entry into any Radiation Control Areas aboard the N/S SAVANNAH. Control Areas are defined as any space, compartment, or area designated as a Radiation Area due to the presence of radioactivity, radiation sources, residual radioactivity, or radioactive contamination in the space or on equipment, in systems, etc. These areas are posted with the appropriate radiation caution signs. Entry into Control Areas should be made with the minimum number of persons required to perform the work or inspection. Time required to perform work or inspections should be as short as possible to prevent unnecessary radiation exposure to personnel.

A. Compartment or space to be entered: SECONDARY CONTAINMENT FROM HATCH ON"B" DECK	B. Date and time entered: 4-6-05 10:05 AM 4-7-65 8:50 AM
C. Protective Clothing Shall be worn as follows:	
1. Anti-C Suits (coveralls)   2. Shoe     2. Clause   4. Been	irators
3. Gloves       4. Resp         5. Hoods (head cover)       6	irators
D. Personnel Dosimeters Shall be worn by each worker:	
E, Record of Personnel Exposure Shall be maintained : (Maintain Personnel Exposure	
F. Record of Numbered Security Seals:	2.2
Number on seal removed: <u>1838</u> Removed	BY: ROAT VENNOUR & PARMISSION FROM BOB SUNFR
Number on seal installed: Installed B	
G. Other Information: FAISX HANNIS & FIRET UPON EXITING THEM PRESONAL WHOLM BONY FRISK ONCR OUD 2-7-05 BASKED ON GIMEAR & FRISK & URVER SHOR COURR & CLOUR FOR UPIRA SECONDARY ENTRY WITH HAMD & FOOT FRISK UPON 12017 ENTRY WITH HAMD & FOOT FRISK UPON 12017 WORK STILL REQUIRES FULL DRESS WITH HAMP & FOOD FRISK ONLY FOR FIXET. FU	Anne E Ciolowood Rysuch ( Anne E Ciolowood Jan ( ( ) up of School Show ) fam ( ) ( ) up of School Show ) fam ( ) ( ) up of School Show ) fam ( ) ( ) up of School Show ) fam ( ) ( ) up of School Show ) fam ( ) ( ) up of School Show ) fam ( ) ( ) up of School Show ) fam ( ) ( ) up of School Show ) fam ( ) ( ) up of School Show ) fam ( ) ( ) ( ) up of School Show ) fam ( ) ( ) ( ) up of School Show ) fam ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (
SRUP CLOSED - ARRA	LEARRAD FOR ENTRY A LEWAL HAS HIGH ROD ARAN AND
WITHOUT DRR 5560T - Lown 15 CONTROURD BY DIFERRAN RUI	Ref ennoch

Form F-1	U.S. MARITIME ADM N/S SAVANN		Date:
	Work Authorization	on Request	4-6-05
1	REQUEST FOR WORK AUT		
To: RADIATION SAF	ETY OFFICER	From: R.Jons St	outy
A. Compartment or space SECONDARY C ON "B" DECK	ce to be entered: CONTAIN MANT FROM HAJCH	B. Date(s) to be entered 4/-6-05 4/-7-05	:
B. Reason for entry (typ IN SPIECTION, PLUG REM	e work or inspection to be performed FRISK SURURY, SMBAR SUR OURL AMN HATCHOPTEMING.	l, etc): UR9, DOGRERATE SURD NOTENTRY	un j
D. Material, equipment, NoNE	machinery, parts, components, etc. t	o be removed:	
E. Number of personnel	required to perform work or inspecti	on: 5	
F. Identification of Perso	on submitting request (name, title, ph	one, fax, email, etc.):	
R.Joss Jrou	ky, Project Monogs	1 336316070	)
Permission for Work Aut subject to the following of No ENTRY UNITL AN	chorization and Entry is approved bas conditions: SEE REQUIRANCE FORTS a Supple rs TANAY AMD AREA CL	ed on information submitt ON FORM F-2-ENT FARDION AIRBARA	ted above, (1) 1145772 Ocinowy
Signature: Rala M.	emont	Date: 4-0	1-05

Form F-1	U.S. MARITIME A N/S SAV	ADMINISTRAT ANNAH	ION	Date:
гони г-т		Work Authorization Request		4-12-05
	REQUEST FOR WORK AND ENTRY INTO RADIA			<b>1</b>
To: RADIATION SAF		From:		
		R.Jons	Stoule	1
				I
A Comportment or spe	ace to be entered.	B Date(s) to	be entered:	· · · · · · · · · · · · · · · · · · ·
A. Compartment or spa Lowne Liever	or Srecommany Contr	B. Date(s) to	be entered.	
	/			
B Reason for entry (ty	pe work or inspection to be per	formed, etc.):		
CORR BORR				
	V			
D. Matarial	mochinger, north	ata ta ha manana 1		
D. Material, equipment	, machinery, parts, components	, etc. to be removed:		
SAMPLR5				
	l required to perform work or in	- /		
-	son submitting request (name, ti	•	il, etc.):	
Roy two Row	Ky, PM, 804-539-126	1		
Permission for Work Au	thorization and Entry is approv	ed based on informa	tion submitte	ed above,
subject to the following	conditions: DOSIMIETA	y REQUIRED		
MR MIETER N				
/	0			
Signature: John G	Kumonh		Date: $(-)$	2-05
r-115 DI ID I	LUSVER			
, NW C				
;	RAMenne	nh		
	1000			

Form F-2

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

Date:

4-12.05

#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

A Work Authorization Request (Form F-1) must be submitted and approved prior to entry into any Radiation Control Areas aboard the N/S SAVANNAH. Control Areas are defined as any space, compartment, or area designated as a Radiation Area due to the presence of radioactivity, radiation sources, residual radioactivity, or radioactive contamination in the space or on equipment, in systems, etc. These areas are posted with the appropriate radiation caution signs. Entry into Control Areas should be made with the minimum number of persons required to perform the work or inspection. Time required to perform work or inspections should be as short as possible to prevent unnecessary radiation exposure to personnel.

A. Compartment or space to be entered: LOWRA LIZURE OF SECONDARY CONTRA	B. Date and time entered: 4-13-05 9.'00 AM
C. Protective Clothing Shall be worn as follows:	
1. Anti-C Suits (coveralls)	Shoe Covers
3. Gloves 4.	Respirators
5. Hoods (head cover)	
D. Personnel Dosimeters Shall be worn by each wo	
E, Record of Personnel Exposure Shall be maintain	ned : YES <u>/</u> NO
(Maintain Personnel Ex	sposure Record on form C-1)
F. Record of Numbered Security Seals:	
Number on seal removed: Rem	noved By:
	alled By:
G. Other Information: Dosimity of M	no MR meta Rayunan Fr
T=MTRY.	S card
PERSONAR SIGN ON	
Rottelemont	June Jose
NW.D.	Jon Steel Dola

Form F-1	U.S. MARITIME ADM N/S SAVAN		Date:
	Work Authorization Request		4-6-05
	REQUEST FOR WORK AUT AND ENTRY INTO RADIATION		
To: RADIATION SAF		From:	
		R. Jou Fou	ky
A. Compartment or space to be entered: PRIMARY CONTRIN MENT FROM SIECONDURY CONTRIMMENT		B. Date(s) to be entered:	
B. Reason for entry (typ / 1/5/15CTIBM AND WORK PL	be work or inspection to be performe , FRISK SUNDED (IF ABLE), De AMMING.	d, etc): DSK RATH SURUMI, SIMM	eun Sunory
D. Material, equipment	, machinery, parts, components, etc.	to be removed:	
Nome Except	WART IS THICAN IN.		
Norie Except E. Number of personnel	required to perform work or inspect	ion: <i>6</i>	
Nonie Except E. Number of personnel F. Identification of Pers R. JUN St Permission for Work Au	thorization and Entry is approved ba	ion: 6 none, fax, email, etc.): 2092, 804 2	ted above
Nowie Except E. Number of personnel F. Identification of Pers R. JUN St Permission for Work Au	when is THRAM IN. required to perform work or inspect on submitting request (name, title, pl Oulcy, Project Work	ion: 6 none, fax, email, etc.): 2092, 804 2	ted above
Nowie $\overline{Exc_{FPT}}$ E. Number of personnel F. Identification of Pers $\overline{R}, JONS$ Permission for Work Au subject to the following of $p_{S}$ Now $\overline{P}$ and $\overline{P}$ $ON$ $\overline{P}$ and $\overline{F}$ -2 - $\overline{D}$ $V_{\overline{E}NT}$ IL ATRED $\overline{R}$ and Signature: $\overline{P}$ $\overline{D}$ $\overline{D}$	thorization and Entry is approved ba	ion: 6 none, fax, email, etc.): Sed on information submitte Ain Sample Chiennes Riegeinen. Size Te ey Containmisto Te Entry Date: 4-6	ted above. Contrinentaria Preguinaments UBR

Form F-2

## U.S. MARITIME ADMINISTRATION N/S SAVANNAH Entry Instructions and Requirements

4-6-05

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#### INSTRUCTIONS AND REQUIRMENTS FOR ENTRY INTO RADIATION CONTROL AREAS AND COMPARTMENTS

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A. Compartment or space to be entered: PRIMARY CONTRINMENT FROM SIE COMBARY CONTRINMIENS	B. Date and time entered: 4-11-05 CONTINUAL			
<ul> <li>C. Protective Clothing Shall be worn as follows:</li> <li>1. Anti-C Suits (coveralls)</li></ul>				
5. Hoods (head cover)				
D. Personnel Dosimeters Shall be worn by each worker: YES / NO				
E, Record of Personnel Exposure Shall be maintained : YES <u>V</u> NO (Maintain Personnel Exposure Record on form C-1)				
F. Record of Numbered Security Seals:				
Number on seal removed: Removed	By:			
Number on seal installed: Installed B	y:			
G. Other Information: PRIMING CONTAINMENT TO BE VENTILATION PRIOR TO AMIS DURING ENTRY. DRESS REQUIRAMENTS AS ABOUR. FRISK HANDS & FRAT AT IEXIT TO PRIMING CONTAINMENT, WHOLE BORY FRISE DETAR EXITING ANAA. PERSONNEL SIGN ON: LI-13-05 PERSONNEL SIGN ON: LAN. B. MAN.				



#### Appendix G SUMMARY OF OPERATING PROCEDURES

The characterization effort was implemented in accordance with a preestablished conduct of operations that included nine project-specific procedures encompassing all radiological aspects of the project. These procedures included the following:

- 1. RADIATION WORKER TRAINING—established the process for training individuals to work safely in radiological areas. This procedure applied to WPI employees and subcontractors who performed or supported work in radiological areas.
- 2. DOSIMETRY ISSUE—described the processes used for issuing dosimetry to WPI and others aboard the N/S SAVANNAH as deemed appropriate by the RSO.
- 3. CONTAMINATION CONTROL—provided instructions for using protective clothing (PC) to control personnel contamination, monitoring personnel, and materials for contamination, and determining follow-up actions.
- 4. RADIATION SURVEYS AND SAMPLING—provided guidance for the performance of radiation surveys using portable survey instruments, surveys for removable surface contamination, and obtaining physical samples of materials.
- 5. RADIOACTIVE AIRBORNE SAMPLING—established the method for collecting various types of airborne radioactivity samples, and for documenting the Derived Air Concentration (DAC) associated with samples collected for purposes of respiratory protection.
- 6. MANAGING RESPIRATORS—described the processes used for the protection of employees from occupational respiratory hazards, both radiological and non-radiological.
- 7. SHIPBOARD RADWASTE MANAGEMENT—provided instructions and established processes for handling radioactive waste aboard N/S SAVANNAH.
- 8. <u>DATA AND RECORD MANAGEMENT</u>—provided instructions for collection, analysis, documentation, and archiving of radiological data and records obtained during characterization.



9. <u>N/S SAVANNAH SPECIAL INITIAL CONTAINMENT ENTRY PROCEDURE</u> provided instructions for the initial entry into primary containment for purposes of sampling, performing radiological surveys, and other characterization efforts.



Appendix H

#### Appendix H Respiratory Protection

To fully assess radiological characteristics of the N/S SAVANNAH, entry into areas with unknown radiological conditions was necessary. Respiratory protection was needed to make these entries.

Qualifying an individual for a respirator involved training, passing a medical, and a fit test. Members of the project, that were likely to perform tasks requiring respirator protection, were trained in wearing respirators and received medical examinations for wearing respirators. These medicals were performed at Bon Secours OccuMed by Roxanne Dietzer, DO. A qualitative respirator fit test was also performed on these individuals. The respirator selected for this project is the MSA Ultra Twin, dual-canister respirator. The combo canister (Number GMA-P100) with both HEPA and charcoal filters was used for this project. These respirators were MARAD (SERAT) equipment.

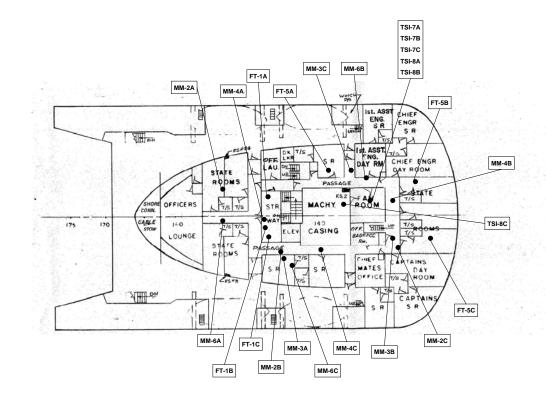
Those individuals that qualified to wear a respirator included the following:

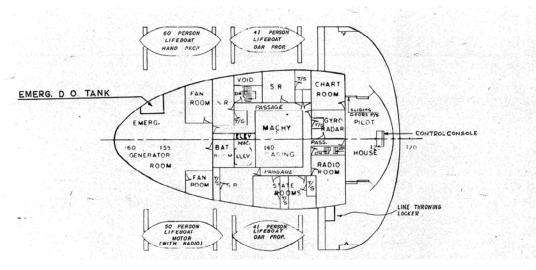
- James H. Lovedahl
- John W. Bowen
- R. Jon Stouky
- Thomas Craddock
- Loman H. Scott

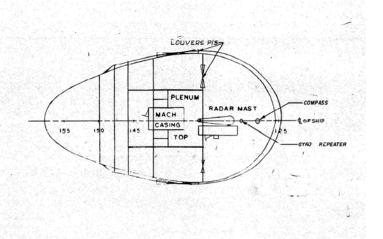


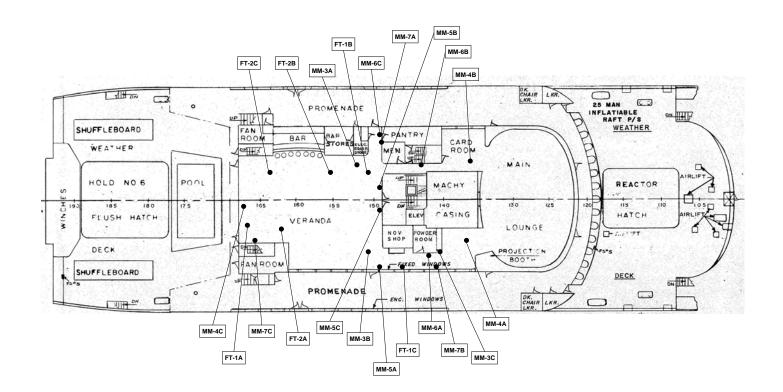
Appendix I

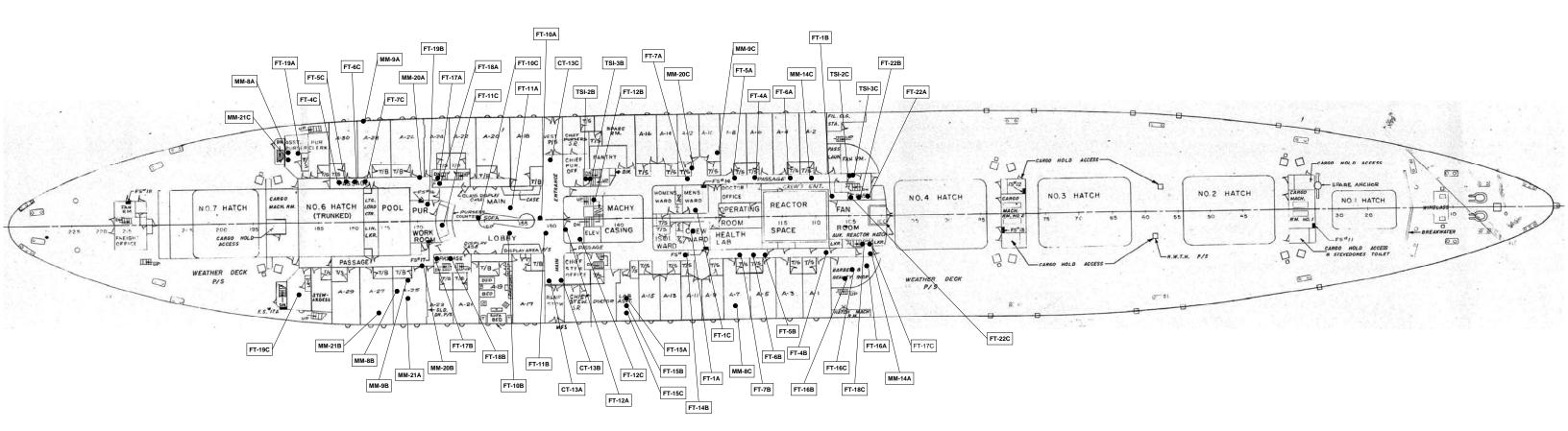
#### Appendix I Revised Deck-specific Sampling Plan

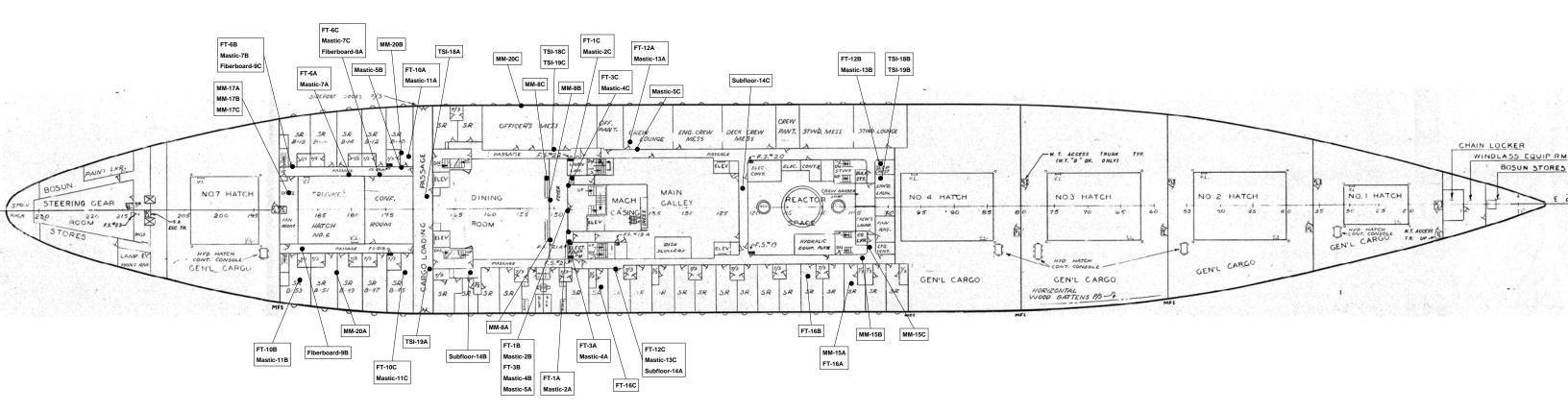


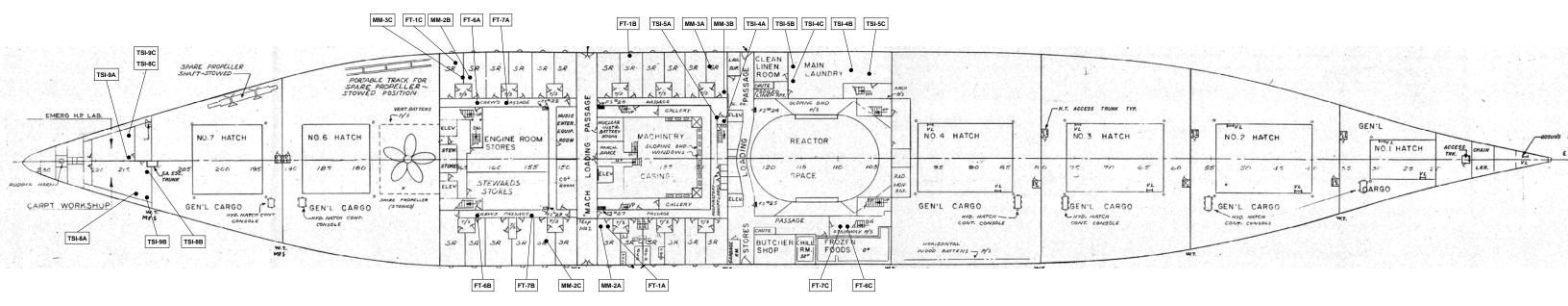


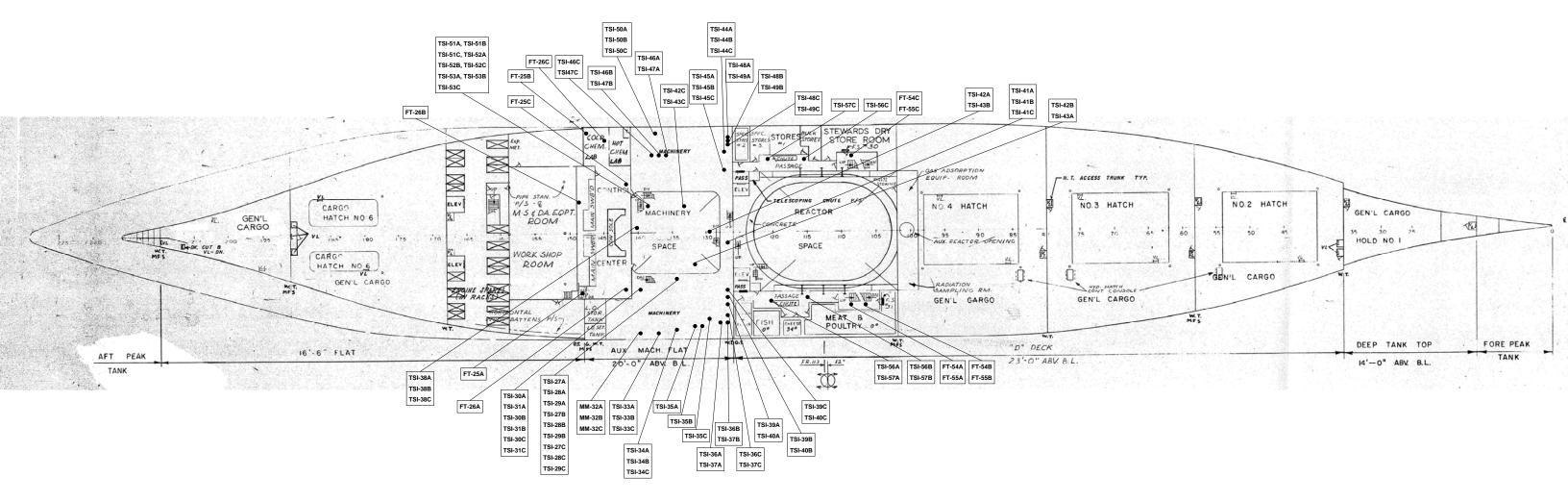


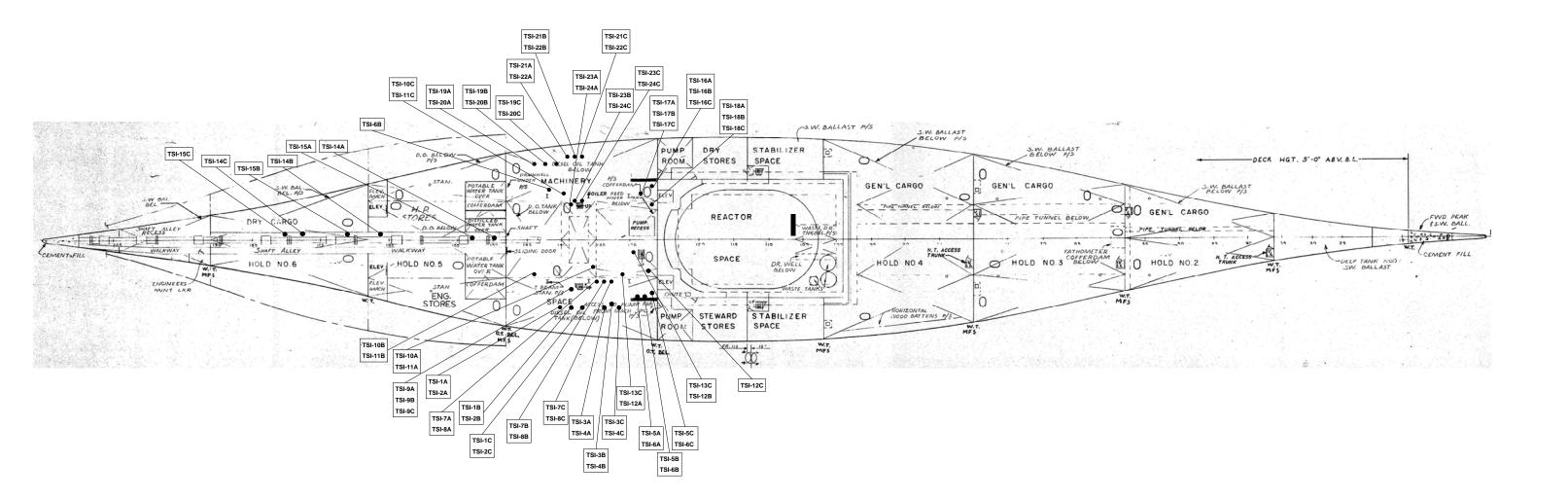












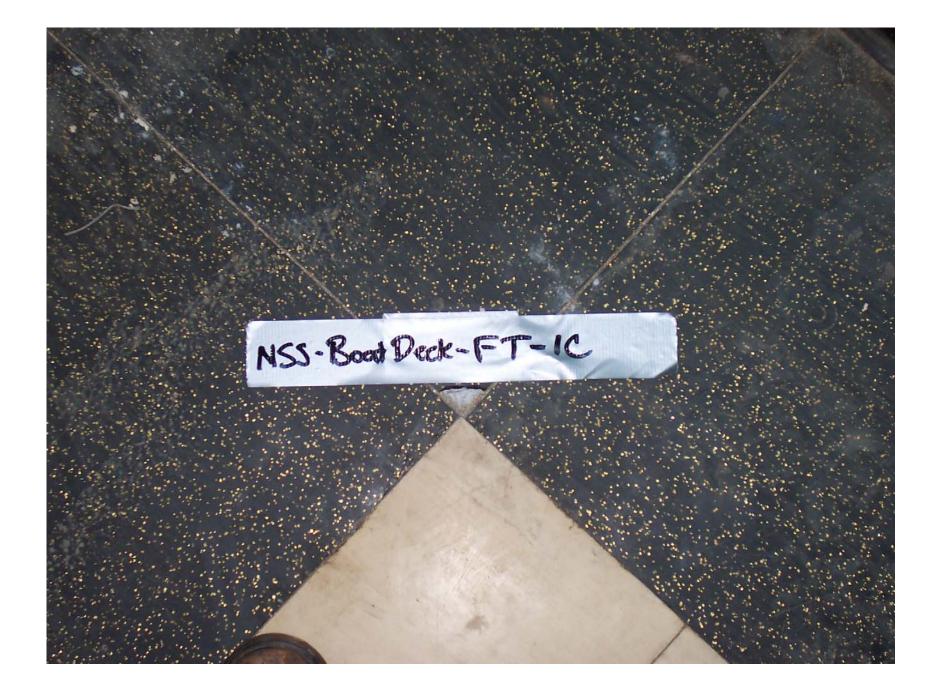


Appendix J

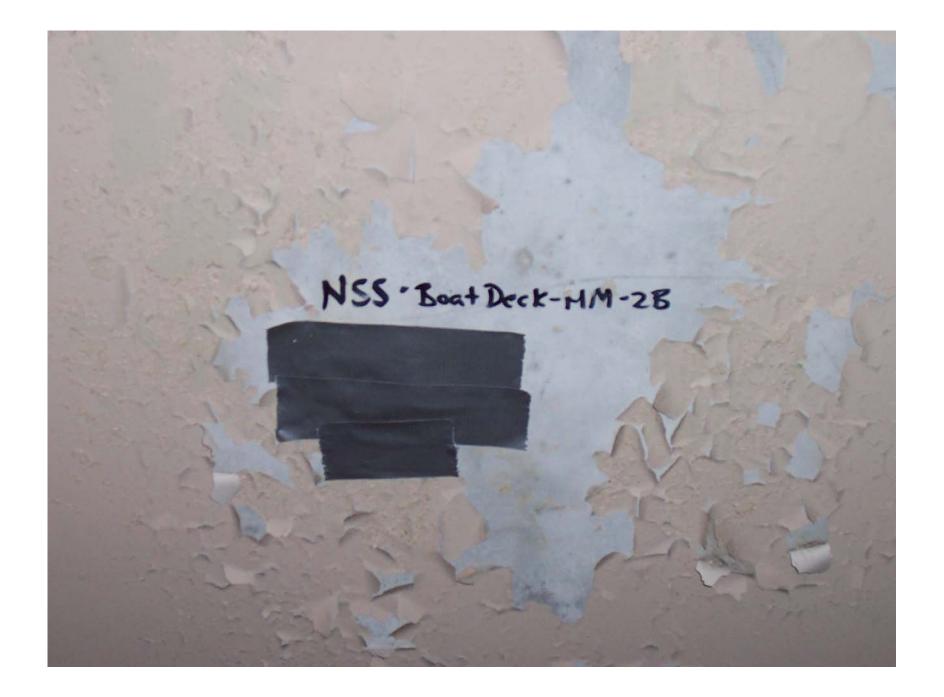
Appendix J Ship Photo Log

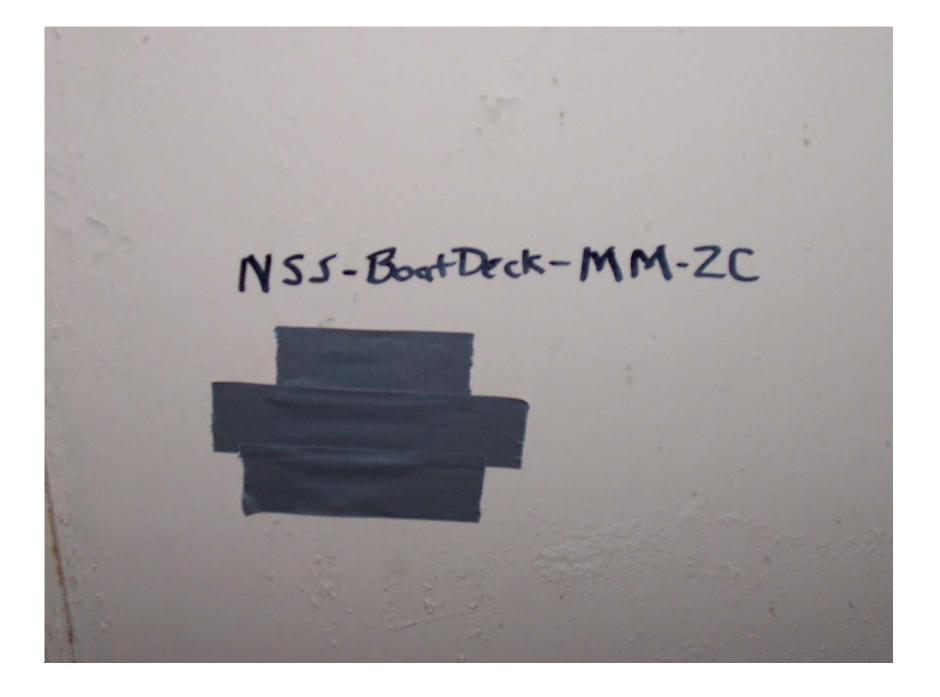






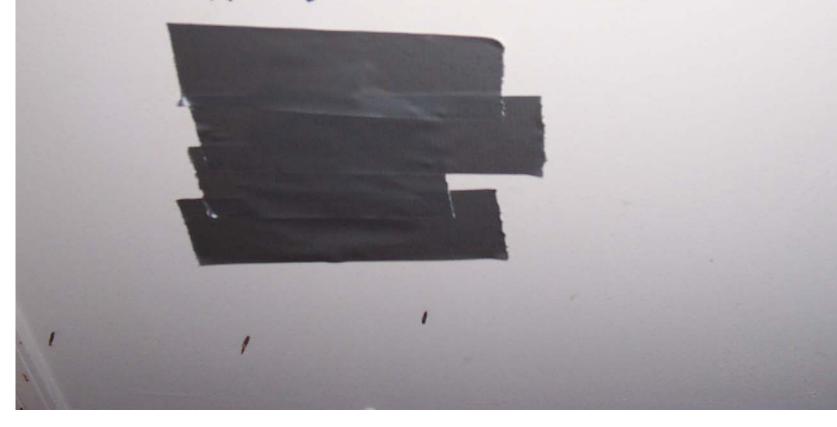






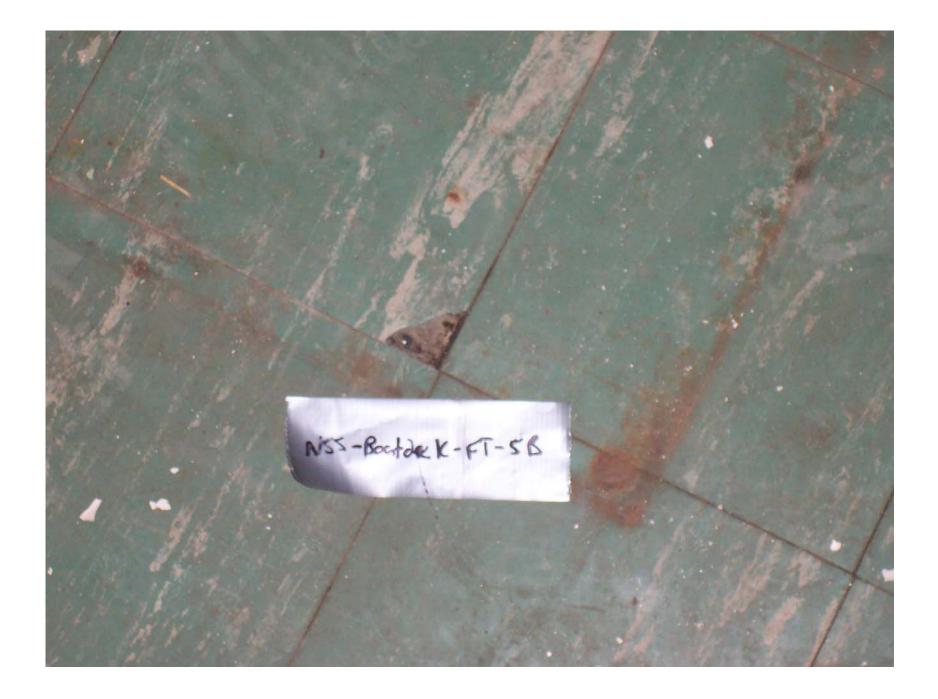
# NSS-Boat Deck-MM-3A

# NSS-BootDeck-MM-3B











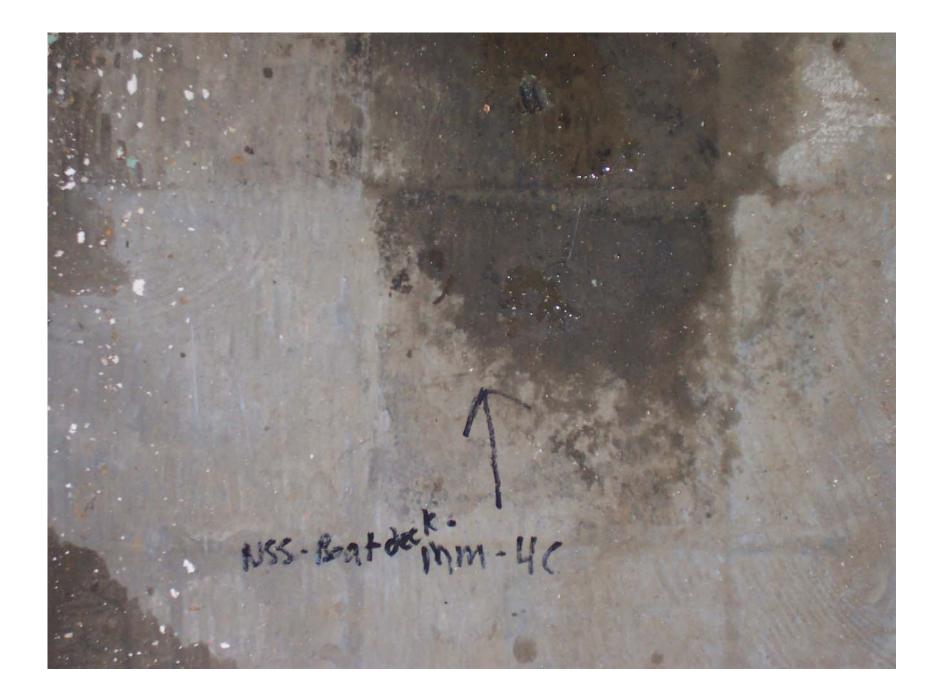
























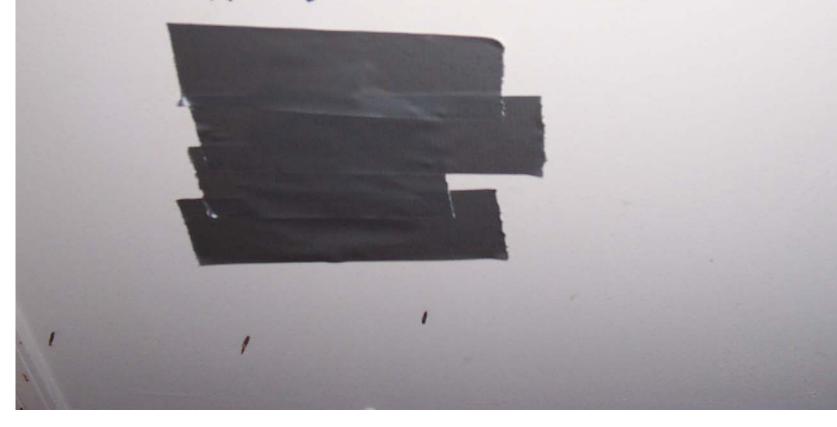




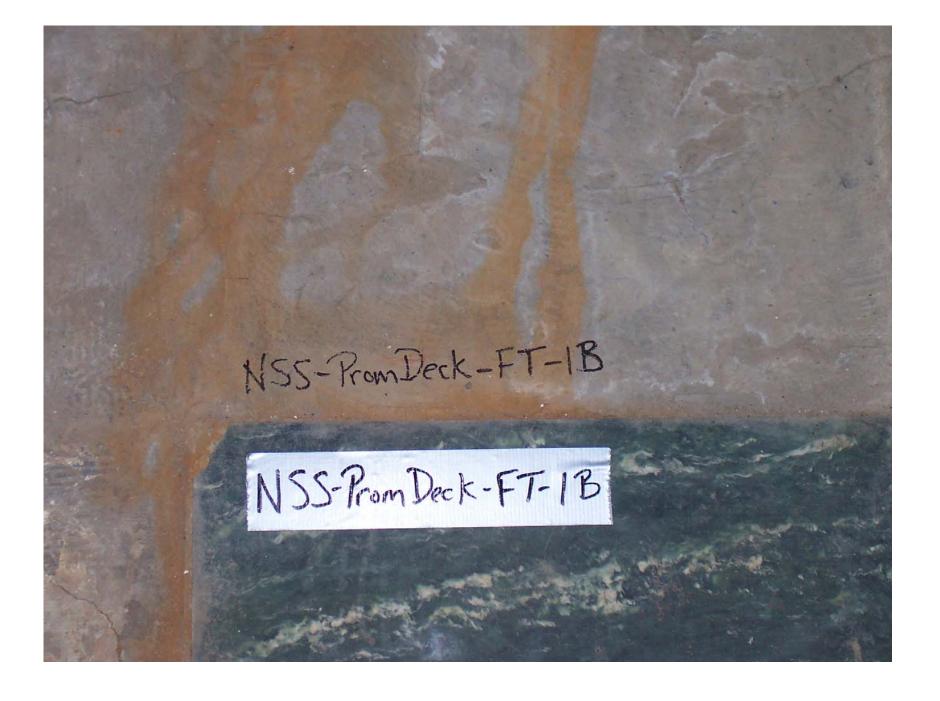


NSS-Prom Deck-MM-6B NSS-Prom Deck-MM-6B

## NSS-BootDeck-MM-3B

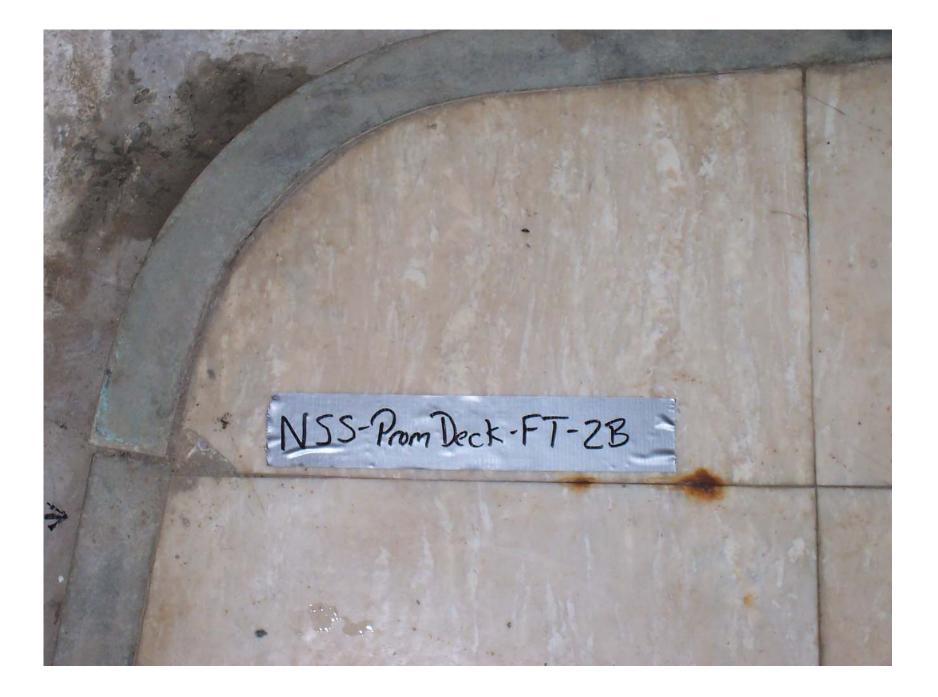


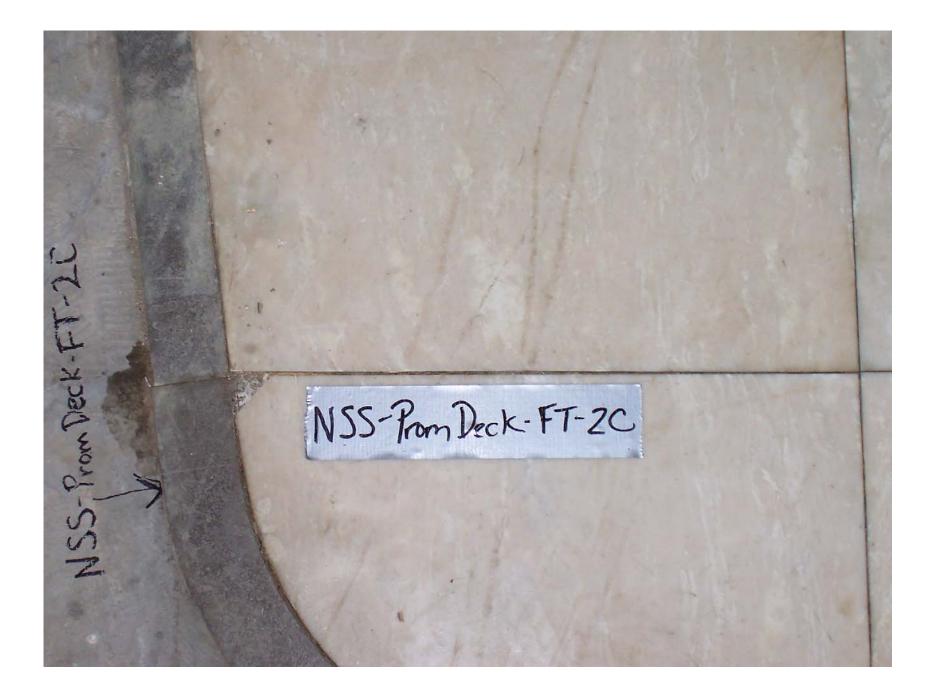


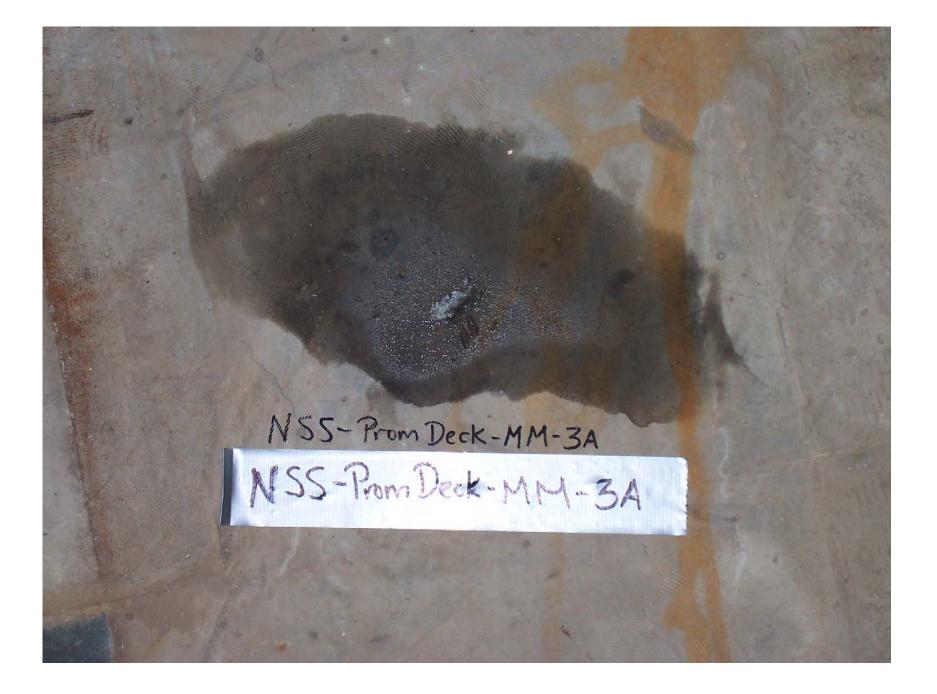






















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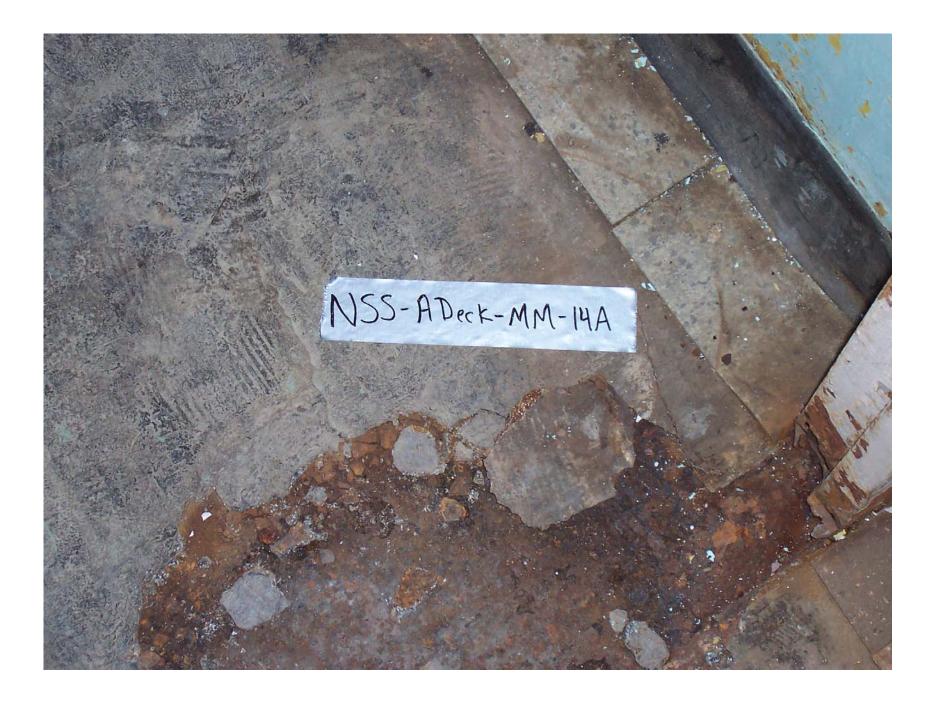


































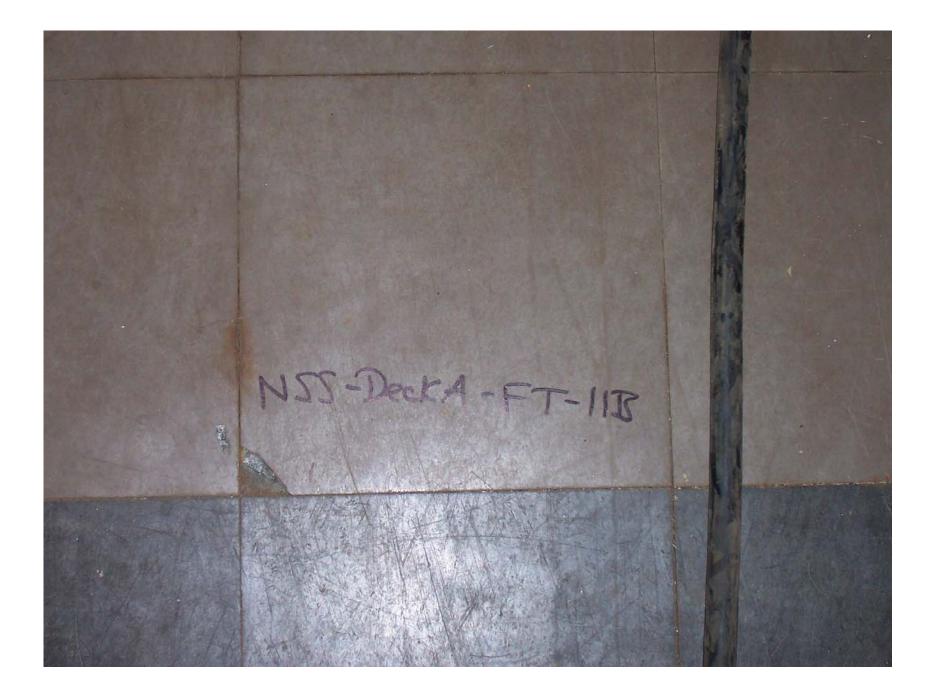






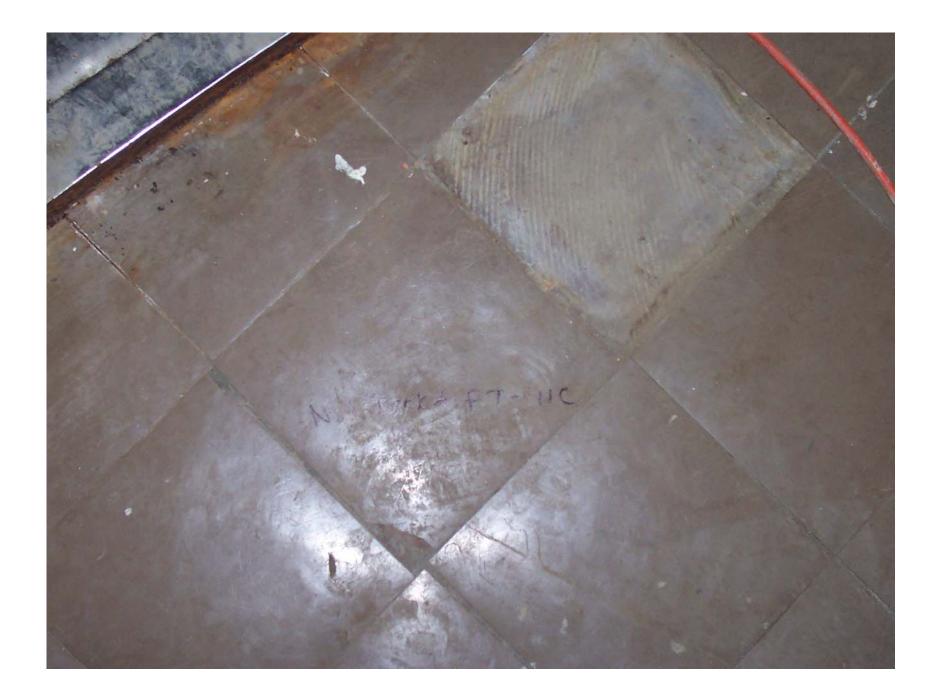


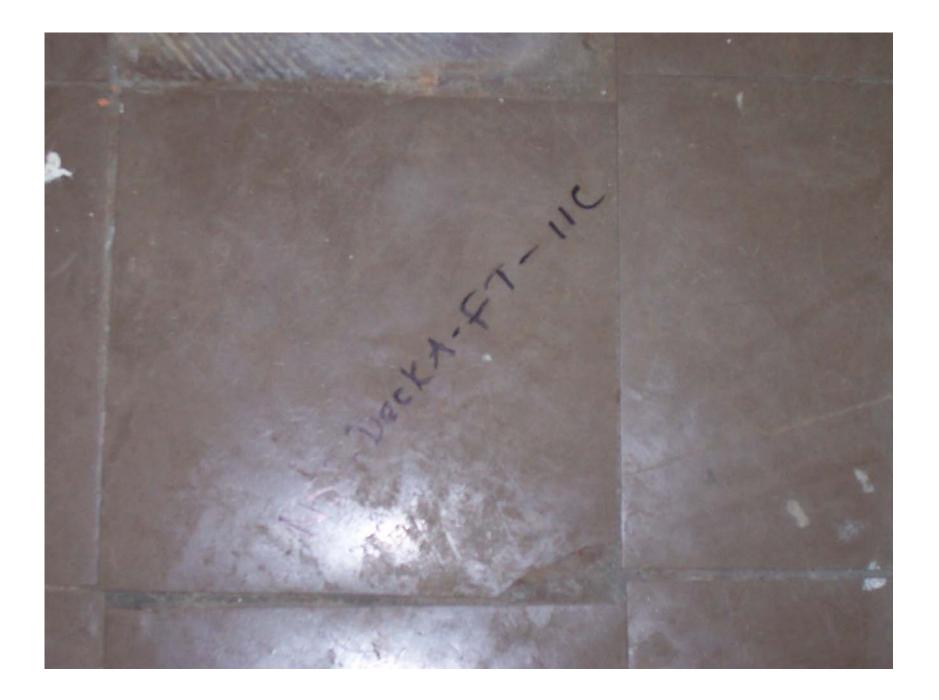
























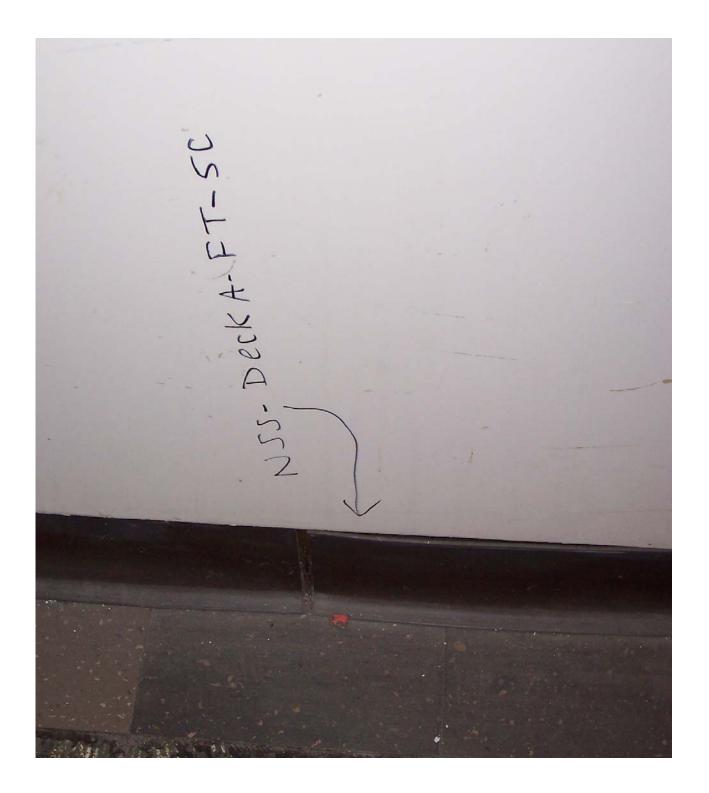


ENSS-DECKA.FT-7B









NSS-DeckA-FT-4C

N55-DECKA-FT-6C

T-7C DeckA-FT N.J.J.

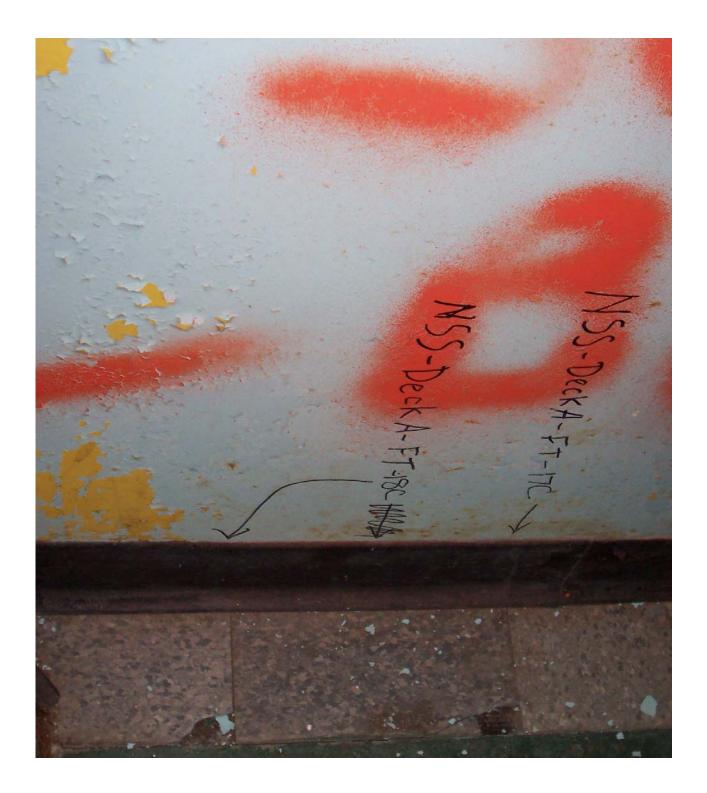






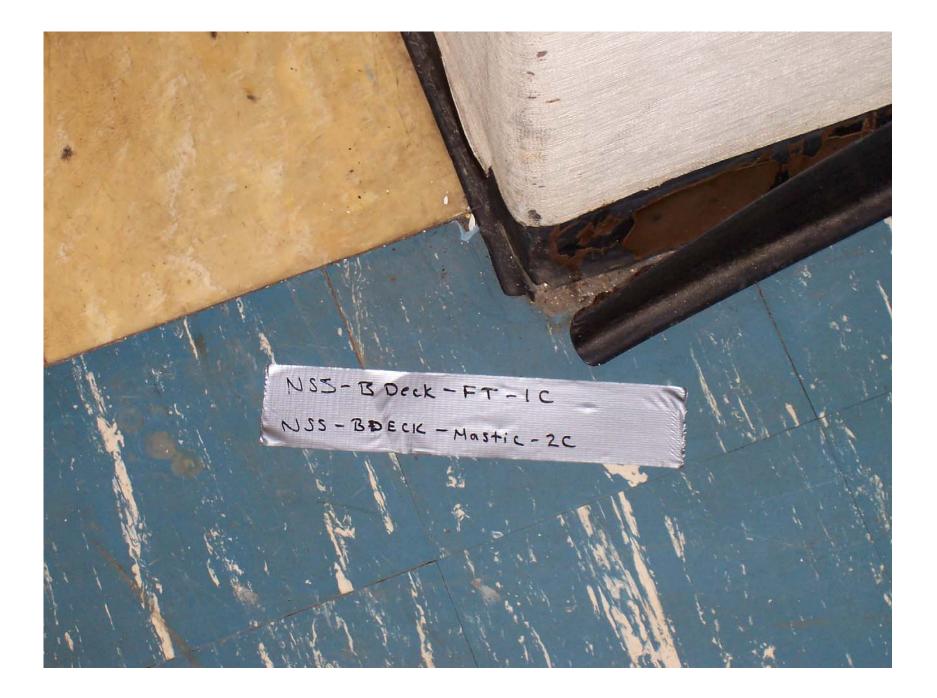


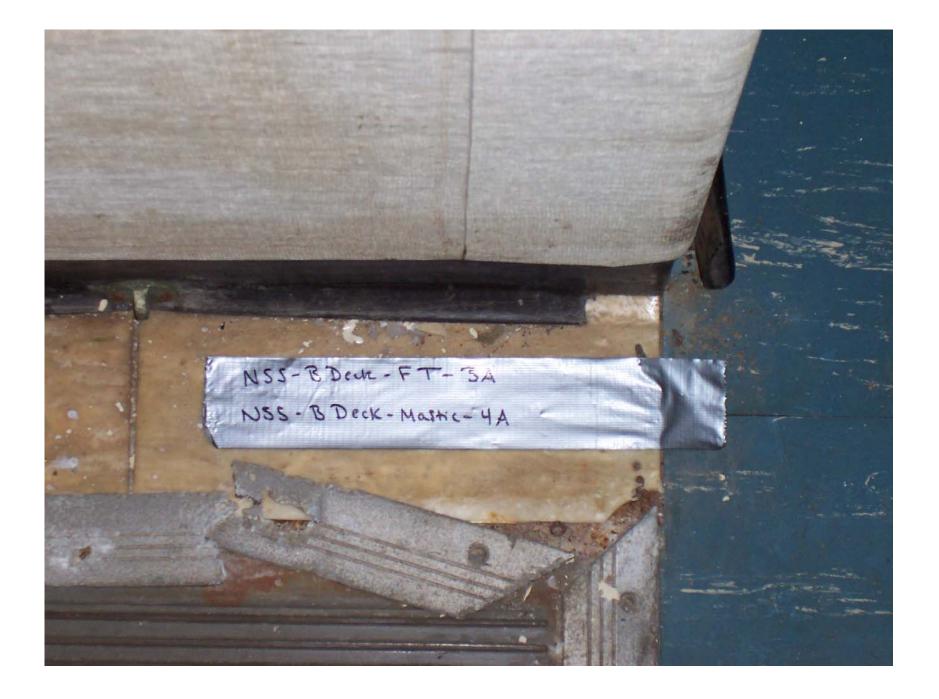


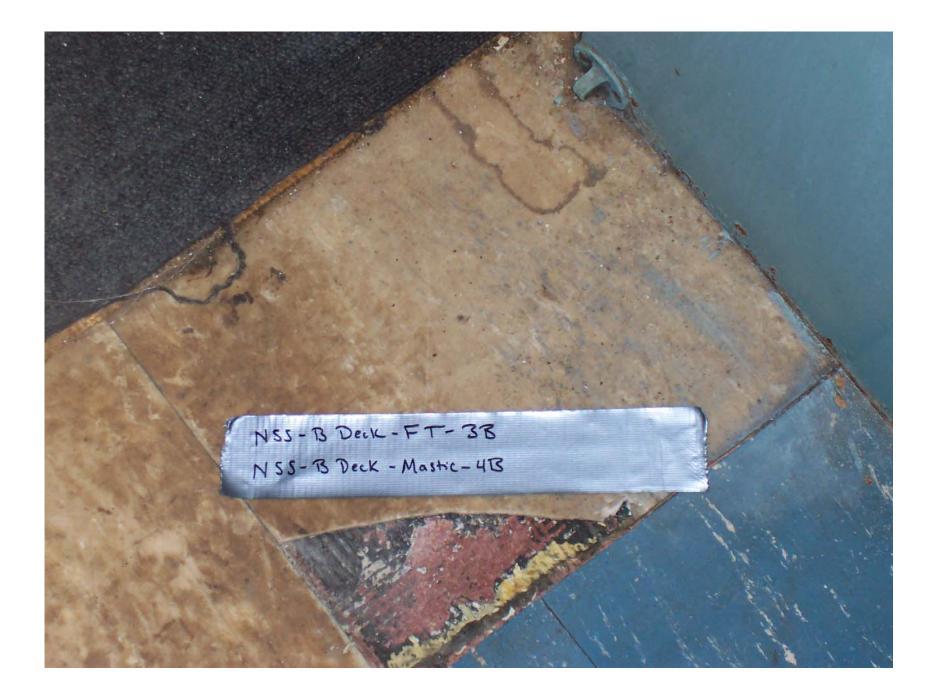




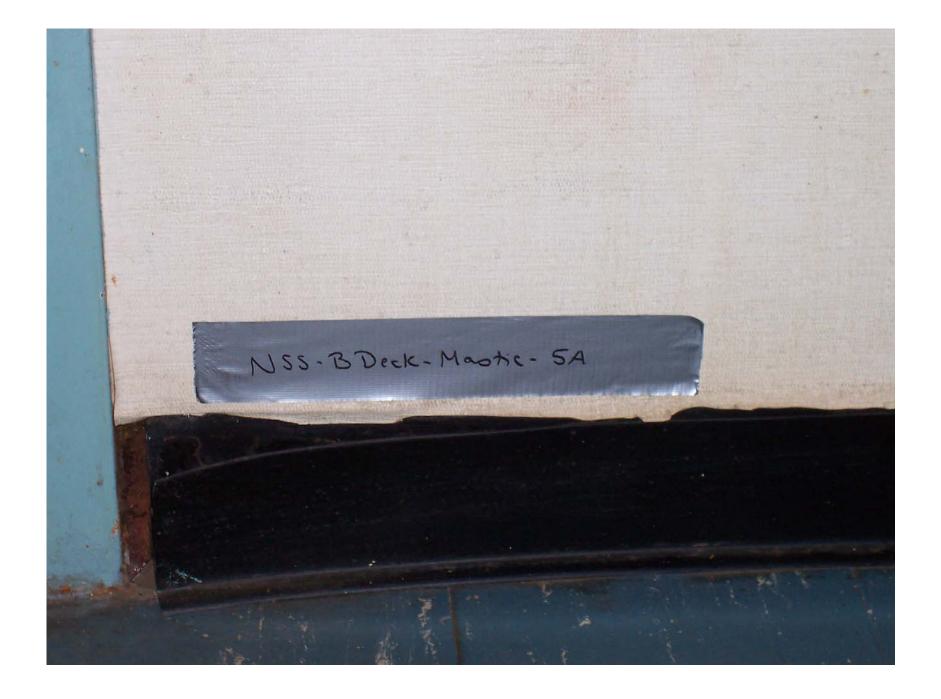












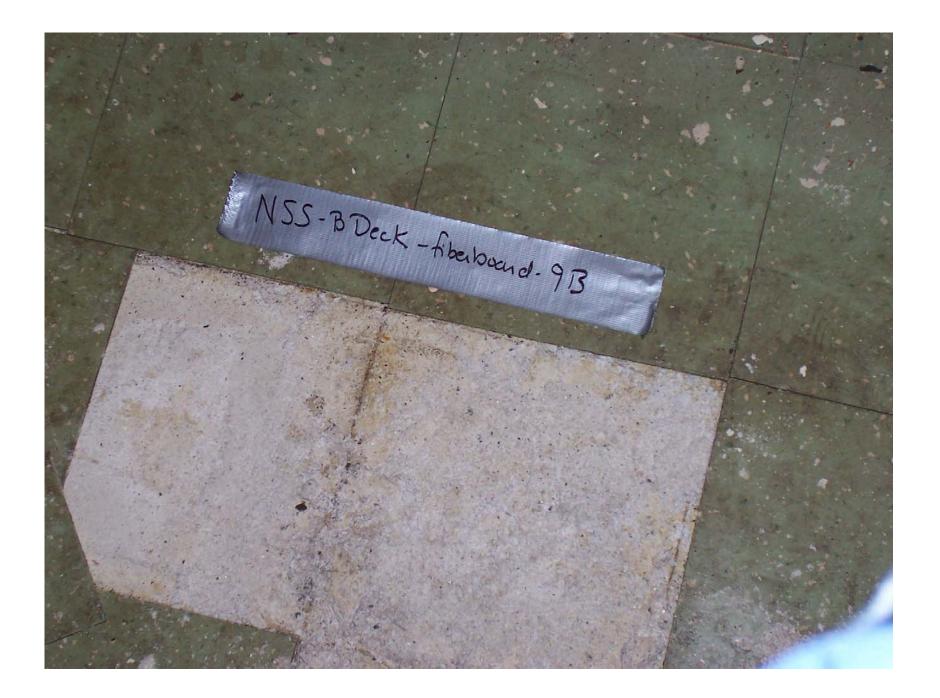






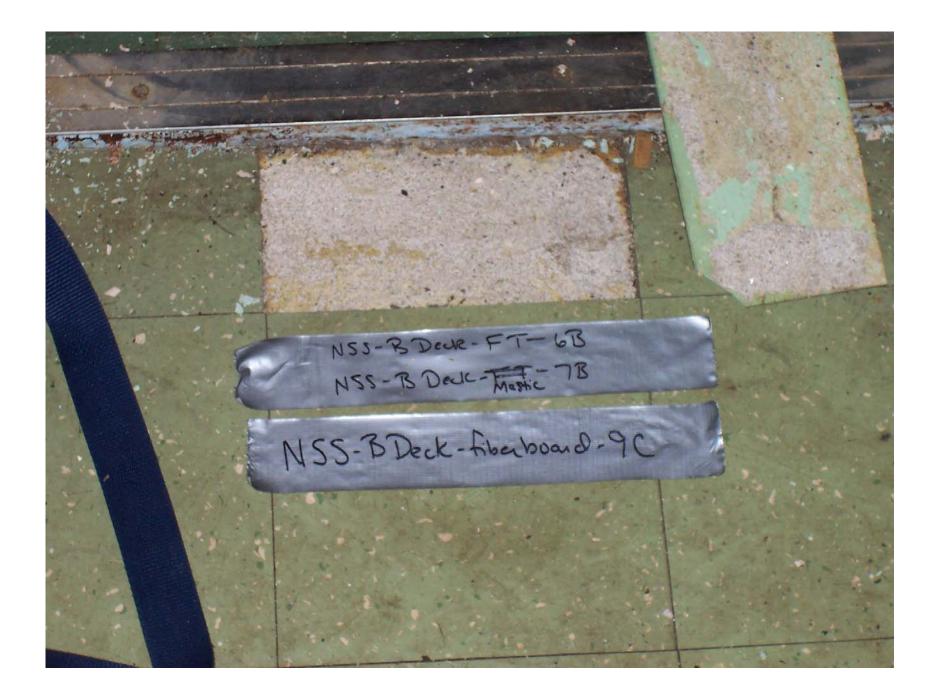






































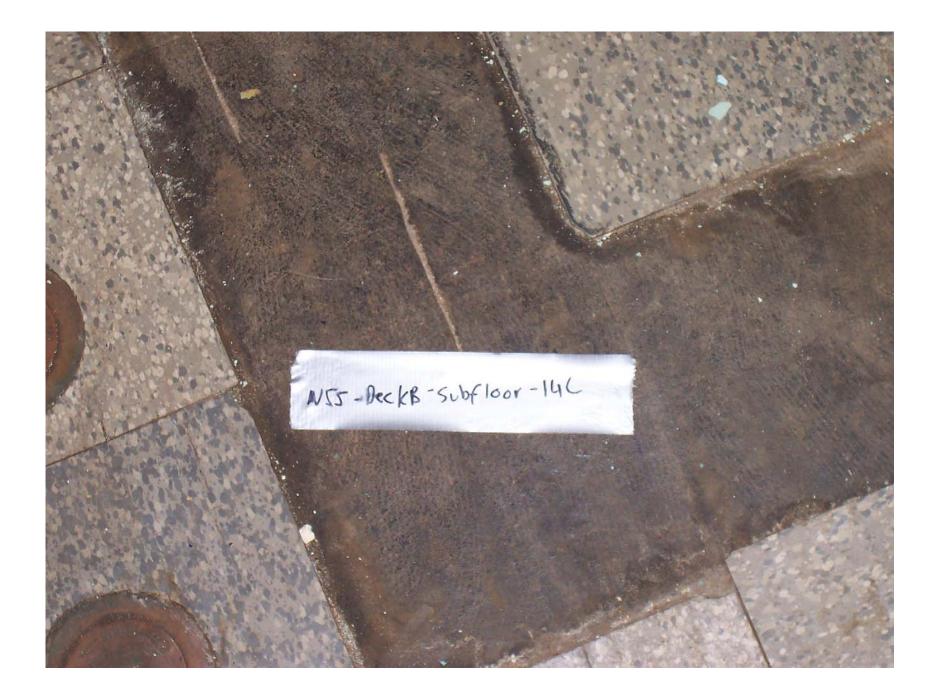






















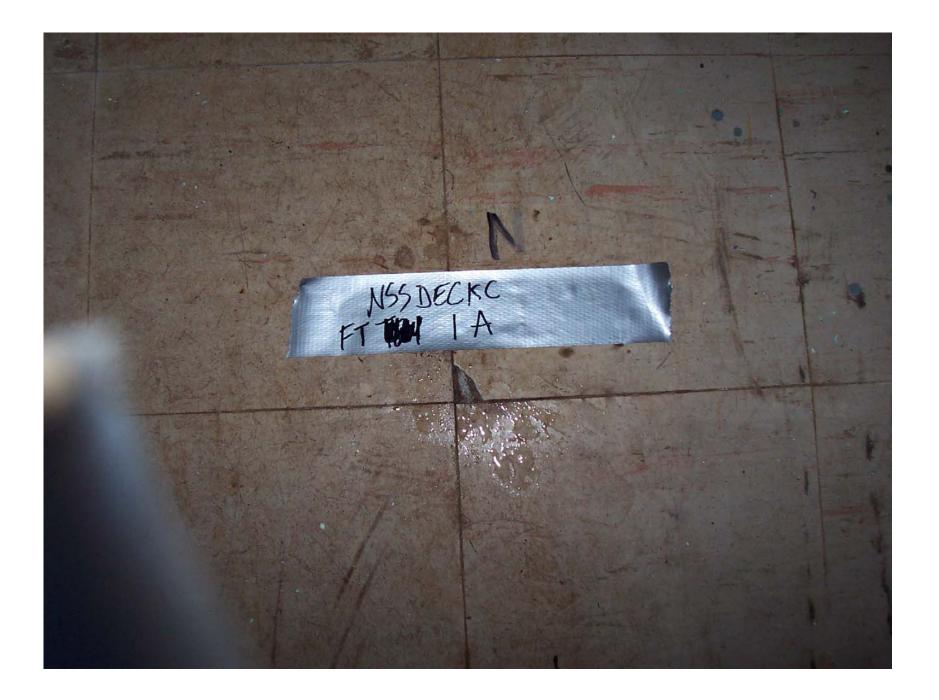
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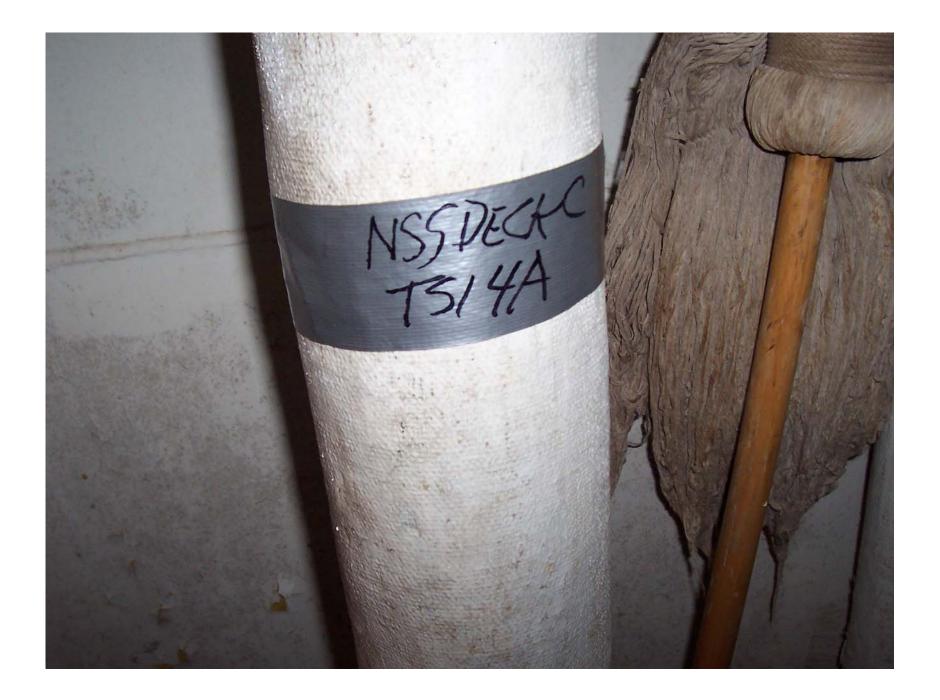












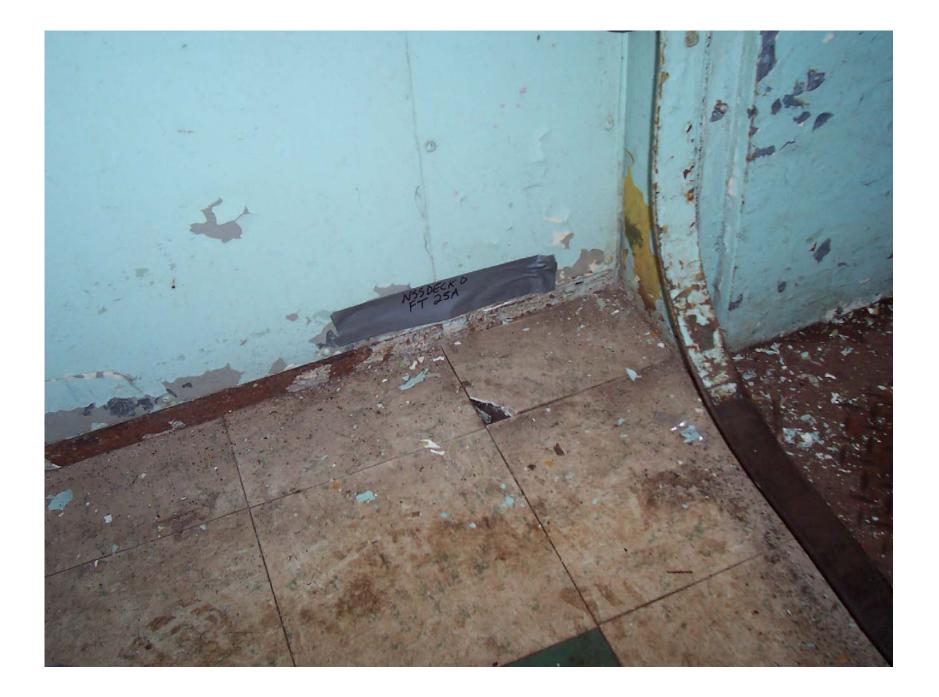












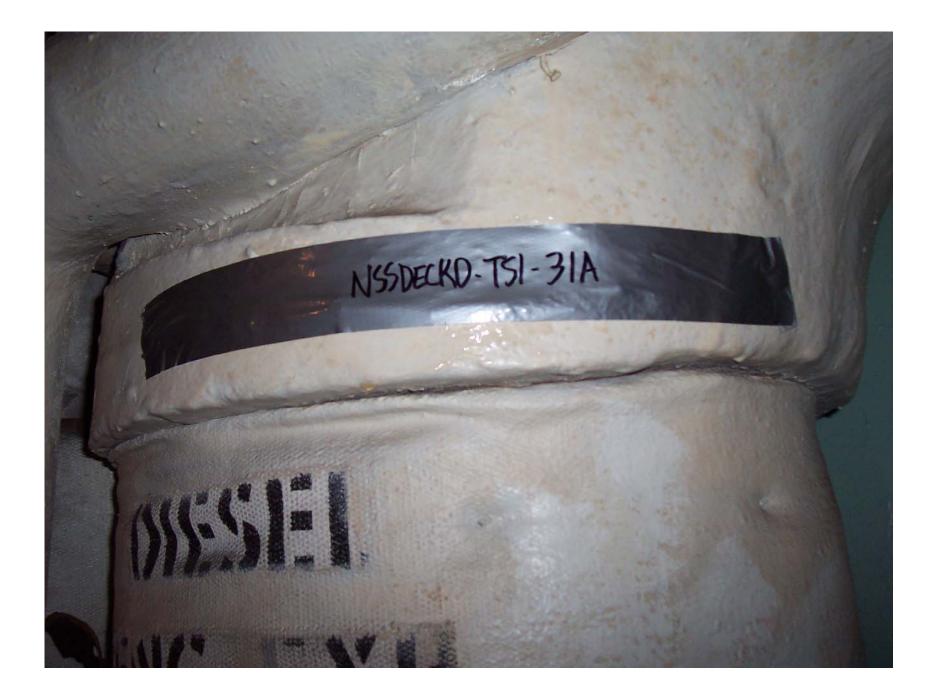
























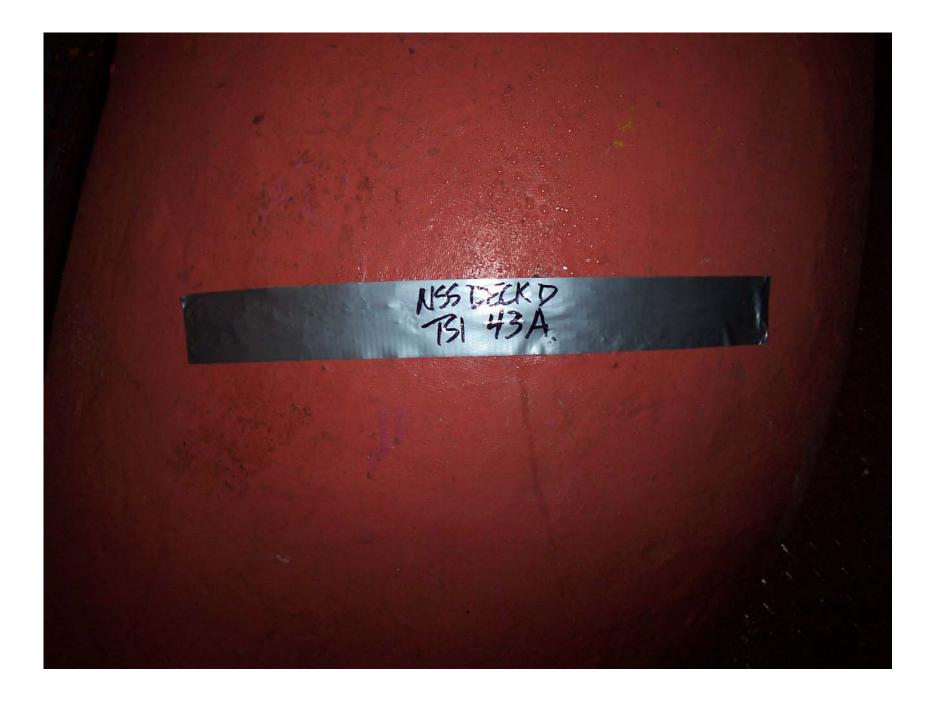




















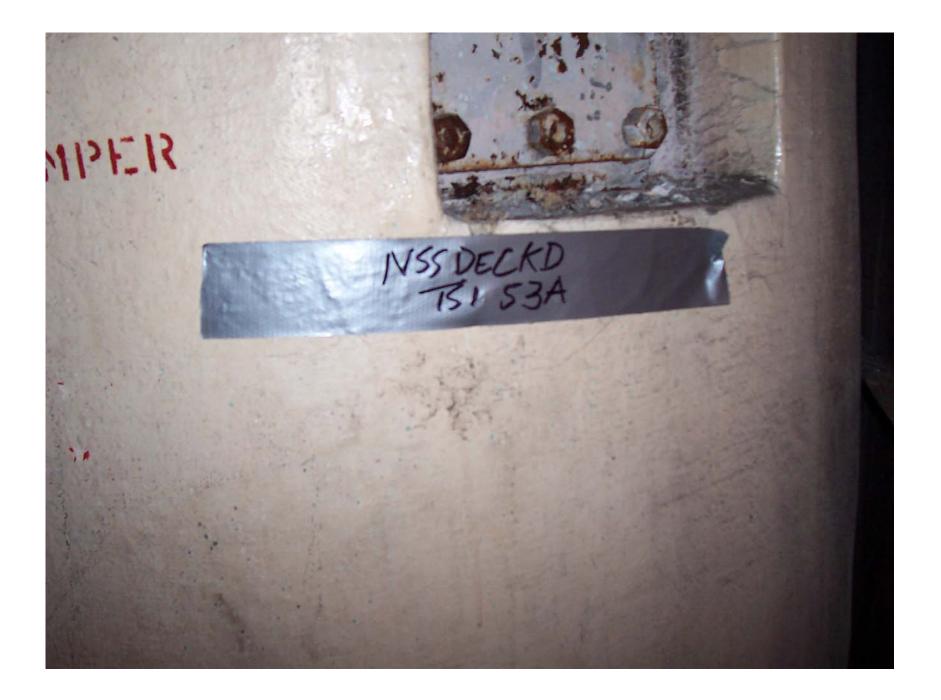
































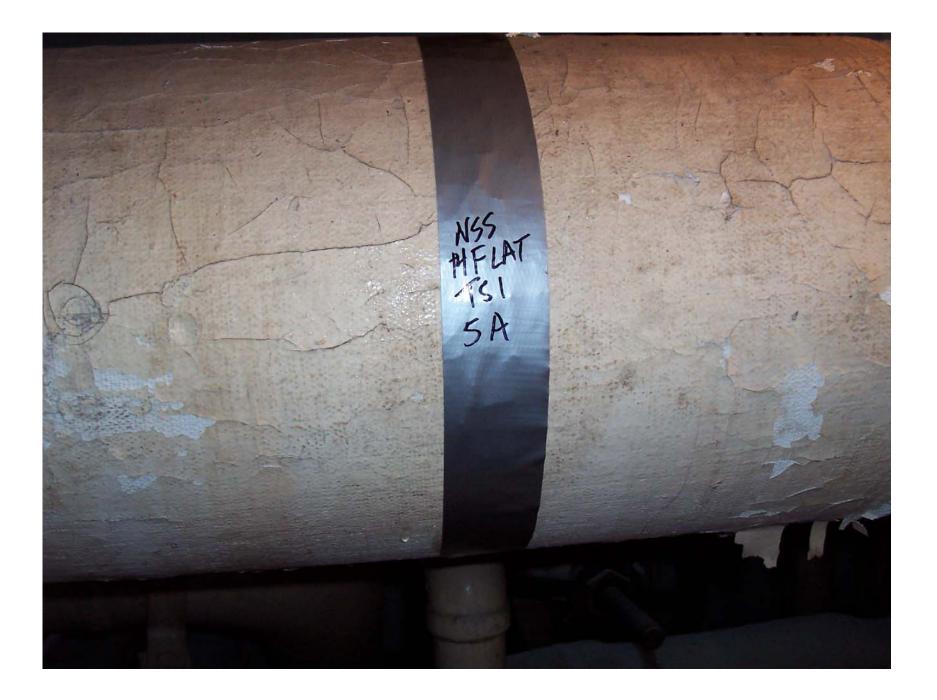


























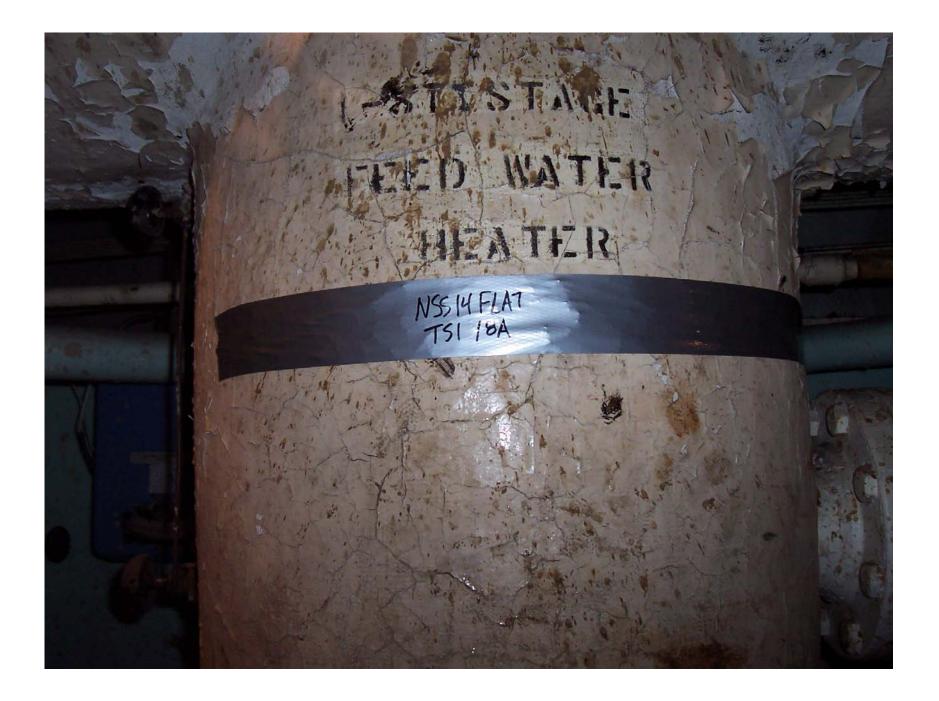


























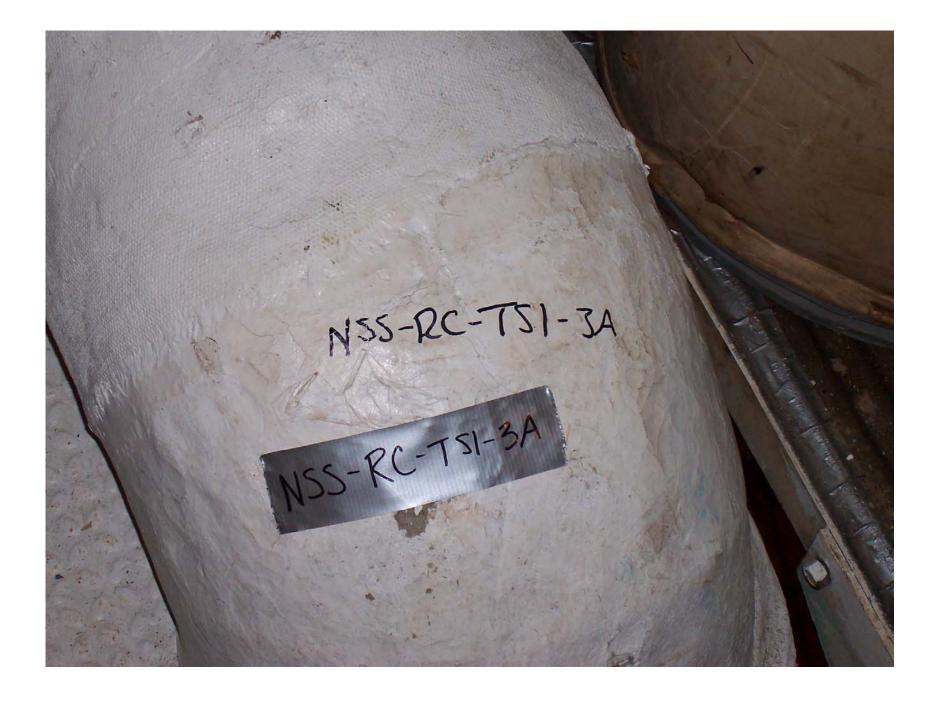


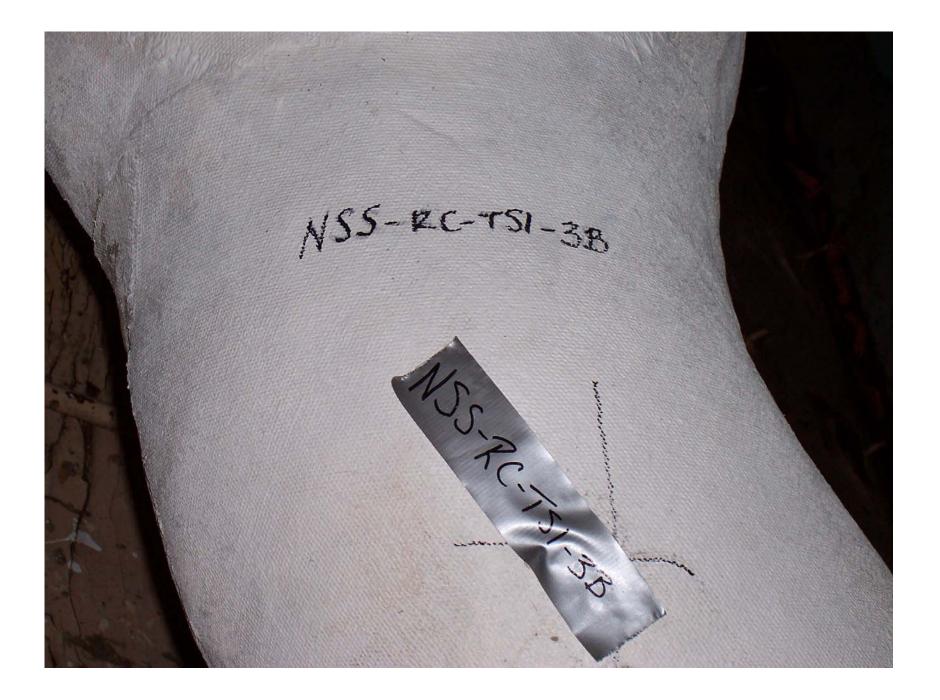






































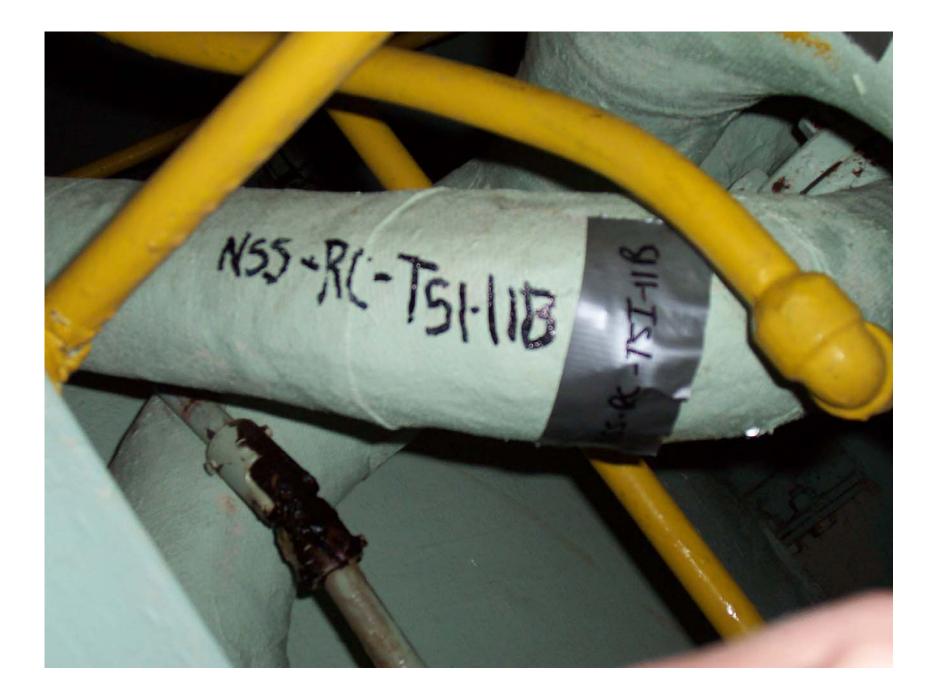








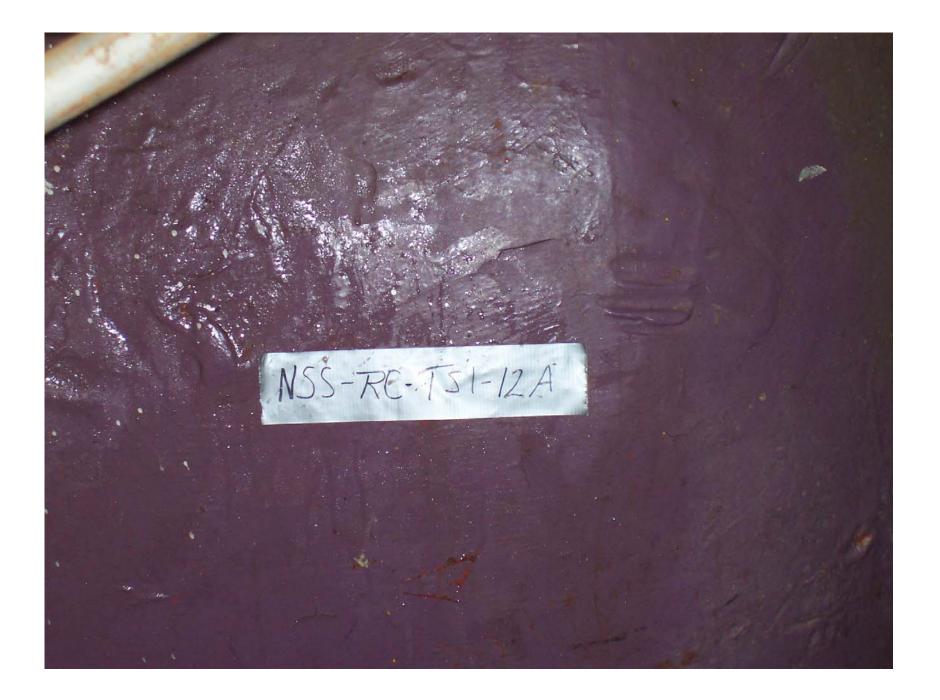


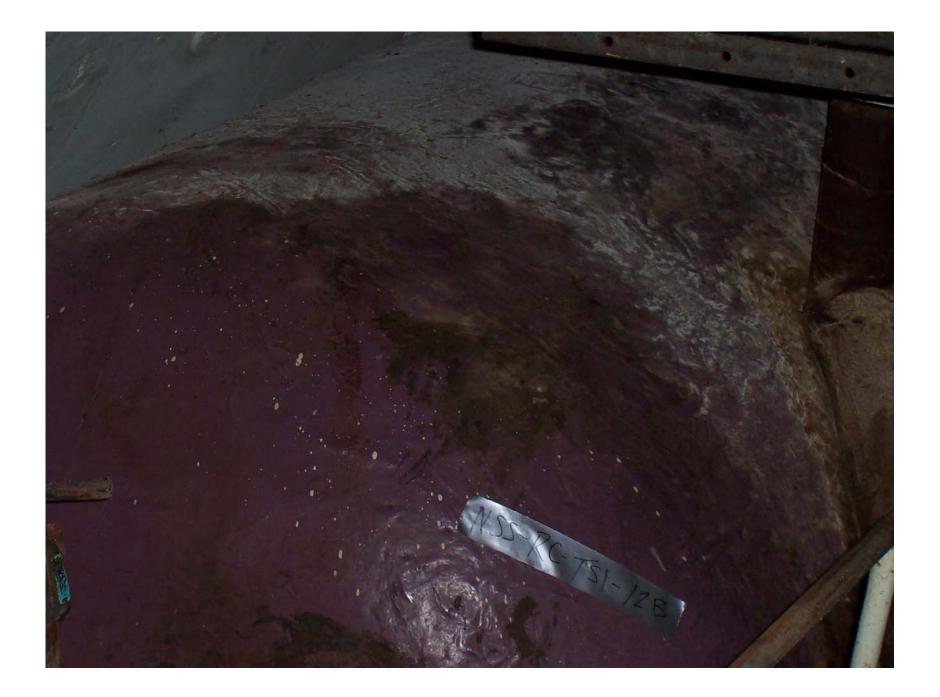


























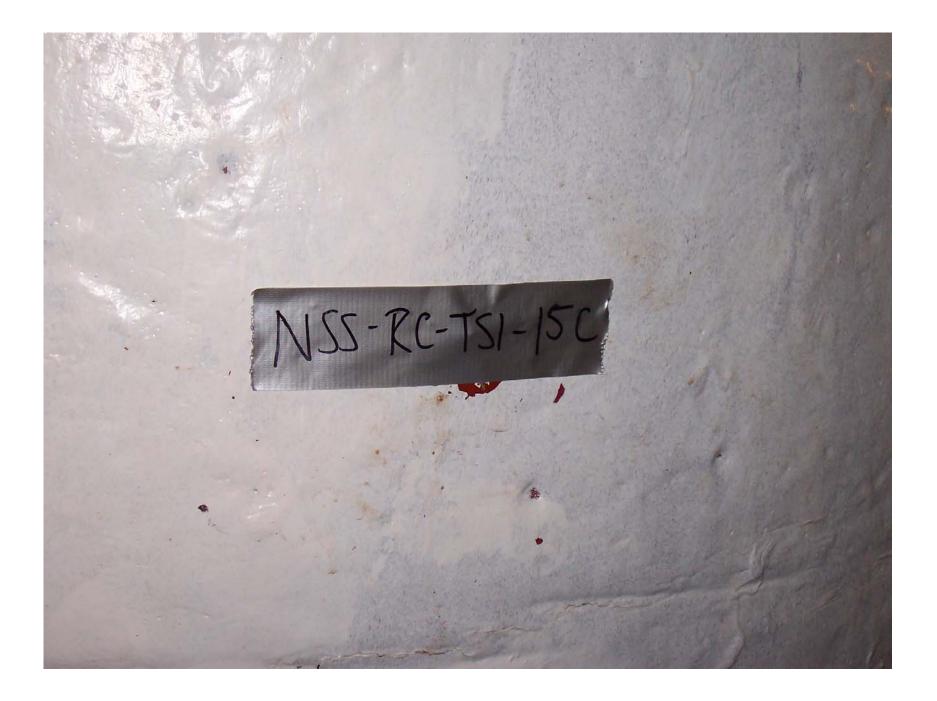








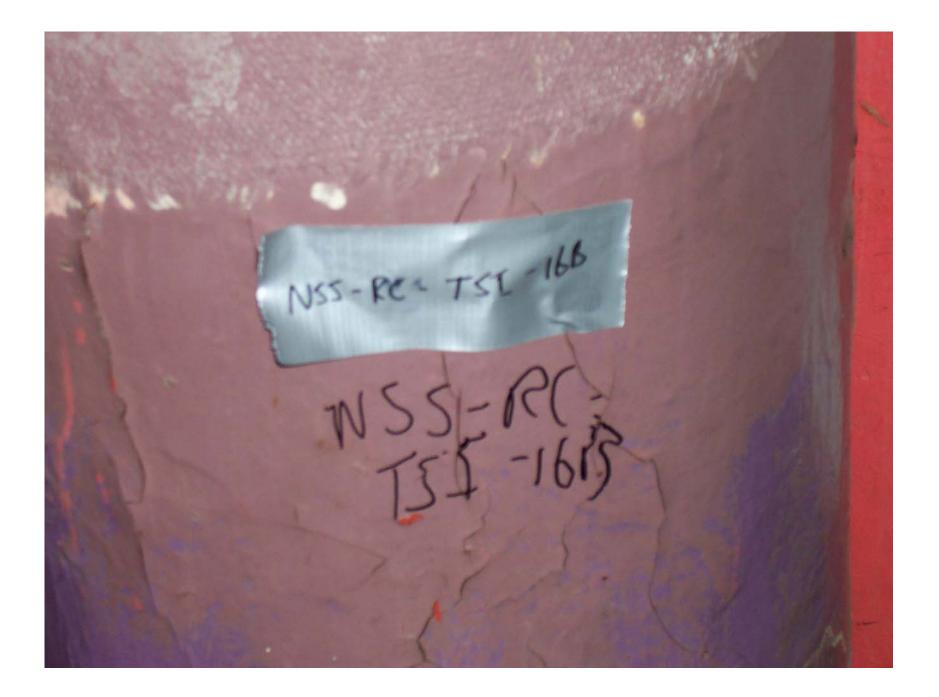






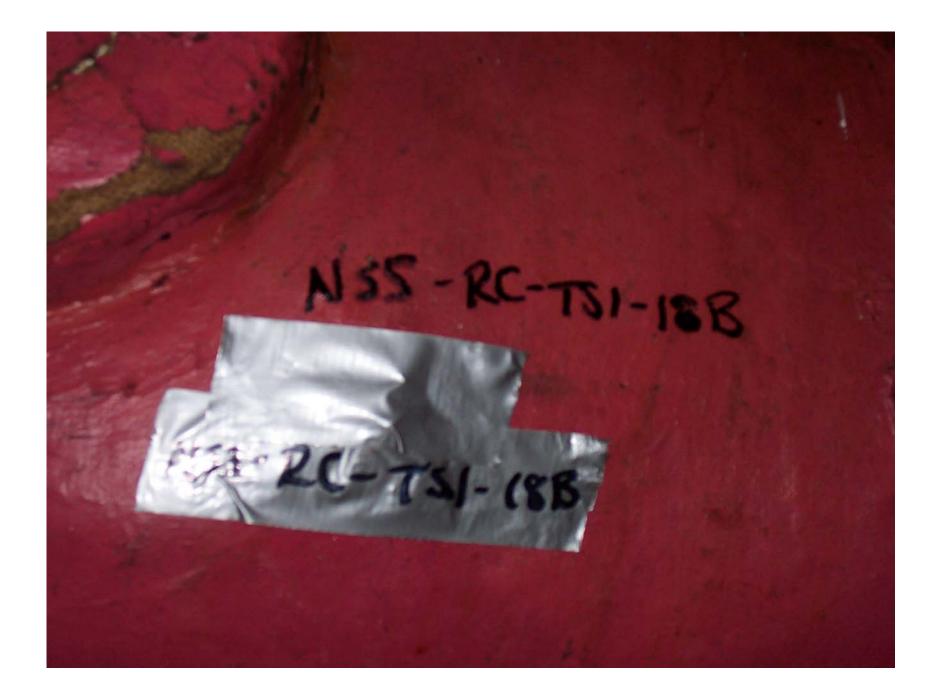








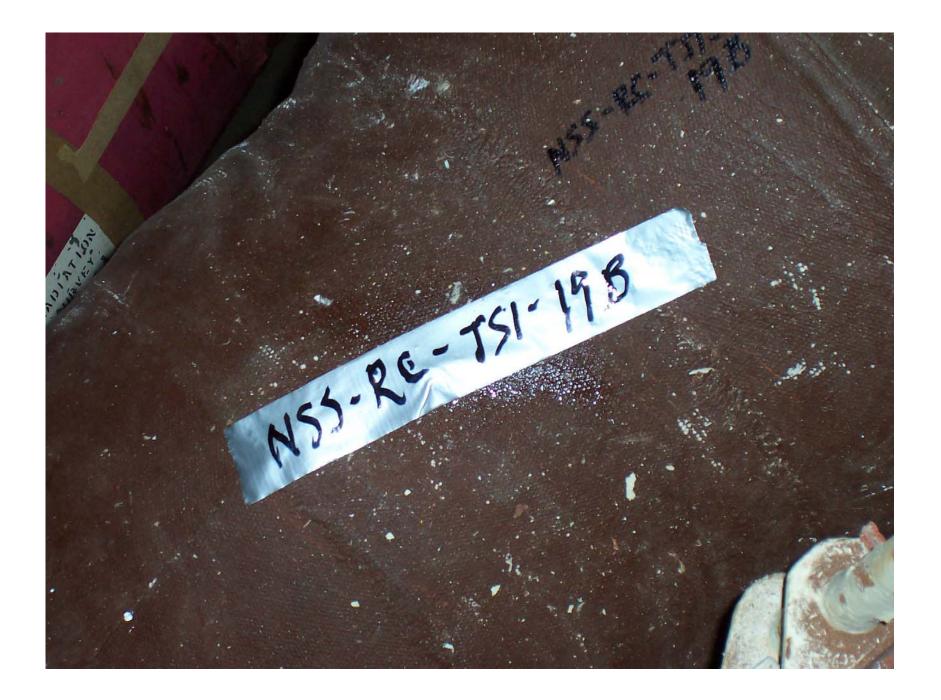


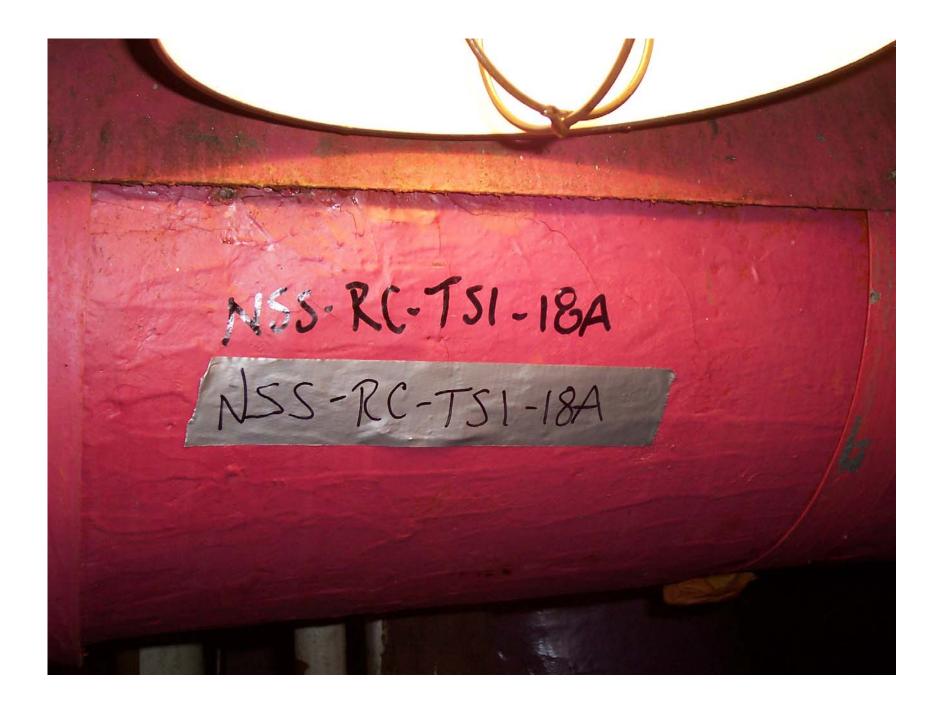




















Appendix K

## Appendix K Asbestos Survey Field Data

## Asbestos Survey Field Data Sheet-Navigation Bridge Deck NS-Savannah Fort Eustis, VA

				Friable?	
Sample ID	Material Description	Location	Condition	Yes	No
NSS-NBD-FT-1A, -1B, -1C	Green ,9"x9" floor tile with white lines and associated mastics	Throughout Navigation Bridge Deck	Fair		x
NSS-NBD-MM-2A, -2B, -2C	White wall board with pinhole pattern	Navigation Bridge Deck-Gyro Radar Room	Good		x
NSS-NBD-TSI-3A, -3B, -3C	Straight run pipe insulation associated with piping above ceilings	Navigation Bridge Deck above ceiling	Good	x	
NSS-NBD-TSI-4A, -4B, -4C	Elbow pipe insulation associated with piping above ceiling	Navigation Bridge Deck above ceiling	Good	x	
NSS-NBD-MM-5A, -5B, -5C	White, drywall associated with walls (1' thickness)	Navigation Bridge Deck Staterooms	Good	x	
NSS-NBD-MM-6A, -6B, -6C	White, drywall associated with ceiling	Navigation Bridge Deck Staterooms	Good	x	
NSS-NBD-MM-7A, -7B, -7C	Brown mastic associated with baseboard molding	Throughout Navigation Bridge Deck	Good		x

## Asbestos Survey Field Data Sheet-Navigation Bridge Deck NS-Savannah Fort Eustis, VA

				Friable?	
Sample ID	Material Description	Location	Condition	Yes	No
NSS-NBD-MM-8A, -8B, -8C	White sub-floor (baseboard)	Throughout Navigation Bridge Deck	Good	x	
NSS-NBD-TSI-9A, -9B, -9C	Straight run pipe insulation associated with generator	Navigation Bridge Deck-Generator Room	Good	x	
NSS-NBD-TSI-10A, -10B, -10C	Elbow pipe insulation associated with generator	Navigation Bridge Deck-Generator Room	Good	х	

Due to time limitations, physical samples were not taken of this deck. The materials that were observed are similar to materials that are located on other decks of the ship. The table identifies samples that ERM would have sampled had time permitted.

Note: All pipes are recorded as total diameter of the pipe and the associated insulation.

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-BoatDeck-FT-1A, -1B, -1C	Black 18"x18" floor tile with white specks and associated mastic	Boat Deck stairwell	Good		х
NSS-BoatDeck-MM-2A, -2B, -2C	White, drywall associated with the wall (1' thickness)	Boat Deck Cabins	Good	x	
NSS-BoatDeck-MM-3A, -3B, -3C	White, drywall associated with ceiling (1/2" thickness)	Boat Deck Staterooms	Good	x	
NSS-BoatDeck-MM-4A, -4B, -4C	White sub-floor (baseboard)	Throughout Boat Deck	Good		x
NSS-BoatDeck-FT-5A, -5B, -5C	Green, 9x9 floor tile with white lines and associated mastic	Throughout Boat Deck	Poor		x
NSS-BoatDeck-MM-6A, -6B, -6C	Brown mastic associated with baseboard molding	Throughout Boat Deck	Good		x
NSS-BoatDeck-TSI-7A, -7B, -7C	Straight run pipe insulation above ceiling	Boat Deck above ceiling	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-BoatDeck-TSI-8A, -8B, -8C	Elbow pipe insulation	Boat Deck above ceiling	Good	x	

#### Asbestos Survey Field Data Sheet-Promenade Deck NS-Savannah Fort Eustis, VA

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-PromDeck-FT-1A, -1B, -1C	Dark green, 18" x18" floor tile with white lines and associated mastics	Promenade Deck-Veranda	Good		x
NSS-PromDeck-FT-2A, -2B, -2C	White, 18"x18" floor tile with white lines and associated mastics	Promenade Deck-Veranda	Good		x
NSS-PromDeck-MM-3A, -3B, -3C	Black sub-floor (baseboard)	Promenade Deck-Throughout floor	Good		x
NSS-PromDeck-MM-4A, -4B, -4C	White, 4'x4' ceiling panels with pinholes	Promenade Deck-Veranda and Main Lounge	Good		x
NSS-PromDeck-MM-5A, -5B, -5C	White drywall (1/2" thickness) associated with walls	Promenade Deck-Veranda	Good	x	
NSS-PromDeck-MM-6A, -6B, -6C	White drywall (1" thickness) associated with ceilings	Promenade Deck-Veranda	Good	x	
NSS-PromDeck-MM-7A, -7B, -7C	Brown mastic associated with baseboard molding	Promenade Deck-Veranda and Main Lounge	Good		x

#### Asbestos Survey Field Data Sheet-Surface Deck NS-Savannah Fort Eustis, VA

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSSSurfaceDeck-MM-1A, -1B, -1C	Black asphalt sealant associated with cargo hold doors	Surface Deck	Good		x

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckA-FT-1A, -1B, -1C	Green, 9"x9" floor tile with white lines and associated mastic	Deck A- Throughout infirmary	Good		x
NSSDeckA-TSI-2A, -2B, -2C	Straight run pipe insulation	Deck A- Piping located above ceiling	Good	x	
NSSDeckA-TSI-3A, -3B, -3C	Elbow pipe insulation	Deck A- Piping located above ceiling	Good	x	
NSSDeckA-FT-4A, -4B, -4C	Brown, 9"x9" floor tile with white specks and associated mastic	Deck A-Throughout hallways adjacent to staterooms	Good		x
NSSDeckA-FT-5A, -5B, -5C	Black, 9"x9" floor tile with white specks and associated mastic	Deck A-Throughout hallways adjacent to staterooms	Good		x
NSSDeckA-FT-6A, -6B, -6C	Light brown, 9"x9" floor tile with white specks and associated mastic	Deck A-Throughout hallways adjacent to staterooms	Good		x
NSSDeckA-FT-7A, -7B, -7C	Tan, "9x9" floor tile with white brown specks and associated mastic	Deck A-Throughout hallways adjacent to staterooms	Good		x

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckA-MM-8A, -8B, -8C	White drywall (1/2" thickness) associated with ceilings	Deck A	Good	x	
NSSDeckA-MM-9A, -9B, -9C	White drywall (1" thickness) associated with walls	Deck A	Good	x	
NSSDeckA-FT-10A, -10B, -10C	White, 9"x9" floor tile and associated mastic	Deck A- Main Lobby	Good		х
NSSDeckA-FT-11A, -11B, -11C	Gray, 18"x18" floor tile and associated mastic	Deck A -Main Lobby	Good		x
NSSDeckA-FT-12A, -12B, -12C	Black, 9"x9" floor tile and associated mastic	Deck A- Main Lobby	Good		x
NSSDeckA-CT-13A, -13B, -13C	White, 2'x3' ceiling panel with pinholes	Deck A- Main Lobby	Good		х
NSSDeckA-MM14A, -14B, -14C	Black sub-floor (baseboard)	Deck A – Main Lobby and forward areas	Good		х

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSDeckA-FT-15A, -15B, -15C	Tan, 9"x9" floor tile and associated mastic	Deck A- Lab Assistant Office	Poor		х
NSSDeckA-FT-16A, -16B, -16C	Orange, 9"x9" floor tile and associated mastic	Deck A- Barber Shop	Good		x
NSSDeckA-FT-17A, -17B, -17C	Brown, 9" x9" floor tile with black and white specks and associated mastic	Deck A- Port and starboard side stairwells	Fair		x
NSSDeckA-FT-18A, -18B, -18C	Tan, 9" x9" floor tile with brown specks and associated mastic	Deck A- Port and starboard side stairwells	Fair		х
NSSDeckA-FT-19A, -19B, -19C	Tan, 9" x9" floor tile with brown specks and associated mastic	Deck A- Staterooms rear of Main Lobby and Pursers Office	Fair		x
NSSDeckA-MM-20A, -20B, -20C	Brown mastic associated with baseboard molding	Deck A	Good		x
NSSDeckA-MM-21A, -21B, -21C	White sub-floor (baseboard)	Deck A- Area rear of Main Lobby	Good	x	
NSSDeckA-FT-22A, -22B, -22C	Red, 9"x9" floor tile with white lines and associated mastic	Deck A- Forward port side stairwell	Good		x

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-B Deck-FT-1A, -1B, -1C	Blue, 9"x9" floor tile with white lines	Deck B- Dining Room	Fair		х
NSS-B Deck-Mastic-2A, -2B, -2C	Mastic associated with blue 9"x9" floor tile with white lines	Deck B-Dining Room	Fair		х
NSS-B Deck-FT-3A, -3B, -3C	White, 18" x18" floor tile	Deck B-Dining Room	Fair		х
NSS-B Deck-Mastic-4A, -4B, -4C	Mastic associated with 18" x18" floor tile	Deck B-Dining Room	Fair		х
NSS-B Deck-Mastic-5A, -5B, -5C	Brown mastic associated with baseboard molding	Deck B-Dining Room	Fair		х
NSS-B Deck- FT-6A, -6B, -6C	Light green, 9" x9" floor tile with white specks	Deck B- Stateroom hallway rear of Cargo Loading Passage	Fair		x
NSS-B Deck-Mastic-7A, -7B, -7C	Mastic associated with light green 9x9 floor tile with white specks	Deck B- Stateroom hallway rear of Cargo Loading Passage	Fair		x

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-B Deck-MM-8A, -8B, -8C	Brown mastic associated with stair treads	Deck-B Dining Room	Good		x
NSS-B Deck-Fiberboard-9A, -9B, -9C	White fiberboard padding beneath floor tile	Deck B- Area rear of Cargo Loading Passage	Fair	x	
NSS-B Deck-FT-10A, -10B, -10C	Dark green, 9" x9" floor tile with white lines	Deck B- Area rear of Cargo Loading Passage	Fair		x
NSS-B Deck-Mastic-11A, -11B, -11C	Mastic associated with 9" x9" floor tile with white lines	Deck B- Area rear of Cargo Loading Passage	Fair		x
NSS-B Deck-FT-12A, -12B, -12C	Gray, 9"x9" floor tiles with specks	Deck B- Throughout area forward of Cargo Loading Passage	Fair		x
NSS-B Deck-Mastic-13A, -13B, -13C	Mastic associated with gray 9" x9" floor tile with specks	Deck B- Throughout area forward of Cargo Loading Passage	Fair		x
NSS-B Deck-Subfloor-14A, -14B, -14C	Gray sub-floor (baseboard)	Deck B- Forward of Cargo Loading Passage	Fair		x

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-B Deck-MM-15A, -15B, -15C	White drywall (1/2" thickness) associated with ceiling	Deck B-Throughout staterooms and hallways	Fair	x	
NSS-B Deck-FT-16A, -16B, -16C	Tan, 9" x9" floor tile with brown lines and associated mastic	Deck B- Starboard side stateroom forward of the Cargo Loading Passage	Fair		x
NSS-B Deck-MM-17A, -17B, -17C	White, 18"x18" ceiling panels with pinholes	Deck B- Dining room and office rear of Cargo Loading Passage	Good		x
NSS-B Deck-TSI-18A, -18B, -18C	Straight run pipe insulation	Deck B– Piping that is located above ceiling	Good	x	
NSS-B Deck-TSI-19A, -19B, -19C	Elbow pipe insulation	Deck B– Piping that Is located above ceiling	Good	x	
NSS-B Deck-MM-20A, -20B, -20C	White drywall (1" thickness) associated with walls	Deck B – Throughout staterooms and hallways	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckC-FT-1A, -1B, -1C	Tan, 9"x9" floor tiles with white lines and associated mastics	Deck C-Staterooms	Good		x
NSSDeckC-MM-2A, -2B, -2C	White drywall (1/2" thickness) associated with state room ceiling	Deck C-Staterooms	Good	x	
NSSDeckC-MM-3A, -3B, -3C	White drywall (1" thickness) associated with state room walls	Deck C-Staterooms and Hallways	Good	x	
NSSDeckC-TSI-4A, -4B, -4C	Straight run pipe insulation associated with pipes above ceiling	Deck C	Good	x	
NSSDeckC-TSI-5A, -5B, -5C	Elbow pipe insulation associated with pipes above ceiling	Deck C	Good	x	
NSSDeckC-FT-6A, -6B, -6C	Brown, 9" x9" floor tile with black specks and associated mastic	Deck C- Hallways	Good		x
NSSDeckC-FT-7A, -7B, -7C	Tan, 9" x9" floor tile with black and white specks and associated mastic	Deck C- Hallways	Good		x

#### Asbestos Survey Field Data Sheet-Deck C NSS-Savannah Fort Eustis, VA

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckC-TSI-8A, -8B, -8C	Straight run pipe insulation associated with piping	Deck C – Carpenters workshop	Good	x	
NSSDeckC-TSI-9A, -9B, -9C	Elbow pipe insulation associated with piping	Deck C- Carpenters workshop	Good	х	

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSS14Flat-TSI-1A, -1B, -1C	Straight run pipe insulation associated with heating system	Deck 14 Flat-Engine Room	Good	х	
NSS14Flat-TSI-2A, -2B, -2C	Elbow pipe insulation associated with heating system drain	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-3A, -3B, -3C	Straight run pipe insulation associated with heating system drain	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-4A, -4B, -4C	Elbow pipe insulation associated with heating system drain	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-5A, -5B, -5C	Straight run pipe insulation associated with auxiliary exhaust	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-6A, -6B, -6C	Elbow pipe insulation associated with auxiliary exhaust	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-7A, -7B, -7C	Straight run pipe insulation associated with fire station 37 (4" diameter)	Deck 14 Flat-Engine Room	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS14Flat-TSI-8A, -8B, -8C	Elbow pipe insulation associated with fire station 37 (4" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-9A, -9B, -9C	Insulation (body) associated with HP/LP crossover system (60" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-10A, -10B, -10C	Insulation (body) associated with HP/LP crossover system (36" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-11A, -11B, -11C	Elbow pipe insulation associated with HP/LP crossover system (36" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-12A, -12B, -12C	Elbow pipe insulation associated with steam dump pipe (24" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-13A, -13B, -13C	Straight run pipe insulation associated with steam dump pipe (24" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-14A, -14B, -14C	Straight run pipe insulation (4" diameter)	Deck 14 Flat-Shaft Alley	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS14Flat-TSI-15A, -15B, -15C	Elbow pipe insulation (4" diameter)	Deck 14 Flat-Shaft Alley	Good	x	
NSS14Flat-TSI-16A, -16B, -16C	Straight run pipe insulation associated with main feed pump	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-17A, -17B, -17C	Elbow pipe insulation associated with main feed pump	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-18A, -18B, -18C	Insulation associated with first stage water heater (body)	Deck 14 Flat-Engine Room	Good	х	
NSS14Flat-TSI-19A, -19B, -19C	Straight run pipe insulation associated with solenoid valve	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-20A, -20B, -20C	Elbow pipe insulation associated with solenoid valve	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-21A, -21B, -21C	Straight run pipe insulation associated with shell coil system	Deck 14 Flat-Engine Room	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS14Flat-TSI-22A, -22B, -22C	Elbow pipe insulation associated with shell coil system	Deck 14 Flat-Engine Room	Good	х	
NSS14Flat-TSI-23A, -23B, -23C	Straight run pipe insulation associated with crossover drain	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-24A, -24B, -24C	Elbow pipe insulation associated with crossover drain	Deck 14 Flat-Engine Room	Fair	х	
NSSDeckD-FT-25A, -25B, -25C	White, 9"x9" floor tile and associated mastics	Deck D-Control Room	Good		x
NSSDeckD-FT-26A, -26B, -26C	Green, 9"x9" floor tile and associated mastics	Deck D-Control Room	Good		x
NSSDeckD-TSI-27A, -27B, -27C	Straight run pipe insulation associated with cooling system (green)	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-28A, -28B, -28C	Elbow pipe insulation associated with cooling system (green)	Deck D-Engine Room	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckD-TSI-29A, -29B, -29C	Insulation associated with cooling system tank (green)	Deck D-Engine Room	Poor	x	
NSSDeckD-TSI-30A, -30B, -30C	Straight run pipe insulation associated with diesel engine exhaust	Deck D-Engine Room	Good	х	
NSSDeckD-TSI-31A, -31B, -31C	Elbow pipe insulation associated with diesel engine exhaust	Deck D-Engine Room	Good	x	
NSSDeckD-MM-32A, -32B, -32C	Gaskets associated with boiler	Deck D-Engine Room	Good	х	
NSSDeckD-TSI-33A, -33B, -33C	Insulation associated with steam generator (pink)	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-34A, -34B, -34C	Straight run pipe insulation associated with steam generator	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-35A, -35B, -35C	Elbow pipe insulation associated with steam generator	Deck D-Engine Room	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckD-TSI-36A, -36B, -36C	Straight run pipe insulation associated with compressors	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-37A, -37, -37C	Elbow pipe insulation associated with compressors	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-38A, -38B, -38C	Pipe insulation associated with boiler duct	Deck D-Engine Room	Good	х	
NSSDeckD-TSI-39A, -39B, -39C	Elbow pipe insulation associated with ADT pipe system (green)	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-40A, -40B, -40C	Straight run pipe insulation associated with ADT pipe system (green)	Deck D-Engine Room	Poor	x	
NSSDeckD-TSI-41A, -41B, -41C	Straight run pipe insulation associated with steam valve system	Deck D-Engine Room	Fair	x	
NSSDeckD-TSI-42A, -42B, -42C	Straight run pipe insulation associated with engine (red)	Deck D-Engine Room	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckD-TSI-43A, -43B, -43C	Elbow pipe insulation associated with engine (red)	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-44A, -44B, -44C	Straight run pipe insulation associated with evaporators	Deck D-Engine Room	Good	х	
NSSDeckD-TSI-45A, -45B, -45C	Elbow pipe insulation associated with evaporators	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-46A, -46B, -46C	Straight run pipe insulation associated with generators	Deck D-Engine Room	Fair	х	
NSSDeckD-TSI-47A, -47B, -47C	Elbow pipe insulation associated with generators	Deck D-Engine Room	Poor	x	
NSSDeckD-TSI-48A, -48B, -48C	Straight run pipe insulation associated with steam valves	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-49A, -49B, -49C	Elbow pipe insulation associated with steam valves	Deck D-Engine Room	Fair	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckD-TSI-50A, -50B, -50C	Straight run pipe insulation associated with boiler water treatment system	Deck D-Engine Room	Fair	x	
NSSDeckD-TSI-51A, -51B, -51C	Insulation associated with vent to first stage heater (body)	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-52A, -52B, -52C	Straight run pipe insulation associated with condensate line	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-53A, -53B, -53C	Straight run pipe insulation associated with diesel engine exhaust (upper section)	Deck D-Engine Room	Good	x	
NSSDeckD-FT-54A, -54B, -54C	Tan, 9"x9" floor tile with black specks and associated mastic	Deck D- Food Storage Area	Poor		x
NSSDeckD-FT-55A, -55B, -55C	Brown 9" x9" floor tile with black and white specks and associated mastic	Deck D- Food Storage Area	Poor		x
NSSDeckD-TSI-56A, -56B, -56C	Straight run pipe insulation	Deck D-Food Storage Area	Good	x	
NSSDeckD-TSI-57A, -57B, -57C	Elbow pipe insulation	Deck D- Food Storage Area	Good	x	

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-RC-TSI-1A, -1B, -1C	Straight run pipe insulation associated with electrical cord	Secondary Containment- Deck A Level	Good	x	
NSS-RC-TSI-2A, -2B, -2C	Straight run pipe insulation associated with UV tanks (12" diameter)	Secondary Containment	Good	x	
NSS-RC-TSI-3A, -3B, -3C	Elbow pipe insulation associated with UV tanks (12" diameter)	Secondary Containment	Good	x	
NSS-RC-TSI-4A, -4B, -4C	Straight run pipe insulation associated with 4" diameter pipes	Primary and Secondary Containment	Good	x	
NSS-RC-TSI-5A, -5B, -5C	Elbow pipe insulation associated with 4" diameter pipes	Primary and Secondary Containment	Good	x	
NSS-RC-TSI-6A, -6B, -6C	Straight run pipe insulation associated with 2" diameter pipes	Primary and Secondary Containment	Good	x	
NSS-RC-TSI-7A, -7B, -7C	Elbow pipe insulation associated with 2" diameter pipes	Primary and Secondary Containment	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-RC-TSI-8A, -8B, -8C	Straight run pipe insulation associated with 10" diameter pipes	Primary and Secondary Containment	Good	x	
NSS-RC-TSI-9A, -9B, -9C	Elbow pipe insulation associated with 10" diameter pipes	Primary and Secondary Containment	Good	x	
NSS-RC-TSI-10A, -10B, -10C	Straight run pipe insulation associated with waste tanks	Lower Secondary Containment	Good	x	
NSS-RC-TSI-11A, -11B, -11C	Elbow pipe insulation associated with waste tanks	Lower Secondary Containment	Good	x	
NSS-RC-TSI-12A, -12B, -12C	Insulation associated with the secondary heat exchanger (purple in color)	Primary Containment	Good	x	
NSS-RC-TSI-13A, -13B, -13C	Straight run pipe insulation associated with pressurizer system (red in color)	Primary Containment	Good	x	
NSS-RC-TSI-14A, -14B, -14C	Elbows insulation associated with pressurizer system (red in color)	Primary Containment	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NS-RC-TSI-15A, -15B, -15C	Insulation associated with pressurizer system tank (red in color)	Primary Containment	Good	x	
NSS-RC-TSI-16A, -16B, -16C	Straight run pipe insulation associated with secondary heat exchanger (purple in color)	Primary Containment	Good	x	
NSS-RC-TSI-17A, -17B, -17C	Elbow insulation associated with secondary heat exchanger (purple in color)	Primary Containment	Good	x	
NSS-RC-TSI-18A, -18B, -18C	Straight run pipe insulation associated with primary heat exchanger system (24" in diameter and red in color)	Primary Containment	Good	x	
NSS-RC-TSI-19A, -19B, -19C	Elbow pipe insulation associated with primary heat exchanger system ( 24" in diameter and red in color)	Primary Containment	Good	x	
NSS-RC-TSI-20A, -20B, -20C	Canvas wrap associated with fiberglass insulation	Primary and Secondary Containment	Good	x	



Appendix L

## Appendix L Field Data Sheets and Results

*Field Data Sheets and Results for Radiation Areas* 

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-RC-TSI-1A, -1B, -1C	Straight run pipe insulation associated with electrical cord	Secondary Containment- Deck A Level	Good	x	
NSS-RC-TSI-2A, -2B, -2C	Straight run pipe insulation associated with UV tanks (12" diameter)	Secondary Containment	Good	x	
NSS-RC-TSI-3A, -3B, -3C	Elbow pipe insulation associated with UV tanks (12" diameter)	Secondary Containment	Good	x	
NSS-RC-TSI-4A, -4B, -4C	Straight run pipe insulation associated with 4" diameter pipes	Primary and Secondary Containment	Good	x	
NSS-RC-TSI-5A, -5B, -5C	Elbow pipe insulation associated with 4" diameter pipes	Primary and Secondary Containment	Good	x	
NSS-RC-TSI-6A, -6B, -6C	Straight run pipe insulation associated with 2" diameter pipes	Primary and Secondary Containment	Good	x	
NSS-RC-TSI-7A, -7B, -7C	Elbow pipe insulation associated with 2" diameter pipes	Primary and Secondary Containment	Good	x	

				Friable?	
Sample ID	Material Description	Location	Condition	Yes	No
NSS-RC-TSI-8A, -8B, -8C	Straight run pipe insulation associated with 10" diameter pipes	Primary and Secondary Containment	Good	x	
NSS-RC-TSI-9A, -9B, -9C	Elbow pipe insulation associated with 10" diameter pipes	Primary and Secondary Containment	Good	x	
NSS-RC-TSI-10A, -10B, -10C	Straight run pipe insulation associated with waste tanks	Lower Secondary Containment	Good	x	
NSS-RC-TSI-11A, -11B, -11C	Elbow pipe insulation associated with waste tanks	Lower Secondary Containment	Good	x	
NSS-RC-TSI-12A, -12B, -12C	Insulation associated with the secondary heat exchanger (purple in color)	Primary Containment	Good	x	
NSS-RC-TSI-13A, -13B, -13C	Straight run pipe insulation associated with pressurizer system (red in color)	Primary Containment	Good	x	
NSS-RC-TSI-14A, -14B, -14C	Elbows insulation associated with pressurizer system (red in color)	Primary Containment	Good	x	

				Friable?	
Sample ID	Material Description	Location	Condition	Yes	No
NS-RC-TSI-15A, -15B, -15C	Insulation associated with pressurizer system tank (red in color)	Primary Containment	Good	x	
NSS-RC-TSI-16A, -16B, -16C	Straight run pipe insulation associated with secondary heat exchanger (purple in color)	Primary Containment	Good	x	
NSS-RC-TSI-17A, -17B, -17C	Elbow insulation associated with secondary heat exchanger (purple in color)	Primary Containment	Good	x	
NSS-RC-TSI-18A, -18B, -18C	Straight run pipe insulation associated with primary heat exchanger system (24" in diameter and red in color)	Primary Containment	Good	x	
NSS-RC-TSI-19A, -19B, -19C	Elbow pipe insulation associated with primary heat exchanger system ( 24" in diameter and red in color)	Primary Containment	Good	x	
NSS-RC-TSI-20A, -20B, -20C	Canvas wrap associated with fiberglass insulation	Primary and Secondary Containment	Good	x	

Sample #	Material Description	Sample Location(s) ⁽¹⁾	Friable? (2)	Condition ⁽ 3)	PLM Results ⁽⁴⁾ (Asbestos Percent/Type)
NSS-RC-TSI-1A, -1B, -1C	Straight run pipe insulation associated with electrical cord	Secondary Containment- Deck A Level	Yes	Good	NAD
NSS-RC-TSI-2A, -2B, -2C	Straight run pipe insulation associated with UV tanks (12" diameter)	Secondary Containment	Yes	Good	25% -Chrysotile and Amosite
NSS-RC-TSI-3A, -3B, -3C	Elbow pipe insulation associated with UV tanks (12" diameter)	Secondary Containment	Yes	Good	35%-Amosite
NSS-RC-TSI-4A, -4B, -4C	Straight run pipe insulation associated with 4" diameter pipes	Primary and Secondary Containment	Yes	Good	20%-Chrysotile and Amosite
NSS-RC-TSI-5A, -5B, -5C	Elbow pipe insulation associated with 4" diameter pipes	Primary and Secondary Containment	Yes	Good	35%-Chrysotile and Amosite
NSS-RC-TSI-6A, -6B, -6C	Straight run pipe insulation associated with 2" diameter pipes	Primary and Secondary Containment	Yes	Good	20%-Chrysotile and Amosite
NSS-RC-TSI-7A, -7B, -7C	Elbow pipe insulation associated with 2" diameter pipes	Primary and Secondary Containment	Yes	Good	25%-Chrysotile and Amosite

Sample #	Material Description	Sample Location(s) ⁽¹⁾	Friable?	Condition ⁽ 3)	PLM Results ⁽⁴⁾ (Asbestos Percent/Type)
NSS-RC-TSI-8A, -8B, -8C	Straight run pipe insulation associated with 10" diameter pipes	Primary and Secondary Containment	Yes	Good	20%-Chrysotile and Amosite
NSS-RC-TSI-9A, -9B, -9C	Elbow pipe insulation associated with 10" diameter pipes	Primary and Secondary Containment	Yes	Good	30%-Chrysotile and Amosite
NSS-RC-TSI-10A, -10B, -10C	Straight run pipe insulation associated with waste tanks	Lower Secondary Containment	Yes	Good	25%-Chrysotile and Amosite
NSS-RC-TSI-11A, -11B, -11C	Elbow pipe insulation associated with waste tanks	Lower Secondary Containment	Yes	Good	45%-Chrysotile and Amosite
NSS-RC-TSI-12A, -12B, -12C	Insulation associated with the secondary heat exchanger (purple in color)	Primary Containment	Yes	Good	25%-Chrysotile and Amosite
NSS-RC-TSI-13A, -13B, -13C	Straight run pipe insulation associated with pressurizer system (red in color)	Primary Containment	Yes	Good	40%-Amosite
NSS-RC-TSI-14A, -14B, -14C	Elbows insulation associated with pressurizer system (red in color)	Primary Containment	Yes	Good	15%-Chrysotile and Amosite

Sample #	Material Description	Sample Location(s) ⁽¹⁾	Friable? (2)	Condition ⁽ 3)	PLM Results ⁽⁴⁾ (Asbestos Percent/Type)
NSS-RC-TSI-15A, -15B, -15C	Insulation associated with pressurizer system tank (red in color)	Primary Containment	Yes	Good	20%-Chrysotile and Amosite
NSS-RC-TSI-16A, -16B, -16C	Straight run pipe insulation associated with secondary heat exchanger (purple in color)	Primary Containment	Yes	Good	25%-Amosite
NSS-RC-TSI-17A, -17B, -17C	Elbow insulation associated with secondary heat exchanger (purple in color)	Primary Containment	Yes	Good	15%-Amosite
NSS-RC-TSI-18A, -18B, -18C	Straight run pipe insulation associated with primary heat exchanger system (24" in diameter and red in color)	Primary Containment	Yes	Good	40%-Amosite
NSS-RC-TSI-19A, -19B, -19C	Elbow pipe insulation associated with primary heat exchanger system ( 24" in diameter and red in color)	Primary Containment	Yes	Good	5%-Chrysotile and Amosite
NSS-RC-TSI-20A, -20B, -20C	Canvas wrap associated with fiberglass insulation	Primary and Secondary Containment	Yes	Good	30%-Chrysotile

Information presented is based upon observations made during an asbestos survey conducted by ERM on 4-15 April 2005.

"NAD" – No Asbestos Detected

(1) Only the general locations from which samples were obtained are included in this table. Material may also be located in other areas of the buildings (see Tables 1 and 2 of the survey report). Where possible, floor tile and drywall samples were taken in areas of pre-existing localized damage.

⁽²⁾ A non-friable material can become friable if the condition of the material has significantly diminished or if its structural integrity has been compromised.

⁽³⁾ The condition of a material reported herein is based upon observations made by an accredited inspector. The condition of floor tile mastics are assumed equal to that of the tile to which they are adhered.

⁽⁴⁾ A material that contains greater than one percent asbestos is classified, and therefore must be managed as an ACM.

# Table 1Materials Classified as Non-ACMs Based on Sampling Results (4-15 April 2005)NS-Savannah – Fort Eustis, Virginia

Sample #	Material Description	Material Location
	Straight run pipe insulation associated with electrical cord	Secondary Containment- Deck A Level

Information presented is based upon observations made during an asbestos survey conducted by ERM on 4-15 April 2005. Materials that contain one percent or less asbestos are classified as non-asbestos-containing materials (non-ACMs).

# Table 2Materials Classified as ACMs Based on Sampling Results (4-15 April 2005)NS-Savannah – Fort Eustis, Virginia

Sample #	Material Description ⁽¹⁾	Material Locations	% Asbestos ⁽²⁾ (Type)	Estimated Quantity ⁽³⁾
NSS-RC-TSI-2A, -2B, -2C	Straight run pipe insulation associated with UV tanks (12" diameter)	Secondary Containment	25% -Chrysotile and Amosite	100 linear feet
NSS-RC-TSI-3A, -3B, -3C	Elbow pipe insulation associated with UV tanks (12" diameter)	Secondary Containment	35%-Amosite	20 elbows
NSS-RC-TSI-4A, -4B, -4C	Straight run pipe insulation associated with 4" diameter pipes	Primary and Secondary Containment	20%-Chrysotile and Amosite	500 linear feet
NSS-RC-TSI-5A, -5B, -5C	Elbow pipe insulation associated with 4" diameter pipes	Primary and Secondary Containment	35%-Chrysotile and Amosite	50 elbows
NSS-RC-TSI-6A, -6B, -6C	Straight run pipe insulation associated with 2" diameter pipes	Primary and Secondary Containment	20%-Chrysotile and Amosite	500 linear feet
NSS-RC-TSI-7A, -7B, -7C	Elbow pipe insulation associated with 2" diameter pipes	Primary and Secondary Containment	25%-Chrysotile and Amosite	20 elbows
NSS-RC-TSI-8A, -8B, -8C	Straight run pipe insulation associated with 10" diameter pipes	Primary and Secondary Containment	20%-Chrysotile and Amosite	800 linear feet
NSS-RC-TSI-9A, -9B, -9C	Elbow pipe insulation associated with 10" diameter pipes	Primary and Secondary Containment	30%-Chrysotile and Amosite	70 elbows

# Table 2Materials Classified as ACMs Based on Sampling Results (4-15 April 2005)NS-Savannah – Fort Eustis, Virginia (continued)

Sample #	Material Description ⁽¹⁾	Material Locations	% Asbestos ⁽²⁾ (Type)	Estimated Quantity ⁽³⁾
NSS-RC-TSI-10A, -10B, -10C	Straight run pipe insulation associated with waste tanks	Lower Secondary Containment	25%-Chrysotile and Amosite	200 linear feet
NSS-RC-TSI-11A, -11B, -11C	Elbow pipe insulation associated with waste tanks	Lower Secondary Containment	45%-Chrysotile and Amosite	40 elbows
NSS-RC-TSI-12A, -12B, -12C	Insulation associated with the secondary heat exchanger (purple in color)	Primary Containment	25%-Chrysotile and Amosite	1600 square feet
NSS-RC-TSI-13A, -13B, -13C	Straight run pipe insulation associated with pressurizer system (red in color)	Primary Containment	40%-Amosite	150 linear feet
NSS-RC-TSI-14A, -14B, -14C	Elbows insulation associated with pressurizer system (red in color)	Primary Containment	15%-Chrysotile and Amosite	10 elbows
NSS-RC-TSI-15A, -15B, -15C	Insulation associated with pressurizer system tank (red in color)	Primary Containment	20%-Chrysotile and Amosite	1500 square feet
NSS-RC-TSI-16A, -16B, -16C	Straight run pipe insulation associated with secondary heat exchanger (purple in color)	Primary Containment	25%-Amosite	1,000 linear feet
NSS-RC-TSI-17A, 17B, -17C	Elbow insulation associated with secondary heat exchanger (purple in	Primary Containment	15%-Amosite	60 elbows

# Table 2Materials Classified as ACMs Based on Sampling Results (4-15 April 2005)NS-Savannah – Fort Eustis, Virginia (continued)

Sample #	Material Description ⁽¹⁾	Material Locations	% Asbestos ⁽²⁾ (Type)	Estimated Quantity ⁽³⁾
	color)			
NSS-RC-TSI-18A, -18B, -18C	Straight run pipe insulation associated with primary heat exchanger system (24" in diameter and red in color)	Primary Containment	40%-Amosite	500 linear feet
NSS-RC-TSI-19A, -19B, -19C	Elbow pipe insulation associated with primary heat exchanger system (24" in diameter and red in color)	Primary Containment	5%-Chrysotile and Amosite	60 elbows
NSS-RC-TSI-20A, -20B, -20C	Canvas wrap associated with fiberglass insulation	Primary and Secondary Containment	30%-Chrysotile	2,000 linear feet

Materials that contain greater than one percent asbestos are classified as asbestos-containing materials (ACMs).

Information presented is based upon observations made during a building survey conducted by ERM from 4-15 April 2005.

- (1) The friability and condition of ACMs are reported as observed on 4-15 April 2005. A non-friable ACM can become friable if the condition of the material has significantly diminished or if its structural integrity has been compromised.
- ⁽²⁾ Asbestos-content determined by Polarized-light Microscopy (PLM) by AMA Analytical Services, Inc. of Lanham, Maryland.
- ⁽³⁾ Quantities are presented as plus or minus 50 percent.

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					Sul	mmary	/ of Po	Summary of Polarized Light Microscopy	I Ligh	t Micr	oscop	y				
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0533813 N	NSS-RC-TSI-	NAD		I	ſ	ľ	I	I	70	ı	1	30	Brown	Homogeneous	CK	
0533814 N	IA NSS-RC-TSI- IB	NAD	1	I	1	1	ł	:	70	ł	1	30	Brown	Homogeneous	CK	
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0533821 N	NSS-RC-TSI- 3C	I	ł	ł	ł	I	ł	1	1	I	ł	I			CK Sa	Sample Not Analyzed- Positive Ston
0533822 N	NSS-RC-TSI- 4A	20	5	15	ł	ł	1	I	ł	ł	ł	80	Off-White	Off-White Homogeneous	CK	
0533823 N	NSS-RC-TSI- 413	I	1	ł	I	I	ł	ł	E	1	:	I			CK Sa Po	Sample Not Analyzed Positive Stop
0533824 Ni	NSS-RC-TSI- 4C	I	;	ł	1	1	ł	1	I	1	ł	1			CK Sa Pc	Sample Not Analyzed Positive Stop

An AIRA (30563), NVLAP (3 401143), & New York ELAP (310920) Accredited Laboratory

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Client:	Envi	ronmental k	Environmental Resource Management, Inc.	nagement. In		Job Name:		NS - Savannah	lah				Chain Of		100701	
Address:		Harry S. Tn	200 Harry S. Truman Drive, Suite 400	Suite 400	Jo	Job Location:		Not Provided	р				Chain Of Custody: Date Analyzed:	custouy: vzed:	1/26/2005	AHP
	Anns	apolis, Mary	Annapolis, Maryland 21401		Ja	Job Number:		0028178					Person Submitting:	bmitting:	Matt Baxler	
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Attention:		Matt Baxter														
					Su	Summary of Polarized Light Microscopy	of Po	larized	I Light	t Micro	oscopi	~				rage 2 of 0
AMA Sample Number	e Client Sample#	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Ashestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other P Percent	Particulate Percent	Sample 1 Color	Homogeneity	Analyst ID	Comments
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0533825	NSS-RC-TSI- 5A	35	30	<i>י</i> ר:	1	:	ł	1	;	1	1	65	Gray	Homogeneous	CK	
0533826	NSS-RC-TSI- 5B	I	1	I	ł	I	ł	;	ł		:	1			CK Sa	Sample Not Analyzed-
0533827	NSS-RC-TSI- 5C	T	I	1	3	J	t	ı	ł	3	:	;			Po CK Sa	Positive Stop Sample Not Analyzed-
0533828	NSS-RC-TSI- 6A	20	9	14	I	ſ	ł	ł	ł	1	1	80 C	ff-White I	Off-White Homogeneous	Po CK	Positive Stop
0533829	NSS-RC-TSI- 6B	1	I	;	1	I	:	;	I	ł	1	1		2		Samule Not Analwsed.
0533830	NSS-RC-TSI- 6C	ł	1	1	ł	I	ł	ł	1	I	1	ı				Positive Stop Sample Not Analyzed-
0533831	NSS-RC-TSI- 7A	25	10	15	l	I	1	ł	:	I	;	75 C	ff-White H	Off-White Homogeneous	Po: CK	Positive Stop
0533832	NSS-RC-TSI- 7B	I	;	;	ł	I	I	1	3	I	I.	I			CK Sar	Sample Not Analyzed-
0533833	NSS-RC-TSI- 7C	I	3	1	:	:	I	1	ł	t	I	I			Pos CK Sar	Positive Stop Sample Not Analyzed-
0533834	NSS-RC-TSI- 8A	20	10	10	I	I	ł	I	ł	I	:	80	Gray F	Homogeneous	Pos CK	Positive Stop
0533835	NSS-RC-TSI- 8B	ł	r	I	I.	1	1	ł	ſ	I	:	ł			CK San	Sample Not Analyzed-
0533836	NSS-RC-TSI- 8C	I	1	r	ł	I	;	1	I	1	I	1			Pos CK San Pos	Positive Stop Sample Not Analyzed- Positive Stop
rt applies onl 1 is submitter Sample types or the accura	This report applies only to the sumple, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization fieldity for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization liability for the excursty and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and applies only to polarized light microscope of hulk samples and reprised more the properiate regulatory guidelines, unless otherwise remeeted by the client Xer. 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As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization fieldity for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization fieldity for the accuracy and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and applies only to polarized light microscov of this formation. Residued and upon the discarded in accordance with the appropriate regulatory guidelines, unless otherwise and applies only to polarized light microscov of built samples.

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200 Harry S. Truman Drive, Suite 400 Annapolis, Maryland 21401 Matt Baxter Matt Baxter Client Total Chrysoitle Amosite Crocid Sample # Asbestos Percent Percent Percent NSS-RC-TSI- 35 30 3 22 9A NSS-RC-TSI- 25 5 20 NSS-RC-TSI	Not Provided 0028178 Not Provided <b>f Polarized</b> eral Fiberglass ool Percent	Light Mic Drganic Synthet Percent Percen	croscop tic Other other	y Particulate Percent	Date Analyzed: Person Submitting:	4/26/2005	AIL
Annapolis. Maryland 21401 Matt Baxter Sample # Asbestos Percent Percent Perc NSS-RC-TSI- 35 30 3 2 NSS-RC-TSI- 35 30 3 2 NSS-RC-TSI- 5 20	0028178 Not Provided f Polarized ool Percent cent	Light Mi	Croscop lie Other	y Particulate Percent	Person Submitting:	CUNTINAL	111 /
Matt Baxter Client Total Chrysotile Amosite Crocid Sample # Asbestos Percent Percent Perc NSS-RC-TSI- 35 30 3 22 NSS-RC-TSI- 5 20 NSS-RC-TSI	Not Provided	Light Mid	Croscop lic Other	y Particulate Percent	0	Matt Bayter	100470 cr
Matt Baxter Client Total Chrysotile Amosite Crocid Sample # Asbestos Percent Percent Perc NSS-RC-TSI- 35 30 3 22 NSS-RC-TSI	f Polarized	Light Mid	Croscop	y Particulate Percent			5
ClientTotalChrysotileAmositeCrocidSample #AsbestosPercentPercentPercNSS-RC-TSI-3530329ANSS-RC-TSI-3530320BNSS-RC-TSI0CNSS-RC-TSI0BNSS-RC-TSINSS-RC-TSI0ANSS-RC-TSI0ANSS-RC-TSI0BNOC10C	f Polarized	Light Mid	Croscop	y Particulate Percent			)
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NSS-RC-TSI- 35 30 3 9A NSS-RC-TSI					Sample Itomogeneity Color	Analyst ID	Comments
NSS-RC-TSI- 9B NSS-RC-TSI- 9C NSS-RC-TSI- 10A NSS-RC-TSI- 10A NSS-RC-TSI- NSS-RC-TSI- NSS-RC-TSI- 10C				55	Court Honora		
NS-RC-TSI		;		2	VII ay LIURINGENCOUS		
NSS-RC-TSI- 25 5 10A NSS-RC-TSI			1				Sample Not Analyzed- Positive Stop
NSS-RC-TSI		ł	ſ		Off. White Linnocommun	8	Sample Not Analyzed- Positive Stop
NSS-RC-TSI-	:	1	1			5 8	The second second second second second second second second second second second second second second second s
	1	1	;	1			Positive Stop
0533843 NSS-RC-TSI- 45 40 5	;	:	1	55	Grav Homogeneous		oampte toot Analyzed- Positive Stop
0533844 NSS-RC-TSI	E	1	t	f		e e	Sample Not Analyzed-
0533845 NSS-RC-TSI	1	1	:	ł			Positive Stop Sample Not Analyzed-
0533846 NSS-RC-TSI- 25 15 10 3 12A		;	ł	40	Beige Homogeneous	CK	Positive Stop
0533847 NSS-RC-TSI	1	1	1	;		, y	Sample Mot Anology
rsi	:	:	1	;			Positive Stop Sample Not Analyzed-

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Client:	Envire	onmental R	Environmental Resource Management, Inc	agement, Inc		Job Name:		NS - Savannah	tah		×		Chain Of	Chain Of Custody:	136891	OZEOL
Address:	200 H	larry S, Tni	200 Harry S. Tnuman Drive, Suite 400	uite 400	Ja.	Job Location:		Not Provided	p				Date Analyzed:	ly zed:	4/26/2005	AHR
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Attention:		Matt Baxter														Page 4 of 6
					Su	mmary	of Po	Summary of Polarized Light Microscopy	l Ligh	t Micr	oscop	y				5
AMA Sample Number	e Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other 1 Percent	Particulate Percent	Sample Color	Homogeneity	Analyst 1D	Comments
0533849	NSS-RC-TSI- 13A	40	:	40	1	I	1	:	I	1	:	60	Gray	Homogeneous	CK	
0533850	NSS-RC-TSI- 13B	1	:	ł	I	1	I	;	t	t	I	ł			CK S	Sample Not Analyzed- Positive Ston
0533851	NSS-RC-TSI- 13C	I	ł	3	1	ł	I	I.	1	I	1	ı			CK S	Sample Not Analyzed-
0533852	NSS-RC-TSI- 14A	15	ŝ	12	:	I	5	I	I	1	ſ	80	Gray	Ilomogeneous	ck .	
0533853	NSS-RC-TSI- 14B	1	1	ł	ſ	:	ł	ł	I.	I	1	1			CK S	Sample Not Analyzed- Positive Ston
0533854	NSS-RC-TSI- 14C	I.	ł	ŀ	I	I	ł		1	ł	I	I			CK S	Sample Not Analyzed- Desitive Stop
0533855	NSS-RC-TSI- 15A	20	15	ŝ	1	I.	15	1	:	1	Ĩ	65	Gray	Homogeneous	CK	
0533856	NSS-RC-TSI- 15B	1	ł	I	I	ł	1	;	1	ł	ł	I			CK S	Sample Not Analyzed- Positive Ston
0533857	NSS-RC-TSI- 15C	I	I	I	ı	ł	I	;	ł	ł	I	;			CK	Sample Not Analyzed- Positive Ston
0533858	NSS-RC-TSI- 16A	25	I	25	ł	ł	ı	:	ł.	:	I	75	Gray	Homogeneous	CK	2
0533859	NSS-RC-TSI- 16B	;	ł	1	;	:	ı	ł	I	:	I	1			CK S.	Sample Not Analyzed- Positive Ston
0533860	NSS-RC-TSI- 16C	I	3	1	1	ł	I	:	1	1	I	:			CK S	Sample Not Analyzed- Positive Stop

An AHAA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory

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C.BCD11	ENVIR	onmental h	cesource Mana	Environmental Resource Management, Inc.		Job Name:		NS - Savannah	nah				Chain Of Custody:	Custody:	136891	
Address:	200 H	arry S. Tn	200 Harry S. Truman Drive, Suite 400	uite 400	Jc	Job Location:		Not Provided	q				Date Analyzed:	yzed:	4/26/2005	AH M
	Аллағ	olis, Mary	Annapolis, Maryland 21401		Jc	Job Number:		0028178					Person Submitting:	bmitting:	Matt Baxter	
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Attention:		Matt Baxter														Page 5 of 6
2					Su	Summary of Polarized Light Microscopy	of Po	larizeo	l Ligh	t Micr	oscop	y				
AMA Sample Number	Client Sample #	Total Ashestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Ashestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other I Percent	Particulate	Sample Color	Homogeneity	Analyst ID	Comments
0533861	NSS-RC-TSI- 17A	15	1	15	1	I	ł	1	1	1	t	85	Gray	Ilomogeneous	CK	
0533862	NSS-RC-TSI- 17B	I	l	:	I	ı	1	I	:	ı	ł	I			CK	Sample Not Analyzed-
0533863	NSS-RC-TSI- 17C	1	I	I	ı	T	T	1	1	ł	l	ł			CK	Fositive Stop Sample Not Analyzed-
0533864	NSS-RC-TSI- 18A	40	ł	40	ł	:	:	I	I	I	ł	60	Gray	Homogeneous	CK	d016 311160 1
0533865	NSS-RC-TS1- 18B	I	;	I	1	I	ł	I	ı	I.	I	I			CK	Sample Not Analyzed-
0533866	NSS-RC-TSI- 18C	:	I	I	ł	1	ł	I	I	;	ł	1			CK	Sample Not Analyzed- Docition Ston
0533867	NSS-RC-TSI- 19A	2	rn	71	1	;	55	ł	ł	:	ł	40	Gray	Homogeneous	CK	4000 011100
0533868	NSS-RC-TSI- 19B	1	ł	ł	1	ł	1	ł	ï	I	ł	1			CK	Sample Not Analyzed-
0533869	NSS-RC-TSI- 19C	ł	ł	E.	t	1	:	I	:	I	ł	ı			CK	Positive Stop Sample Not Analyzed- Docitive Stop
0533870	NSS-RC-TSI- 20A	30	30	I	;	ł	ł	I	30	:	ł	40	Off-White	Off-White Homogeneous	CK	doic stilles
0533871	NSS-RC-TSI- 20B	t	L	I	ī	ţ	1	:	ł	1	I	E			CK	Sample Not Analyzed- Positive Ston
0533872	NSS-RC-TSI- 20C	I	1	ſ	1	I	I	3	I	:	:	I.			CK	Sample Not Analyzed- Positive Stop

Au <u>ALHA (33063), NVLAP (2 101143), & New York SLAP (210930) Accredited Laboratory</u>

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Client: Address: Attention: Attention: AMA Sample Number I The 1 TEM 2 MAT	Environmential Resource Management, Inc.       Job Name:       Ns - Swamah       Chain Of Custudy:       136891       March         2001 Ilary S. Truman Drive, Suite 400       Job Namber:       Not Provided       Date Analyzed:       426/2005       426/2005         maspolis, Maryland       21401       Job Number:       0028178       Person Submitting:       426/2005       426/2005         mi       Matt Baxter       P.O. Number:       0028178       Person Submitting:       426/2005       426/2005         mi       Matt Baxter       P.O. Number:       0028178       Person Submitting:       426/2005       426/2005         mi       Matt Baxter       Natt Baxter       Natt Baxter       Person Submitting:       426/2005       426/2005         Matt Baxter       Matt Baxter       Natt Baxter       Person Submitting:       Matt Baxter       426/2005         Analyzed G. Analyzed C. Chrystolite       Anosite Croteding Cutter       Natt Baxter       Person Submitting:       426/2005         Matt Baxter       Sample J. Abbusto       Ferrein Percent Percent Percent Percent Percent Percent Percent Percent Percent Percent Color       Matt Baxter       Page 6 of         Sample J. Abbusto       Ferrein Percent Percent Percent Percent Percent Percent Percent Percent Percent Percent Percent Color       Matt Baxter       Percent Pe	Environmental Resource Management, Inc. 200 Llarry S. Truman Drive, Suite 400 Annapolis, Maryland 2140] Matt Baxter Matt Baxter E Asbestos Percent Percent e # Asbestos Percent Percent g footnotes only apply to those samples whi MMENDATION - Please note, due to resolu of or asbestos may contain a significant qua croscopy. EDUCTION RECOMMENDATION - Please inficant quantity of asbestos which is obscur fects of matrix components, followed by rear	<ul> <li>Job Name: Job Location: Job Number: P.O. Number:</li> <li>P.O. Mu and/or</li> </ul>	<ul> <li>b Name:</li> <li>b Location:</li> <li>b Number:</li> /ul>	NS - Savannah Not Provided 0028178 Not Provided <b>Olarized</b> Fiberglass Ol Percent P Percent P Percent addition de that the additioned	Job Name: NS - Savamah (Tain Of Custody: 136891 Job Location: Not Provided Date Analyzed: 4262005 Job Number: 0028178 P.O. Number: 0028178 P.O. Number: Not Provided P.O. Number: Not P. Provided P.O. Number: Not P. P. Nut and P. P. Nut and P. P. Nut A second P. P. Nut A second P. P. Number P. P. Nut and P. P. Nut and P. P. Nut and P. TEM P. P. Nut A second P. P. Nut A second P. P. Nut A second P. P. Nut and P. TEM P. P. Nut and P. TEM P. P. Nut and P. TEM P. P. Nut and P. TEM P. P. Nut A second P. P. Nut and P. TEM P. P. Nut and P. TEM P. P. Nut A second P. P. Nut and P. TEM P. P. Nut and P. TEM P. P. Nut and P. TEM P. P. Nut A second P. P. Nut A second P. P. Nut and P. TEM P. P. Nut and P. TEM P. P. Nut and P. TEM.	OSCOPY Other Particulate Percent Percent rrix components of thi chnique of TEM be us s. results which are rep mique of gravimetric r	Chain Of Custody: Date Analyzed: Person Submitting: Sample Homogen Color Color subestic whice d to check for asbest	Custody: 136891 tyzed: 4/26/2005 thmitting: Matt Baxter Matt Baxter Homogeneity Analyst Evits which are reported via for asbestos fibers below the for asbestos fibers below the cordonated on this sample to	AHA 100470 AHA Page 6 of 6 Page 6 of 6 Comments Comments a PLM as negative he resolution limits 06) for asbestos may
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Field Data Sheets for Non-Radiation Areas

### Asbestos Survey Field Data Sheet-Navigation Bridge Deck NS-Savannah Fort Eustis, VA

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-NBD-FT-1A, -1B, -1C	Green ,9"x9" floor tile with white lines and associated mastics	Throughout Navigation Bridge Deck	Fair		x
NSS-NBD-MM-2A, -2B, -2C	White wall board with pinhole pattern	Navigation Bridge Deck-Gyro Radar Room	Good		x
NSS-NBD-TSI-3A, -3B, -3C	Straight run pipe insulation associated with piping above ceilings	Navigation Bridge Deck above ceiling	Good	x	
NSS-NBD-TSI-4A, -4B, -4C	Elbow pipe insulation associated with piping above ceiling	Navigation Bridge Deck above ceiling	Good	x	
NSS-NBD-MM-5A, -5B, -5C	White, drywall associated with walls (1' thickness)	Navigation Bridge Deck Staterooms	Good	x	
NSS-NBD-MM-6A, -6B, -6C	White, drywall associated with ceiling	Navigation Bridge Deck Staterooms	Good	x	
NSS-NBD-MM-7A, -7B, -7C	Brown mastic associated with baseboard molding	Throughout Navigation Bridge Deck	Good		x

#### Asbestos Survey Field Data Sheet-Navigation Bridge Deck NS-Savannah Fort Eustis, VA

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-NBD-MM-8A, -8B, -8C	White sub-floor (baseboard)	Throughout Navigation Bridge Deck	Good	x	
NSS-NBD-TSI-9A, -9B, -9C	Straight run pipe insulation associated with generator	Navigation Bridge Deck-Generator Room	Good	x	
NSS-NBD-TSI-10A, -10B, -10C	Elbow pipe insulation associated with generator	Navigation Bridge Deck-Generator Room	Good	x	

Due to time limitations, physical samples were not taken of this deck. The materials that were observed are similar to materials that are located on other decks of the ship. The table identifies samples that ERM would have sampled had time permitted.

Note: All pipes are recorded as total diameter of the pipe and the associated insulation.

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-BoatDeck-FT-1A, -1B, -1C	Black 18"x18" floor tile with white specks and associated mastic	Boat Deck stairwell	Good		х
NSS-BoatDeck-MM-2A, -2B, -2C	White, drywall associated with the wall (1' thickness)	Boat Deck Cabins	Good	x	
NSS-BoatDeck-MM-3A, -3B, -3C	White, drywall associated with ceiling (1/2" thickness)	Boat Deck Staterooms	Good	x	
NSS-BoatDeck-MM-4A, -4B, -4C	White sub-floor (baseboard)	Throughout Boat Deck	Good		x
NSS-BoatDeck-FT-5A, -5B, -5C	Green, 9x9 floor tile with white lines and associated mastic	Throughout Boat Deck	Poor		x
NSS-BoatDeck-MM-6A, -6B, -6C	Brown mastic associated with baseboard molding	Throughout Boat Deck	Good		x
NSS-BoatDeck-TSI-7A, -7B, -7C	Straight run pipe insulation above ceiling	Boat Deck above ceiling	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-BoatDeck-TSI-8A, -8B, -8C	Elbow pipe insulation	Boat Deck above ceiling	Good	x	

Note: All pipes are recorded as total diameter of the pipe and the associated insulation.

### Asbestos Survey Field Data Sheet-Promenade Deck NS-Savannah Fort Eustis, VA

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-PromDeck-FT-1A, -1B, -1C	Dark green, 18" x18" floor tile with white lines and associated mastics	Promenade Deck-Veranda	Good		x
NSS-PromDeck-FT-2A, -2B, -2C	White, 18"x18" floor tile with white lines and associated mastics	Promenade Deck-Veranda	Good		x
NSS-PromDeck-MM-3A, -3B, -3C	Black sub-floor (baseboard)	Promenade Deck-Throughout floor	Good		x
NSS-PromDeck-MM-4A, -4B, -4C	White, 4'x4' ceiling panels with pinholes	Promenade Deck-Veranda and Main Lounge	Good		x
NSS-PromDeck-MM-5A, -5B, -5C	White drywall (1/2" thickness) associated with walls	Promenade Deck-Veranda	Good	x	
NSS-PromDeck-MM-6A, -6B, -6C	White drywall (1" thickness) associated with ceilings	Promenade Deck-Veranda	Good	x	
NSS-PromDeck-MM-7A, -7B, -7C	Brown mastic associated with baseboard molding	Promenade Deck-Veranda and Main Lounge	Good		x

Note: All pipes are recorded as total diameter of the pipe and the associated insulation.

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckA-FT-1A, -1B, -1C	Green, 9"x9" floor tile with white lines and associated mastic	Deck A- Throughout infirmary	Good		x
NSSDeckA-TSI-2A, -2B, -2C	Straight run pipe insulation	Deck A- Piping located above ceiling	Good	x	
NSSDeckA-TSI-3A, -3B, -3C	Elbow pipe insulation	Deck A- Piping located above ceiling	Good	x	
NSSDeckA-FT-4A, -4B, -4C	Brown, 9"x9" floor tile with white specks and associated mastic	Deck A-Throughout hallways adjacent to staterooms	Good		x
NSSDeckA-FT-5A, -5B, -5C	Black, 9"x9" floor tile with white specks and associated mastic	Deck A-Throughout hallways adjacent to staterooms	Good		x
NSSDeckA-FT-6A, -6B, -6C	Light brown, 9"x9" floor tile with white specks and associated mastic	Deck A-Throughout hallways adjacent to staterooms	Good		x
NSSDeckA-FT-7A, -7B, -7C	Tan, "9x9" floor tile with white brown specks and associated mastic	Deck A-Throughout hallways adjacent to staterooms	Good		x

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckA-MM-8A, -8B, -8C	White drywall (1/2" thickness) associated with ceilings	Deck A	Good	x	
NSSDeckA-MM-9A, -9B, -9C	White drywall (1" thickness) associated with walls	Deck A	Good	x	
NSSDeckA-FT-10A, -10B, -10C	White, 9"x9" floor tile and associated mastic	Deck A- Main Lobby	Good		х
NSSDeckA-FT-11A, -11B, -11C	Gray, 18"x18" floor tile and associated mastic	Deck A -Main Lobby	Good		x
NSSDeckA-FT-12A, -12B, -12C	Black, 9"x9" floor tile and associated mastic	Deck A- Main Lobby	Good		x
NSSDeckA-CT-13A, -13B, -13C	White, 2'x3' ceiling panel with pinholes	Deck A- Main Lobby	Good		х
NSSDeckA-MM14A, -14B, -14C	Black sub-floor (baseboard)	Deck A – Main Lobby and forward areas	Good		х

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSDeckA-FT-15A, -15B, -15C	Tan, 9"x9" floor tile and associated mastic	Deck A- Lab Assistant Office	Poor		х
NSSDeckA-FT-16A, -16B, -16C	Orange, 9"x9" floor tile and associated mastic	Deck A- Barber Shop	Good		x
NSSDeckA-FT-17A, -17B, -17C	Brown, 9" x9" floor tile with black and white specks and associated mastic	Deck A- Port and starboard side stairwells	Fair		x
NSSDeckA-FT-18A, -18B, -18C	Tan, 9" x9" floor tile with brown specks and associated mastic	Deck A- Port and starboard side stairwells	Fair		х
NSSDeckA-FT-19A, -19B, -19C	Tan, 9" x9" floor tile with brown specks and associated mastic	Deck A- Staterooms rear of Main Lobby and Pursers Office	Fair		x
NSSDeckA-MM-20A, -20B, -20C	Brown mastic associated with baseboard molding	Deck A	Good		x
NSSDeckA-MM-21A, -21B, -21C	White sub-floor (baseboard)	Deck A- Area rear of Main Lobby	Good	x	
NSSDeckA-FT-22A, -22B, -22C	Red, 9"x9" floor tile with white lines and associated mastic	Deck A- Forward port side stairwell	Good		x

Note: All pipes are recorded as total diameter of the pipe and the associated insulation.

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-B Deck-FT-1A, -1B, -1C	Blue, 9"x9" floor tile with white lines	Deck B- Dining Room	Fair		х
NSS-B Deck-Mastic-2A, -2B, -2C	Mastic associated with blue 9"x9" floor tile with white lines	Deck B-Dining Room	Fair		х
NSS-B Deck-FT-3A, -3B, -3C	White, 18" x18" floor tile	Deck B-Dining Room	Fair		х
NSS-B Deck-Mastic-4A, -4B, -4C	Mastic associated with 18" x18" floor tile	Deck B-Dining Room	Fair		x
NSS-B Deck-Mastic-5A, -5B, -5C	Brown mastic associated with baseboard molding	Deck B-Dining Room	Fair		х
NSS-B Deck- FT-6A, -6B, -6C	Light green, 9" x9" floor tile with white specks	Deck B- Stateroom hallway rear of Cargo Loading Passage	Fair		x
NSS-B Deck-Mastic-7A, -7B, -7C	Mastic associated with light green 9x9 floor tile with white specks	Deck B- Stateroom hallway rear of Cargo Loading Passage	Fair		x

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-B Deck-MM-8A, -8B, -8C	Brown mastic associated with stair treads	Deck-B Dining Room	Good		x
NSS-B Deck-Fiberboard-9A, -9B, -9C	White fiberboard padding beneath floor tile	Deck B- Area rear of Cargo Loading Passage	Fair	x	
NSS-B Deck-FT-10A, -10B, -10C	Dark green, 9" x9" floor tile with white lines	Deck B- Area rear of Cargo Loading Passage	Fair		x
NSS-B Deck-Mastic-11A, -11B, -11C	Mastic associated with 9" x9" floor tile with white lines	Deck B- Area rear of Cargo Loading Passage	Fair		x
NSS-B Deck-FT-12A, -12B, -12C	Gray, 9"x9" floor tiles with specks	Deck B- Throughout area forward of Cargo Loading Passage	Fair		x
NSS-B Deck-Mastic-13A, -13B, -13C	Mastic associated with gray 9" x9" floor tile with specks	Deck B- Throughout area forward of Cargo Loading Passage	Fair		x
NSS-B Deck-Subfloor-14A, -14B, -14C	Gray sub-floor (baseboard)	Deck B- Forward of Cargo Loading Passage	Fair		x

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS-B Deck-MM-15A, -15B, -15C	White drywall (1/2" thickness) associated with ceiling	Deck B-Throughout staterooms and hallways	Fair	x	
NSS-B Deck-FT-16A, -16B, -16C	Tan, 9" x9" floor tile with brown lines and associated mastic	Deck B- Starboard side stateroom forward of the Cargo Loading Passage	Fair		x
NSS-B Deck-MM-17A, -17B, -17C	White, 18"x18" ceiling panels with pinholes	Deck B- Dining room and office rear of Cargo Loading Passage	Good		x
NSS-B Deck-TSI-18A, -18B, -18C	Straight run pipe insulation	Deck B– Piping that is located above ceiling	Good	x	
NSS-B Deck-TSI-19A, -19B, -19C	Elbow pipe insulation	Deck B– Piping that Is located above ceiling	Good	x	
NSS-B Deck-MM-20A, -20B, -20C	White drywall (1" thickness) associated with walls	Deck B – Throughout staterooms and hallways	Good	x	

Note: All pipes are recorded as total diameter of the pipe and the associated insulation.

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckC-FT-1A, -1B, -1C	Tan, 9"x9" floor tiles with white lines and associated mastics	Deck C-Staterooms	Good		x
NSSDeckC-MM-2A, -2B, -2C	White drywall (1/2" thickness) associated with state room ceiling	Deck C-Staterooms	Good	x	
NSSDeckC-MM-3A, -3B, -3C	White drywall (1" thickness) associated with state room walls	Deck C-Staterooms and Hallways	Good	x	
NSSDeckC-TSI-4A, -4B, -4C	Straight run pipe insulation associated with pipes above ceiling	Deck C	Good	x	
NSSDeckC-TSI-5A, -5B, -5C	Elbow pipe insulation associated with pipes above ceiling	Deck C	Good	x	
NSSDeckC-FT-6A, -6B, -6C	Brown, 9" x9" floor tile with black specks and associated mastic	Deck C- Hallways	Good		x
NSSDeckC-FT-7A, -7B, -7C	Tan, 9" x9" floor tile with black and white specks and associated mastic	Deck C- Hallways	Good		x

### Asbestos Survey Field Data Sheet-Deck C NSS-Savannah Fort Eustis, VA

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckC-TSI-8A, -8B, -8C	Straight run pipe insulation associated with piping	Deck C – Carpenters workshop	Good	x	
NSSDeckC-TSI-9A, -9B, -9C	Elbow pipe insulation associated with piping	Deck C- Carpenters workshop	Good	х	

Note: All pipes are recorded as total diameter of the pipe and the associated insulation.

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSS14Flat-TSI-1A, -1B, -1C	Straight run pipe insulation associated with heating system	Deck 14 Flat-Engine Room	Good	х	
NSS14Flat-TSI-2A, -2B, -2C	Elbow pipe insulation associated with heating system drain	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-3A, -3B, -3C	Straight run pipe insulation associated with heating system drain	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-4A, -4B, -4C	Elbow pipe insulation associated with heating system drain	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-5A, -5B, -5C	Straight run pipe insulation associated with auxiliary exhaust	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-6A, -6B, -6C	Elbow pipe insulation associated with auxiliary exhaust	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-7A, -7B, -7C	Straight run pipe insulation associated with fire station 37 (4" diameter)	Deck 14 Flat-Engine Room	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS14Flat-TSI-8A, -8B, -8C	Elbow pipe insulation associated with fire station 37 (4" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-9A, -9B, -9C	Insulation (body) associated with HP/LP crossover system (60" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-10A, -10B, -10C	Insulation (body) associated with HP/LP crossover system (36" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-11A, -11B, -11C	Elbow pipe insulation associated with HP/LP crossover system (36" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-12A, -12B, -12C	Elbow pipe insulation associated with steam dump pipe (24" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-13A, -13B, -13C	Straight run pipe insulation associated with steam dump pipe (24" diameter)	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-14A, -14B, -14C	Straight run pipe insulation (4" diameter)	Deck 14 Flat-Shaft Alley	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS14Flat-TSI-15A, -15B, -15C	Elbow pipe insulation (4" diameter)	Deck 14 Flat-Shaft Alley	Good	x	
NSS14Flat-TSI-16A, -16B, -16C	Straight run pipe insulation associated with main feed pump	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-17A, -17B, -17C	Elbow pipe insulation associated with main feed pump	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-18A, -18B, -18C	Insulation associated with first stage water heater (body)	Deck 14 Flat-Engine Room	Good	х	
NSS14Flat-TSI-19A, -19B, -19C	Straight run pipe insulation associated with solenoid valve	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-20A, -20B, -20C	Elbow pipe insulation associated with solenoid valve	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-21A, -21B, -21C	Straight run pipe insulation associated with shell coil system	Deck 14 Flat-Engine Room	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSS14Flat-TSI-22A, -22B, -22C	Elbow pipe insulation associated with shell coil system	Deck 14 Flat-Engine Room	Good	х	
NSS14Flat-TSI-23A, -23B, -23C	Straight run pipe insulation associated with crossover drain	Deck 14 Flat-Engine Room	Good	x	
NSS14Flat-TSI-24A, -24B, -24C	Elbow pipe insulation associated with crossover drain	Deck 14 Flat-Engine Room	Fair	х	
NSSDeckD-FT-25A, -25B, -25C	White, 9"x9" floor tile and associated mastics	Deck D-Control Room	Good		x
NSSDeckD-FT-26A, -26B, -26C	Green, 9"x9" floor tile and associated mastics	Deck D-Control Room	Good		x
NSSDeckD-TSI-27A, -27B, -27C	Straight run pipe insulation associated with cooling system (green)	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-28A, -28B, -28C	Elbow pipe insulation associated with cooling system (green)	Deck D-Engine Room	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckD-TSI-29A, -29B, -29C	Insulation associated with cooling system tank (green)	Deck D-Engine Room	Poor	x	
NSSDeckD-TSI-30A, -30B, -30C	Straight run pipe insulation associated with diesel engine exhaust	Deck D-Engine Room	Good	х	
NSSDeckD-TSI-31A, -31B, -31C	Elbow pipe insulation associated with diesel engine exhaust	Deck D-Engine Room	Good	x	
NSSDeckD-MM-32A, -32B, -32C	Gaskets associated with boiler	Deck D-Engine Room	Good	х	
NSSDeckD-TSI-33A, -33B, -33C	Insulation associated with steam generator (pink)	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-34A, -34B, -34C	Straight run pipe insulation associated with steam generator	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-35A, -35B, -35C	Elbow pipe insulation associated with steam generator	Deck D-Engine Room	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckD-TSI-36A, -36B, -36C	Straight run pipe insulation associated with compressors	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-37A, -37, -37C	Elbow pipe insulation associated with compressors	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-38A, -38B, -38C	Pipe insulation associated with boiler duct	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-39A, -39B, -39C	Elbow pipe insulation associated with ADT pipe system (green)	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-40A, -40B, -40C	Straight run pipe insulation associated with ADT pipe system (green)	Deck D-Engine Room	Poor	x	
NSSDeckD-TSI-41A, -41B, -41C	Straight run pipe insulation associated with steam valve system	Deck D-Engine Room	Fair	х	
NSSDeckD-TSI-42A, -42B, -42C	Straight run pipe insulation associated with engine (red)	Deck D-Engine Room	Good	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckD-TSI-43A, -43B, -43C	Elbow pipe insulation associated with engine (red)	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-44A, -44B, -44C	Straight run pipe insulation associated with evaporators	Deck D-Engine Room	Good	х	
NSSDeckD-TSI-45A, -45B, -45C	Elbow pipe insulation associated with evaporators	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-46A, -46B, -46C	Straight run pipe insulation associated with generators	Deck D-Engine Room	Fair	х	
NSSDeckD-TSI-47A, -47B, -47C	Elbow pipe insulation associated with generators	Deck D-Engine Room	Poor	x	
NSSDeckD-TSI-48A, -48B, -48C	Straight run pipe insulation associated with steam valves	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-49A, -49B, -49C	Elbow pipe insulation associated with steam valves	Deck D-Engine Room	Fair	x	

				Fria	ble?
Sample ID	Material Description	Location	Condition	Yes	No
NSSDeckD-TSI-50A, -50B, -50C	Straight run pipe insulation associated with boiler water treatment system	Deck D-Engine Room	Fair	x	
NSSDeckD-TSI-51A, -51B, -51C	Insulation associated with vent to first stage heater (body)	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-52A, -52B, -52C	Straight run pipe insulation associated with condensate line	Deck D-Engine Room	Good	x	
NSSDeckD-TSI-53A, -53B, -53C	Straight run pipe insulation associated with diesel engine exhaust (upper section)	Deck D-Engine Room	Good	x	
NSSDeckD-FT-54A, -54B, -54C	Tan, 9"x9" floor tile with black specks and associated mastic	Deck D- Food Storage Area	Poor		x
NSSDeckD-FT-55A, -55B, -55C	Brown 9" x9" floor tile with black and white specks and associated mastic	Deck D- Food Storage Area	Poor		x
NSSDeckD-TSI-56A, -56B, -56C	Straight run pipe insulation	Deck D-Food Storage Area	Good	x	
NSSDeckD-TSI-57A, -57B, -57C	Elbow pipe insulation	Deck D- Food Storage Area	Good	x	

Note: All pipes are recorded as total diameter of the pipe and the associated insulation.

### Asbestos Survey Field Data Sheet-Surface Deck NS-Savannah Fort Eustis, VA

				Fria	able?
Sample ID	Material Description	Location	Condition	Yes	No
NSSSurfaceDeck-MM-1A, -1B, -1C	Black asphalt sealant associated with cargo hold doors	Surface Deck	Good		x



Appendix M

# Appendix M Lead-Based Paint Survey Results

## Table I Positive (≥ 1.0 mg/cm²) Lead Based Paint Results NS Savannah Ft. Eustis, Virginia April 2005

Test Number	Area Location	Color	Component	Substrate	Result (mg/cm ² )
		April	4, 2005	15.009.303.000	
008	A deck level	Grey	Center wall	Metal	1.6
010	A deck level	White	Ship side	Metal	6.1
020	A deck level	White	Ship wall	Metal	2.7
021	A deck level	White	Side rail	Metal	5.4
026	Upper deck level	White	House wall	Metal	7.5
029	Upper deck level	White	House wall	Metal	5.5
033	A deck level	White	Winch tower support	Metal	1.0
035	A deck level	White	Winch tower floor	Metal	6.5
		April	5, 2005		
006	A deck main lobby	Off white	Wall	Metal	1.0
077	SE passage corridor	Red	Wall	Drywall	1.9
078	SE passage corridor	Red	Wall	Drywall	3.2
079	SE passage corridor	Red	Wall	Drywall	1.6
080	SE passage corridor	Red	Ceiling	Drywall	3.6
084	SR A-29	Red	Door	Metal	3.0
085	SR A-29	Red	Door casing	Metal	2.2
092	Linen Locker	Red	Door	Metal	2.6
093	SE passage corridor	Red	Wall	Drywall	2.8
096	Stairwell	Red	Wall	Drywall	2.7
114	Boat deck	White	Railing support	Metal	1.6
117	Boat deck	White	Stair carriage	Metal	1.0
119	NBD	White	Wall	Metal	1.8
120	NBD	White	Wall	Metal	>9.9
121	NBD	White	Door	Metal	8.7
146	B deck/ Fan room	Orange	Handrail	Metal	1.9
202	B deck/ NS corridor	Blue	Handrail	Metal	1.9
203	B deck/ No. 4 hatch	White	Wall	Metal	1.7
204	B deck/ No. 4 hatch	Red	Floor	Metal	2.8
207	B deck/ No. 4 hatch	White	Wall	Metal	1.7
211	B deck/ No. 4 hatch	White	Duct	Metal	2.0
212	B deck/ No. 4 hatch	White	Floor	Metal	3.1
		April	6, 2005		
047	C deck/ hallway	Yellow	Electric box	Metal	2.4
048	C deck/ stairwell	Orange	Railing	Metal	1.6

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### Table I Positive (≥ 1.0 mg/cm²) Lead Based Paint Results NS Savannah Ft. Eustis, Virginia April 2005

Test Number	Area Location	Color	Component	Substrate	Result (mg/cm ² )
		April	6, 2005		
053	C deck/ NS corridor	Green	Cables	Metal	3.9
063	C deck/ load passage	Red	Floor	Metal	3.4
067	C deck/ load passage	Yellow	I-beam	Metal	2.6
070	C deck/ load passage	Green	I-beam	Metal	2.7
071	C deck/ mach. space	Green	Elevator shaft	Metal	8.1
073	C deck/ mach. space	Red	Floor	Metal	2.8
080	C deck/ mach. space	Green	Cables	Metal	1.9
098	C deck/ locker	White	Cables	Metal	3.6
127	D deck/ machine room	Yellow	Compressor Delaval	Metal	7.1
128	D deck/ machine room	Green	Turbine	Metal	1.6
144	14' D deck	Orange	Handrail	Metal	5.9
151	14' D deck	Yellow	Tank	Metal	3.8
156	14' D deck shaft alley	Orange	Handrail	Metal	2.1
157	14' D deck	Yellow	Pipe	Metal	2.2
163	A deck-pursers office	Orange	Door	Metal	1.0
171	D deck/ control center	Green	Wires	Metal	2.3
177	D deck/ workshop	Green	Wires	Metal	1.5
181	D deck/ engine spares	Orange	Wall	Metal	2.5
185	D deck/ stewards room	Orange	Wall	Metal	2.4
		April	7, 2005		
004	Ship starboard side	Red	Hull	Metal	5.8
022	B deck/ stairwell	Yellow	Wall	Metal	3.0
		April	8, 2005		
009	Reactor room	Tan	Reactor wall	Insulation	8.2
012	Reactor room	Orange	Handrail	Metal	1.0
021	Reactor room	Tan	Reactor wall	Insulation	>9.9
023	Reactor room	Green	Cables	Metal	1.0

### Table II Lead Paint Chip Sample Results NS Savannah Ft. Eustis, Virginia April 2005

Sample Number	Color	Location	Component	Surface	Paint Chip Result (%)
05121040601P	Red/ Orange	A Deck	Wall	Metal	3.2
05121040602P	White	Bridge Deck	Wall	Metal	0.71
05121040603P	White	Veranda	Wall	Metal	0.034
05121040604P	Blue	B Deck	Wall	Metal	0.3
05121040605P	Red	B Deck	Floor	Metal	3.9

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ADDRESS: James Liver, FT. Evstis, VA JOB NAME: NS Savernach

FIELD FORM **RMD LPA-1** 

TEST NO./RESULT(mg/cm2) -0 -7 0.0 0.2 0.4 <u>0</u> 0.0 0.2 0.9 0.3 1.6 6.1 0.2 0.4 0.4 0.8 0.8 0.0 0.2 <u>.</u> <u>016</u> 018 010 012 013 014 015 019 900 008 600 011 017 002 005 200 003 004 8 0.4-0.4 + 1 ٨ ام 1 + ١ ١ 0.1/ ١ + f ι 0.0 ¥ ١ ۱ 0.2. 0.4 ٥, ٢ و 0.0 0 0 0.2 COMMENTS N)57 Valoc=1.0 0 4 <u>с</u> 1 2.1 0.2 0-1 1.2 COMPONENT SUBSTRATE CONDITION Neter N.H. 2  $\overline{\mathbf{z}}$ 2 2 2 3 Ī Ī 2 2 2 2 2 2 え 2 57 2 4 ì, î 2 Anchar Winch M Z I z 4 z Ź 2 ٤ 2 Σ z ٢ 1 1 Corgo Coner White Hatch Door Erren Cargo laves Bury Centorial PZ NW Side Gary Tic. off Deck Side Wite Ninch 12 NE side White Sick Deck ビー uall NE Side With Side NU Side White Wall L'hik Pipe Entrance Whife Wall كمحر (15) NN Side White Certer Green Center Green NW Siele White NW rdc UMH Gum Center (P3) (enter (Pel) Center West Naut Deck PT 12 Mast ŝ (66) 5 12 004 Deck Level - Sow 92 . DOSA Derk Level - Side TON REPORTEROOM SUMM. ODT A Deck level 006 A Deck level. 012A Deck Level 008 & Deck Level OTO A Deed Level 014 Diele Level 000 Deule Level 011 A Deute Level 013 A Deck Level N 015 A Deck Level OTTAD CUR CEVED 1018 A Deule Level 016 A Dede Level 020 DC 019 A D L TEST^C allocate 002 003 001

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PSPO Actor DATE: 1.4.05

2015.00160 ------

JOB# 05121

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ADDRESS: James Rich, F4. Fustis, VA JOB NAME: NS Savannah

RMD LPA-1 FIELD FORM

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TEST	ΓOC	LOCATION	COLOR	COMPONENT		SUBSTRATE CONDITION	COMMENTS	~ =	TEST NO (RESULT TIMO/Cm2)	(cmoloim)
021 A DL	2	NU sele UC:	16.16	Rail	ź	Ē		+		
022 A PU	2	NE Siele Lib H	H	Side Keit	ź	2		i i	120	5.4
023 <b>A</b> DL	69 564	-ster	black	stair	. 1				022	0.0
024 <b>A</b> OC	00	ł	i'i'	Sher	· •	2		6.2	023	-0.2
				caniage	٤.	12		0.0	) 024	0.0
025 UVL - Verkl	5	Centro	ANGN	Deck	z	ī		-1.0	025	0
026 WDU =	810+11 cm	center	r'i'	Light (E)	َ ک ر	2		5 7		- r
027 WOLL >	3	(entre 1	21-1-1	box adjacan	۶	2			020	<b>c</b> .
028 WDL 5 42	Ĵ	- Lenter	Gater (	Cango cover	T	12			170	0.0
029 <b>ック</b> じ・	3		Uluik .		T y	ī		1 - 2 - 2	028	-0.1
030 WW ~	3	W SIDE	Gaey	4:c-0ff	5	2		2	670	5.5
031 WDL -	Prz W		Jr. 1	100	Z	12			030	0.0
032 UDL - V	<b>ن</b> ه	E side red		chain a the changest	·2	2	- 4	, , , , , , , , , , , , , , , , , , ,	031	0.0
033 A DL	(enter			Linch huse const	, X			4 1 5	032	-0.2
034 A DL	Center	1		with the					033	1.0
035 <b>A DL</b>		ļ	white 1	Lines Floor	Ľ	2		1 1 2 -	034	0.3
036 A PL	Center	.	utic «	traduc somert	М	īz			035	0.5 0.5
037 A DL	rents	ĺ		win un un	٤	Ir ¹		1	0.00	0.3
038 A DL	<b>لل</b>	E side while		Wall	x	N N		0.4 -	U3/ N3R	7.0
039 A D. CUMider N/3	ž		(anch	المرر	٢	١٧		с 0		+ 0
040 AD to NS CODINGE	NL NL		hum	lini	5	الر			U.39	0.0

PAGE 2_0F H

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DATE: 4-4-05 -0934

JOB# 05121

JOB NAME: <u>NJS Javannah</u> ADDRESS: James Richt Fil. Evils, vA

RMD LPA-1 FIELD FORM

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TEST				-					
	FOCATION	COLOR	COMPONENT	SUBSTRATE CONDITION	CONDITION	COMMENTS		TEST NO /RESULT TIma/cm3)	(Cural)
AV N/2 Vanielar	<b>W</b> 3	exer.	<u> </u>	٢	ź			044	
042 AD NJS KNAIdan	24	دور المزير	WIL	¥	17		-7:0		-0.2
043 AD N/S (versibar	(در) ا	11 11	( قرآن الم	7	7		-1.0	042	-0.2
044 RJ N/S (worister	ہ آ	1	0	-	5		0.4 -	043	-0.4
045 AD State Rom 3			Maria	2	Í		0.1 \	044	-0.1
1				Y Fe		· · · · · · · · · · · · · · · · · · ·	0.1 ~	045	0.1
8	- 2M			× ;			0.0.0	046	0.0
<b>H</b>	24	7 7 7					۰ 0 0	047	0.0
2				74 74	=		0.1 :	048	-0.1
3		3	me#4)				0.1 ~	049	-0.1
<b>2</b>	· .		seiling deck	·		dry wall certing	0.1 -	050	-0.1
052 \\			uinclew	دلس المعال			2.1.5	051	-0.1
053 AD State Rm ? Barkiness		-			2		0.0	052	0.0
054 AD State Can 3		1 .:		म	2		5.0	053	0.1
		-	Adar		~ .		0.1 ~	054	0.1
056 Stat Com 7		_	Carries Carries		<u>کر</u> :		0.0	055	0.0
<b>1</b>	-		1741.	24 24	ž		01-	056	Ģ
<b>b</b>			1	J. C	12 :		- 1.0	057	0.1
<b>b</b>		_	l'stil	5 K			0.1~	058	0.1
h					<u>-</u>  :		0.1	059	Ŷ
	-	1 1		11	え		d.1 -	060	- Ģ
									]

PAGE 3_0F

DATE: 4/4/05 - 09 34

JOB# 05121

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JOB NAME: NS Sammah

ADDRESS: James River, H. Evilis, VA

RMD LPA-1 FIELD FORM

. San Jan Ka

-0.2 Ģ. -0.1 <u>0</u> -0.1 -0.2 -0.2 TEST NO./RESULT(mg/cm2) ò. 0.0 -0--Ģ ģ 0.0 0.0 0.0 0.9 072 074 075 076 066 690 062 063 065 068 070 071 073 061 064 067 ١ к 0.0 ~ ١ ١ ١ ١ L ١ ł 0- J 1.1.0 ١ ١ 0.0 2.0 0.1-0. 0.1 D 0 0 0 0.1 ~ 0 <u>0</u> 0.2 NIST Value = 1.0 COMMENTS COLOR COMPONENT SUBSTRATE CONDITION ž : 2 ź 2  $\overline{2}$  $\overline{2}$ 2 ī วิ 2 ź ī 5 2 ž 5 • scamis tit ĺ 2 35 7 3 ٢ 3 Ł ٢ Ź z 5 ; ž lanthroom Latter Dathroom door Seaing Metal D chair real *caloinets* dour ceiling. arange casing 2 3 2001 ころこ < 101et Nel. gellow chosen 2 ۲ 20037 うで、 til. Orange لإذالعي ; R ٦ L.H.F ટ્રે 3 30 3 1 ŗ 2 3 LOCATION \$ Scilinz 2 53 5 ž 3 37 52 3 いち Ы3 N S 3 いい 2 1 ير Ξ * ~ 4 3 ÷ ¥ 2 3 S, ۲ Ξ. <u>N</u> . . . 1 ROOM' 065 AD Start Lova 064 AD SIELE GOM State Com T County -1, 4D 076 240 063 1 ? 1 1 ; 5 5 1 5 5 2 061 062 066 067 068 069 020 071 072 074 075 073 TEST

PAGE 4 OF 4 Nob Schwernage

0.8

0.8

077 078

DATE: 4405 -0934

JOB# 05121

078 079 080

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ADDRESS: Names River, FT. Evelis JOB NAME: NS Savannah

RMD LPA-1 FIELD FORM

TEST NO./REŞULT(mg/cm2)	0.8	0.8	0.8	-0.3	-0.1	1.0	0.1	-0.1	-0.1	-0.4	0.2	-0.1	-0.3	-0.3	-0.2	0.0	0.1	-0.1	-0.2	0.0
TEST NO./RE	001	002	003	004	002	000	007	008	600	010	011	012	013	014	015	016	210	018	019	020
COMMENTS N157 Value = 1.0			$\sum$	1 1 1 1	\ 1	+0,	11:0	1.0.1	1.0.1	· · · ·	0.2		10.3	6.0-	-0.2	0 Ø	0.1	-0.1	2.0 -	ô,¢
COMPONENT SUBSTRATE CONDITION	•		) / /	12 Mb	ي الألى	N N	dw -	2	× •	transte 1	N N	~		• 1) W(r) L		M. M.	N1 N1	M FIL		シーシ
COMPONENT	~			w/all				door	U 0000	celling "	et 000	2 00'C	M'AIÍ	Wall	certing.	Junal S	NJall C	wall	<b>.</b>	-
COLOR	7	$\backslash$	J	2M				14.5	tan	(MO	たら	ten	MO	ωN	μŋ	ы Мо	30	Ņ		
	(			1 M	57	M3	WH	3	IM	Ceiling	NN I	101	22	N. H	لإمرا أتمع	celling.	ہ ک	ZM	53	N L
on todatte kommentation and a todat				4 AD = SHEL, L'ELLEV		Q	μ.	8			AD-Ent NS Cooridor	2			12 12	16	17 Laundry Adi, to SPZ			20
TESTC∩	- 001	002	003	004	002	006	200	008	600	010	011	012	013	014	015	016	017	018	019	020

PAGE 1 OF #2

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DATE: 4/5/05 - 0759

JOB# 05/21

JOB NAME: NS Savanah ADDRESS: Lames River Ft Evstis

RMD LPA-1 FIELD FORM

TESTIN 105 - COLPR TRAVEROOM TO SERVEROOM TO SERVER FILE CONDITION COLOR COMPONENT SUBSTRATE CONDITION	<ul> <li>Constitution (1) - Constitution</li> </ul>		COLOR CC	MPONENT 5	SUBSTRATE CONDITION	COMMENTS	TEST	TEST NO./RESULT(mg/cm2)	(mg/cm2)
021 Laundry ad	10 562	W3	ow h	له وهر	M NI		-0.3	021	-0.3
		Culling	*	Aichert		2	Č. I	022	0.1
· 023		٣ ^{يل}		もいった	a	))	~ 0. <i>1</i>	023	-0.1
(1024) · · · · · · · · · · · · · · · · · · ·		Cellinz	~	support		).	-0.3	024	-0.3
025 SR 2		2 3	Yellow	wall			2.5	025	0.2
026		w2	E.S. gyand	اله بعر بتعليم		<b>Q</b>	0.0	026	0.0
. 027		M3	1. <b>P</b> 1.			X	1.01	027	-0.1
028		l Mi-J	->	-` <b>&gt;</b> .		3	0.1	028	-0.1
029		Ce il ig	<del>3</del>	CC-1-1-1-	chui	X	1.0~	029	-0.1
030		5,4	Light Leiny	Lair /	N ²	1	1.0.1	030	-0.1
031		wil		:~1: \\\cd0:1	du)	ι. Γ	10.2	031	-0.2
032		الہ) لڑ		Lap Mic.	dw	\$ <u>}</u>	~ 0, O	032	0.0
033		MZ	Guerr	200 k	· W	·	0.0	033	0.0
034		W2		Gran JOON	X.	)	0. i	034	0.1
035 SC-21 bat	ba throom	3	New	Wall ^w	div	0	ەرە	035	0.0
1036		j.vl	1) +	Le ravio	CENTRA CENTRA	7~	2.0.2	036	-0.2
037		152	× 0	_∕o o yo	<u> </u>	•	0,1	037	0.1
038		3	>	eleorces of M	T. *20	٥ ١	****** 0	038	-0.1
039 Lartes Room	(526)	2	Gue Wall	Vall	c, k'		0. D	039	-0.2
040	الم الم مستقدمة من الم الم الم الم الم الم الم الم الم الم	MC	V mm C	فعدا	de la	>	0.0	040	0.0

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<u>рате: 4/5/05 0759</u>

JOB# 05/21 2012

- Lindd do

ADDRESS: James Ryer, H. Eustis JOB NAME: NS Savannah

RMD LPA-1 FIELD FORM

TEST NO./RESULT(mg/cm2)	-0.1	-0.2	-0.1	0.2	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	0.1	-0.1	0.0	-0.1	-0.2	0.1	0.1	0.0	0.3
TEST NO./RE	041	042	043	044	045	046	047	048	049	020	051	052	053	054	055	056	057	058	059	060
	- 0.1	-0,2	101	0.2	1.0 -	101	- 0 -	- 0,2	- 0°	X 0.1	- Q.	0-1	-0-1	0.0	10-1	10.2	0.1	0.1	0 0	ó.3
COMMENTS																				
CONDITION	2	Ī	2																	>
SUBSTRATE	С Г	dul	div)	M	dW	ŕ	٢	1.	<u>دا ای</u>	3 W	1 M	A West	il.	<u></u>	V			Ž	r	4
COLOR COMPONENT	Gauge LIGIT	Sheer 1. Soll	Current	et a	ي لا د ا	door	Caner Consin	v stati	Mawe worth	أالعل	M-II	Nall	Ceilis S	JOON	ولون ر دوي کې	Wall U	electrication	A LOW PIPE	Green NOrd	Guar ( Nail
COLOR	GUAN	3. 5	<u>ک</u>	~	Ş	S	Canul	>	Masue	Š	3	Mer Nr.	ν'n	30	5-70	υ'n	- 11-0-11-	ANNUL 1	Clean C	
~ LOCATION	<b>W3</b>	W.	Schi S	Celling	2	W3	50	5	<u>S</u>	3	N3	P.M	ce bed	ī	12	て	5	איז	13.5	23
A DEPARTMENT OF THE ROOM THE ADDRESS A COMPANY STORED	Lates Room - SC-6				Ladro Room (closer-(5PL) WI			Lectres Rever Shower (SRG)	Doctors Office	OPer a ting Room	ofer thin - hours	Doctors Office	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			oranty loom	Jott offer		200 Stainwell artia. to thep. Ent Con. W 1	
A VTESTOA KA	041	042	043	044	045	046	047	048 [	049	020	051	052	053	054	055	056	057	058	059	090

PAGE <u>3</u> OF <u>12</u>

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DATE: 4/ 5/05 .0759

JOB# 05(2) [2410]

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JOB NAME: N5 Sevanneh ADDRESS: Vames River, Ft. Eustis

RMD LPA-1 FIELD FORM

TESTON DUE DARGE AVERTION DEDALTAS DOUGH RELOCATION	KOOM THE REPORT OF	** LOCATION	COLOR COMPONENT	COMPONENT SUBSTRATE CONDITION	structures of the second comments		TEST NO./RESULT(mg/cm2)	(mg/cm2)
061 Startwell and to	to Hosp Entlevel W3	х, <u>5</u> ,3	Green wall	M NI		-0.1	061	-0.1
062		μŅ	Guer wali			0.0	062	0.0
063		٣ď	(Iner door	<b>1</b>		0.1	063	0.1
064		ŝ	Gund door			1.0 -	064	-0.1
065		13	Gree that the here	, Ya		0.3	065	0.3
066		Cilled	N Wing		*	101	066	-0.1
067		M	Guen V.P.C	T		0.3	067	0.3
068	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Fier-	Red Floor	Ĩ	<b>5</b>	0 0	068	0.0
069 A-20 Seware Parting	- Parting	R	NEU WO	V.	<b>20-</b>	1.0-	069	-0.1
020		NZ			<b>A</b>	- 0 1	010	-0.1
071		W3				- 0,3	071	-0.2
072	~	μų	→ ->			0.2	072	0.2
073		te Wing	ow coired	Σ		0,0	073	0.0
074		۲. ۲.	OW dumb deve	۲ ب		0.0	074	0.0
075	-	М Г М	Caner door	I,		0,0	075	0.0
076		25	Greet Noor	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		-0.1	076	-0.1
OTT SE Parase	Coontelion (	Ī	Red would	the Toreson		6.	220	1.9
2. 078 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		23	liced wall	AN LINA		32	078	3.2
620	65)	w4	Red 4241	1.50			670	1.6
080		eriting	Red ceiling Than	Thous V	Å I	<b>ک</b> آن	080	3.6

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DATE: 4/5/05 - 0759

JOB# 05/2/

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JOB NAME: N5 Savannah ADDRESS: Vance River, FF Euslis

RMD LPA-1 FIELD FORM

T(mg/cm2)	0.0	0.0	-0.2	3.0	2.2	0.0	-0.1	-0.1	0.0	-0.1	-0.1	2.6	2.8	0.0	-0.2	2.7	0.0	-0.3	-0 4	-0.1
TEST NO./RESULT(mg/cm2)	081	082	083	084	085	086	087	088	089	060	091	092	093	094	095	960	260	860	660	100
	0 ()	0.0		14) ()	22.	~ 0° 0	1.0 -	1.0-	0.1	- 0	- 0.1	2.10	5.3	- 0.0	- 0.2	2.7	0.0	- 0.3	- a. 4	- 0.1
COLOR COMPONENT SUBSTRATE CONDITION													-							
NOITION	Ź						·													
SUBSTRATE CO	dw	cher	L W	Z	Y Y	Σ	2	٤.	7	Ľ	٢	7	Trav	SR	59-	SR	Σ	SK	s,r	5R
COMPONENT	LJ= [[	hJali	Curlins,	clocit	Juer's	کرموں مرکب	2000 2000	نی شار ^ی	h-Jali	Pipe alani	Let N U	gocie	11211	Wall	Certino	1.16.1	Bride Rail	1Jail	Wall	culting.
COLOR	3		~>	Ro	led	3	3	3	3	3	3	Red	Red	17 1310 100		200	Glide	C	3	6-4
* LOCATION	13	SW1	ردما أمع	ЦЧ	Ыų	<b>ک</b> گ	503	7 WI	23	N3	Callion	r? '	1 1 1	IT	terling	5	Itorid Reil	Ч Ц Х	hry	collag
(1) TEST SATINGS CLAREGROOM ANSIES SOUTH STUDIES COCATION	1 S C 29						<b>*</b>	B Linen Locker Anors Tron A-17				092	3 56 Russed Curr. NJ. 15 A-51		095	6 Stairwell SE of Lubby		8 SIN Prover Conictor AS, 10 1.22	3	
TEST	081	082	^{, 083}	084	085	086	0.087	088	680	060	091	092	093	094	095	960	260	098	650	100

PAGE ___5_0F <u>/2</u>

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DATE: 4/5/05 -0759

JOB# 05121 2018

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ADDRESS: James River H. Events JOB NAME: NS Savannah

RMD LPA-1 FIELD FORM

TEST NO/RESULT(mg/cm2)	- 0.2 101 -0.2	·- 0.1 102 -0.1	- 0 · 1 103 -0.1	- 0 · č 104 -0.1	- 0,1 105 -0.1	- 2 / 106 -0.1	、 <i>ひ</i> リ 107 -0.1	~ 0 2 108 -0.2	- 0.7_ 109 -0.2	0.0 110 0.0	- 0.2 111 -0.2	- 0.4	ά. το 113 0.0	1. Le 114 1.6	Q. 0 115 0.0	- 0.1 116 0.1	/ ð 117 1.0	- 0.5 118 0.3	119	
COMMENTS																				
SUBSTRATE CONDITION	NI							·····				<b></b>								
	sil	SR	1-1	1.	Z	\$ 2	3,6		Z,	٢	Ň	L	ž.	Í.	z	Z		Cocking I	5	Z
COLOR COMPONENT	1. Jer 11	المالي	000	0 40 4	Vail	11 - 11	Meri	Collig >	Linn ford	もよい	F. Caron	N. Count	intervente ve	Reif Jumart	Garen Hour	5472007	Stan-	Titer	4.1011	wold -
	Sive	Ove	BLIC	8100	yether)	3	5	in l	3	<u>و</u> ر مربع	Given	3	3	2	Given	3	3	יושצער	3	3
		6.01	1	ī	112	112	<b>W</b>	Celling	12 M	Ect +F	Floor	the meth	ていてい	C. S. M.	10017	in interior	W Stairie	Ĥ tor	DECK N.	Pilot Hove
						Wedge				··· · .							3		·	
Proc. Toward 25 Strate CROOM Stratt (7.5)	5R A-32				105 SL A-34	106 Rom Derke (PD) Venander			~	110 Werther Dede			113 Joost Deck				$\rightarrow$	118 NBD		~~~
TESTON AND	101	102	103	104	105	106	107	108	2 m 109	110	۰ 111	112	13	114	115	116	117	118	119	120

PAGE 6 OF 12

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the second

DATE: 4/5/05 0759

ALCO COMPANY

JOB# 05/3/

- Landed

ADDRESS: James Liver, Ft Evels JOB NAME: NS Savannah

RMD LPA-1 FIELD FORM

W $a_{1}Va_{1}$ M $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$ $NM$	n r
Witten $-0.5$ $122$ Watt $H$ $-0.1$ $123$ Watt $H$ $-0.1$ $123$ Watt $H$ $-0.1$ $123$ Watt $H$ $-0.1$ $123$ Watt $H$ $-0.1$ $123$ Watt $H$ $-0.1$ $123$ Low $H$ $-0.2$ $126$ Watt $H$ $-0.1$ $123$ Low $H$ $-0.2$ $126$ Used $H$ $-0.2$ $126$ Used $H$ $-0.2$ $128$ Used $H$ $-0.2$ $128$ Used $H$ $-0.2$ $128$ Used $H$ $-0.2$ $128$ Used $H$ $-0.1$ $132$ Used $H$ $-0.1$ $132$ Used $H$ $-0.1$ $132$ Used $H$ $-0.1$ $132$ Used $H$ $-0.1$ $132$ Used	
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ADDRESS: Names Rues, F. Lushs JOB NAME: NS Savannah

RMD LPA-1 FIELD FORM

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.T(mg/cm2)	0.0	-0.1	0.2	0.0	0.2	1.9	0.4	0.0	0.2	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.0
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DATE: 4/5/05-0759

JOB NAME: <u>N5 Savannah</u> ADDRESS: <u>James Pryce</u>, 77, EUS/S

RMD LPA-1 FIELD FORM

LT(mg/cm2)	0.4	0.5	0.0	-0.1	-0.2	0.1	1.1	1.0	1.1	-0.2	0.1	-0.1	-0.1	-0.1	0.0	-0.2	-0.1	-0.1	0.2	0.2
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The second second second second second second second second second second second second second second second se	0.4	0.5	0.0	1.0-	- 0.2	D. [	(al bratel in Deve A	0		NIST 5RM 2573=1.04 - 0.7	Ú.	.0.1		03	Q.Q	.0-	- 0.1	- 0.1	2.0	0.1
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COLOR COMPONENT S	لامت م المعدال	Tower.	duct.	Great (reveretter	Panel	05 <u>0</u>		4		1. Jeel	(arl)	Euch Car	DOUN	Del Com	Mall	1 vali	Chell 107	d ver	luail	1.22 []
COLOR	لآشيا	Care .	3	6 run.	GIVE	GREEFT	••	(	)	3	3	3	Chree.	Bre	?	۲: : ک	3	10-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	BUC	Elec wall
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TETESTUR OPP - COLOVE STORMOOM PLANED THE COLOUR STORES	161 Target Hunge Exterior Dete		163	164 NDO-ENIN, Geneur.		.166	167	168		170 Mairy Gellen - BD		1472)	173		*175	176 BD-NJS CONTRACT East Sink W 2	1777 Sec. 1777	1778	179 B.D S.R. B-5	180

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DATE: 4/5/05 -0759

JOB# 05121

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ADDRESS: James Rvin, Ft Eusly JOB NAME: N > Savannah

RMD LPA-1 FIELD FORM

SAFESTORION - STOLON SKROOM SKROOM SKROOM		COLOR	COMPONENT SUBSTRATE CONDITION	SUBSTRATE		Providente de la commente		TEST NO./RESULT(mg/cm2)	T(mg/cm2)
181 ED - SC 8-5	Cathorn	Buc	Buc here have M	Z	2		- 0° 0	181	0.0
182 BO-3R B-5	hours But Parker.	But	Oct Ra.	F.			0.0	182	0.0
183	They are	Cive Cive	Devr	M			- () -	183	-0.1
184	7	Que"	2005 U	Ĩ			- 0	184	-0.1
185 RD-Crew Coundary	2	3	WARI U	~			0.0	185	0.0
186	CALL WY	2	0:00	Z			-0.2	186	-0.2
187	23	3	Mari 1 Venere	Z			- 0 -	187	-0.1
188 (D. Linur Locker Stars (W)	1001	CARKEN S	FLOON	Z			0.7	188	0.2
88	5	VIII IN	state well	I			£-0	189	0.3
190	Steres	black	L'Er	X	A DOMONOMA La OVERNEY A VOLAN AVIA	-	0. 0	190	0.0
191	50	Courses.	Navy	5			0.0-	191	0.0
192 BU-NB Conider W side	523	Galer	ا) بكارسا	2			- 0.1	192	-0.1
193	WH	لماريله	Max	5			0. l	193	0.1
194	(list)	$\mathbb{C}^{1}$	(2-Dig	d w			1.0-	194	-0.1
195 20 - 0 fr w Ners	EI.	But	با ^{مر} ز ا	MP			- 0.1	195	-0.1
196	لكرظ	tan	1-JAU	JN			-00	196	0.0
197	Part has	ich.e		3			0.0	197	0.0
. 198	Ceiley.	2	E. O. F.	Jus .			~ 1) E	198	-0.2
. 199	+=101×	Due	12 12 1 12 12 1	Ţ			0.3	199	0.3
200	2M	Gr. c	$\overline{\nabla}$	r.	$\searrow$		- 0.2	200	-0.2

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**JOB#** 05(2) 05

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ADDRESS: JAMES RIVER FT EUSIS

JOB NAME: NS Savannah

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CONTESTOR (CD.) E.O.C.M. COMPRESSION SUPPORT OF SUPPORT		COLOR		SUBSTRATE C	CONDITION	SUBSTRATE CONDITION PREPAREMENTS COMMENTS		TEST NOJRESULT(mg/cm2)	_T(mg/cm2)
001 RD. Africe Meria	WZ	Birc	Carlow (Carlow)	Y	ا لا		- à.Ò	201	0.0
002 8.D- MJS Conver 1) Side	17	Sive	Ment 0	5			<b>6</b>	202	1.9
003 BD - No. 41 Hetch	IM	3	Well	Z			1	203	1.7
004	Pleav	Red	Floo/	2			2.8	204	2.8
500. -	Certing	3	to ears	7			- 0,1	205	-0.1
900	£ 33	3	1757	X.			1.01	206	-0.1
007	N 7	3	11°57	Ţ			1,7	207	1.7
008	M 2	Silver	51000	Weod			- O -	208	0.1
,	Ferrice	b)ac.K	E	ر اربر			0.0	209	0.0
010	Certing	3	Jeck B	r. T			-0.1	210	-0.1
011	chuct work	3	cluct	Z			2,0	211	2.0
× 012	FLOOR	3	Flow	Z			3.1	212	3.1
013	57	3	1102	wood			- 0,-	213	-0.1
014 BD - LJ att Lachies Run Haren	3	<u></u>	Well	Loco			-0-) )	214	-0.1
015	ZMP	2	d our	1,Jund			- 0.2	215	-0.2
	214	G 24-1	<140%	1-5300	:		- · Ç	216	0.1
017 BD- Stward Laundry	I'M	tar	U a N U	2			0.0	217	0.0
018	121	tan	Duct	2		ттуницики (	2.0-	218	-0.2
019 BD-ELECT CARI PLATION	3	5.2	Wall	5			1.0	219	-0.1
1020 844 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	F100V	Reed	F1001	M			-0.0	220	0.0

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DATE: 4/5/05 -0759

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ADDRESS: Vames River, F.F. Euchs JOB NAME: N5 Savannah

RMD LPA-1 FIELD FORM

LT(mg/cm2)	-0.1	-0.1	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.1	0.9	1.0	1.0			
TEST NO./RESULT(mg/cm2)	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237			
	- 0.1	- 0.1	0.01	- 0.1	- 0, 1	- 0.2	-0.1	- 0.1	-0.0	- 0, 1	- 0.0	- 0 -	- 0.t	- 0.1	NIST Value = 1.0					
MENTS														,	2 IST R					
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1									9 WYO											
CONDITION	2							n	-						ł					
SUBSTRATE	SR	Se	ĩ	M	Σ	5	Z	Z	dw	V	- Mrs	Σ	Y	2			`` \			
OMPONENT	an wall	11,001	Dur	Door	510	eleventer	I brain	Dovr	Wall	1)001	thiling	el ovr	Coster	Clark Control			770			
COLOR	212	βW	ton				?	31.45		16.17	3	tern	fores	+ crv	:	-				
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1	Lund				) 6-10053	, O			) Side								2			
M to the second				~	10.0 C			>	NK RATER - BD- JW SIDE					$\rightarrow$						
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and a state of the second second second second second second second second second second second second second s	60 -			-	27-Co				NKS Par								$\geq$			
TEST	021	022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	037	038	039	UAN

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JOB# 05/2/ 2002

FIELD FORM **RMD LPA-1** 

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ADDRESS: James RIVER

JOB NAME: N 5 Savanny N

TEST NO./RESULT(mg/cm2) 0.0 -0.2 .-1 ç. -0.1 -0.2 03 ç. 0.2 Ģ. 0.1 0.0 ò. <u>.</u> 0.9 0,9 0.8 <u>.</u> 012 016 001 002 004 005 900 008 600 010 011 013 014 015 017 018 200 COMMENTS NIST Value - 10 0.0 0 () 10.7 - 0. **'** 1.0-1.01 - 0.0 --0 ---0 1.0. ---0 0.2 M 5 i v ò. 0 ŧ. A 11 40 11 11 COLOR COMPONENT SUBSTRATE CONDITION **ī**2 25 SP Z ٤ NS 25 R ٢ ป 5 3 I 2 T 1 Door cellins Lindow Poor stain carringe コミニ Noll 1122 0001 1)51 door 2011 Yellow Wall じょう 1Jall じゅつ BIN Blue BUC Bre BUC 402 ていて للہ لا 584 6he 3 1020 ter ter ten 404 ceiling CONTRACTOR CONTRACTOR M2 3 7<u>3</u> Stewoo いて 53 ゴ 53 ź 2 3 22 3 3 BD- SW NJS GORIGUN Hains 80-SR 8-16 bathween COMPARACE ACOM SECOND SECOND 017 30- conferma lon 911-Q BD-SR 6-10 € 00-5R 0.01400 10 014 013 010 016 018 019 002 003 004 005 006 008 600 011 012 015 007 TEST 001

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JOB NAME: NS Savannah ADDRESS: Kames River FH. Eustrs

RMD LPA-1 FIELD FORM

HTEST (A. M. C. M. Durk, "WARNEROOM, "LAP DEATH, "MEAD II A LOCATION		COLOR	COLOR COMPONENT	SUBSTRATE	CONDITION	COMMENTS	1	TEST NO./RESULT(mg/cm2)	T(mg/cm2)
021 BD-5E 215 Lavaidor	μŊ	tar	Ĩ.	32	ź		2.0 -	021	-0.2
	57	tan	Vent	x			1.01	022	-0.1
023 8D-5R 6-53	5	SUC	non	SR			10.4	023	-0.4
024	57	צרינ	Nall Nall	SC			1.0.	024	-0.1
025	るろ	540	ころう	٢			۰ O.S	025	-0.5
026	МC	Blue	- Alicary	z			2.0.2	026	-0.2
027	ЪЧ	Bhe	مادور	z			- 0-	027	-0.1
028 BD - JE N/3 WANDER # 23	3	ied	FIC WOR	2			~ 0. 0	028	0.0
120 SO - 3K 6 - 37	ัก	Guer	L'all	SR			- 0.1	029	-0.1
030	52	Gum	Luail	25			- 0.0	030	0.0
031	ī	Gum	Door	٢			0.0	031	0.0
032 Hand reil an wall outsident 8.37	ЪЧ	Buck	وت	٤			0.6	032	0.6
033 BD - Elevertor Door mer BIT	L L	She	C.000	I			-0.2	033	-0.2
034 CD - CALUS Pass-ye ed. to Hono	22	Greens		٢			1.0-	034	-0.1
035	53	Green	1137	K			1.0	035	0.1
036	ŝ	Green		٢			, o	036	0.4
	وزالننا	3	لو يلاما	SR			- 0.0	037	0.0
038	р и2,	Black	vailing	T			0.0	038	0.0
039	Ē	Bue	Door chul. Panel	٢			- 0.1	039	~0.1
040 CO-SC CY	1 I	GALLY	Mall	SR	7		2.0	040	0.2

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DATE: 4-6.05 .0759

JOB# 65121 (2011)

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TEST NO./RESULT(mg/cm2) 641 042 043 044 1.0--0.7 0 0 1 0.0 -COMMENTS ę CONTRACTOR COLOR COMPONENT SUBSTRATE CONDITION 2 RMD LPA-1 FIELD FORM à Σ T I Lindou 000 Green Light Grun pipe 52.2 Erel Greet W3 6 F3 1117 ADDRESS: Vances Liver, FX EUSILS NTESTAR ADD - RAY COMPARADOM - NAMARA JOB NAME: NS Savannah 041 CD - 3R C.4 042 043 1.00

ç. 0.0 -0.2

044	Ч Х	ومدر	0000	I		- 0.0	044	0.0
045 CD - 52 C-4 Bathroom	3	3∎	1127	I		2.0 -	045	-0.2
	Celling	3	I beam	٤		1.0 -	046	-0.1
047 CD Hell outside SR- CH	22	1 clion	Share power elect. box	٢		۲.۲	047	2.4
048 Stainwell est to SR-CZ	3	Overya	overge Ruihing	٤		د	048	1.6
049	5 N	3	ורזמון	r		0.0	049	0.0
050	Ceiling	3	p;pe	Fibers lans		- 0.[	050	-0.1
051 CD-NS CURRIER ESIGE CA	Floor	Sher	Green Fluor	٤	-	- ٥. <i>د</i>	051	0.6
052	ר ג	Grun	Gun Lall	٤		7.0-	052	-0.2
053 · · · · · · · · · · · · · · · · · · ·	МЧ	Gwes G	culolus	r		3.9	053	3.9
054	J J	Blue	cloar	ĩ		0.0 0	054	0.0
055	<u>с</u> 4	Blue	lenel c	I		- , ,	055	-0,1
056 CD-56. CN	Ī	Gruns	וושרו	SR		0.3	056	0.3
057	ы М	Gum	ااهرا	SR		0.0	057	0.0
058	ร ว	Green	Pipe	٢		0.2	058	0.2
050	Prd Prd	Green	ind brid	z		-0.2	059	-0.2
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FIELD FORM **RMD LPA-1** 

ADDRESS: Names Liver, Ft. Evel's

JOB NAME: NS Savannah

TEST NO./RESULT(mg/cm2) 0.0 -0 -0.0 0.0 -0.2 2.8 0.2 0.1 0<u>-</u>1 0.1 0.1 0.0 2.6 0.4 3.4 0.1 0.1 2.1 8.1 075 076 078 079 072 062 063 065 068 069 070 061 064 066 067 5 073 074 110 0.0 0 0 1 0 L o ò o O 2.7 ō 3.4 -0--0.2 ų. Ģ 2.1 1.0 ---O -. 0 --0 3.1 2.8 0:1 ł COMMENTS COLOR COMPONENT SUBSTRATE CONDITION 2 Cal -Z T z I 1 ٤ 1 z I L I 1 I I L 1 ٤ Σ Duct Camier Lair back board Side Port Theam H beam Elevator Shaft flow Dow P.P.C. Yenow I beam すいの 3 6100L Peipe, ニュ Guen ciling d d Mell 5.00 Giver 5 وسع واستدر Sur Greek Set C Ś 760 Green Green 53 5 زدك Red Red いる **Ceiling** (eilin b COP (MC NEDWORROW) SUCCES REASON , THE PARTICIN S Celling 5 لمرامور - into Celling ی م 1001J т 3 **W**3 23 12 ろろ 53 3 53 3 CD - Mach , Lood. Parsage ad to C-11 CD - Machine Gar ģ 078 079 069 010 071 073 074 075 076 077 066 068 072 061 062 063 064 065 067 TEST

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- Lind J.J. 

JOB NAME: NS Savannah ADDRESS: Lames River, F. Evstis

RMD LPA-1 FIELD FORM

CD-Franseyung New C-22 CD-Franseyung New C-22 CD-5R C-20 Pretheroom CD-5R C-20 Pretheroom CD-5R C-20 CD-5R C-5R C-5R C-20 CD-5R C-5R C-20 CD-5R C-5R C-5R C-5R C-5R C-5R C-5R C-5R C	DB1 CD. Hoch Co Geller	081 CD. Hedi Contra Geller WI	3	L Lail	٢	えと		ר י. ל	081 -0.4	
		53	Court		٢		-	0.0	082	0.0
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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		<b>1</b> 2	3	pipe	いろう			1.0 -	094	-0.1
The CD-Source Sink LankerW1W1WallMailM-C.1096 $(1,1)$ W1 $(1,0)$ $(1,0)$ $(1,0)$ $(1,0)$ $(1,0)$ $(1,0)$ $(1,0)$ W1 $(1,0)$ $(1,0)$ $(1,0)$ $(1,0)$ $(1,0)$ $(2,0-)$ W1 $(1,0)$ $(1,0)$ $(1,0)$ $(1,0)$ $(2,0-)$ W1 $(1,0)$ $(1,0)$ $(1,0)$ $(1,0)$ $(2,0-)$ W1 $(1,0)$ $(1,0)$ $(1,0)$ $(1,0)$		2 M M	Grun		Ţ			-0.1	095	-0.1
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		ī	97S	Shuft	I			1.0 -	260	-0.1
CD-SE C-15 WI Guen Wall SP 000 -0.2 000 CD-SR V W3 Grun Wall SP V 0.1 100	<b>~</b>	アユ	- 3		Σ			3.6	098	3.6
CD-5R V W3 Grun Wall SR V 0.1 100	co - 50	Ī	Green	Wall	ŞĈ			-0.2	660	0.2
		<b>5</b> <b>1</b> <b>3</b>	Grun		SR	P		0.1	100	0.1

JOB NAME: NS Savannah ADDRESS: 7 Lancs RNA FH EUSAS

RMD LPA-1 FIELD FORM

POTESTURA ROLO, COMUNICACIÓN SOBOTICACO CUACIÓN	CURE TO LOCATION	COLOR	COLOR COMPONENT	SUBSTRATE CONDITION	CONDITION	COMMENTS		TEST NOJRESULT (mg/cm2)	T(mg/cm2)
101 3 - SC C-15	certing.	3	دماانم	56	2		101	101	-0.2
102		Guer	Lindor	I			0 0	102	0.0
103 CD - SR C.IS Bartinoon	<b>Wall</b>	3	لالمال	I			1.0.1	103	-0.1
×104	ь Ч	ב	Pipe	fiber Starso			- 0.2	104	-0.2
102 ·	لالتالي	3	НХ	I			- Ö ı	105	0.1
106	ددنانيه	2	deck	I			1.0.1	106	-0.1
+ 107 × 107	floor	3	base to and	seconi c			2.0-	107	-0.2
108 CD N/S Resonant new C-21	23	Green	Mail Mail	製工		олония и на оказания на оказания на оказания на оказани 	1.0.1	108	-0.2
109 × 1	アユ	Siner	רזמון	r			- 0.1	109	-0.1
110	ъЧ	Grun	dob	٤		ланинального мольки и и и и и и и и и и и и и и и и и и	~ 0.0 _	110	0.0
	ردزان	2	مذانكم	SR			- ċ ,	111	-0.1
112 0 C 0 C Com	м М	402	Lail	I			0.3	112	0.3
· 113	<b>ы</b> з	404	Mall	I			~· 0 ·	113	-0.1
<b>11</b>	floor	اردها	F1005	I			101	114	-0.2
115	ودتانيح	tor	di De	٤			2.0	115	0.2
-116	54	Giprees	door	٤			- 0.1	116	-0.1
117 CD-Main Lamely	2M	tar	201	I			- 0.0	117	0.0
118 	certing	404	らしても	Z			0.0	118	0.0
600 100 100 100 100 100 100 100 100 100		C.rry	100her	r			0.0	119	0.0
120	citi	3	A year	T	>	- In the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	-0-	120	0.1

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ADDRESS: Names River HA EUslis JOB NAME: N5 Savannah

RMD LPA-1 FIELD FORM

A TESTCA DW . BULLER BOOK SOUSSIONE CONTON	4169-001-000-00-001-		COLOR	H	SUBSTRATE	ONDITION	SUBSTRATE CONDITION PROFESSION COMMENTS		TEST NO./RESULT(mg/cm2)	_T(mg/cm2)
121 CD - Store Londing Paro-ye	Paroy	Rectur	3	11or	Ľ	ī		000	121	0.0
122 CD- From Foods	, erro	Fluor	Beelk	FLOOR	٢			- 0.3	122	-0.3
123 CD - UP Strine 11 Adj to France	1 Adj to Forces	3tair	Gurd	stain conity	I			1.0.1	123	-0.1
12124 State 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	· · · · · · · · · · · · · · · · · · ·	Stairs	(mm	Stain a	٢			1.0 -	124	-0.1
125		2	BNC	العدا	I			1 0.0	125	0.0
126		مناقنمه	The K	Black hand	I		<i>5</i>	0 9 1	126	0.0
127 DD - Acres Nom		PS computed yelles computed.	y cllw	Belaut.	Í			1.1	127	7.1
128	69	Turbine	Green	Tweine	r			1.6	128	1.6
129		Tubin	P.c.O .	Turbine	Ľ			- 0.1	129	-0.1
130		Floor	Red	flear	T			0.2	130	0.2
	·.a • *	Group Ctrol	350	Breec	Ľ			2.0-	131	-0.2
132		WY Grun	JARK	Wall	r			2.0-	132	-0.2
133 (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (133) (1		Graup Stri. Red		222	Contract			<b>ç</b> .0 -	133	0.3
134 × 134		Stringer R.S		State	I			10.1	134	-0.1
135		Julan	3		- 190 - MAN			- 0.2	135	-0.2
136	76	20100	(Jack	10200	I			0.1	136	0.1
137		Braun	Guerr 1	Guer Ercan	I			1.0 -	137	-0.1
138		Generator Rach		Generator	٢			<ul><li>0.0</li></ul>	138	0.0
139		₽¢	Pearly	ちろ	τ			0.0-	139	0.0
140	/ ***	W3	Green	hor	T	7		0.01	140	0.0

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Boelli Hitel

ADDRESS: Frames P. W. Fr. Evstis JOB NAME: NS Savannah

RMD LPA-1 FIELD FORM

- THESTOR (DW - COLOR OPPOSICINOM CHERRICH)		Component COLOR COMPONENT	COLOR		SUBSTRATE CONDITION	CONDITION	COMMENTS		TEST NO./RESULT(mg/cm2)	T(mg/cm2)
141 DD-Marchine Room	- - 	22	Guery Marl	וושרו	I	Ī	· · · ·	- 0.1	141	-0.1
142 14'D- Machim Room	\$		Black Wall	107	٤			.0.1	142	-0.1
143		Lesiter United	المالع	Vesse	٤			0.0	143	0.0
144	01.9	hand	Unamp	crampe vail	Í			5.9	144	5.9
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148		1: perfloot feed		Pipe	I			0.4	148	0.4
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JOB NAME: NS Savannah ADDRESS: James River F7 Evstis

RMD LPA-1 FIELD FORM

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			2	<b>&gt;</b>		NIST RIM	-	166	0.7
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171 · · · · · · · · · · · · · · · · · ·	53	South	Com wind	£			2.3	171	2.3
172 Loute Shap Roum	29	Green wall	1mail	I			1.0.	172	-0.1
173	57	SALAN	Wall	٢			- 0.2	173	-0.2
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175	to og	-	Pole	I			0.0	175	0.0
176		Green	floor	I			- 0.2	176	-0.2
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RMD LPA-1 FIELD FORM

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FIELD FORM **RMD LPA-1** 

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## RMD LPA-1 FIELD FORM

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JOB NAME: NS Savannah

RMD LPA-1 FIELD FORM

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RMD LPA-1 FIELD FORM

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NY ELAP	AHA 100470 15-Apr-05 1 ^a Revision	Page I of I	ents	Received Time Apr. 15. 2:58PM	tion to clients, the public and these Laboratorics, licity matter without prior written authorization tories, we expressly disclaim any knowledge and requested by the client. NVLAP Accreditation duct certificution, approval, or endorsement by All rights reserred. AMA Analytical Services, Inc.
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	131706 4/11/2005 Patrick Dincher 4/12/2005		Final Result	3.2 %Pb 0.71 %Pb 0.334 %Pb 0.3 %Pb 3.9 %Pb 3.9 %Pb 3.9 %Pb analytical results of quality samples. Technical Manager: G E	thual protection to c ising or publicity m ese Laboratories, v es otherwise reque so otherwise Product ce All righ
SISAT	Chain Of Custody: Dale Submitted: Person Submitting: Date Analyzed:	f Atomic Absorption Analysis for Lead	Reporting Linúl	0.01       %Pb       3.2       %Pb         0.01       %Pb       0.71       %Pb         0.01       %Pb       0.034       %Pb         0.01       %Pb       0.334       %Pb         0.01       %Pb       0.34       %Pb         0.01       %Pb       0.39       %Pb         Seee QC Summary for analytical results of quality control samples       associated with these samples.         associated with these samples.       Technical Manager: G Edward Carney	This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, from us. Sample types, locations and collection protoceds are based upon the information provided by the cprism submitting them und, unless callected by personnel of these Laboratories, we expressly disclaim may knowledge and liability for the accuracy and collection protoceds are based upon the information provided by the persons submitting them und, unless callected by personnel of these Laboratories, we expressly disclaim may knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarted in accordance with the appropriate regulatory guidelines, unless of this information. Residual sample will be discarted in accordance with the appropriate regulatory guidelines, unless of the federal Government.
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-	Job Name: Job Locatian: Job Numher: P.O. Number;	Summary o	Sample Type	Faint Chip Paint Chip	d and is not necessarily indiculive of the client to whom it is addressed and based upon the information provide in. Residual sumple material will be in. Residual sumple material will be in. Residual sumple material will be in. Residual sumple intervent in a subsection of the subsection of the subsection in a subsection of the subsection of the subsection in a subsection of the subsection of the subsection in a subsection of the subsection of the subsection is a subsection of the subsection of the subsection of the subsection is a subsection of the subsection of the subsection of the subsection is a subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the subsection of the
AMA Analytical Services, Inc.	& Analysis, Inc shton Road 21076		Analysis Type	0531896       051210406 01P       Flame       Paint Chip         0531897       051210406 03P       Flame       Paint Chip         0531898       051210406 03P       Flame       Paint Chip         0531899       051210406 03P       Flame       Paint Chip         0531899       051210406 05P       Flame       Paint Chip         0531900       051210406 05P       Flame       Paint Chip         Analysis Method For Furnace:       Air, Wipes, Paints, and Soil/Soilds: EPA 600/R-93/200(R       Paint Chip         All Parent Paints       mg/Kg = parts per Inliton       uppm       by weight       mg/L = parts per Inliton         Note:       All results       mot eve soignificant digits. Any additional digits shown       Note:       Al	<ul> <li>investigated and is not n isive use of the client to will revote are based upon is information. Residual is information. Residual sumples and transmissio ernment.</li> </ul>
<b>Hytical Se</b> # New University	Aerosol Monitoring & Analysis, Inc PO Box 646, 1331 Ashton Road Hanover, Maryland 21076	Gary Urban	Client Sample Number	(0531896(0531896(0531897(0531897(0531897(0531897(0531898)(0531898)(0531898)(0531898)(0531210406 04P)Flame(0531890(0531210406 03P)(0531200406 03P)Flame(0531200406 03P)Flame(0531900(0531200406 03P)(0531200406 03P)FlameAnalysisAnalysisAnalysisand Soil/SoilAnalysisMethod for Flame: Air, Wipes, Paints, and Soil/SoAnalysisMethod for Flame: Air, Wipes, Paints, and Soil/SoAnalysisAnalysisAnalysisAnalysisMethod for Flame: Air, Wipes, Paints, and Soil/SoAnalysisMethod for Flame: Air, Wipes, Paints, and Soil/SoNA = Not Applicablemg/Kg = parts per million (ppm)%Fb = percent lead by weightug = microgramsuNote: Allsamples were received in good condition unless oNote: All results have two significant digits. Any additional is fould not be considered when interpreting the result.Air and Wipe results are not corrected for any blank results	the sample, or sample, d accepted for the exclontion and collection y and completeness of hulk ght nucroscopy of bulk nev of the Federal Government
	Client: Address:	Attention:	AMA Sample Number	0531896051210405318970512104053189705121040531898051210405318990512104053190005121040531900051210405319000512104053190005121040531900051210405319000512104053190005121040531900051210405319000512104053190005121040512104Method For Furnace:N/A = Not Applicablemg%Pb = percent lead by weightNote: All results have two significableNote: All results have two significableNote: All results have two significableAir and Wipe results are not co	This report applies only to the sample, or samples, investigated and is not necessarily indicutive of this report is submitted and accepted for the exclusive use of the client to whom it is addressed and from us. Sample types, locations and collection profocols are based upon the information provid liability for the accuracy and completeness of this information. Residual sample material will be NVLAP, NIST, or any agency of the Federal Government.
⊺ • di	6692 -	894	(INE)	SSOLVAS LEDIJELAH HMH 910:50	

<b>N</b>	×					Page 1 of 1
	а. Т.	Lead Pain	Paint Sampling Survey Sheet	vey Sheet		
Date Collected		April 6,2005 Address: James 2	James River Reserve Fleet	Fleet	Company:	AMA/ERM
Job Number	05121	Furt Er	Fort Ewohis, VA		Telephone No.:	( 410 ) 684 - 3327
Job Site	NS Savannah	Contact Person:	Gary Urban / Breat Williams	Williams	Samples Taken By:	By: Rob Sheennagel
					Chain of Custody #:	y#: 131706
Sample	Paint Color	Jocation	Component	Substrate	Condition of the Material	Results Photo Conments
1040P	Kes/ Orange	Decle A - Conidon outside	H 11811	Metal	□ Good Kair	□ Yes #
05121 0406 020	White	Navigation Bridge Deve outside of P.10t House	Exterior well P Pilot Howoe	Metel	□ Good □ Fair ★Poor	# No
05121 0406 03P	Lubite	Wall 1 & Venadar Promunde Deuk	Wall 1	Metal	□ Good □ Fair ★ Poor	Yes   #   No
046 12120	Bue	BDeck- Cent. Meas Room	Wall 3	Metal	□ Good □ Fair <b>X</b> Poor	TYes #
92121 0406 1250	Red	B Deck- Caugo Hold #4	Floor	Metal	□ Good ★ Fair □ Poor	□Yes # □No
					<ul> <li>Good</li> <li>Fair</li> <li>Poor</li> </ul>	□Yes # □No
(Revised 09/01)						

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(Please Refer To This 131706 Number For Inquires) 131706	<u> </u>	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	MATRIX     WATER     CLIENT CONTACT       AIR     BULK     WIPE     AND       AIR     DULK     MIPE     (LABORATORY STAFF ONLY)	Date/Time: Contact: By:	Date/Time: Contact: By:	Sign:
CHAIN	4110 6.8° ~3.8 Reporting Informa	TEM Bulk TEM Bulk DELA DELA DOunt TEM Water DOunt DOunt DOunt DOunt DOunt DELA	UME WIPE ANALYSIS ERS) AREA TEM PCM PLM LEAD OTHER			100 @ ROVia: MEN By (Prim)
AMA Analytical Services, Inc. AIHA (#8863) NVLAP (#1143) NY ELAP (10920) 4475 Forbes Blvd. • Lanham, MD 20706 (301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643 www.amalab.com		Date & Linte Results Kequitted:@ cell # <b>Asbestos Analysis</b> PCM Air – Please Indicate Filter Type: PC MCE Porosityin a 25mm 37mm O NIOSH 7400(QTY) TEM Air – Please Indicate Filter Type: PC MCE Porosityin a 25mm 37mm O AHERA(QTY) O NIOSH 7402(QTY) O NIOSH 7402(QTY) D Other (specify)(QTY) D EPA Point Count(QTY) O NY State Friable(QTY) O Other (specify)(QTY) O Other (specify)(QTY) O Other (specify)(QTY) O Other (specify)(QTY)	ANALYSIS INF	05131040605 P		LABORATORY STAFF ONLY: (CUSTODY)         1. Date/Time RCVD:/         2. Date/Time Analyzed:/         3. Results Reported To:         4. Comments:

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Air and Wipe results are not corrected for any blank results	Note: All samples were received in good condition unless otherwise noted Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.	%Pb = percent lead by weight	Anarysis mennod non noninace. An, writes, name, and som somes increased on the market market is the market. Sint some increased on the market is the market is the market in the market is the market is the market is the market in the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market is the market	Analysis Method For Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-31118 Analysis Method For Furness: Air Wines, Points, and Soil/Solids : EPA 600/P.03/200(M)-7421; Water: SM 3:	0535029	0535028	0535027	0535026	AMA Sample Number		Attention: J		*	Address: 2	Client: E	AMA ANOIQUICOI Services, INC.	
are not corrected for	ere received in good of two significant digits ered when interpretire	by weight ug = n	rumace. All, vypes ma/Ka = parts	Flame: Air, Wipes, P	RC - Second Cont.	RC - Reactor	RC - Cooling Tanks	RC-Pressure	Client Sample Number		Jeff Flanzenbaum		Annapolis, Maryland 21401	200 Harry S. Truman Drive, Suite 400	Environmental Resource Management, Inc.	Anoiycicol Dervices, in A Specialized Environmental Laboratory	
any blank results	condition unless othe s. Any additional dig ng the result.	ug = micrograms ug/	; per million (ppm) by	aints, and Soil/Solid	Flame	Flame	Flame	Flame	Analysis Type				21401	rive, Suite 400	e Management, Inc.	<b>VICES, INC.</b> tal Laboratory	
	rwise noted. its shown	ug/L = parts per billion (ppb)	ice: אוו, wipes, rainits, and solveonids : ברא סטעות-פאזבטע(או)-ויאבו, wat marKa = parts per million (pom) by weight marL = parts per million (pom)	s: EPA 600/R-93/20	Paint Chip	Paint Chip	Paint Chip	Paint Chip	Sample Type	Summary of Atomic Absorption		P.O. Number:	Job Number:	Job Location:	Job Name:	CER	
		(ddd)	arts per million (ppn	0(M)-7420; Water:	***	****	****	***	Air Volume (L)	of Atomic A		Not Provided	0028178	Fort Eustis, VA	NS Savannah	CERTIFICATE OF ANA	
Ver /1	2	2	n) aler, om-orrod	SM-3111B	N/A	N/A	N/A	N/A	Area Wiped (ft ² )							OF ANAL	
111				See QC Summary for analytical results of quality control samples associated with these samples.	0.01 %Pb	0.01 %Pb	0.01 %Pb	0.01 %Pb	Reporting Limit	Analysis for Lead		Date Analyzed:	Person Submitting:	Date Submitted:	Chain Of Custody:	LYSIS	
				ilytical results of quality	0.64 %Pb	4.9 %Pb	0.95 %РЬ	0.23 %Pb	Final Result			4/29/2005	ng: Brent Williams	4/29/2005	<b>iy:</b> 127633		
				y control samples					Comments			<b>Report Date:</b>					
									18	Page 1 of 1		29-Лрг-05				NY ELAP	2 ' )

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This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by All rights reserved. AMA Analytical Services, Inc.

<u>An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory</u> 4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643



Appendix N

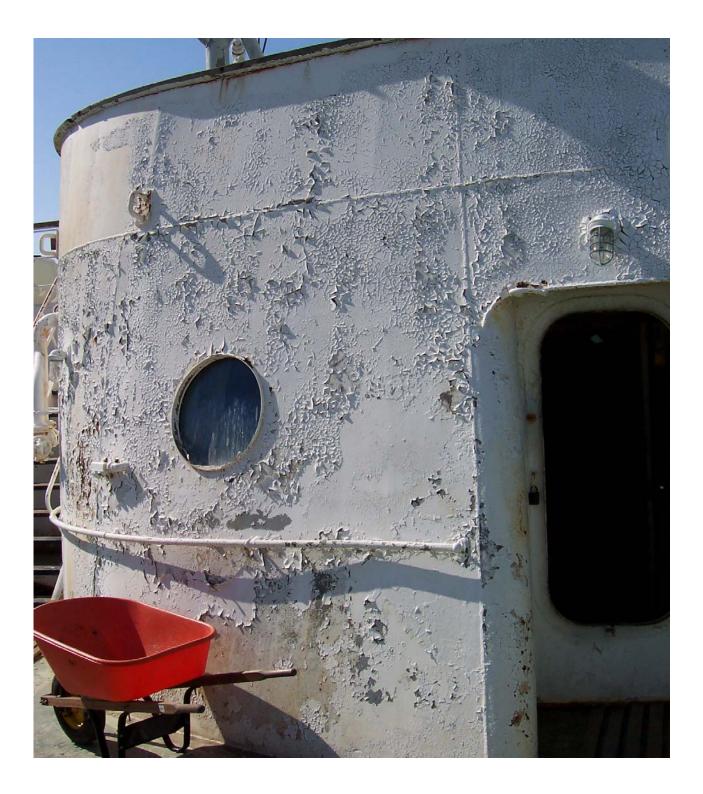
NSS Characterization Report September 22, 2005 Revision 0 Page 1 of 34

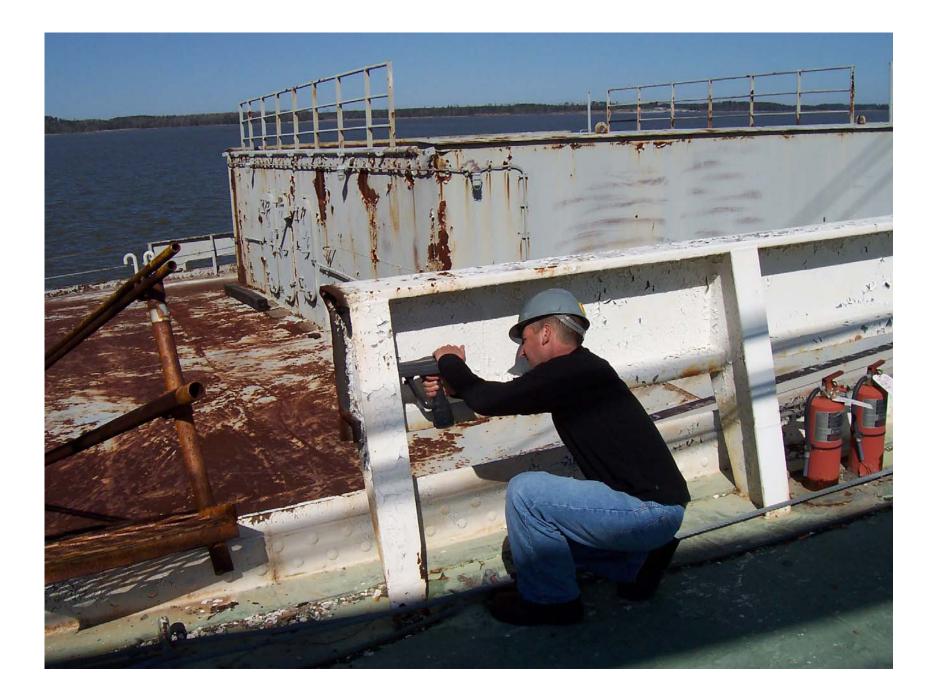
## Appendix N Lead-Based Paint Survey Photo Log







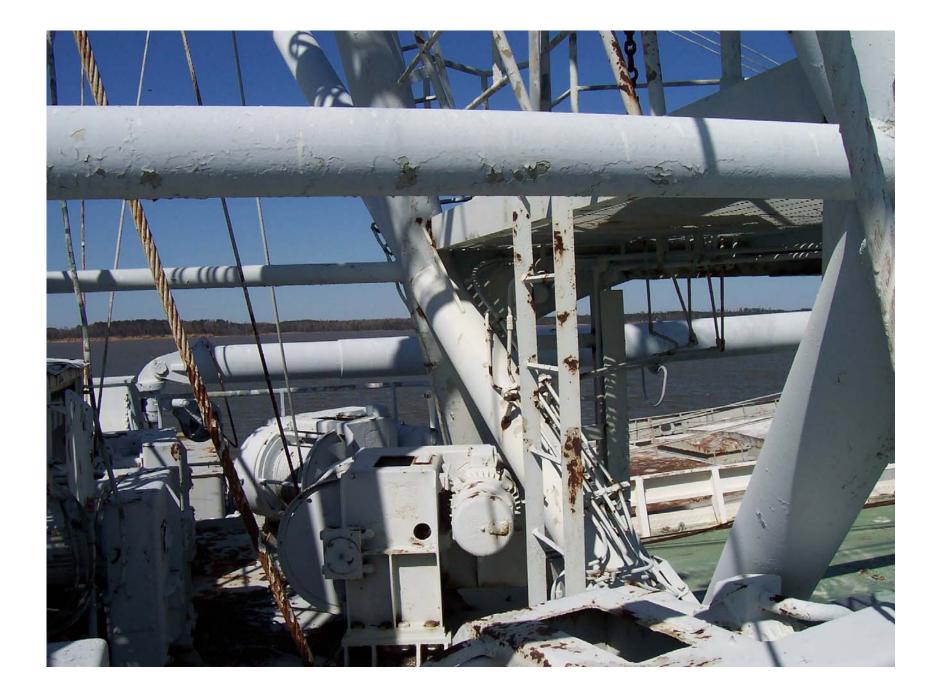




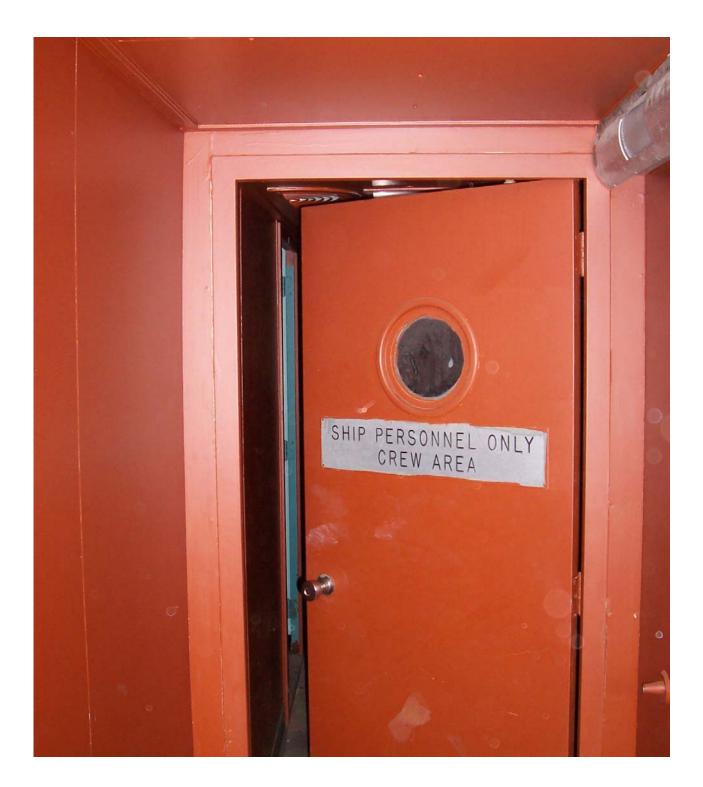






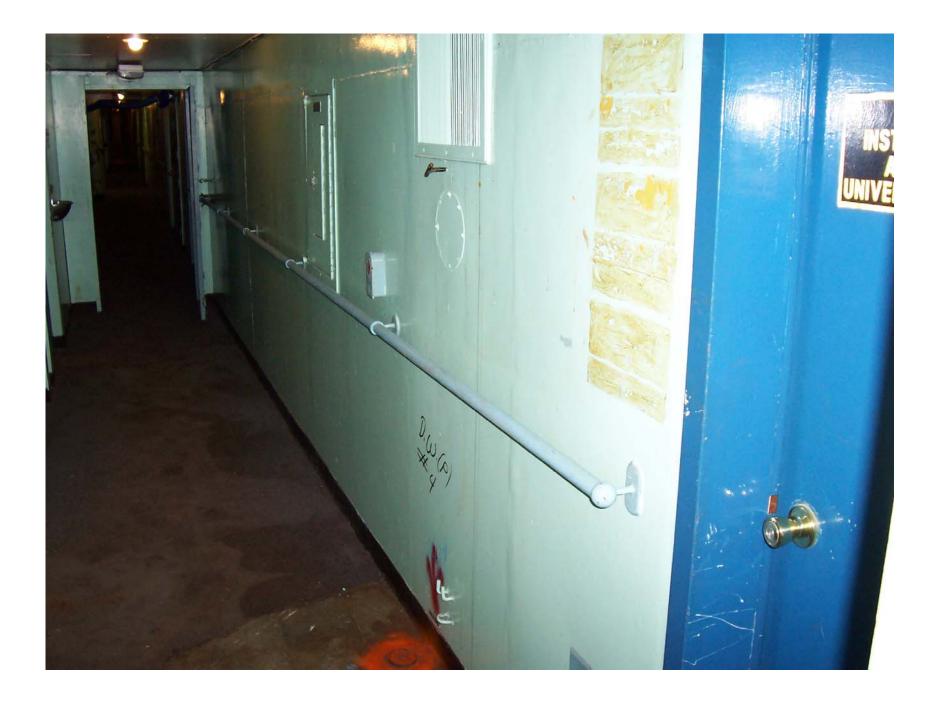












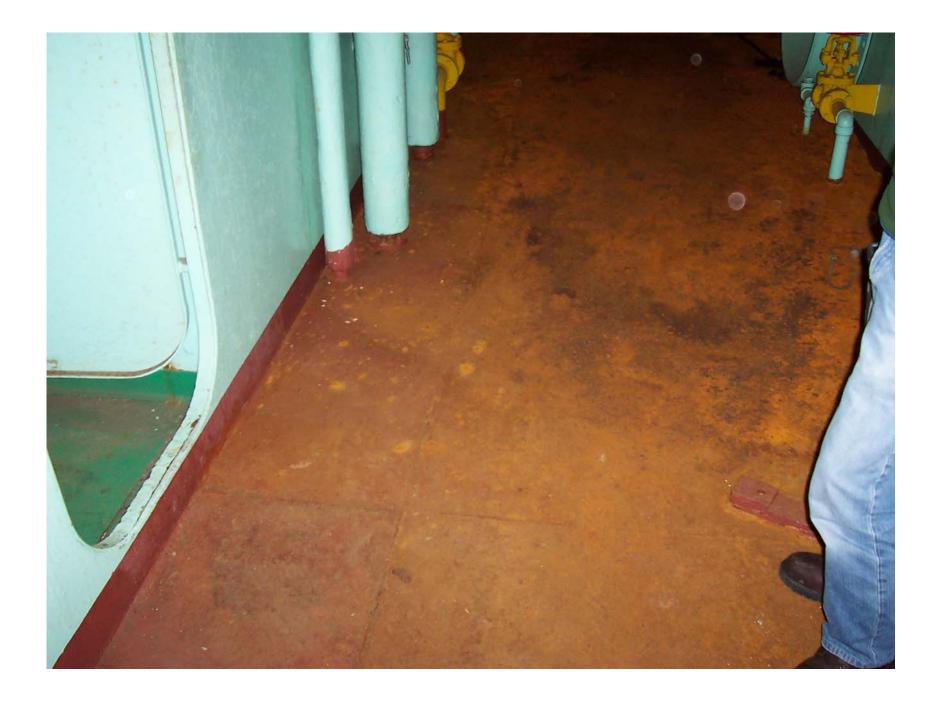








































Appendix O

## Appendix O Radiological Spaces Liquid Survey Results



### **FROEHLING & ROBERTSON, INC**

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS ENGINEERS • LABORATORIES **"OVER ONE HUNDRED YEARS OF SERVICE"** 

#### **CERTIFICATE OF ANALYSIS**

May 17, 2005 0504550 LAB#: ERM **CLIENT:** 200 Harry S. Truman Parkway, Suite 400 Annapolis MD, 21401 **Brent Williams** NS Savannah **PROJECT:** 0028178 **PROJECT NO.: Brent Williams SAMPLED BY:** 04/26/05 **RECEIVED:** 

Results to follow.

#### Audrey Brubeck Manager Analytical Laboratory Services

HEADQUARTERS: 3015 DUMBARTON ROAD • BOX 27524 • RICHMOND, VA 23261-7524 TELEPHONE (804) 264-2701 • FAX (804) 264-1202 • www.FandR.com

BRANCHES: ASHEVILLE, NC • BALTIMORE, MD • CHARLOTTE, NC • CHESAPEAKE, VA CROZET, VA • FAYETTEVILLE, NC • FREDERICKSBURG, VA GREENVILLE, SC • HICKORY, NC • RALEIGH, NC • ROANOKE, VA • STERLING, VA CERTIFICATIONS

VIRGINIA DRINKING WATER - 00150 NORTH CAROLINA DENR - 432 SOUTH CAROLINA DHEC- 93010001 & 93010 MARYLAND DRINKING WATER - 279

Page 1 of 9



Lab ID:
Client ID:
Sampled Date/Time:

		Quant						
Analyte	Result	Limit	Units	Prepared	Analyzed	Method	Analyst	Notes
Metals								
Silver	BQL	0.02	mg/L	5/3/05 10:00	5/4/05 18:37	SW846/6010	TG	
Arsenic	BQL	0.01	"	5/3/05 10:00	5/9/05 13:46	"	TG	
Barium	BQL	0.01	"	5/3/05 10:00	5/9/05 13:46	"	TG	
Cadmium	0.02	0.01	"	5/3/05 10:00	5/9/05 13:46	"	TG	
Chromium	0.3	0.01	"	5/3/05 10:00	5/9/05 13:46	"	TG	
Mercury	0.00027	0.0002	"	5/3/05 10:01	5/3/05 16:23	SW846/7470 A	JLW	
Lead	0.5	0.01	"	5/3/05 10:00	5/9/05 13:46	SW846/6010	TG	
Selenium	BQL	0.01	"	5/3/05 10:00	5/9/05 13:46	"	TG	
Semivolatile Organic Compounds								
Acenaphthene	BQL	28	μg/L	4/27/05 15:00	5/13/05 20:02	SW846/8270C	JHV	
Acenaphthylene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Aniline	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Anthracene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Benzo(a)anthracene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Benzo(b)fluoranthene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Benzo(k)fluoranthene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Benzo(g,h,i)perylene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Benzo(a)pyrene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Bis(2-chloroethoxy)methane	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Bis(2-chloroethyl)ether	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Bis(2-chloroisopropyl)ether	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
4-Bromophenylphenylether	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Bis(2-ethylhexyl)phthalate	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Butyl benzyl phthalate	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
4-Chloroaniline	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
4-Chloro-3-methylphenol	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2-Chloronaphthalene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2-Chlorophenol	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
4-Chlorophenylphenylether	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Chrysene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Dibenz(a,h)anthracene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Dibenzofuran	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Di-n-butyl phthalate	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	



Lab ID:	
Client ID:	
Sampled Date/Time:	

		Quant						
Analyte	Result	Limit	Units	Prepared	Analyzed	Method	Analyst	Notes
Semivolatile Organic Compounds								
1,2-Dichlorobenzene	BQL	28	μg/L	4/27/05 15:00	5/13/05 20:02	SW846/8270C	JHV	
1,3-Dichlorobenzene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
1,4-Dichlorobenzene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
3,3'-Dichlorobenzidine	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2,4-Dichlorophenol	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Diethyl phthalate	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2,4-Dimethylphenol	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Dimethyl phthalate	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
4,6-Dinitro-2-methylphenol	BQL	111	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2,4-Dinitrophenol	BQL	111	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2,4-Dinitrotoluene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2,6-Dinitrotoluene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Di-n-octyl phthalate	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Fluoranthene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Fluorene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Hexachlorobenzene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Hexachlorobutadiene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Hexachlorocyclopentadiene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Hexachloroethane	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Indeno(1,2,3-cd)pyrene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Isophorone	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2-Methylnaphthalene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2-Methylphenol	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
4-Methylphenol	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Napthalene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2-Nitroaniline	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
3-Nitroaniline	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
4-Nitroaniline	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Nitrobenzene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2-Nitrophenol	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
4-Nitrophenol	BQL	111	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
N-Nitrosodimethylamine	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
N-Nitrosodiphenylamine	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
N-Nitroso-di-n-propylamine	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	



Lab ID:	
Client ID:	
Sampled Date/Time:	

		Quant						
Analyte	Result	Limit	Units	Prepared	Analyzed	Method	Analyst	Notes
Semivolatile Organic Compounds								
Pentachlorophenol	BQL	111	μg/L	4/27/05 15:00	5/13/05 20:02	SW846/8270C	JHV	
Phenanthrene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Phenol	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Pyrene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
1,2,4-Trichlorobenzene	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2,4,5-Trichlorophenol	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
2,4,6-Trichlorophenol	BQL	28	"	4/27/05 15:00	5/13/05 20:02	"	JHV	
Volatile Organic Compounds								
Benzene	BQL	5	μg/L	5/2/05 10:37	5/3/05 1:57	SW846/8260B	SS	
Bromobenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Bromochloromethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Bromodichloromethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Bromoform	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Bromomethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
n-Butylbenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
sec-Butylbenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
tert-Butylbenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Carbon tetrachloride	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Chlorobenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Chloroethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Chloroform	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Chloromethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
2-Chlorotoluene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
4-Chlorotoluene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Dibromochloromethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,2-Dibromo-3-chloropropane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,2-Dibromoethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Dibromomethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,2-Dichlorobenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,3-Dichlorobenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,4-Dichlorobenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Dichlorodifluoromethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,1-Dichloroethane	BQL	5		5/2/05 10:37	5/3/05 1:57	"	SS	



Lab ID:	
Client ID:	
Sampled Date/Time:	

		Quant						
Analyte	Result	Limit	Units	Prepared	Analyzed	Method	Analyst	Notes
Volatile Organic Compounds								
1,2-Dichloroethane	BQL	5	μg/L	5/2/05 10:37	5/3/05 1:57	SW846/8260B	SS	
1,1-Dichloroethene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
cis-1,2-Dichloroethene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
trans-1,2-Dichloroethene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,2-Dichloropropane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,3-Dichloropropane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
2,2-Dichloropropane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,1-Dichloropropene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Ethylbenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Hexachlorobutadiene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Isopropylbenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
p-Isopropyltoluene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Methylene chloride	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Naphthalene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
n-Propylbenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Styrene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,1,1,2-Tetrachloroethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,1,2,2-Tetrachloroethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Tetrachloroethene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Toluene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,2,3-Trichlorobenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,2,4-Trichlorobenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,1,1-Trichloroethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,1,2-Trichloroethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Trichloroethene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Trichlorofluoromethane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,2,3-Trichloropropane	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,2,4-Trimethylbenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
1,3,5-Trimethylbenzene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
Vinyl chloride	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
m,p-Xylene	BQL	10	"	5/2/05 10:37	5/3/05 1:57	"	SS	
o-Xylene	BQL	5	"	5/2/05 10:37	5/3/05 1:57	"	SS	
	-							



# Lab ID:0504550-02 (Oil)Client ID:Stabilizer hyd. oilSampled Date/Time:4/25/05 13:15

Analyte	Result	Quant Limit	Units	Prepared	Analyzed	Method	Analyst	Notes
PCBs - Polychlorinated Biphenyls								
Aroclor 1016	28	1	mg/kg	5/9/05 15:00	5/10/05 10:22	SW846/8082	CLA	
Aroclor 1221	BQL	1	"	5/9/05 15:00	5/10/05 10:22	"	CLA	
Aroclor 1232	BQL	1	"	5/9/05 15:00	5/10/05 10:22	"	CLA	
Aroclor 1242	BQL	1	"	5/9/05 15:00	5/10/05 10:22	"	CLA	
Aroclor 1248	BQL	1	"	5/9/05 15:00	5/10/05 10:22	"	CLA	
Aroclor 1254	BQL	1	"	5/9/05 15:00	5/10/05 10:22	"	CLA	
Aroclor 1260	12	1	"	5/9/05 15:00	5/10/05 10:22	"	CLA	
Subcontracted Analysis (Air, Water & Soil,	Inc.)							
Total Halogens	73	10	mg/kg	5/5/05 0:00	5/5/05 0:00	SW846/9076	sub	



# Lab ID:0504550-03 (Oil)Client ID:Stabilizer lube oilSampled Date/Time:4/25/05 13:40

		Quant						
Analyte	Result	Limit	Units	Prepared	Analyzed	Method	Analyst	Notes
PCBs - Polychlorinated Biphenyls								
Aroclor 1016	BQL	1	mg/kg	5/9/05 15:00	5/10/05 10:49	SW846/8082	CLA	
Aroclor 1221	BQL	1	"	5/9/05 15:00	5/10/05 10:49	"	CLA	
Aroclor 1232	BQL	1	"	5/9/05 15:00	5/10/05 10:49	"	CLA	
Aroclor 1242	BQL	1	"	5/9/05 15:00	5/10/05 10:49	"	CLA	
Aroclor 1248	BQL	1	"	5/9/05 15:00	5/10/05 10:49	"	CLA	
Aroclor 1254	BQL	1	"	5/9/05 15:00	5/10/05 10:49	"	CLA	
Aroclor 1260	BQL	1	"	5/9/05 15:00	5/10/05 10:49	"	CLA	
Subcontracted Analysis (Air, Water & Soil,	Inc.)							
Total Halogens	BQL	10	mg/kg	5/5/05 0:00	5/5/05 0:00	SW846/9076	sub	



# Lab ID:0504550-04 (Water)Client ID:Trip BlankSampled Date/Time:4/25/05 0:00

		Quant						
Analyte	Result	Limit	Units	Prepared	Analyzed	Method	Analyst	Note
Volatile Organic Compounds								
Benzene	BQL	5	μg/L	5/2/05 10:37	5/2/05 19:48	SW846/8260B	SS	
Bromobenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Bromochloromethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Bromodichloromethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Bromoform	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Bromomethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
n-Butylbenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
sec-Butylbenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
tert-Butylbenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Carbon tetrachloride	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Chlorobenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Chloroethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Chloroform	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Chloromethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
2-Chlorotoluene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
4-Chlorotoluene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Dibromochloromethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,2-Dibromo-3-chloropropane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,2-Dibromoethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Dibromomethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,2-Dichlorobenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,3-Dichlorobenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Dichlorodifluoromethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,4-Dichlorobenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,1-Dichloroethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,2-Dichloroethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,1-Dichloroethene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
cis-1,2-Dichloroethene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
trans-1,2-Dichloroethene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,2-Dichloropropane	BQL	5	"	5/2/05 10:37	5/2/05 19:48		SS	
1,3-Dichloropropane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
2,2-Dichloropropane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,1-Dichloropropene	BQL	5	"	5/2/05 10:37	5/2/05 19:48		SS	
Ethylbenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	



# Lab ID:0504550-04 (Water)Client ID:Trip BlankSampled Date/Time:4/25/05 0:00

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#

Does not pass acceptance criteria.

	D 14	Quant	TT '4	D I				<b>N</b> T (
Analyte	Result	Limit	Units	Prepared	Analyzed	Method	Analyst	Notes
Volatile Organic Compounds								
Hexachlorobutadiene	BQL	5	μg/L	5/2/05 10:37	5/2/05 19:48	SW846/8260B	SS	
Isopropylbenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
p-Isopropyltoluene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Methylene chloride	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Naphthalene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
n-Propylbenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Styrene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,1,1,2-Tetrachloroethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,1,2,2-Tetrachloroethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Tetrachloroethene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Toluene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,2,3-Trichlorobenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,2,4-Trichlorobenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,1,1-Trichloroethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,1,2-Trichloroethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Trichloroethene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Trichlorofluoromethane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,2,3-Trichloropropane	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,2,4-Trimethylbenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
1,3,5-Trimethylbenzene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
Vinyl chloride	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	
m,p-Xylene	BQL	10	"	5/2/05 10:37	5/2/05 19:48	"	SS	
o-Xylene	BQL	5	"	5/2/05 10:37	5/2/05 19:48	"	SS	

#### **Notes and Definitions**

mg/L =	milligrams per Liter	mg/kg =	milligrams per kilogram	su =	standard	units
$\mu g/L =$	micrograms per Liter	ppm =	parts per million	NTU =	Nephe	lometric Turbidity Units
pCi/L =	picocuries per Liter	CFU/mL =	Colony forming units per milliliter	MPN/1	00mL =	Most Probable Number per 100 milliliters
BQL =	Below the Quantitation Limit					



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#### **CERTIFICATE OF ANALYSIS**

May 17, 2005		Page
LAB#:	0504527	
CLIENT:	ERM 200 Harry S. Truman Parkway, Suite 400 Annapolis MD, 21401 Brent Williams	
PROJECT:	NS Savannah	

PROJECT:NS SavannanPROJECT NO.:0028178SAMPLED BY:Brent WilliamsRECEIVED:04/23/05

PARAMETER	PREP DATE/TIME	ANALYSIS DATE/TIME		METHOD	ANALYST
PCBs	5/9/05 15:00	5/10/05 9:29	5/14/05 12:35	SW846/8082	CLA
Total Halogens	4/27/05 9:30	4/27/05 9:30		SW846/9076	sub

LAB #	0504527-01	0504527-02	-	-		
SAMPLE ID	sec.cont. sump (0)	Pri. contain (0)	-	-		
DATE/TIME	04/15/05	04/15/05	-	-	Quant	
MATRIX	Oil	Oil	-	-	Limit:	Units
PCBs - Polychlorinated Bipher	ıyls (Oil)					
Aroclor 1016	76	1180	-	-	1	mg/kg
Aroclor 1221	<1	<1	-	-	1	mg/kg
Aroclor 1232	<1	<1	-	-	1	mg/kg
Aroclor 1242	<1	<1	-	-	1	mg/kg
Aroclor 1248	<1	<1	-	-	1	mg/kg
Aroclor 1254	<1	<1	-	-	1	mg/kg
Aroclor 1260	197	430	-	-	1	mg/kg
Subcontracted Analysis (Prim	ary Laboratories, Inc.) ((	Dil)				
Total Halogens	107	242	-	-	10	mg/kg

#### **Notes and Definitions**

mg/L = milligrams per Liter	mg/kg = milligrams per kilogram	su = standard units
$\mu$ g/L = micrograms per Liter	ppm = parts per million	NTU = Nephelometric Turbidity Units
BQL = Below the Quantitation Limit	CFU/mL = Colony forming units per milliliter	MPN/100 mL = Most Probable Number per 100 milliliters

#### Audrey Brubeck Manager Analytical Laboratory Services

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Page 1 of 1



Appendix P

# APPENDIX P SERAT REPORT

# Radiological Sampling and Gamma Scans Aboard the N/S SAVANNAH Conducted for the U.S. Maritime Administration April 2005

Keith Welch, Erik Abkemeier, Zachary Edwards Jefferson Lab, 12000 Jefferson Ave. Newport News, VA 23606

# Background

Thomas Jefferson National Accelerator Facility (Jefferson Lab) has entered into an agreement with the U.S. Maritime Administration (MARAD) to provide support for the Savannah Emergency Response Assessment Team (SERAT) efforts related to N/S SAVANNAH in the event of an incident that might have radiological implications (Reimbursable Agreement #MA-5-A04, to fund Work for Others Project SURA 2004W007). The lab's role is advisory, related to the health physics concerns associated with initial response activities in the event of an emergency.

Commensurate with its role of health physics support for SERAT efforts, Jefferson Lab conducted a series of measurements to confirm the primary nuclides of concern remaining in the reactor systems of the N/S SAVANNAH. This report details the findings of the measurements.

# Acknowledgements

Jefferson Lab was afforded access to the primary plant areas of Savannah in conjunction with work being conducted by WPI. WPI performed radiological and environmental assessments aboard N/S SAVANNAH which required opening all reactor-related spaces. The assessment included a breach of the primary reactor cooling water system, in which samples were taken by WPI. WPI provided various samples to Jefferson Lab for analysis. Jefferson Lab acknowledges the kind assistance of WPI in obtaining data for this report.



## Introduction

The purpose of conducting the measurements described in this report is to obtain a measurement-based estimate of the quantity and distribution of radionuclides in reactor primary systems aboard the N/S SAVANNAH. The specific focus of this assessment is radioactivity in residual liquids and transferable contamination that may be subject to a spill or spread in the event of damage to the ship or flooding of compartments containing reactor systems. In the event of an emergency, knowledge of the reactor plant nuclide inventory is important in facilitating emergency response efforts in which Jefferson Lab may be involved. Previous calculations have been conducted to estimate volumetric nuclide content in the reactor vessel⁽¹⁾. This report does not address volumetric activation (neutron induced activity), but rather the distribution of internal surface contamination and contaminated liquids within piping and components of the primary system. The quantity of radioactivity deposited in the system as contamination is very small compared to the total activity in reactor vessel components.

Internal surface contamination content has been estimated previously, but the present assessment effort provided a rare opportunity to reevaluate radioactivity estimates based on a combination of measurement methods.

#### General Approach

Two methods were used to assess the residual radioactivity in the reactor systems. One method was to analyze samples from within the primary system. The second method was by direct scans with portable gamma spectroscopy equipment.

Samples (smears and liquid) taken from the primary system and within the reactor containment were quantitatively analyzed by high-resolution gamma spectroscopy at the Jefferson Lab Radiation Control Group (RCG) radioanalytical lab for presence and amounts of gamma-emitting radionuclides.

The direct gamma scan survey is qualitative in nature, its goal being to gather "snapshots" of the radiation field around various system components to further enhance the understanding of primary system nuclide content.



#### Equipment and Measurement Techniques

Measurements of sample media were made with a Canberra Industries ultrahigh-purity, coaxial germanium detector (relative efficiency, ~20%) with associated NIM electronics, operated via the Canberra Genie[®] software package. The system is energy- and efficiency-calibrated for a number of sample geometries annually and receives daily quality assurance checks according to Jefferson Lab RCG procedures. Jefferson Lab also participates in the U.S. Department of Energy Mixed Analyte Performance Evaluation Program (MAPEP) for measurement quality assurance.

Onboard gamma spectra were collected primarily with a Berkeley Nucleonics Corporation Model SAM-935[®] portable surveillance and measurement system, consisting of a 3 x 3 NaI(TI) detector coupled to the base unit electronics. The collected spectra can be analyzed with built-in software or uploaded to a PC for analysis using third-party software. A few spectra were also collected with a portable high-resolution germanium detector coupled to a Canberra Inspector[®] electronics package and analyzed using the Genie[®] software. This system proved to be difficult to manage in the shipboard environment due to its bulkiness and required a lengthy stabilization period each time the detector was shut down for movement and subsequently restarted.

Energy calibration of the SAM-935 is initially conducted by the factory using a multinuclide source. The calibration coefficients are stored in the firmware of the instrument. Field adjustment/drift correction of the energy calibration is done with an automated calibration routine using a small Cs-137 check source. This routine can be conducted repeatedly at the user's discretion. In addition, to enhance the accuracy the field measurements, some spectra were collected with reference sources present. The reference sources provided gamma rays of known energy, which can be used for a posteriori energy calibration corrections.

Nuclide identification from the SAM spectra was conducted using on-board analysis routines. Some of the spectra were also analyzed using a third-party program, PGT Quantum[®] gamma analysis software. This was done to conduct manual energy calibration corrections that allowed better photopeak identification when a peak could not be confidently identified by the SAM. Quantum also contains a superior nuclide library.



Energy calibration of the portable high-resolution system was initially conducted at Jefferson Lab, with manual fine adjustments made in the field using reference peaks from small sources and known nuclides in the sampled spectrum.

### Scope and Limitations

The direct survey is limited to those nuclides which decay with gamma emissions between approximately 30 keV and 3 MeV. Locations for measurement were chosen with the intent to monitor a reasonable cross-section of systems that contain radioactivity. Consideration had to be given to ambient radiation intensity such that the monitoring system could acquire spectra without encountering detector saturation problems (ambient radiation fields above about 1 mR/hour cause significant detector dead-time), as well as the physical constraints of manipulating the detector and associated equipment within the spaces aboard the ship and protecting the equipment from potential radioactive contamination. Several locations within and outside the primary containment were monitored. Since these measurements were made in a "general area" radiation field involving complex source geometries, quantitative results regarding the concentration of radioactive material are not possible. However, gamma energy peaks provide qualitative verification of the presence and distribution of the most predominant gamma-emitting nuclides.

A limitation inherent in all the area scans is that the spectra include contributions from all sources in the vicinity of the item being monitored. One cannot determine conclusively that the activity indicated is attributable exclusively to the item of interest. Another limitation in assessing the contents of components is the self-shielding of the radiation by the components themselves.

Analysis of samples from the primary system provides the best opportunity to determine what nuclides might be present in the event of a spill from the system. The gamma analysis system used for sample counting has a functional energy range of about 5–2000 keV. Detector response extends below 5 keV (making detection of Fe-55 possible in principle), but sample configuration and self-shielding probably prevent detection of photons below about 5–7 keV.

One goal of the WPI assessment team was to investigate the existence and quantity of water in the primary system beyond the reactor vessel. Steam generator hot-leg access was performed for this purpose. It was discovered that a significant quantity of water



was present in the generators and lower hot-leg piping. Smear and water samples were obtained from inside the steam generators. An estimate of the total contamination inventory is made based on samples from the starboard steam generator. Also analyzed were smear samples from the primary containment enclosure that showed positive results during gross alpha/beta counting.

### General Findings

Co-60 was expected to be the most widespread nuclide in the primary system due to the radiological decay characteristics of the isotopes involved. This expectation was confirmed in the measurements taken. All the area monitoring spectra taken around primary systems indicated Co-60 activity. Most monitored locations also indicated the presence of Cs-137 (this may have some practical implications, as is discussed below). A photopeak present in some of the spectra at approximately 75 keV is attributed to lead fluorescence X-rays (K_{$\alpha$}—72.8 keV, K_{$\beta$}—74.9 keV), as significant quantities of lead shielding are present around the reactor vessel and in other monitored areas.

The WPI assessment team found very little surface contamination external to primary system piping and components. A few smear samples from reactor spaces showed a combination of Co-60 and Cs-137. In one case, only Cs-137 was present. This is reasonable given the low activity in that area and the ratio of Cs-137 to Co-60 on the other smears (see detailed findings). It might also be surmised that the presence of the contamination is due to past spills of system coolant or ion exchange media, rather than the dry release of crud from piping internals. This deduction is discussed further below.

# Detailed Findings

Samples from inside the primary system showed the following characteristics. The steam generator water sample contained Cs-137 almost exclusively (Cs-137 concentration was about 1000 times greater than that of Co-60), but contamination on interior surfaces of the steam generator was found to contain only Co-60. This is undoubtedly a result of the chemical form of the contaminants. Co-60 is usually found as an insoluble oxide and tends to deposit on surfaces of reactor systems (forming the common "crud" deposits found in all reactors), whereas Cs-137 is present as a very soluble oxide or hydroxide.



A spill of the coolant would be likely to spread both Co-60 and Cs-137, as the Co-60 is easily removable and would be flushed from surfaces by any significant movement of the water (hence the speculation above that contamination on surfaces in the reactor compartment may be the result of past liquid (or ion exchange media) spills). A spill to the environment (i.e., into the James River) would probably behave similarly with respect to the distribution of these nuclides. The Cs-137 would likely remain dissolved in the river water, whereas insoluble components would eventually find their way into sediment.

The tables below summarize the area monitoring and sample analysis results. The area scans performed with the SAM 935 contain exposure rate estimates associated with the identified nuclides. This is a calculation made by the SAM using an algorithm that converts counts in a photopeak to an energy-corrected exposure rate. The exposure rate indication provides a reasonably accurate relative intensity measurement.

Scan ref. #	Location	Component or system	Nuclides and exposure rate (μR/h)		Cs-137/ Co-60 exp. rate ratio	Notes
M1	Hold Deck, Port passageway	4" piping below deck level	Cs-137 Co-60	0.95 30	0.03	
M2	Hold Deck Port passageway	Aft end of passage, effluent piping under deck	Cs-137 Co-60	0.08 1.6	0.05	
M3	Hold Deck Port passageway between port charge pumps aft	Small-diameter pipe behind cage chg. pmp. buffer seal system	Cs-137 Co-60	1.4 5.9	0.24	
M4	Port Stabilizer Room	6" piping from charging pump buffer seal system	Cs-137 Co-60	12.1 21.6	0.56	1
M5	Primary Containment upper level	Primary coolant line interface to reactor vessel forward	Co-60	581	N/A	
M6	Primary Containment upper level	Primary coolant line interface to reactor vessel aft	Co-60	564	N/A	

Table 1. Area Monitoring Results



Scan ref. #	Location	Component or system	Nuclides and exposure rate (μR/h)		Cs-137/ Co-60 exp. rate ratio	Notes
M7	Primary Containment upper level	Upper pressurizer head, port	Co-60	183	N/A	
M8	Primary Containment upper level	Forward upper regen./nonregen. heat exchanger	Cs-137 Co-60 Co-60	6 242 137	0.025	
M9	Primary Containment 2 nd level	Crossover line from upper to lower regen./nonregen. heat exchanger	Cs-137	8.5	0.062	
M10	Primary Containment 3 rd level	Main pressurizer leg to primary coolant line, just under pressurizer.	Cs-137 Co-60	6.8 156	0.044	
M11	Primary Containment 4 th level	Check valve adjacent to forward primary coolant line near vessel	Cs-137 Co-60	19 360	0.053	
M12	Primary Containment 4 th level	Reactor vessel (shield tank wall) forward, just starboard of center	Cs-137 Co-60	11 479	0.023	
M13	Primary Containment 1 st level	Rx ventilation plenum duct, starboard	Cs-137 Co-60	18 84.5	0.21	2
M14	Cold Chem Lab upper level	Rx ventilation duct	Cs-137 Co-60	0.043 0.25	0.17	2
M15	Cold Chem Lab lower level	Primary sample sink, sample bulb inside sink hood	Cs-137 Co-60	3.6 242	0.015	
M16	Port Charge Pump Room	Between pumps at aft bulkhead	Cs-137 Co-60		0.096	3

1. Exposure rates estimated.

2. Measurement on ventilation ducts.

3. Measured with high-resolution Ge detector. Ratio taken from peak area data.



Ref #	Location/Component	Sample Type	Nuclides	Activity
S1	Starboard steam generator tube sheet	Smear	Co-60	144,300 dpm/ 100 cm ²
S2	Starboard steam generator interior (average) ¹	Smear	Co-60	22,000 dpm/ 100 cm ²
W1	Starboard steam generator water	100 mL water	Cs-137 Co-60	1.04E-3 μCi/ml 1.45E-6 μCi/ml
S3	Reactor 3 rd level forward at pressurizer (highest) ²	Smear	Cs-137 Co-60	1200 dpm/100 cm ² 250 dpm/100 cm ²
S4	Reactor 1 st level forward Rx head (average) ³	Smear	Cs-137	350 dpm/100 cm ²

#### Table 2. Sample Analysis Results

¹Average of four smears, excludes tube sheet.

² Composite count of six smears, all activity attributed to one smear.

³ Composite count of five smears, activity averaged over the total.

# Calculation of Total Contamination Inventory

The total contamination inventory for the primary system was estimated based on the sample data. The contamination inventory is broken into two parts: internal surface contamination and contamination entrained in residual coolant.

#### Surface Contamination

The surface contamination estimate begins with an assessment of the steam generator contamination content. Published industry data⁽²⁾ indicate that in pressurized-water reactors (PWRs), the majority of coolant-borne corrosion/fission products that are not removed by the chemical volume and control system (CVCS) are deposited in the steam generators. For a *reference PWR**, the generators contain about 85% of the total deposited activation product inventory. The balance of the activity is distributed in various other components based on relative surface area and deposition characteristics of the system/component.

Steam generator activity content was estimated based on the highest contamination level found in the starboard generator. Assumptions for the calculation are as follows:

- The only nuclide of concern for surface contamination is Co-60.
- Smears were taken over a 100-cm² area.
- The removal factor for smears is assumed to be 0.1



Steam generator dimensional estimates:

- Tube diameter: 0.5 inches (1.27 cm)
- Average tube length: 30 feet (900 cm)
- Number of tubes: 2000
- Shell interior diameter: 100 cm
- Total plenum length: 100 cm

*The *Reference PWR* in the literature was the Trojan Nuclear Plant. Distribution of radioactivity in three other PWRs was evaluated and reported in Ref. 2. The percentage of radioactivity deposited in steam generators was similar in each case.

Tube surface area:  $2\pi(0.635)(900)(2000) = 7.18E6 \text{ cm}^2$ .

Total tube sheet area:  $2[\pi(50)^2 - \pi(0.635)^2(2000)] = 1.06E4 \text{ cm}^2$ .

Plenum area:  $2\pi(50)(100) = 3.14E4 \text{ cm}^2$ .

Internal surface area of one steam generator:  $7.18E6 + 1.06E4 + 3.14E4 = 7.2E6 \text{ cm}^2$ .

Total activity in one generator in curies is calculated as follows:

 $\frac{144,300 \text{ dpm x } 7.2\text{E6 cm}^2}{0.1 \text{ x } 100 \text{ cm}^2 \text{ x } 2.22\text{E12}} = 0.0468 \text{ Ci, or } 93.6 \text{ mCi for both steam generators.}$ 

Adjusting for reactor/steam generator surface area ratios and unit layout (2-loop vs. 4-loop), activity distribution assignments were made based on the reference PWR. Associated activity levels were calculated and are summarized in the following table.



System	Activity distribution (%)	Total activity (Ci)					
Reactor vessel and internals	5	0.0054*					
Steam generators	87	0.0936					
RCS ¹ piping	3	0.0032					
Non-RCS piping	2.3	0.0025					
Pressurizer	0.2	0.0002					
Other	2.5	0.0027					
Totals	100	0.108					

### Table 3. Total Surface Contamination Inventory

* Excludes volumetrically distributed activation products in the reactor vessel ¹RCS = Reactor Cooling System (main cooling loops)

### Contamination in Residual Coolant

Using visual indications from the steam generator coolant content, the estimated volume of water in the primary system is calculated below, with the associated total radioactivity.

Volume of generator primary side:  $\pi(0.635)^2(900)(2000) + \pi(50)^2(100) = 3.1E6$  cc (mL).

In addition, a portion of the RCS hot and cold legs run horizontally into and out of the generator. The total length of this piping is estimated to be about 26 feet (780 cm) for each loop. The piping diameter is estimated at 18 inches (45 cm).

Volume of horizontal piping:  $\pi(22.5)^2(780) = 1.2E6$  mL.

Total volume of contiguous horizontal coolant envelope (1 loop): 1.2E6 + 3.1E6 = 4.6E6 mL.

The water level in the starboard generator was observed to be about halfway up the generator tube sheet; the port generator was reported to be about one-third full. For this estimate, both will be considered half full.

Total water volume in horizontal legs: 4.6E6 (2) = 4.6E6 mL (~1200 gal).

2

It has been estimated by others that about 1100 gallons of water resides in the lower reactor head. We estimate another 200 gallons is distributed around the balance of the



reactor systems (this is based partly on the observation discussed below regarding location of liquid via the presence of Cs-137). This brings the total volume to 2500 gallons ( $9.5E^6$  mL). Assuming the activity in the water is uniform through the plant and represented by the activity in the steam generator, the total activity is:

Cs-137—(1.04E-3  $\mu$ Ci/mL)(9.5E6 mL) = 9840  $\mu$ Ci. Co-60—(1.45E-6  $\mu$ Ci/mL)(9.5E6 mL) = 14  $\mu$ Ci.

# Additional Observations and Some Speculation

The observed distribution of Co-60 and Cs-137 might serve as an indicator of the presence of liquid within various systems and components. If the same physical separation of nuclides found in the steam generator is assumed to exist throughout the system, one could use the presence of Cs-137 in an area scan of primary piping as an indicator of liquid in the component in question. If only Co-60 is present, it may be an indication that the piping or component is internally dry or contains little liquid.

The results of the area scans taken qualitatively support this idea. For instance, no Cs-137 was seen in scans of the upper main coolant lines at their interface to the Reactor Vessel. By comparison, all the scans of the lower-level reactor compartment (containing the primary side of the steam generators and other low-point piping) show Cs-137. Although not conclusive, these data are is consistent with the hypothesis that dry piping contains little or no Cs-137 contamination. The ratio of Cs-137 to Co-60 activity was found to be highest near piping outside the primary containment in the lowest levels of the ship (e.g., piping in the Hold level, Stabilizer Room lower level, and Charge Pump Room). Table 1 includes these ratios for information purposes.

Several gamma scans were taken on reactor ventilation ductwork, both inside and outside the primary containment. In these scans, the ratio of Cs-137 to Co-60 is considerably higher than in primary piping. (It is difficult to state this conclusively since the source of the radiation in any given scan cannot be isolated to a particular component, but this limitation is inherent to all the scans.) Based on the characteristics of the contaminants, we surmise the following process. Soluble Cs-137 was preferentially released to the atmosphere (compared to Co-60) during plant operations via "weeping" of small primary system leaks. The dissolved cesium contamination was released as an aqueous vapor and distributed through the ventilation system, some of it



being deposited within the system. No samples from within the ventilation system were analyzed to confirm the nuclide ratio.

## **Conclusions**

Scans and samples confirmed that the primary nuclide deposited on surfaces in reactor systems aboard N/S SAVANNAH is Co-60. It is estimated that the total inventory of Co-60 in surface deposits is approximately 100 mCi. This figure is in reasonable agreement with previous estimates⁽¹⁾. Cs-137 is the predominant nuclide present in residual water within the primary system. We estimate the presence of about 2500 gallons of water total within the primary system. The total waterborne Cs-137 content in the reactor system is estimated at about 10 mCi.

We believe that this represents the bulk of the potentially mobile nuclide inventory. This result supports the conclusion that even a worst-case incident aboard SAVANNAH, resulting in the loss of all the transferable contamination to the environment, would have no significant impact on the environment or on dose to the public. The conclusion is based on the results of the characterization program that indicates that the radiological consequences of a breech to the primary system would be insignificant. It is not a problem due to dilution. The water in the primary system needs to be disposed of before decommissioning.

#### **References**

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- 2. "Potential Recycling of Scrap Metal From Nuclear Facilities," Appendix A, September 2001, R. Anigstein, et al., for U.S. EPA. Available at <u>http://www.epa.gov/radiation/docs/cleanmetals/tsd/scrap_tsd_041802_apa1.pdf</u>.
- 3. Materials from meeting presentation "NS Savannah Decommissioning Plans" for NRC, September 24, 2003.