Report of Radiation Safety Surveillance for Quarter 3, 1998

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EXECUTIVE SUMMARY

Between September 14 and September 30, 1998, routine radiation surveillance and special project activities were performed by Integrated Environmental Management, Inc. (IEM) at the Shieldalloy Metallurgical Corporation (SMC) site in Newfield, New Jersey. IEM employees, who were qualified on the basis of training and experience to perform these activities, completed the following:

- Performed of radiation and contamination surveys.
- Inspected the instrument and radioactive check source inventory.
- Retrieved and deployed environmental dosimeters and personnel extremity dosimeters.
- Inspected restricted areas to confirm appropriate signs and labels are in place.
- Erected additional signs in the Storage Yard.
- Collected breathing zone air samples and contamination survey data during three baghouse maintenance campaigns.
- Performed a gamma walkover survey and collection of rock/soil samples from the Newfield Landfill (north of the Storage Yard), with samples forwarded to an off-site laboratory for analysis.
- Conducted Radiation Safety Committee training for SMC personnel.
- Performed a final status survey of the Haul road after excavation of residual slag.
- Performed a final status of survey of A-Warehouse.
- Performed contamination surveys of used (spent) furnace electrodes.
- Performed contamination surveys of various utility vehicles (forklifts, loaders, etc.).
- Performed gamma walkover survey of grounds where the pumphouse was formerly located.
- Performed gamma walkover survey of the driveway at the home of an SMC employee.

The results of the ambient gamma surveys in various restricted and unrestricted areas of the plant exhibited exposure rates ranging from background to 1,400 microR per hour in the immediate vicinity of the former CANAL storage location in D102 (measurement taken immediately adjacent to residual CANAL). Since no area exceeded 5,000 microR per hour, no areas were posted as "radiation areas" pursuant to 10 CFR 20.1902.

The results of the contamination surveys in various restricted and unrestricted areas of the plant showed total (fixed plus removable) activity ranging from background to 2,453 disintegrations per minute (alpha) per 100 cm^2, with the maximum activities noted by the AAF baghouse. No other results, other than those in the vicinity of the AAF and Flex Kleen baghouses, exceeded the site release criterion of 600 disintegrations per minute (alpha) per 100 cm^2 specified in Radiation Safety Procedure No. RSP-009, "Contamination Control". The Flex-Kleen baghouse and the AAF baghouse are classified as "Contaminated Areas".

Perimeter exposure rates ranged from background to 0.18 millirem per hour, with the maximum result noted in the immediate vicinity of the Storage Yard. This area does not exceed the two (2) millirem per hour dose rate limit in 10 CFR 20.1301(a)(2). In addition, the likely dose to date incurred by the maximally-exposed member of the general population in the vicinity of the Newfield plant from all sources is less than the 10 CFR 20.1301(a)(1) limit of 100 millirem for the calendar year.

Extremity monitoring results confirm that in no case has the dose limit specified in 10 CFR 20.1201 been exceeded. For the calendar year to date, personnel exposures from external and internal sources were below the 5,000 millirem per year (TEDE) dose limit specified in 10 CFR 20.1201(a)(1)(I), and the SMC administrative limit of 2,500 (TEDE).

As of the end of this quarter, the radioactive materials inventory remains below the limits for thorium and uranium as specified in Radioactive Materials License No. SMB-743. All storage locations that contain thorium or uranium in excess of 100 microcurie each, as specified in 10 CFR 20.1902(e), were posted as "Radioactive Materials" areas.

No unusual conditions were noted during performance of this routine surveillance activity.

INTRODUCTION

Integrated Environmental Management (**IEM**) was contracted by Shieldalloy Metallurgical Corporation (SMC) to conduct the third quarter 1998 surveillance activities at SMC's Newfield, New Jersey facility. The routine on-site activities took place between September 14 and September 30 and were performed by R. Alan Duff, R.R.P.T., Alex J. Boerner, C.H.P., and Ronn Merkel. Additional baghouse maintenance surveillance was performed by Mr. Boerner during a June 29 through July 2, 1998 campaign, and during a July 12 through July 16, 1998 campaign. A description of each individual's qualifications is contained in Appendix A. Appendix B contains copies of the Field Activity Daily Logs maintained while on-site.

All surveillance activities were performed pursuant to a checklist, the contents of which were approved in advance by the SMC Radiation Safety Officer (RSO). Appendix C contains a copy of the checklists showing the closure status of each item. The following sections of this report contain descriptions of the specific surveillance methodologies, along with a summary of findings, as applicable. The data and records associated with each methodology are contained in the appendices.

AMBIENT GAMMA EXPOSURE RATES

Ambient gamma exposure rates were measured in various areas of the facility. These areas included buildings D111, D102, D-117, A warehouse, B warehouse, D warehouse, G warehouse, and the Flex Kleen and AAF baghouses.

The surveys were performed on September 18, 1998. A Bicron Microrem gamma scintillation survey meter held at approximately 3 feet (waist level) from the walking surface was used to acquire exposure rate information. Results were recorded on survey maps and ancillary forms, copies of which are contained in Appendix D.

A final status survey of A-Warehouse was conducted and documented. The findings of this evaluation are reported elsewhere.[1]

Exposure rates in G warehouse were indistinguishable from background except in the vicinity of pallets of potassium fluoroborate and drums of mixed salts. At these locations, exposure rates ranged to a maximum of 40 microR/hr above background.

Exposure rates in D-Warehouse were indistinguishable from background except in the vicinity of drums of misch metal and chrome oxide. At these locations, exposure rates ranged to a maximum of 20 microRem per hour above background.

Exposure rates in D102 ranged from background to 1,400 microR/hr above background. In D111, exposure rates ranged from background to 475 microR/hr above background. In both D111 and D102, the maximum measured exposure rate was in the immediate vicinity of previous CANAL storage locations (bulk CANAL was relocated from D102 and CANAL stored in supersacks was relocated from D111 to the storage yard during Quarter 1, 1998) or residual ferrocolumbium slag.

No unexpected exposure rates were noted at any of the areas surveyed. The exposure rates at the AAF Baghouse ranged from 15 to 30 microRem per hour. In the Flex Kleen Baghouse, they ranged from background to 15 microrem per hour. Rates in D-117 were indistinguishable except in the immediate vicinity of the CANAL and CANAL-Lite samples (500 microrem per hour on contact) and a box of samples in the lab basement (90 microrem per hour on contact). There are no Radiation Areas at SMC.

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[1] Integrated Environmental Management, Inc., Report No. 94005/G-16171, "Final Status Survey of A-Warehouse", prepared for to Shieldalloy Metallurgical Corporation.

CONTAMINATION STATUS

Surveys for removable and total (fixed plus removable) surface contamination were conducted on September 18, 1998. The areas surveyed included buildings D111, D102, D117, D202, D102 lunchroom, A, B, G and D warehouses, and the D111 Flex-Kleen and AAF baghouses.

Total contamination surveys were performed with a Ludlum Model 2225 ratemeter connected to a Model 43-89 dual alpha/beta scintillation detector, operated in the alpha mode. The instrument was source-checked prior to use with a Th-230 source. Background measurements taken adjacent to each measurement location exhibited from zero (0) counts per minute (cpm) alpha up to 4 cpm alpha.

The total contamination in each area was assessed by scanning the surfaces with the detector held within 1/8" of the surface being monitored. The detector was moved at a rate of one (1) to two (2) inches per second over the surfaces. Surfaces monitored included floors, desks, equipment, tables, and other accessible horizontal surfaces.

The results of total contamination surveys were recorded on survey maps and ancillary forms, copies of which are contained in Appendix D. The following summary of results compare favorably with those acquired during the previous quarter:

- D117, D202 lab (upper and lower), A warehouse, D warehouse - Not distinguishable from background.
- G warehouse - Background to 358 dpm/100 cm^2.
- D111 office and break area - Background to 890 dpm/100 cm^2.
- D111 upper level - Maximum of 268 dpm/100 cm^2.
- D111 lower level - Maximum of 278 dpm/100 cm^2
- AAF dust collector - Maximum of 2453 dpm/100 cm^2, which exceeds the release criterion.
- Flex-Kleen dust collector - Maximum of 1058 dpm/100 cm^2, which exceeds the release criterion.
- D102 - Maximum of 1,500 dpm/100 cm^2, with the highest levels measured in the location of the former CANAL stockpile (some residual materials remain there).

Surveys for removable activity were conducted by taking smears of the area being monitored. Samples were taken by wiping cloth smears in an "S"-shaped pattern on the surface being surveyed using moderate pressure. Each smear covered approximately 100 cm^2 (16 in^2) in area. Smears were counted on an Ludlum Model 2929 alpha scintillation scaler that was source-checked using a NIST-traceable ^{230}Th source.

The results of removable contamination surveys were recorded on survey maps and ancillary forms, copies of which are contained in Appendix D. The following summary of results compares favorably with those acquired during the previous quarter:

- G-warehouse, D102, D202, D111 office and break area, D111 upper and lower levels, D202 basement, B and G warehouses, and the D111 AAF baghouse- Not distinguishable from background.

- D-111 upper level - Maximum of 65 dpm/100 cm^2.

- D-111 lower level - Maximum of 107 dpm/100 cm^2.

- Flex-Kleen dust collector - Maximum of 82 dpm/100 cm^2.

The contamination limit for unrestricted areas, from Radiation Safety Procedure No. RSP-009, "Contamination Control", is 600 dpm α per 100 cm^2 (by direct frisk). Areas that exceeded this limit were confirmed to be posted with "Contaminated Area" signs.

PERSONNEL MONITORING

External (Extremity) Exposure Monitoring

Extremity exposures of certain SMC personnel are measured using thermoluminescent dosimeters in finger rings. On September 16, 1998, rings that had been issued/posted for the previous quarter were collected and returned to the TLD supplier for processing and reporting. New rings were issued to these individuals on September 16th.

The deployment logs for the ring exchange are contained in Appendix E. The extremity monitoring results from the previous quarter are also shown in Appendix E. No statistically positive results were noted.

Internal (Bioassay) Exposure Monitoring

Internal exposure monitoring of certain SMC personnel is performed by collecting and analyzing urine samples as described in RSP-010, "Exposure Control". No bioassay samples were collected during the third quarter of 1998. Therefore, there are no results to report.

Internal (BZA) Exposure Monitoring

Personnel air sampling was performed for workers who participated in the three baghouse maintenance campaigns. These results are reported in the section of this report entitled "Special Project Summaries".

AREA AIR MONITORING

No area air samples were collected during Quarter 3.

ENVIRONMENTAL MONITORING

Ambient Gamma Exposure Rates

External exposure rates at the perimeter fence of the Newfield facility are measured using thermoluminescent dosimeters (TLD). On September 16, 1998, dosimeters that had been deployed the previous quarter were collected and returned to the TLD supplier for processing and reporting. New TLD were deployed at the same time. The deployment logs for the TLD exchange are contained in Appendix E.

The monitoring results from the previous quarter are also contained in Appendix E. These results demonstrated exposure rates ranging from background to 0.18 millirem per hour. The maximum measured exposure rate was due north of the Storage Yard, approximately 30 feet from the slag piles. However, the closest residence to the Newfield plant is over 750 feet from the slag piles. The ambient gamma exposure rate at this location is not discernible from background.

There are only three potential exposure scenarios for members of the general public. They involve (1) constant and continuous presence 750 feet from the slag piles; (2) periodic presence (e.g., less than one hour per week) at any randomly-selected location around the perimeter fence; or (3) periodic presence (e.g., less than one hour per month) at the aforementioned location of maximum measured exposure.[2] The maximum possible exposure of a member of the general public for the most limiting of these scenarios over this calendar quarter is:

$$D_{Q3} = 0.18 \frac{mR}{hr} \times 3\ hr = 0.54\ mR$$

Exposure Rates from Airborne Emissions

The annual dose estimate (to date) for the maximally-exposed off-site individual is determined by the following:

$$Dose_{airborne}\ (mrem) = t \times 3.02 \times 10^{-4}$$

where t = the duration of ferrocolumbium production (hrs/yr) and 3.02×10^{-4} = a dose conversion factor taken from Report No. 94005/G-6131.[3] During this quarter there was no ferrocolumbium production. Therefore, the estimated exposure rate from airborne emissions of source material is zero (0).

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[2] A stay-time of one hour per month at this location is conservative in that there is no physical evidence that individuals frequent this area. Furthermore, monitored Shieldalloy employees who frequent the area for durations greatly in excess of one hour per month, incurred exposures that were only slightly above the nominal detection limits of the dosimetry system (e.g., 10 millirem).

[3] Integrated Environmental Management, Inc., "Radiation Dose Estimates from Atmospheric Emissions from the Newfield Facility", Report No. 94005/G-6131, March 11, 1997.

Year-to-date Exposure of the General Public

The maximum year-to-date exposure of a hypothetical member of the general public is determined by:

$$D_{ytd} = \sum_{i=1}^{4} (D_{airborne} + D_{radon} + D_{external})$$

where $D_{airborne}$ = the dose (microR) from stack emissions during ferrocolumbium production, D_{radon} = the dose rate (microR per hour) from storage yard radon emissions, $D_{external}$ = the ambient gamma dose rate (microR per quarter as determined above) from the Storage Yard, and I = the quarter number for this calendar year.

Since the maximally-exposed individual in the vicinity of the SMC facility may incur a radiation dose of 3.43×10^{-6} microR per hour from radon emissions from the Storage Yard,[4] the year-to-date exposure estimate for a member of the general public is:

$$D_{ytd} = 552.30 + 0.02 + 12.08 = 564.41\ \mu R = 0.56\ mR$$

This value is well-below the regulatory dose limit of 100 mR (TEDE) per calendar year.

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[4] Integrated Environmental Management, Inc., "Radiation Dose Estimates from Atmospheric Emissions from the Newfield Facility", Report No. 94005/G-6131, March 11, 1997.

RADIOACTIVE MATERIALS INVENTORY

During this quarter, no shipments of source material were received. Appendix F shows the inventory status to date, adjusted from the previous quarter's to account for these receipts. At the end of this calendar quarter, SMC is at 96.8% of its thorium limit and 87.6% of its uranium limit.

HEALTH PHYSICS INSTRUMENTS

The SMC instrument inventory was inspected for function and calibration status. The survey instrument inspection log is contained in Appendix G. Included also in Appendix G are the instrument check forms and calibration certificates for those instruments used to perform the surveillance activities reported herein.

The survey instrument calibration frequency specified in RSP-008, "Instrumentation and Surveillance" is once every twelve (12) months, or more frequently if so recommended by the vendor. In compliance with this requirement, several instruments had calibration due dates before the end of the upcoming quarter and were therefore sent to a calibration laboratory. All instruments and check sources in the active inventory were accounted for during the inventory.

PROGRAM AUDITS

No audits of the radiation safety program were performed this quarter.

SPECIAL PROJECT SUMMARIES

Project 1 - Surveillance of Baghouse Maintenance Work

Between June 29 and July 2, 1998, again between July 12 and 16, 1998, and again between September 15-30, 1998, SMC implemented a fairly comprehensive maintenance program for the Flex-Kleen baghouse that involved the change-out of the majority of the bags. The workers involved in this project were monitored, using personal breathing zone samplers, whenever they entered the baghouse or performed work with the potential for airborne activity.[5] In addition, health physics coverage was provided to check and, if necessary, decontaminate personnel and equipment that left the temporary exclusion zone that was instituted specifically for this project.[6]

Health physics coverage for the first two campaigns was provided by Alex J. Boerner, C.H.P. The second campaign was covered by Ronn Merkel. Descriptions of Mr. Boerner's and Mr. Merkel's qualifications are contained in Appendix A. Appendix B contains copies of the Field Activity Daily Logs maintained by both individuals while on-site.

These special project activities were performed pursuant to a checklist, the contents of which were approved in advance by the SMC Radiation Safety Officer. Appendix C contains a copy of the checklists from the campaigns showing the closure status of each item

Appendix H contains a copy of all other records generated during this special project. Airborne radioactivity concentrations measured in the breathing zone of the workers during both campaigns were negligible. In addition, no personnel contamination in excess of the release criteria shown in RSP-009, "Contamination Control" was noted.

Project 2 - Assessment of Radiological Conditions During D-102 Demolition

Health physics coverage was provided for workers performing demolition activities in D-102. The surveys were performed by Alan Duff (see Appendix A for qualifications and Appendix B for Field Activity Daily Logs) pursuant to a checklist that was pre-approved by the SMC Radiation Safety Officer (see Appendix C).

During the surveillance period, each worker was monitored using a breathing zone sampler and each worker was frisked prior to exiting the work area. No detectable gross alpha activity above a nominal detection limit of 5×10^{-13} μCi/ml was identified on the air filters. All frisking results, with one exception, were indistinguishable from background. (The exception was the left shoe heel of one worker that exhibited residual alpha activity of 10 counts per minute. The shoe was

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[5] The pumps worn by the workers were turned off when they exited areas with potential for airborne radioactivity.

[6] Although not reported herein, frisking results for all involved personnel and equipment were negative for the presence of residual radioactivity above background.

decontaminated and re-surveyed, with the final contamination level being indistinguishable from background.) The records associated with this effort are contained in Appendix I.

Project 3 - Soil Sampling for Lagoon Closure Project

On August 3-4, 1998, samples of soil were collected from various stockpiled and excavated locations in the vicinity of the Lagoon Closure Project. The samples were collected by Alan Duff (see Appendix A for qualifications and Appendix B for Field Activity Daily Logs) pursuant to a checklist that was pre-approved by the SMC Radiation Safety Officer (see Appendix C).

A total of 20 samples from the affected areas and from background locations were packaged and forwarded to an off site laboratory for analysis by the methodologies of gamma spectroscopy. The records associated with this effort, including the analytical results, are contained in Appendix I. A comparison of results to those from a series of background samples confirmed that the soils may be released for unrestricted use (i.e., without regard for radiological constituents).

Project 4 - Survey of Forklifts, Spent Electrodes and Ancillary Equipment

Ambient gamma and total (fixed plus removable) contamination surveys were performed on a variety of forklifts at the Newfield facility, on seven (7) pallets of spent electrodes that were deposited in the Storage Yard, and on four (4) pallets of ancillary equipment. The surveys were preformed by Ronn Merkel (see Appendix A for qualifications and Appendix B for Field Activity Daily Logs). Instrument types and serial numbers are noted on the survey forms. In all cases, the results were indistinguishable from background. The records associated with these survey efforts are contained in Appendix J.

Project 5 - Landfill Investigation

A cursory contact gamma survey of the Newfield Landfill was performed on September 17, 1998 by Alan Duff (see Appendix A for his qualifications). Instrument types and serial numbers are noted on the survey form.

During the survey, materials with elevated exposure rates were, indeed, noted. A sample of these materials was collected and forwarded to a radioanalytical laboratory for isotopic analysis. The results confirmed that radioactive materials above background are present in the landfill, but that they are not characteristic of SMC's licensed materials. Appendix K contains the records associated with this effort.

Project 6 - Driveway Investigation

A contact gamma survey of the driveway at the home of an SMC employee was performed September 15, 1998 by Alan Duff (see Appendix A for his qualifications). For the survey, the sensitive portion of the detector probe was held at a distance of approximately 0.5 inch from the driveway surface, and count rates were observed. Instrument types and serial numbers are noted on the survey form.

Although count rates in excess of background were noted, the levels were not indicative of the presence of source material (i.e., greater than 0.05% thorium and uranium by weight). Appendix L contains the records associated with this effort.

Project 7 - Characterization of Former Pumphouse Area

On September 16 through 18, 1998, the radiological character of a former pumphouse area was determined by Alex Boerner (see Appendix A for his qualifications). The area in question is located adjacent to and north of the access road outside of the controlled area. The purpose of the characterization was to determine whether levels of radiation in excess of a pre-determined "action level" were present, and whether additional remedial action is necessary.

A walkover surface scan was conducted using a Ludlum Model 2241 ratemeter and Ludlum Model SPA-3 scintillation probe. The probe was placed in close proximity to the ground and swung in a short "arc" to cover a wider area while noting the instrument response. A drawing of the pumphouse area was developed as the survey progressed, a copy of which appears in Appendix M. Site features and areas of elevated surface activity were drawn approximately to scale.

The walkover scan was designed to cover a much wider area than the excavated area where the former pumphouse stood. Specifically, the surface scan began east of the excavation at the fenceline denoting Shieldalloy's controlled area and extending as far north (~134 feet) to a building used for vehicle storage. This area was covered with grass and appeared undisturbed by human activities. Readings throughout this area approximated background levels on the scintillation detector, i.e., five (5) to seven (7) thousand counts per minute (kcpm). These readings were well below the action level of 20,000 cpm (~13,500 cpm above background).

The walkover scan then proceeded to the location of the former pumphouse which was easily recognizable as a denuded, soil area covering an approximate area of 2,068 square feet (approximate dimensions of 44 feet north to south by 47 feet east to west). An additional recognizable site feature was the raised mound upon which the former pumphouse was built. The initial walkover of the excavated area did not result in an elevated detector response above the action level with the exception of two discrete areas located on the southeast edge of the excavation. The first area began at the access road, covering a one foot wide area and extending approximately 33 feet north (~33 ft^2). The elevated readings appeared to be due to the presence of slag material (rocks). The second area also began at the road and covered an area of 96 ft^2 (eight feet north to south by twelve feet east to west). This second area adjoined the first area noted previously. The source of the elevated readings in this area were not as apparent.

The walkover scan concluded with a characterization of the area west of the former pumphouse - an area which had also been disturbed by human activities. This area is primarily composed of sandy soil, with areas of vegetation on the northern end. Elevated levels of radiation were noted both over large and discrete (i.e., small/localized) areas. These levels ranged from 20 kcpm (the action level) to 115 kcpm throughout much of this area, which at its widest dimensions covered an area of approximately 50 feet north to south by 70 feet east to west. The actual area of

contamination, however, is smaller than these stated dimensions (e.g., even within this large area, background levels and/or levels below the action level were found). The source of the contamination was due, at least in part, to the presence of slag. A black, soil-like material was also observed in a slightly eroded, sub-surface location, running a length of several feet in an approximate north-south direction. This location registered the highest of the readings.

These findings indicate that residual radioactivity exists in the area located west of the former pumphouse and the two discrete areas of elevated readings on the southeast portion of the excavated area. The areas were marked with spray paint to facilitate future identification.

EXIT INTERVIEW SUMMARY

An exit interview with the SMC Radiation Safety Officer took place on September 18, 1998. The topics discussed included the following:

- Preliminary findings of the routine surveillance effort;
- Deployment of new TLDs (finger ring and perimeter);
- The final status surveys of A-Warehouse and the Haul Road (post excavation);
- The status of the landfill walkover gamma survey and sample collection; and
- Radioactive materials that were present in the basement of lab building D202 (uranium standards and pyrochlore samples) and in D117 (pyrochlore samples) that should be consolidated with other materials for processing.

No other items or recommendations were discussed.

APPENDICES

Appendix A - Personnel Qualifications

R. Alan Duff

Professional Qualifications

Mr. Duff has over twenty years of experience in nuclear and hazardous materials project management, design support, surveillance, operational health physics, training, and decommissioning activities. He has prepared numerous plans, procedures, and license documents for U. S. Department of Energy facilities, U. S. Department of Defense facilities, U. S. Nuclear Regulatory Commission licensees, and commercial client facilities that are regulated by agreement states. Mr. Duff is well versed in the area of civilian and government radioactive and mixed waste transport and disposal requirements. He is registered by the National Registry of Radiation Protection Technologists (NRRPT).

Education

Confined Space Entry Training, 1998
CNSI Advanced Radioactive Material Transportation and Disposal Class, 1989 and 1993
IT Corporation Project Management Course (40 hours), 1992.
40-Hour OSHA HAZWOPER (29 CFR 1910.120) Training, 1987.
Eight-hour Supervisor Training, 1990
Eight-hour OSHA Annual Refresher (29 CFR 1910.120), 1997.
Canberra Multichannel Analyzer Operations Class, 1988.
Operational Water Chemistry and Radiological Controls, U.S. Navy, 1982
Engineering Laboratory Technician School, U.S. Navy, 1980.
Nuclear Power Training Unit (prototype), U.S. Navy, 1980.
Naval Nuclear Power School, U.S. Navy, 1978.

Registrations/Certifications

Registered Radiation Protection Technologist (RRPT), National Registry of Radiation Protection Technologists

Experience and Background

1995 - Present *Project Manager, Integrated Environmental Management, Inc., Knoxville, Tennessee.* Provides high-quality project management and remediation services to commercial and government clients. As a member of the client's response team, works with clients to: Develop scopes-of-work and bid packages for specialty subcontractors handling highly focused assignments; identify those subcontractors who will provide the greatest value to the client; manage teams of specialty subcontractors to ensure that the client's goals and expectations (technical, regulatory, and financial) are met from the beginning until project completion; provide insights into future regulatory issues and their impact as input to the client's long-range business planning and cost forecasting process; provide site remediation/decommissioning services for radioactive and hazardous materials; advise and train clients on waste transportation and disposal issues; and develop project

specific plans and procedures to conduct on site activities. Mr. Duff also serves as the Radiation Safety Officer (RSO) for IEM operations.

1994 - 1995 *Senior Environmental Specialist, AWK Consulting Engineers, Inc., Pittsburgh, Pennsylvania* While assigned to the Oak Ridge, Tennessee office, was responsible for performing technical and administrative duties required to satisfy customer needs on site characterization and pre-remedial design support projects and for all aspects of D&D projects. Responsible for preparing project plans, project work plans, task specific Health & Safety Plans, and budgets/schedules for these projects. Also responsible for identifying and implementing decommissioning and decontamination methods for these projects.

1987 - 1994 *Project Manager, Health Physics Supervisor, Nuclear/Mixed Waste Engineering Services, IT Corporation, Knoxville, Tennessee.* Provided project management and health physics support services for nuclear and mixed waste projects throughout the United States.

1978 - 1987 *Engineering Laboratory Technician (ELT), Leading Petty Officer, Radiological Controls Shift Supervisor*, United States Navy Supervised a division of 40 personnel, provided support for nuclear powered submarines, and performed over 250 error-free shipments of radioactive materials. Served as Leading ELT and Engine Room Supervisor on the USS Grayling, SSN 646.

Professional Society Memberships

Health Physics Society (Plenary Member)
American Nuclear Society
Conference of Radiation Control Program Directors (Advisor to the Radioactive Waste Management Committee E-5 and to the D&D Committee E-24)
International Society of Decontamination and Decommissioning Professionals

Awards

Navy Achievement Medal for conducting the first Trident Class submarine ion exchange resin discharge and solidification.
IT Corporation *Project Management Associate*

Example Project Descriptions

- Project Manager for escalated decommissioning a State-licensed site that manufactured, tested, and distributed gauging devices in anticipation of the sale of the company and the possibility of its moving its operations to another location. Responsible for preparation of work plans, negotiations with regulatory agencies, decontamination of indoor and outdoor areas, performance and documentation of a final status survey, shipment of waste, and project-specific health and safety.

- Project Manager and health physicist for the remediation of a building foundation drainage system and the processing of over 100,000 gallons of water contaminated with cobalt-60 up to levels of one (1) μCi per liter for a commercial client. Responsible for coordination of a water processing subcontractor, an excavation subcontractor, and off-site analytical laboratory activities. Also interfaced with on-site U. S. Nuclear Regulatory Commission, U. S. Environmental Protection Agency, and a variety of state and local agencies.

- Technical writer for the development of a logic flow diagram for identifying radioactive and mixed wastes at the U. S. Department of Energy's Portsmouth (Ohio) Gaseous Diffusion Plant.

- Technical writer for the Fernald Remedial Investigation/Feasibility Study (RI/FS). Provided technical guidance to engineering staff, generated reports on radioactive and mixed waste packaging, transport, and disposal.

- Site Manager for the characterization survey of an EPA Superfund site three story warehouse that had been used in the past as a lantern mantle manufacturing facility and had been contaminated with thorium. Assisted in the development of project plans and final reports, supervised a crew of Health Physics technicians performing characterization surveys, interfaced with the facility owner and EPA personnel while on site.

- Project Manager for the decommissioning and decontamination of three facilities at Sandia National Laboratory contaminated with radioactive and mixed waste. Responsible for the coordination of resources for the development of project plans, development of Project Work Plan, and maintaining project budget and schedule commitments.

- Health Physics Supervisor for a transuranic (TRU) waste repackaging project. Supervised the characterization, repackaging and shipment of 130 containers of high-activity americium-241 and plutonium-238 hot cell waste. The waste was packaged to meet the WIPP waste acceptance criteria and was transported (highway route controlled quantity) to the Idaho National Engineering Laboratory (INEL) for storage.

- Project Manager for the excavation and disposal of radium waste cells for the Corps of Engineers at Bergstrom Air Force Base in Austin, TX. Developed all project plans, supervised field efforts, and coordinated waste transport and disposal activities.

- Project Manager for the decontamination and final release survey of a 70,000 ft^2 facility that manufactured cesium-137 level gauges. Decontamination efforts involved overhead areas, work area concrete floors, and removal of soil under the floor slab. Facility was released from their license following a verification survey by the state

radiological licensing agency. Developed state approved decommissioning plan and final status survey report.

- Project Manager for the packaging and disposal of 55,000 Curies of cobalt-60 teletherapy sources. Sources were loaded into cask liners in the facility hot cell and loaded into Type B casks for shipment for disposal. Also supported the packaging and disposal of several low level waste drums and HEPA filters that required the use of shielded Type A and B shipping containers.

- Project Manager for the decommissioning and decontamination of IT's Oak Ridge Mixed Waste Analytical Laboratory. Developed the decommissioning and decontamination plan that was approved by the State of Tennessee. Also supervised the field crew during final surveys of facility.

- Project Manager for the decommissioning and decontamination of a magnesium-thorium waterfall grinding booth at Tinker Air Force Base in Oklahoma. Responsible for the development of project plans, schedule and budget management, and disposal of radioactive and mixed wastes.

- Project Manager for the decommissioning of a commercial facility which had previously processed ores containing uranium and thorium. Generated the decommissioning plan submitted to and approved by the U. S. Nuclear Regulatory Commission, and was responsible for schedule, budget, and on site activities.

- Project Manager for the removal of a 22 MeV particle accelerator from a major university medical center. Developed State-approved decommissioning and decontamination plans, arranged for waste disposal and transfer of the accelerator to a university in Beijing, China, and was responsible for budget, schedule and all on site activities.

- Project Manager for the decommissioning and decontamination of two radioactive source manufacturing laboratories at Chevron Research and Technology. The laboratories housed a neutron generator and were contaminated with tritium, carbon-14, cesium-134, and cobalt-60. Negotiated plan approvals with the State agency, and was responsible for budget, schedule, and all on site activities including waste transport and disposal.

- Project Manager for the routine quarterly surveillance and special radiological projects at a metallurgical facility licensed by the NRC. Conducted radiation, contamination, and airborne radioactivity surveys as well as personnel bioassay and dosimetry program and environmental monitoring program each quarter. Provided health physics coverage for non-routine activities such as baghouse and stack testing, heats of specialty materials, final release surveys of an excavated road area and a

warehouse formerly used for storage of radioactive materials, and recovery of radioactively contaminated equipment improperly released from site. Responsible for the generation of quarterly surveillance reports.

- Project Manager for the development of a conceptual decommissioning plan for a maintenance facility located in South Carolina. The plan was generated to provide support for the facility's decommissioning funding plan.

- Health and Safety Manager/Project Manager at the U. S. Department of Energy's Fernald site thorium silo and bins decommissioning and decontamination project. Developed the project-specific health and safety plan, and interfaced with the client on health physics and health/safety issues. This project received safety and quality awards from the client.

- Health Physics Supervisor responsible for the sampling of underground storage tanks with radioactive and mixed wastes at Brookhaven National Laboratory.

- Health and Safety Manager for the U. S. Department of Energy's Fernald Plant K-65 Silo sampling project. Developed the health/safety and sampling plans. The silos contained up to 0.5 μCi of Radium-226 per gram and were the largest single source of radon gas in the U.S.

- D&D Technical Manager for the decommissioning of the U. S. Department of Energy's LEHR facility at the University of California at Davis. Developed project decommissioning and decontamination plans and field procedures.

- Health Physics Supervisor for the excavation of waste materials which included mixtures of uranium and explosives.

- Proposal Coordinator for over 40 business proposals for nuclear decommissioning and decontamination projects including job walk downs, cost estimation, scheduling, and technical content of proposals.

- While in the US Navy, acted as radioactive materials shipper for the Trident Submarine Refit Facility. Performed over 250 error-free shipments of radioactive materials including Type B quantity radiography source shipments and radioactive waste shipments to the naval shipyard.

Alex J. Boerner

Professional Qualifications

Mr. Boerner has fifteen years of senior-level experience in nuclear and radiological activities with emphasis in the design and conduct of radiation surveys in both occupational and environmental settings. He also has extensive experience in training all levels of personnel about radiological topics. Mr. Boerner is actively involved in the areas of environmental monitoring, site decommissioning, program evaluations and development, and detection and quantification of low-levels of radioactivity.

Education

M.S., Radiation Biology, University of Tennessee, Knoxville, Tennessee; 1982
B.S., Biology, Augusta College, Augusta, Georgia; 1977

Certifications

Certified Health Physicist (Comprehensive), American Board of Health Physics, 1989
Recertified: 1993, 1997

Hazardous Materials Incident Response Operations (165.5) course (29 CFR 1910.120 OSHA Health and Safety Training for Operations in Hazardous Waste Sites), Roane State Community College, Institute for Environmental Health and Safety, in cooperation with the USEPA Office of Emergency and Remedial Response, Oak Ridge, Tennessee, 4/21 - 4/25/97); completed 8 hour annual refresher training (IT Corporation), May, 1998

Permit-Required Confined Space Training (29CFR1910.146(g)), Environment, Safety, and Health, Inc., September, 1998.

Experience and Background

1997 - Present — *Senior Health Physicist, Integrated Environmental Management, Inc., Knoxville, Tennessee*. Provides high-quality radiation protection services to commercial and government clients. As a member of the client's response team, works with clients to promote an understanding of what is required to achieve and/or maintain compliance in the eyes of all pertinent regulatory agencies, individually or jointly; develop an overall strategy for achieving compliance and reduce liabilities in a technically-sound, legally-defensible, and fiscally-conservative business manner; recommend specific solutions that are compatible with the client's operating philosophy; and provide insights into future regulatory issues and their impact as input to the client's long-range business planning and cost forecasting process.

1986 - 1996 *Health Physics Instructor, Professional Training Programs, Oak Ridge Institute for Science and Education, Oak Ridge, Tennessee.* Instructed in approximately 200 training courses for a wide audience ranging from elementary, high school, and college students to NRC, NRC licensees, DOE, DOE contactors, EPA, DOD, state radiological health personnel, and other professionals in applied health physics. Developed curricula, coordinated and conducted classroom and laboratory/field exercises for professional training courses and general classes in the following health physics and radiation protection areas: Applied Health Physics, Safe Use of Radionuclides, Air Sampling for Radioactive Materials, Environmental Monitoring for Radioactivity, Gamma Spectroscopy, Health Physics for the Industrial Hygienist, and Radiological Surveys in Support of Decommissioning. In addition:

- Managed and coordinated for several years the NRC's five-week "Health Physics and Radiation Protection" (HPRP) and one-week "Health Physics Engineering" (HPE) courses through the Office of State Programs in Rockville, Maryland and the Office of Analysis and Evaluation of Operational Data/Technical Training Center in Chattanooga, Tennessee.

- Developed, coordinated, and presented three special two-day "Radiological Surveys in Support of Decommissioning" courses for the NRC at offsite locations in Rockville, Maryland and King of Prussia, Pennsylvania.

- Conducted "Site Access Training" and "Site Access Refresher Training" for NRC inspectors in Bethesda, Maryland and Rockville, Maryland.

- Presented lectures in the one-week DOE-sponsored "Radiological Assessors Training (for DOE auditors and inspectors): Applied Radiological Control" in Oak Ridge, Tennessee, Albuqueque, New Mexico, and Las Vegas, Nevada. Served as team coordinator during a visit to and an assessment of the Nevada Test Site.

- Presented a series of lectures in the following DOE-sponsored courses: "Environmental Laws and Regulations", "Introduction to Radiation Protection of the Public and the Environment", "Radiological Control Manual for Managers Training" and "10 CFR 835" training.

- Presented several lectures in nuclear criticality safety training and "Train the Trainer" courses for Lockheed-Martin Y-12 and contractor employees.

- Assisted in special projects including the preparation and development of a DOE EH-74 Radiation Protection Topical Area study guide in support of the DOE Technical Qualification Program.

1983 - 1986 *Health Physics Team Leader, Radiological Site Assessment Program, Oak Ridge Institute for Science and Education, Oak Ridge, Tennessee* Planned environmental survey strategies and organized survey trips. Directed a team of health physics technicians in conducting environmental radiological surveys throughout the United States to quantify the nature and extent of radiological contamination at these sites. Reviewed survey data, interpreted results, and compared the results with applicable standards to determine whether site decontamination efforts were successful in achieving applicable clean-up criteria. Prepared survey reports. Assisted with the development of equipment, procedures, and techniques for conducting surveys.

1982 - 1983 *Health Physics Technician, Radiological Site Assessment Program, Oak Ridge Institute for Science and Education, Oak Ridge, Tennessee* Conducted environmental radiological surveys throughout the United States to characterize the nature and extent of radiological contamination at sites and to perform certification surveys at sites where site decontamination efforts were completed.

1977 - 1979 *Health Physics Technician, Edwin I. Hatch Nuclear Power Plant, Georgia Power Company, Baxley, Georgia* As an ANSI-qualified technician, designed and conducted surveys to determine the level of external and internal hazards associated with the operation and maintenance of a nuclear power generating station.

Professional Society Membership

Health Physics Society (Plenary member)

East Tennessee Chapter, Health Physics Society (President-elect 1998-1999; Treasurer, 1990 - 1991; Chairman of Handbook Committee, 1988-89;Co-Chairman, Continuing Education Committee, 1988-1990; Area Representative, 1989; Co-Chairman, Picnic Committee, 1988; Technical Tours Committee, 1984-1986)

Phi Kappa Phi National Honor Society (inactive)

Publications/Presentations

"Comprehensive Radiological Survey of the Niagara Falls Storage Site Off-Site Properties, Lewiston, New York", presented at the 29th Annual Meeting of the Health Physics Society, New Orleans, Louisiana, June,1984.

Author or co-author of approximately 20 technical reports for the NRC and DOE in the area of environmental site characterization and verification; numerous oral presentations; approximately 200 training courses taught.

Other Appointments/Awards

Member of the ORISE Radiation Emergency Assistance Center/Training Site (REAC/TS) Emergency Response Team (1986-1996)

Adjunct faculty instructor, Health Physics Technology Program, Roane State Community College, Harriman, Tennessee (1989-1996)

Member of DOE Safety and Health Task Force addressing concerns noted following a Technical Safety Appraisal (TSA) of the Martin Marietta Oak Ridge facilities (1989).

Ronn Merkel

Professional Qualifications

Mr. Merkel has over nine (9) years of experience in the radiation protection field, with emphasis on decontamination, site surveillance and applied health physics.

Education

Shoreham Wading River High School (diploma)
Suffolk Community College (Summer Session)
Christ for the Nations Bible College (AS degree)
Computer Aided Design (Certificate)
Drafting (3 years)
OSHA 40-hour Waste Worker Training (Certification 9140B0155)
U. S. Department of Energy Core Course (Health Physics)
Radiation Worker Training - MK Ferguson (June, 1994)
General Employee Training - MD Ferguson (June, 1994)

Experience and Background

December 1995-Present - Health Physics Technician, Integrated Environmental Management, Inc. (Knoxville, Tennessee) - Duties include surveillance activities, instrumentation usage/control, decontamination, site characterization, documentation, and other general health physics duties.

June, 1994-November, 1995 - Sr. Health Physics Technician, STEP, Inc. (Oak Ridge, Tennessee) - Duties included all aspects of health physics, radiation and contamination surveys; performance of free-release surveys; packaging of radioactive waste; instrument calibration; and site health physics.

February, 1994-April, 1994 - Sr. Health Physics Technician, UCAR Carbon (Cleveland, Ohio) - Duties included free-release survey o facility contaminated with ^{137}Cs, decontamination of areas that were observed to be greater than background readings; setup of all applicable instrumentation; shipment of radioactive waste.

August, 1993-December, 1993 - Health Physics Technician, Comanche Peak Power Plant (Granbury, Texas) - Duties included radiological surveys of surfaces, equipment and personnel; control point operations; counting room operations; and other health physics duties.

January, 1993-September, 1993 - Health Physics/Chemistry Technician, Terra Analytical Laboratory (Granbury, Texas), - duties included setup of a fully-equipped analytical laboratory; assisted in preparation of procedures to obtain radioactive materials license;

purchase, setup and calibration of various analytical equipment; and drafting operating procedures for lab equipment.

May, 1992-December, 1992 - Sr. Health Physics Technician, Radion Sterilizers, Decatur, Georgia - Duties included supervision of decontamination technicians, performance and documentation of radiological surveys, initiation of Radiation Work Permits, routine air sampling, packaging and shipment of radioactive waste, setup and coverage of systems, daily source checks of survey instruments, analysis of soil samples, preparation (drafting) of free-release survey maps, and other general health physics duties.

February, 1992-May, 1992 - Health Physics Technician, Bartlett (Assigned to Perry Nuclear Power Plant, Cleveland, Ohio) - Duties included radiological surveys of rooms, equipment and personnel; control point operations at entrance and exit of auxiliary building, and other general health physics duties.

August, 1991-December, 1991 - Jr. Health Physics/Senior Decon, Vogtle Unit 1, Waynesboro, Georgia - Duties included surveying and handling of radioactive waste and laundry, decontamination and release of tools and equipment, pre-release surveys and routine air sampling. Qualified in the use of various health physics instrumentation.

April, 1991- May, 1991 - Temporary Chemistry/QC Technician, Wheatland Farms, Inc., Dallas, Texas - Duties included sampling and chemistry analysis of all processed products. Analysis included %salt, fat content, pH, viscosity, conductivity, weights, and others. Also responsible for ensuring that work was conducted safely and with quality.

January, 1989-March, 1990 - Chemistry/Counting Room Technician, Alpha Nuclear Laboratories, Inc., Dallas, Texas - Duties included preparation and analysis of samples for Pb-210, total radium content, gross alpha and beta on solids and liquids, Po-210, and isotopic radium. All were performed in accordance with EPA protocols and ASTM-recommended methods.

July, 1988-December, 1988 - Jr. Health Physics/Senior Decon, Vogtle Unit 1, Waynesboro, Georgia - Duties included surveying and handling of radioactive waste and laundry, decontamination and release of tools and equipment, performance of pre-release surveys and routine air sampling; qualified in the use of various health physics instruments.

Appendix B - Field Activity Daily Logs

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC – Newfield

Date: 6/29/98 | Time: 7:10a – 1:10pm; 11:30p – 12:00 am | Job/Task Number: 94005.05

Client Name: Shieldalloy Metallurgical Corporation

Address of Work Site: 12 West Boulevard, Newfield, NJ

Description of Work: Preparation for Baghouse Change-out Activities

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Arrived on site 7:10 am. Checked in/signed in at guard shack. Met Rob Degrange who took me into the HP office

7:15a – 1:10p

Informed by Rob Degrange that baghouse operations (changing out bags in the Flex-Kleen baghouse) apparently began last night on the midnight shift. He had no details, except to say Dave Smith and IEM had not been informed of this change.

Attempted to calibrate the 5 BZA's waiting for me when I arrived. All BZA's had been charged overnight. However, the mini-Buck calibrator was not working correctly. Instead of displaying "0000"s on the readout, a series of four dashes appeared instead. Called Brian to discuss, but could not resolve. Called Frank Gavila at F+J to discuss (a series of three phone calls occurred). Between phone calls, I emptied the flow cell of soap and rinsed the cell w/water. Upon reassembly of the unit it was apparent the device was responding as expected. I suspect residual soap had interfered with one or both sensors. Before the problem was corrected, I had also tried D. Smith's calibrator which responded with "dashes" also. He indicated to me (once I met him at ~8:30 am) that the problem started this past Friday and could not be resolved. In any event, I then proceeded to calibrate the 5 BZA's and document the results. Informed Brian problem had been corrected

Informed by D. Smith ~10:30a that baghouse operations had started last night

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
Baghouse operations began prematurely (prior to IEM arrival); changing out bags will now be performed on midnight shift

Weather Conditions: Overcast; intermittent rain

Important Telephone Calls and Interactions: B. Kelly to discuss calibrator problems and premature start of baghouse operations; Frank Gavila, F+J, to discuss calibrator problems

Personnel on Site: R. DeGrange, D. Smith, A. Boerner

Name Printed: Alex Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield		
Date: 6/29/98	Time: 7:10a - 1:10pm; 11:30p - 12:00a	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation		
Address of Work Site: 12 West Boulevard, Newfield, NJ		
Description of Work: Preparation for Baghouse Change-Out Activities		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

and that A should report the remainder of the week in time for the 12 midnight to 8 am shift.

Performed background + source checks on the Ludlum 43-89/2224 and Bicron µrem meter. Bicron read ~ 15 µrem/hr background due to the storage of nine containers holding "Canal Lite" sampled. Containers read ~ 60 - 70 µrem/hr. Bldg was a more respectable 5 µrem/hr elsewhere in the room. Performed statistical check on the 2224/43-89

Brian + A discussed questions to ask of the midnight crew when A first met with them to determine what they did, what protective clothing was used and where discarded, no. of people involved in the operation and their stay times, whether any monitoring equipment was used, etc. We also discussed the use of paper filters instead of membrane filters for air monitoring. Brian gave permission to use paper filters which apparently has been the filter media of choice in the past.

Received tour of facility from D. Smith ~ 12:15 - 1:00 pm, including location of tailgate safety meeting and the Flex-Kleen baghouse. It was apparent many of the bags had been removed on last evening's shift and placed in a nearby roll-off box. Dave + A discussed the chemical, physical and radiological hazards associated with this operation. He suggested surveys of the break room in Bldg. 4, the lunch room and restrooms in D-102, and the locker room in Bldg 4.

Returned to Bldg 4 at 1 pm and placed BZA's back on charge. Collected the necessary paperwork and left the site at 1:10 pm after conferring w/ the guard

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
See page 1 of 3

Weather Conditions: See p. 1 of 3

Important Telephone Calls and Interactions:

Personnel on Site: A. Boerner, D. Smith

Name Printed: Alex Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield
Date: 6/29/98 | Time: 7:10a - 1:10p; 11:30p - 12:00a | Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation
Address of Work Site: 12 West Boulevard, Newfield, NJ
Description of Work: Preparation for Baghouse Change-Out Operations

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

concerning my return later this evening.

1:30 pm : Arrived back at Country Inn + Suites

1:45 - 3:00p: Prepared FADL, reviewed and updated the Tailgate Safety form for tonight's activities, and reviewed paperwork.

11:05 pm : Arrived onsite for midnight shift. Signed in w/ guard who provided access to HP Office. Checked out instruments, took BZA's off "charge", picked up additional paperwork, and then proceeded to guard shack to pick up radio and verify emergency procedures (all guards are certified as EMT's)

11:35p - 12:00a : met Paul Drewes, night supervisor, who escorted me along w/ the guard to Bldg D-111 break room where Tailgate Safety Meeting would be held.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
See page 1 of 3

Weather Conditions: Humid

Important Telephone Calls and Interactions:

Personnel on Site: P. Drewes, A. Boerner

Name Printed: Alex Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation
Date: 6/30/98 | Time: 12a - 10:15a; 10:45p - 12:00a | Job/Task Number: 94005.05
Client Name: Shieldalloy
Address of Work Site: 12 West Boulevard, Newfield, NJ
Description of Work: Change Out of Bags in Flex-Kleen Baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

12:00a - 12:50a: Conducted initial tailgate safety meeting for the four workers who started the Baghouse operation prematurely on last night's midnight shift; the 4 workers (3 of them new employees as of last week) were William (Tim) Chew, Stefford Govan, Milton White, and Eddie Jordan (lead operator). The following RZA's were issued:

$240 - Chew
$241 - Govan
$242 - Jordan
$243 - White

} issued in alphabetical order

Posted the RWP which Dave Smith had prepared and the Tailgate Safety Form in the D111 break room.

12:50 - 1:40a: Proceeded to Flex-Kleen Baghouse and waited for night supervisor, Paul Drewes, to arrive with work gloves and dust masks. While waiting, I discussed last night's operations w/ Eddie Jordan who answered several pertinent questions (see separate writeup on this)

1:40a - 2:05am: First entry into the baghouse. Access to the baghouse was by a set of stairs on the NE side (only access stairs present. Workers instructed on contamination zone setup and where frisking of personel, equipment, would take place.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: overcast. some rain; muggy w/ occasional light breeze
Important Telephone Calls and Interactions:

Personnel on Site: A. Boerner, T. Chew, S. Govan, E. Jordan, M. White

Name Printed: Alex Boerner
Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy metallurgical Cosporation
Date: 6/30/98 | Time: 12a - 10:15a; 10:45p - 12:00a | Job/Task Number: 94005.05
Client Name: Shieldalloy
Address of Work Site: 12 West Boulevard, Newfield, NJ
Description of Work: Bag change out - Flex Kleen Baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

First entry only lasted 25 minutes because the first break was scheduled for 2 am. Frisked workers upon egress. Hands, feet, shoes and clothes were checked using a benchmark of 12 counts per six seconds (in integration mode) was essentially equivalent to the 600 dpm/100 cm^2 site-specific criteria. The highest count recorded was "one" (1) over the six second span.

2:12a - 2:36a : Break Time
2:36a - Restarted BZA's as baghouse operations resumed.

NOTE: All initial flow rates and tracking of stay times were documented. See appropriate records.

2:36 - 3:00a: Started writing up FADL for the ending of the 6/29 work day and start of 6/30 graveyard shift. Based on info supplied by M. White, I surveyed a barrel located ~50' north of the baghouse (south of Bldg D-111) - this barrel contained the worker's dust masks and work gloves from last night's operations. the highest count recorded was one count over six seconds. Proceeded to a second barrel located on the west side of Bldg. D-115. this barrel contained two of the coveralls from last night's operations. The coveralls were surveyed and again, the count was the maximum count observed over six seconds. As for the other two workers, one of them did not wear Tyvek's but rather work clothes last night, so there was nothing to survey.. the fourth

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: See p1 of 6
Important Telephone Calls and Interactions:
Personnel on Site: See p1 of 6
Name Printed: A. Boerner
Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation
Date: 6/30/98 Time: 12a - 10:15a; 10:45p - 12:00a Job/Task Number: 94005.05
Client Name: Shieldalloy
Address of Work Site: 12 West Boulevard, Newfield, NJ
Description of Work: Bag Change Out - Flex Kleen Baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

worker indicated he ripped his Tyvek's all to pieces at the conclusion of last night's activities. He could not tell me where he had placed them. However, based on the other survey results, it appears likely nothing of significance would have been found.

3:00 - 3:20a : Continued FADL update. Surveyed ~20 bags (used) that had been stripped from their support cages and dropped on the ground just north of the baghouse. Highest count recorded = "one" (1) over six second time frame.

NOTE: During baghouse operations, the objective has been to remove the cages from the bags and drop the used bags into the hopper below. The 20 bags above were not/could not be discarded in this way. Hence, they were placed on the ground.

3:20 - 3:48a : Walked around the baghouse from the ground level and noted rad'n area posting. However, the exposure rates seem too low (~10 urem/hr) to warrant this. Started an exposure rate survey around the ground level of the baghouse.

3:48a - Workers egress from baghouse for 4:00 am Break. RZA's turned off and workers frisked (3:48 - 3:58a). No contamination noted.

3:58 - 5:03 Break

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: See p1 of 6
Important Telephone Calls and Interactions:
Personnel on Site: See p1 of 6
Name Printed: Alex Boesner
Signature: Alex J. Boesner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation
Date: 6/30/98 | Time: 12a - 10:15a; 10:45p - 12:00a | Job/Task Number: 94005.05
Client Name: Shieldalloy
Address of Work Site: 12 West Boulevard, Newfield, NJ
Description of Work: Bag Change Out - Flex Kleen Baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

5:03 - 5:53 am : Work resumes. Continued micrometer survey, but the IEM drawing was not to scale and I decided to terminate this particular survey for another time.

5:53 am : Break; workers smoked and RZA's turned off.

NOTE: Work on this shift has concentrated on removing the used bags from the east side of the baghouse. The objective is to lift up the cage (using a crowbar-like device) and knock the bag loose and down into the hopper below. When successful the cage is presently transferred and stacked on the west side (inside the baghouse) of the baghouse, until the cages are fitted w/ new bags. This latter activity has not occurred to date.

6:05 - 6:20a : Placed the micrometer into three different access doors positioned along the length of the east side of the baghouse. Ambient readings ranged from 5-10 micrometers per hour. No contact readings taken because I am not allowed access into a confined space.

NOTE: When looking into the baghouse, there seems to be an array arrangement where the bags/cages are segregated into squares. I estimated ~ 4/3 squares lengthwise (N to S) and five squares in width (E to W). Each square contains 12 slots for the bags. This arrangement would equate to ~ 720 bags (which is close to the 900 bags per side of the

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

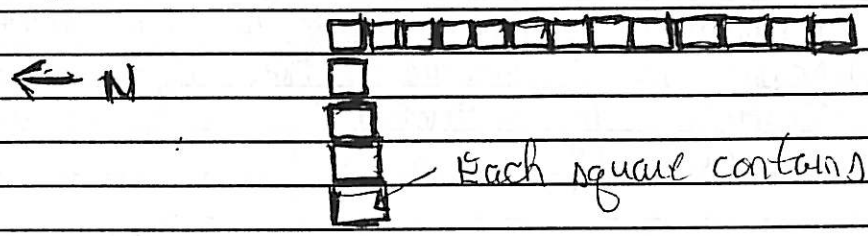
Weather Conditions: See p1 of 6
Important Telephone Calls and Interactions:
Personnel on Site: See p1 of 6
Name Printed: Alex Boesnes
Signature: Alex J. Boesnes

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility:	Shieldalloy Metallurgical Corporation
Date: 6/30/98	Time: 12:00a - 10:15a; 10:45p - 12:00a Job/Task Number: 94005.05
Client Name:	Shieldalloy
Address of Work Site:	12 West Boulevard
Description of Work	Bag Change Out - Flex Kleen Baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

baghouse SMC has estimated are present.



13 x 5 x 12 = 720 bags

6:20 - 7:20a : BZA's turned back on (6:20a) and work resumes. At 7:05a, workers left the baghouse and opened up a roll off box (empty) to dump the ~20 bags left on the ground. Morton and Chew went back to the baghouse to retrieve "stuck" bags and place them in the roll-off box. BZA's were left on throughout this activity.

NOTE: the roll off box was initially empty. I estimated its dimensions at ~20' x 7' x 6'. There was a marking on the side of the box which indicated a capacity of 25 cubic yards.

7:20a - 7:45a: Turned off BZA's (7:20a) and frisked ~~worker~~ (4) workers. Returned to HP office after discussing tomorrow night's activities w/ E. Jordan and picking up this shift's Tailgate Form from the D-III break room.

7:45a - 10:15a : Completed post-shift paperwork, and followed through

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: See p. 1 of 6	Important Telephone Calls and Interactions:
Personnel on Site: See p 1 of 6	
Name Printed: Alex Boerner	Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation
Date: 6/30/98 Time: 12a - 10:15a; 10:45p - 12:00a Job/Task Number: 94005.05
Client Name: Shieldalloy
Address of Work Site: 12 West Boulevard
Description of Work: Bag Change out - Flex Kleen Baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

on recording relevant survey instrument (post-shift) parameters and BZA/GM calibrator documentation. Discussed project status with Brian Kelly who requested fax of preliminary documentation of survey results to assist in dust assessment. Discussed project status w/ Dave Smith. Requested less assistance from the SMC receptionist to C. Berger and B. Kelly. Returned radio to guard shack and signed out. Left site at 10:15a

5:30p - 7:45p: Evaluated paperwork in hotel room. Prepared for tonight's shift. Wrote up official FADL for 6/30/98

10:45p - 12:00a: Arrived on site 10:45p to prepare for night shift. Checked out survey instruments and calibrated/verified operation of BZAs. Recorded information. Returned to guard shack for escort to Bldg D-111 break room - escorted partway by guard and partway by Paul Drewes, night supervisor.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: See p1 of 6
Personnel on Site: See p1 of 6; also D. Smith
Important Telephone Calls and Interactions: Phone call to B. Kelly (project status) and discussion w/ D. Smith (project update)
Name Printed: Alex Boerner
Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation		
Date: 7/1/98	Time: 12:00a - 12:05p	Job/Task Number: 94005.05
Client Name: Shieldalloy		
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344		
Description of Work: Bag Change Out - Flex Kleen Baghouse		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

12:05a - 12:20a : Conducted Tailgate Safety meeting for Tim Chew, Steffon Govan, Eddie Jordan, and Milton White. Posted tailgate form in Bldg D-111 break room for the remainder of the shift

12:20a - 12:52a : Proceeded to Flex-Kleen Baghouse, but had to wait for Paul Drewes to arrive w/ requested supplies in the form of protective clothing.

12:52a - 1:55a: Initial entry into baghouse. Initial flow rates and "time in" information recorded. The following BZAs were used:

8240 - T. Chew
8241 - S. Govan
8242 - E. Jordan
8243 - M. White

Workers left baghouse 1:55a for 2am break. Fridking indicated a maximum reading of one count over six seconds.

1:55a - 2:30a: Break; discussed SMC operations with the maintenance supervisor, Earl Paulhamus (sp?). He verified there are a total of 1800 bags (600/side). 2:30a

2:30a - 3:35 : Baghouse operations resumed. BZA's turned back on. M. White indicated ~700 bags have been removed from them

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: Brisk wind (cool/cold)	Important Telephone Calls and Interactions:
Personnel on Site: Chew, Govan, Jordan, White, Boerner	
Name Printed: Alex Boerner	Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation
Date: 7/1/98 | Time: 12:00a - 12:05p | Job/Task Number: 94005.05
Client Name: Shieldalloy
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344
Description of Work: Bag Change Out - Flex Kleen Baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

cages thus far. This leaves ~200 to go, at which time they will start putting the new bags on.

*S. Govan told me the tubing to his BZA had come off during the initial 12:52-1:55a work period. He did not know when this occurred

Updated FADL and started filling out air sampling data sheets. Workers egressed at 3:35a and were frisked (no findings). BZAs were turned off at 3:35a, but as has been common, the workers take breaks up on the catwalk. During the 2:30 - 3:35a period, for example, they took ~a twenty minute break while the BZAs were still running. I have only been cutting off the BZAs when they egress to be frisked. Keeping track of these additional unscheduled breaks is a complicating factor.

Break Time: 3:35a - 5:08a

5:08a - BZAs restarted and work resumes

5:10 - 5:30a: Surveyed ground level around and under baghouse using Bicron micrem meter. On the concrete sidewalk north of the baghouse (tunnel located underneath), readings were 5-7 μrem/hr. South end under the baghouse = 4-5 μrem/hr. The vast majority of the area under the baghouse ≅ 10-14 μrem/hr. Two locations were noted w/ elevated readings. On both the NE and NW sides, a "hopper" looking device (but not a true hopper) (AB) is connected to the hoppers located directly under the baghouse. Read 80-90 μrem/hr and 50-60 μrem/hr. Both these V-shaped

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: See p.1
Important Telephone Calls and Interactions:

Personnel on Site: See p.1

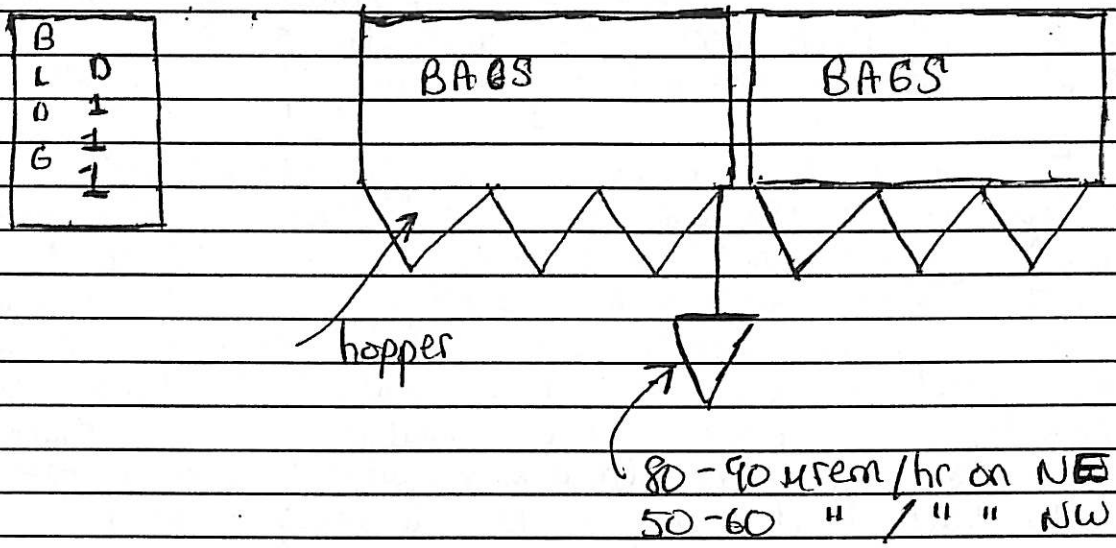
Name Printed: Alex Boerner
Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation		
Date: 7/1/98	Time: 12:00a - 12:05p	Job/Task Number: 94005.05
Client Name: Shieldalloy		
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344		
Description of Work: Bag Change Out - Flex Kleen Baghouse		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

devices are connected to the main hopper system. They are both located ~ in the middle of the two sets of hoppers. They are also both located directly adjacent to the "Radiation Area" signs found on both sides of the baghouse.



Workers egressed 6:05 am. BZA's turned off + workers frisked. Highest ct = 1 ct over six seconds. NOTE: ~ 20 minutes of the 57 minute monitoring period was spent taking an unofficial break and also transporting boxes (presumably containing new bags) up to the main catwalk. BZA's were kept on during this time, but no activities associated w/ the old bags were taking place.

6:28a - BZA restarted for E. Jordan who resumed work by himself (temporarily) in baghouse. Joined by Chew + White at 6:35a; Doran at 6:37a.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: Sunny at 6 am; breezy	Important Telephone Calls and Interactions:
Personnel on Site: See p.1	
Name Printed: Alex Boerner	Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation
Date: 7/1/98 | Time: 12:00a - 12:05p | Job/Task Number: 94005.05
Client Name: Shieldalloy
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344
Description of Work: Bag Change out - Flex Kleen Baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

workers egressed at 7:40a. Collected all BZAs and tracked workers for the final time this shift. Picked up Tailgate Safety Form from Bill break room and RWP (to copy and then return)

8:00a - 12:05p Arrived HP Office and conducted usual routine of performing post-shift instrument checks, BZA final flow rates, post-shift BZA calibrations, BZA recharging, and paperwork updates.

In addition, I ran a 50 minute blg on the smear counter and then counted the 6/30/98 and 7/1/98 air filters. The filters were only counted for one minute in order to get a quick "reality check". The highest count was ~40 net cpm (from this morning's air filters (no radon correction made). Based on sample volumes etc, the concentration was 9.6E-11 uCi/ml. Called Brian Kelly ~10:45 am to discuss (also left voice mail for C. Berger). Brian requested I stay at the site until 11:30 am while he tries to get through to Carol. In the meantime, he will determine an MDA for comparison to the appropriate DAC.

Spoke w/ Carol ~11:30 am. Requested I try to "fix" SMC's Eberline calibrator if possible. Carol indicated the air filters can be counted at IEM next week. There is no need to take readings in the AAF baghouse this trip, but break room/locker room/final status survey should be performed. Other issues were discussed, including reminder to have a close out survey w/ Dave Smith tomorrow if possible. Wrapped up paperwork and signed out of Plant at 12:05 pm. Drove back to Philadelphia and arrived in Knoxville 11 pm. (AJB)

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: See p. 3
Important Telephone Calls and Interactions: Voice mail (C. Berger); project update (B. Kelly); project status (C. Berger)
Personnel on Site: See p. 1
Name Printed: Alex Boerner
Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation		
Date: 7/2/98	Time: 12:00a – 11:30a	Job/Task Number: 94005.05
Client Name: Shieldalloy		
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344		
Description of Work: Placing New Bags on Cages (Replacing Baghouse Bags - East Side)		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

7/1/98

Arrived on site ~10:50pm. Checked in with guard and proceeded to HP office to perform survey instrument and air sampler calibrations/checks. Left HP office 11:40p to pick up radio from security and proceed to Bldg D111 break room.

7/2/98

Work crew was not present in break room at 12:00a, so I left D111 to find them. Found crew near D115 break room and proceeded as a group to D111 break room. Next several minutes spent answering questions about radiation and additional discussion about the SME license violation.

12:35 – 12:40a Conducted tailgate safety meeting and obtained worker signatures. Was informed by Eddie Jordan that tonight's work involves putting new bags onto the cages. No work involving the old bags is expected to be performed tonight. (I was told that at some future day, any old bags located in the hoppers will be removed and placed in a roll off box for disposal.)

(a&B)

12:40 – 12:45a : Crew and I departed for the Flex-Klean baghouse.
12:45a : BZAs turned on and work at the baghouse commenced.
1:10 – 1:25a : Conducted survey of Bldg D111 break room. Found 7-8 urem/hr throughout. Took 3 one minute instrument readings w/ the Ludlum 43-89/2224 followed by 3 smears at the same locations. Scanned table, desk, and chairs (nothing of significance noted). See survey documentation in project file.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: mild, slight breeze	Important Telephone Calls and Interactions: NA
Personnel on Site: T. Chew, S. Govan, E. Jordan, M. White, A. Boerner	
Name Printed: Alex J. Boerner	Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Cosporation
Date: 7/2/98 | Time: 12:00a - 11:30a | Job/Task Number: 94005.05
Client Name: Shieldalloy
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344
Description of Work: Placing New Bags on Cages (Replacing Baghouse Bags - East side)

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Workers exited baghouse (1:44a). No contamination noted during frisking. Highest count recorded = "3" over six seconds.

Break Time: 1:50a - 3:00a ✓ 2:15-2:30a ✓ on floor

During the break, I surveyed the 0115 Break Room. Took 3 α meas. Highest count was 4 cpm on west side of room. One smear was taken at this location. Microrem readings ranged from 4 - 5 μrem/hr. See survey documentation in project file.

At 2:30 am, the work crew asked to see the HP office so I could demonstrate the response of the 43-89 to an α source. For ~ ½ hour, we discussed radiation (both ionizing and non-ionizing), decon methods, and other relevant issues.

3:03a - BZAs turned on and work resumed ← Also scanned tables, benches
3:20 - 3:35a: Surveyed D102 lunch room. Five α total measurements taken, no smears. 5-8 μrem/hr noted in lunch room.
3:42a - Workers exit baghouse area. BZA's turned off + workers frisked. Highest ct recorded = "3" in six seconds. Total time ≅ 40 minutes (3:03 - 3:42a)

Break Time: ~3:45a - 4:57a

4:57a - Restarted BZAs

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: See p. 1
Important Telephone Calls and Interactions: NA
Personnel on Site: See p. 1
Name Printed: Alex J. Boerner
Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation		
Date: 7/2/98	Time: 12:00a - 11:30a	Job/Task Number: 94005.05
Client Name: Shieldalloy		
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344		
Description of Work: Placing new bags on cages (Replacing Baghouse Bags - East side)		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

5:00a - 5:35 Began survey of and surrounding the baghouse. Took smears from inside the baghouse (2), and 1 each from the railing, a used bag, the catwalk, top surface of a forklift used to transport boxes containing new bags to a staging area on the NE side of the baghouse, and a front forklift tine.

Surveyed (scanned) the forklift, including the tines, driver seat, and horizontal surfaces where dust had collected. Highest count recorded was "5" over a span of six seconds from a horizontal surface behind the driver's seat (rear of the forklift)

5:28a - S. Govan's tubing came loose from the BZA and he immediately notified me. He also requested to be frisked at this time because he had been working down in the hopper where hundreds of bags (used bags) are presently located. Frisked his hands, shoes, and several areas on his Tyvek's. Highest count = "6" over a six second time frame. Restarted BZA at 5:32a

5:53a - Workers exit baghouse. BZAs turned off and workers frisked (no problems noted on frisking). E. Jordan's pump had been turned off sometime during the sampling period - he did not know when this occurred. The maximum sampling time for this period was 56 minutes

Break Time: ~5:55a - 6:25a (for S. Govan, E. Jordan, and M. White)
6:25a: BZAs turned on for Govan, Jordan, and White.
6:45a: BZA turned on for T. Chew.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: See p 1	Important Telephone Calls and Interactions: NA
Personnel on Site: See p 1	
Name Printed: Alex Boerner	Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation
Date: 7/2/98 | Time: 12:00a - 11:30a | Job/Task Number: 94005.05
Client Name: Shieldalloy
Address of Work Site: 12 west Boulevard Newfield, NJ 08344
Description of Work: Replacing Baghouse Bags - East side

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

6:25a - 6:45a Workers requested discussion of additional radiation issues. The BZAs were not turned off, however, and should have been since the discussion took place in the vicinity of, but not at the baghouse. Therefore, the first 20 minutes will not provide useful monitoring information. Also during this time, one of the workers tapped his air filter holder and blew into the holder, conceivably invalidating the air filter count which will follow in the near future.

7:20a - T. Chew exits baghouse area to leave for the day, followed at 7:25a by Govan, Jordan, and White. All BZAs turned off for the final time and the workers frisked (no problems). Surveyed a pallet which had contained boxes of new bags. Nothing of significance noted.

7:35a - Govan, Jordan, White, and Boerner leave baghouse area and proceed to DIII break room. Picked up Tailgate Safety Form and RWP.

7:35 - 8:00a - Completed final status survey (which had started at 5:45 am and continued intermittently thereafter.) Took swipes, fixed measurements, and microrem readings. Returned to IEP office 8am

8:00 am - Conducted close out meeting w/ Dave Smith. Verified post-shift
11:30 am instrument and air sampler response. Performed a post-shift calibration of the four BZAs used on the shift. Attempted to "fix" the Gilian calibrator by soaking the cell w/ water, but didn't work. Verified checklist. Received short tour of engineering building from D. Smith. Left site 11:30 am

11:00 pm - Arrived home in Knoxville.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: Sunny, mild in the early am
Important Telephone Calls and Interactions: Close-out meeting with Dave Smith
Personnel on Site: See p 1
Name Printed: Alex J. Boerner
Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ		
Date: 7/12/98	Time: 0945p	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation		
Address of Work Site: 12 West Boulevard, Newfield, NJ		
Description of Work: Pre-shift preparation		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0945p - Arrived onsite and checked in with security office. Escorted to HP office and unpacked equipment.

10:00 - 11:45p - Calibrated BZAs for both the midnight and day shifts; conducted pre-shift checkouts of Ludlum 2224/43-89 & monitor and Bicron microrem; placed MSA BZAs on chargers in preparation for dayshift use; organized paperwork.

11:45p - 12:00a - Picked up radios at security office; escorted by security to D111 break room

Changes from Plans and Specifications, and Other Special Orders and Important Decisions: NA	
Weather Conditions: night time (cool); clear skies	Important Telephone Calls and Interactions: NA
Personnel on Site: A. Boerner	
Name Printed: Alex J. Boerner	Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ

Date: 7/13/98 | Time: 12:00a | Job/Task Number: 94005.05

Client Name: Shieldalloy Metallurgical Corporation

Address of Work Site: 12 West Boulevard, Newfield, NJ

Description of Work: Changing out clean bags in Flex-Kleen baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

12:00a - met three of the four workers assigned to this shift: Ken Schooley, Carnel Boyd, and Eddie Jordan. Fourth worker, Larry Remsen, had not appeared as yet.

12:30a - Informed that L. Remsen will not be working tonight. Tailgate safety meeting conducted for Boyd, Jordan, and Schooley from 12:30a - 1:00a. Fourth worker, Milton White, appears as substitute for L. Remsen as safety meeting concluded. Major points were re-discussed with him.

1:05a - BZAD issued to the four workers

Sampler No. 8240 : C. Boyd
" " 8241 : E. Jordan
" " 8242 : K. Schooley
" " 8243 : M. White

} issued in alphabetical order

1:10a - 1:30a - waited on supplies (dust masks, gloves) for workers.
1:35a - work commenced in Flex-Kleen baghouse. BZAD turned on and flow rate noted. Objective is to place new bags on cages.

2:00a - workers egress baghouse; pumps turned off, times recorded, and workers frisked (highest count recorded = 2 counts over six seconds)

2:05 - 2:30a - Break
2:30a - work resumed; pumps restarted
3:45a - workers egress baghouse; pumps turned off; negative findings on persons

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

NA

Weather Conditions: night time (mild temperatures)

Important Telephone Calls and Interactions: NA

Personnel on Site: A. Boerner, C. Boyd, E. Jordan, K. Schooley, M. White, P. Orewes (night Supervisor)

Name Printed: Alex J. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ

Date: 7/13/98 | Time: 3:50a | Job/Task Number: 94005.05

Client Name: Shieldalloy Metallurgical Corporation

Address of Work Site: 12 West Boulevard, Newfield, NJ

Description of Work: Placing clean bags on cages in Flex-Kleen Baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

frisks. Workers leave for scheduled break.

3:50 - 4:00a: Examined east side of baghouse for estimate of progress. It appears that slightly less than half of the bags have been replaced. Each new bag measures 120.5" x 5 7/8" (~10'x6" Placed mrem meter just inside one access door (measured 7 mrem per hour

4:57a - Work resumes; BZAs turned back on.
5:50a - Workers egress; " " off; negative findings again on frisking

6:35a - Work resumes; pumps re-started.
7:13a - C. Boyd departs (pump turned off); negative findings on frisk
7:28a - K. Schooley egresses
7:30a - E. Jordan, M. White egress } negative findings on frisk

7:30a - 7:45a - Picked up BZAs from the night shift and returned to HP office; picked up replacement BZAs and filters and returned to Mill break room to deliver tailgate safety meeting.

7:45a - 8:15a - Waited on fourth workers to appear for this shift. The four workers were Lem Cordero, Juan Cortez, George Serrano, and Steffon Govan

8:15a - 8:45a - Conducted Tailgate Safety meeting for day shift personnel

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

NA

Weather Conditions: See p1

Important Telephone Calls and Interactions: NA

Personnel on Site: See p. 1. also Cordero, Cortez, Serrano, and Govan

Name Printed: Alex J. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ
Date: 7/13/98 | Time: 8:45a | Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation
Address of Work Site: 12 West Boulevard, Newfield, NJ
Description of Work: Placing clean bags on cages; removing used bags from hoppers

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

8:45 - 9:10a Issued BZAs to the four workers, started the pumps, and left for the HP office. Len Cordera was made aware he should contact Dave Smith for monitoring questions.

The pumps were assigned as follows:

Pump # 1 - L. Cordero
" # 2 - J. Cortez
" # 3 - S. Govan
" # 5835 - G. Serrano
↳ serial # on front of pumps

9:10a - 10:00 Performed usual post-shift activities (BZA recalibration, instrument checks, change outs of filters, etc)

Left message for D. Smith concerning what I did last night and this morning as far as getting new shift started. Was also informed earlier that the night crew would be working a 12 hr shift tonight from 8 o'clock pm to 8 am. Informed Dave of this as well (by message since he was in a meeting).

10:00 - 10:10a Wrapped up and left site 10:10 am

6:00p - Returned back onsite to prepare for 8 pm shift.
6:00p - 7:00pm - Conducted instrument checkouts and pre-shift BZA (Gilian calibrations; prepared tailgate safety form and other documentati

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
NA

Weather Conditions: Warm, sunny
Important Telephone Calls and Interactions: NA on phone calls. Left written message for D. Smith prior to leaving site

Personnel on Site: See p. 2
Name Printed: Alex J. Boerner
Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ

Date: 7/13/98 | Time: 7:00 pm | Job/Task Number: 94005.05

Client Name: Shieldalloy Metallurgical Corporation

Address of Work Site: 12 West Boulevard, Newfield, NJ

Description of Work: Removing used bags from hopper.

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

7:00 - 7:45 pm : went back to baghouse and DIII break room to load BZAs used during day shift. Returned BZAs to HP office, collected air filters conducted post-shift calibration using mini-buck, and loaded new filters for tomorrow's day shift (if required). Placed all MSA BZAs on charge.

7:45 - 8:00p : Gathered instrumentation etc and left for DIII break room.

8:00 - 8:15p : Conducted tailgate safety meeting. Four workers ~~will~~ (AB) for tonight's shift are: Carnel Boyd, Eddie Jordan, Larry Remson, and Ken Schooley. Remson replaced Milton White on tonight's shift

BZAs were assigned as follows:

8240 - C. Boyd
8241 - E. Jordan
8242 - L. Remson
8243 - K. Schooley

8:25p : Work commences and BZAs started.

The day shift had apparently removed ~ half of the used bags from the east side of the baghouse and had placed them in a roll-off box located on the west side of the baghouse and then additional bags in another roll-off box located on the NE side of the baghouse. The night shift continued this activity, but had initial difficulties emptying bags into the NE roll off box because the bin selected by the day shift

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

NA

Weather Conditions: Mild; nighttime

Important Telephone Calls and Interactions: NA

Personnel on Site: Boerner, Boyd, Jordan, Remson, Schooley

Name Printed: Alex J. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ

Date: 7/13 | Time: 8:45p | Job/Task Number: 94005.05

Client Name: Shieldalloy Metallurgical Corporation

Address of Work Site: 12 West Boulevard, Newfield, NJ

Description of Work: Removing used bags from east side hopper / placing bags in roll-off box

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

to transport the bags to the roll-off box caused many of the bags to get stuck. Removing the bags from the bin (transported by a forklift) generated a dust cloud carried by the prevailing winds in a northeasterly direction. A different bin was brought in to continue used bag removal from the east side hopper.

9:10 - 9:20 pm - Surveyed both roll-off boxes containing used bags. Highest count recorded was "3" over a span of six seconds. It therefore appears that even though dust is/has been generated by both this morning's and this shift, radioactivity levels on the bags are essentially background

9:22 - 9:25 p - Workers curtail removing used bags; BZAs turned off and workers frisked. No problems noted

9:45p - Walked up to baghouse catwalk. Observed that all new bags have been positioned on the east side of the baghouse. That portion of the work is now complete.

10:00 - 10:45p : Updated paperwork

10:33 - 11:05p : Workers re-enter area around / in hopper to continue removing used bags from hopper. Previous break extended while workers waited on more coveralls.

at different times

11:25pm - Surveyed 2 crowbars removed from inside hopper. No contamination found.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

NA

Weather Conditions: See p 4

Important Telephone Calls and Interactions: NA

Personnel on Site: See p. 4

Name Printed: Alex J. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ		
Date: 7/13/98	Time: 11:55p	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation		
Address of Work Site: 12 West Boulevard, Newfield, NJ		
Description of Work: Removing used bags from hopper		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

11:55p - Workers exit baghouse area for 12 midnight break. Even w/ the dusty conditions being generated in removing the used bags from the hopper, no elevated readings have been noted. In fact, all readings continue to fall within typical background levels!

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

NA

Weather Conditions: See p 4	Important Telephone Calls and Interactions: NA
Personnel on Site: See p 4	
Name Printed: Alex J. Boerner	Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ
Date: 7/14/98 | Time: 1:00 a | Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation
Address of Work Site: 12 West Boulevard, Newfield, NJ
Description of Work: Removing used bags from hopper

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

1:00 am – Workers return; pump for Schooley turned on 1:00 am; all others at 1:05 am.

NOTE: For the last few hours, two of the workers (Schooley and Boyd) have been the ones that go into the hopper area and push out the used bags onto the ground. Upon exiting the hopper, they use an air pressure hose to blow dust off their protective clothing. The hose kicks up more dust into the air. It is possible the air sample results for these two workers will differ from those of Remson and Jordan.

2:05a – Workers exit baghouse area. BZAs turned off and workers frisked. No readings noted above background.

NOTE: all bags (900) have been removed from the hopper on the east side of the baghouse. At some point (probably day shift), dust caked on the walls of the hopper and ~1.5" deep on the floor, will have to be removed.

3:25a – BZAs turned back on. Workers resume baghouse activities, i.e. placing used bags in a transport bin.

3:40a – Workers exit for 4 am break. BZAs turned off and workers frisked.
4:00 – 4:30a – Calibrated MSA BZAs for day shift; prepared tailgate safety meeting form for day shift personnel.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
NA

Weather Conditions: mild; nighttime
Important Telephone Calls and Interactions: NA

Personnel on Site: A. Boerner, C. Boyd, E. Jordan, L. Remson, K. Schooley

Name Printed: Alex J. Boerner
Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ		
Date: 7/14/98	Time: 5:05a	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation		
Address of Work Site: 12 West Boulevard, Newfield, NJ		
Description of Work: Storing remaining used bags in a temporary transport bin		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

5:05a - Workers return. Pumps restarted. Two roll-off boxes are now full.

6:00a Remaining bags left on the ground placed in a transport bin for temporary storage until a third roll-off box is delivered. Workers egress exit 6:00 am. BZAs turned off and workers frisked.

6:40a - Workers return and pumps restarted. Workers begin transferring wire cages from west side of baghouse (where they had been stored) to the east side where they will be inserted into the new bags

6:55a - Surveyed forklift used to transport bags to roll-off boxes. Highest total count recorded was "3" over a counting interval of six seconds.

7:20a - Workers exited area for last time on this shift. No problems noted during frisking.

7:30 - 7:50a - Performed post-shift instrument checks; re-checked calibration of Gillian BZAs used on night shift (post-shift calibration). Placed Gillian BZAs in charge.

7:50a - Proceeded to Dill break room

8:00 - 8:30a - Conducted tailgate safety meeting for day shift personnel and issued BZAs as follows:

Pump # 1 : Lem Cordero Pump # 3 : Marcellina Ojeda
" # 2 : Juan Cortez " # 5835 : George Serrano

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

NA

Weather Conditions: overcast	Important Telephone Calls and Interactions: Tailgate meeting w/ Day shift personnel
Personnel on Site: Boerner, Boyd, Jordan, Remson, Schooley	
Name Printed: Alex J. Boerner	Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ

Date: 7/14/98 | Time: 8:35a, 5:50p | Job/Task Number: 94005.05

Client Name: Shieldalloy Metallurgical Corporation

Address of Work Site: 12 West Boulevard, Newfield, NJ

Description of Work: Scraping of North wall in baghouse to remove accumulated deposits; activating mechanical auger to dislodge accumulated dust.

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

8:35a - 8:40a Updated FADL + placed clean filters into filter holders for the night shift.

8:45a - Departed the SMC facility.

5:50p - Arrived back on site. Called Dave Smith and discussed current job
6:30p status. He and I walked over to the baghouse area and spoke w/ Lem Cordera, lead operator, for an update on day shift activities. His shift finished scraping all the walls and floors inside the east side of the baghouse except for the walls on the north side (left for nights shift). Lem's crew also completed placing all the wire cages inside the 900 bags.

Dave mentioned that they may need to perform a "dye test" inside the baghouse prior to the production run. Therefore, he is not sure when I can leave the site officially. I will be checking back w/ him on the am at the conclusion of the night shift to re-evaluate the situation.

6:30 - 7:30p Checked out all instrumentation and air samplers and prepared the proper documentation.

7:45p - Proceeded to OIII break room.

8:10p - Conducted tailgate safety meeting; picked up 4 MSA BZAs used on
8:15p day shift.

8:35p - Work commences; BZAs turned on at 8:35p for 3 of the 4 workers (8:40 pm for K. Schooley). K. Schooley and L. Remson working on outside of hopper first to

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

NA

Weather Conditions: mild

Important Telephone Calls and Interactions: Discussion of project status w/ D. Smith; left voice mail for C. Berge

Personnel on Site: Boerner, Boyd, Jordan, Remsen, Schooley, D. Smith

Name Printed: Alex J. Boerner | Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ		
Date: 7/14/98	Time: ~~0850~~ p	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation		
Address of Work Site: 12 West Boulevard, Newfield, NJ		
Description of Work: Removal of accumulated dust from north end of east-side baghouse.		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

dislodge accumulated dust in hopper. The 2 workers hit the side of the hopper w/ a shovel and sledge-like tool while a motor is activated to turn an auger (screw) to mechanically loosen the dust. The dust drops out one of the ends of the hopper into a storage bin which is then dumped into a roll-off box. R. Schooley then entered baghouse to start scraping walls. Work continued in this fashion until egress occurred at 9:28p for R. Schooley and 9:35p for the three other workers. BZAs turned off and frisking conducted (no problems).

9:35 - 10:05p Took day shift BZAs back to the HP office and re-calibrated all four monitors. Placed BZAs on charge. Updated paperwork.

10:05 - 10:25p Returned to baghouse area. Continued paperwork update. Auger device has been kept on during the break to remove as much dust as possible.

10:30p = BZAs cut on for Boyd and Jordan
10:40p - " restarted for Remsen and Schooley
10:50p - Access door (plate) to hopper replaced and bolted (2 bolts missing) indicating hopper has been appropriately cleaned of baghouse dust.

11:00 - 11:10p - Reviewed SMC checklist

NOTE: During this work period, the workers transported additional baghouse dust to the roll-off box, and placed pipes on top of new bags

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

NA

Weather Conditions: mild; nighttime	Important Telephone Calls and Interactions: NA
Personnel on Site: See p 3 (except for D. Smith)	
Name Printed: Alex J. Boerner	Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ

Date: 7/14-15/98 | Time: 11:45 pm | Job/Task Number: 94005.05

Client Name: Shieldalloy Metallurgical Corporation

Address of Work Site: 12 West Boulevard, Newfield, NJ

Description of Work: Re-position pipes over new bags

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

11:45 Schooley + Remsen egress area ; all workers frisked. Highest count
11:50 Jordan + Boyd " " ; recorded = "2" over 60 seconds.

12:50a (7/15/98) - Work resumes. BZA0 restarted. Workers working back up at top of baghouse where bag access located. Five bags are being replaced w/ new ones; pipe racks are being re-positioned over new bags.

1:15 - 1:30a - Used microrem meter to confirm/determine gamma radiation levels under the baghouse area and near the baghouse. Hopper-like device located on the east side of the baghouse still is the most elevated location (~70 urem/hr) - see documentation from 6/29-7/3/98 SMC trip. Most other areas 7-10 urem/hr. Roll-off boxes containing used bags and trash read ~12-20 urem/hr. These readings are in keeping w/ readings taken two weeks ago.

1:50a - Workers egress. Negative findings once again for frisking of hands, feet, etc.

2:57a - BZA0 turned on for Jordan, Remsen. ; All workers up in baghouse
3:05a - " " " " Boyd, Schooley ; (east side) placing pipes over new bags.

3:10 - 3:25a - Surveyed DII break room. Took 4 fixed measurements and 3 urem/hr readings. No smears. See drawing of room for results. All results < 600 dpm/100 cm² site criteria.

3:40a - Workers egress; BZA0 turned off + workers frisked

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

NA

Weather Conditions: mild; night time

Important Telephone Calls and Interactions: NA

Personnel on Site: Boerner, Boyd, Jordan, Remsen, Schooley

Name Printed: Alex T. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ

Date: 7/15/98 | Time: 3:45a | Job/Task Number: 94005.05

Client Name: Shieldalloy Metallurgical Corporation

Address of Work Site: 12 West Boulevard, Newfield, NJ

Description of Work: Fix broken metal supports in baghouse; complete attaching pipes in baghouse

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

3:45a - Gamma survey on catwalk of baghouse and placing detector inside the
3:55a baghouse resulted in readings of 7-10 μrem/hr. Fixed measurements taken on shovels, pry bars, etc. used earlier to knock accumulated dust out of the baghouse resulted in a maximum of two counts over one seconds

5:35a - Apparently, a problem developed during the previous work period (exact problem unknown) requiring a welding operation to be performed. Eddie Jordan requested the assistance of one Ralph Willis to perform the welding. It appears that several pieces of angle iron which are used to support and position the piping which lays across the baghouse bags had come loose. If not welded back, several pipes would not be secured properly.

5:53a - BZA turned on for E. Jordan
6:25a - " " off " " " ; welding operation completed

Frisked E. Jordan and Ralph Willis. Also checked forklift carrying welding equipment (no problems noted)

6:42a - BZAs turned on for E. Jordan, K. Schooley who enter baghouse to finish placing pipes over new bags.

7:15a - K. Schooley exits baghouse, followed by E. ~~Johnson~~ Jordan (AB) at 7:20am. Eddie Jordan indicated the last thing left to do is to check the integrity of the bags by performing a dye test. Will have to be done on day shift.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Delay due to broken metal supports in baghouse requiring re-welding

Weather Conditions: mild; partly cloudy at sunrise

Important Telephone Calls and Interactions: Discussed my role with Ralph Willis

Personnel on Site: See p5 plus Ralph Willis (welder)

Name Printed: Alex J. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation
Date: 7/15/98 | Time: 7:30a | Job/Task Number: 94005.05
Client Name: SMC
Address of Work Site: 12 West Boulevard, Newfield, NJ
Description of Work: Preparation for dye test

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

7:30a - Returned to HP office. Had discussions w/ SMC personnel
8:45a who indicated they are now considering changing out the other 900 bags before they start production. Bob DeStrange questioned how much coverage of the baghouse operations from a HP standpoint is really required. He indicated he will get w/ Dave Smith and all of us may contact Carl Berger or Brian Kelly at IEM to discuss this issue.

7:45a - 8:00a - Began collecting filters from night shift just ended. Did not complete.

8:00a - 8:30a - Received phone call from Brian Kelly. Discussed issues of perform dye test on one-half of the baghouse where clean bags reside, level of HP support required if an additional 900 bags are replaced (a for that matter any time air monitoring is performed), and issue of running a baghouse of only half the bags have been replaced. I indicated a phone conversation w/ R. DeStrange, D. Smith, and myself may occur later today to discuss these issues.

8:30a - 10:25 Returned to baghouse and observed preparations to conduct dye test of section containing new bags; returned to HP office to get several of the MSA BZAs ready for use at the baghouse; spoke w/ D. Smith (IEM) and provided a status report (Dave indicated he would call me later at my hotel w/ SMC's plans regarding changing out the other 900 bags and adjustments to my travel schedule); returned to baghouse area w/ BZAs for day shift personnel; did not have time to conduct a

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
Decision forthcoming on whether to change out west side baghouse used bags w/ clean replacem

Weather Conditions: cloudy, mild
Important Telephone Calls and Interactions: B. Kelly, D. Smith to discuss task status

Personnel on Site: See p.6

Name Printed: Alex J. Boerner | Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Shieldalloy Metallurgical Corporation		
Date: 7/15/98	Time: 10:25a	Job/Task Number: 94005.05
Client Name: SMC		
Address of Work Site: 12 West Boulevard, Newfield, NJ		
Description of Work: Post-shift instrument checks; readjust travel plans		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

post-shift instrument check (Ludlum 43-89 and Bicron microrem) at a tailgate safety meeting for day shift personnel; received message to call Carol Berger; left site 10:25 am.

10:55a Left voice mail for C. Berger
11:00 - 11:05 updated field notes

12:45p - 1:30p - Called Avanti Travel to postpone today's airplane flight; called Alamo CC in Philadelphia to extend rental car use; spoke with Carol Berger regarding project status update

Received fax later in the day from C. Berger stating I did not need to report for the 8 pm shift, but to arrive the next morning to close out this task and depart for Knoxville

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: mild; overcast	Important Telephone Calls and Interactions: Discussion of project status w/ C. Berger
Personnel on Site: A. Boerner	
Name Printed: Alex F. Boerner	Signature: Alex F. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC - Newfield, NJ
Date: 7/16/98 | Time: 7:10a | Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation
Address of Work Site: 12 West Boulevard, Newfield, NJ
Description of Work: wrap up of task activities, return flight to Knoxville

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

7:10a - Arrived onsite and signed on at security

7:20a - Proceeded to DLL break room and picked up the 4 BZAS used briefly on day shift yesterday (3 of the 4 samplers were only used for 35 minutes; one sampler for 1520 minutes), paperwork showing stay times. Also picked up tailgate safety form and the original RWP for this job.

7:45-8:15a - Conducted post-shift instrument and air monitor (calibration) checks. Collected and labeled filters from yesterday's day shift.

8:15-10:15 - updated FADL and began packing equipment; met and discussed task status with C. Berger (onsite today for Radn Safety Committee meeting and to conduct training); spoke briefly w/ D. Smith as a short close-out meeting; finished packing equipment and labeled 3 cases for FedEx shipment - the receptionist agreed to drop these off for me at the nearest FedEx location; signed out at security and left site at 10:15 am for return flight to Knoxville. Due to weather problems, did not arrive home until 11:30 pm.

** NOTE: Was informed by day shift personnel upon arrival at the site this morning that the dye test had been successful and that SMC had opted to start a vanadium production run without replacing the 900 bags located on the west side of the baghouse. The other 900 bags will be replaced at a future date.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
900 bags on west side of baghouse will not be replaced on this trip

Weather Conditions: overcast; mild; threat of rain

Important Telephone Calls and Interactions:
close out w/ D. Smith; task status discussion w/ C. Berger

Personnel on Site: A. Boerner, D. Smith, C. Berger, J. Valenti

Name Printed: Alex T. Boerner

Signature: Alex T. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield

Date: 8/3/98 | Time: 0750 | Job Number: 94005.05

Client Name: Shieldalloy Metallurgical Corp.

Address of Work Site: West Blvd., Newfield, NJ

Type of Work: Lagoon soil excavation, work in D102

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0750 Arrived on site, preparing BZA pumps for use @ D102 & Lagoon projects.
0820 Issued BZA #8241 to contractor Brian Taylor - working in D102 - pressure washing steel.
0830 Met w/D. Smith & J. Valenti - discussed activities to be performed
0900 Issued BZA #8240 to contractor Rob Bennett - working @ lagoons - excavating soil.
0910 Toured lagoon area w/D. Smith, he pointed out locations for soil samples (elevated readings), location of soils already excavated, what sampling is necessary.
0930 Toured Bldg. D102 w/D. Smith, pointed out activities being conducted & stockpile locations.
1100 Collecting soil samples from excavated lagoon areas.
1130 Surveyed workers from D102 (pressure washing steel) & lagoons (excavation). See survey map 080398-01 for results.
1200 Lunch
1300 Surveying ~200 pieces of steel being loaded into truck for removal from site. See survey map #080398-~~03~~ 02 for results.
1400 Surveyed cut up steel in dumpster by D102. See map #080398-~~02~~ 03 for results.
1500 Collecting soil samples from piles of clean soil excavated from lagoons & soil covered with plastic awaiting hazardous chemical analysis.
1515 Collected BZA pumps from personnel.
1600 Performed survey of vehicles used @ lagoon & D102. See map #080398-02 for results

Visitors on Site: None	Changes from Plans and Specifications, and Other Special Orders and Important Decisions: None
Weather Conditions: Sunny, clear, wind-calm	Important Telephone Calls and Interactions: None

Personnel on Site: DuFF, Valenti, Smith, contractors working in D102 (2) & Lagoon excavation (2)

Name Printed: R.A. DuFF | Signature: R.A. DuFF

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 8/3/98	Time: 0750	Job/Task Number: 94005.05
Client Name: SMC		
Address of Work Site: West Blvd., Newfield, NJ.		
Description of Work: Lagoon excavation, work in D102		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

1620 Counting smears in HP office.
1640 Conducting survey of Bldg. D102, structures yet to be taken down. See survey map for results.
1700 Counted smears from D102.
1730 Left site. Noted potential pathways of personnel exposure in D102 during walk through today. Pathways included direct exposure from residual CANAL, inhalation of dust and/or mist from decon operations, skin contamination from spraying activities. Water from pressure washing operations is mixing with residual CANAL dust on floor & sticking to personnel's clothing. Informed ARSO of this condition on 8/4.

No
further
Entries

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:	
Weather Conditions: SEE PG. 1	Important Telephone Calls and Interactions:
Personnel on Site:	
Name Printed: R. Alan Duff	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield

Date: 8/4/98 | Time: 0730 | Job Number: 94005.05

Client Name: Shieldalloy Metallurgical Corporation

Address of Work Site: 12 West Blvd., Newfield, NJ.

Type of Work: Lagoon soil excavation, work in D102

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0730 On site, preparing air samplers for use today. Issued sampler to Rob Bennett on ~~Air~~ Lagoon excavation project. No work being conducted in D102 today.

0930 Collecting soil samples of plastic covered dirt piles from lagoon.

1000 Collecting soil samples of background from extreme westernend of site, outside fence.

1030 collecting soil samples of plastic covered dirt piles from lagoon, sample from 3rd lagoon ~~area~~ area (B8)

1100 Prepared samples for shipment to laboratory.

1130 Took samples to Federal Express for shipment.

1215 Replaced radioactive materials sign in storage yard.

1330 Collected BZA from lagoon personnel.

1340 Debriefed ARSO. Told him someone knowledgable w/materials in storage yard needs to inspect & ensure that it is properly posted. Discussed soil sampling activities, results of surveys over the past 2 days.

1350 - Left site

No Further Entries

Visitors on Site: None

Changes from Plans and Specifications, and Other Special Orders and Important Decisions: None

Weather Conditions: Sunny, clear, wind-calm

Important Telephone Calls and Interactions: None

Personnel on Site: Duff, valent., contractors - 4 performing lagoon excavation

Name Printed: R.A. Duff

Signature: [signature]

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 9/14/98	Time: 0700	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: 12 West Blvd., Newfield, NJ		
Description of Work: Quarter 3 Surveillance		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0700 On site, preparing BZAs for personnel use on ~~bagg~~ Flexkleen baghouse entry for bag changeout, checked in w/security guard.
0745 Duff/Merkel @ D111 to issue BZA samplers, brief workers.
0815 Started BZA samples, briefed Flexkleen workers @ Tailgate safety meeting.
0830 Work commenced at Flexkleen baghouse, emptying baghouse hoppers.
0900 Met w/Dave Smith, discussed surveillance activities to be performed, schedule, locations to survey.
1000 Picked up P-10 gas bottle off site.
1025 Checked guard house survey instrument, cal. due on 9/10 (last Thurs.), locating replacement that is in calibration.
1100 Received FedEx packages from IEM Knoxville.
1200-1230 Broke for lunch, scheduled 'A' warehouse w/Lydia for tomorrow P.M.
1230 Merkel back @ D111, covering Flexkleen baghouse entry. Duff assembling Floor monitor.
1300 Floor monitor not purging correctly (no flow registered exiting inst.) will have to investigate cause. SMC personnel entering Flexkleen baghouse
1400 Met w/contractor excavating haul road. Conducted a cursory survey of areas excavated. Noted locations inside fence that continued to show elevated readings on sides of excavations both north & west of the haul road. (Range From 30,000 - 80,000 cpm w/2241, 44-10, bkgd. ~15,000 cpm). Noted isolated spots on haul road outside fence. Spoke w/Dave Smith, determined we will go ahead & survey & mark areas w/elevated readings w/paint for excavation.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
None.

Weather Conditions: Cloudy, warm, humid Wind From S ~ 5mph.	Important Telephone Calls and Interactions: Call to C. Berger on Haul Rd. release limits.
Personnel on Site: Duff, Merkel, D111 workers (6), Dave Smith, Jim Valent:	
Name (print): R. A. Duff	Signature: R A Duff

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 9/14/98	Time: 0700	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: 12 West Blvd., Newfield, NJ		
Description of Work: Quarter 3 Surveillance		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

1500 Personnel @ baghouse take break, Merkel Inc has been frisking them upon each exit from the area, no contamination > bkgd. has been detected.

1600 Secured work at baghouse for the day.

1730 Left site

No Further Entries This Date

Changes from Plans and Specifications, and Other Special Orders and Important Decisions: SEE PAGE 1	
Weather Conditions:	Important Telephone Calls and Interactions:
Personnel on Site:	
Name (print): R.A. Duff	Signature:

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC, Newfield		
Date: 9/15/98	Time: 0730	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: 12 West Blvd., Newfield, NJ		
Description of Work 3rd Qtr. Surveillance		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0730 On site, preparing instruments to use today, attempting to troubleshoot Floor monitor Flow problem.
0800 Merkel @ D111 Flexkleen baghouse, issuing BCAs to workers entering baghouse.
0830 Went w/Dave Smith & Charlie Williams to Char. Williams house to survey areas of slag in his driveway.
0900 Conducted walkover survey of driveway w/2241 + 44-10 probe. Moved over area in a serpentine pattern w/probe ≤1" from surface.
0930 Surveyed area in Front of lab (Former Pumphouse location) that had been previously noted as an area of slag. Performed a cursory check of the area w/2241 + 44-10 probe, noted ~~see~~ some areas of elevated measurements. Agreed w/Dave Smith that IEM will document a γ walkover survey in this area.
1000 At haul road, preparing to perform surveys.
1015 Marked off Haul road into ~15' square grids w/paint. Used Fire hydrant @ south end of road as ~~measurement~~ landmark starting point. ~1/2 way down the road, used "No Dumping" sign as the ~~mea~~ landmark for grids headed north up to site fence.
1030 Commenced surveying haul road. Marking areas w/elevated counts with paint for future excavation (>13,500 cpm above background w/ 2241/44-10 ≤1" above soil surface).
1200-1230 Lunch
1230 Merkel @ Flexkleen baghouse, Duff @ Haul road continuing surveys.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
Noted ~~ex~~ epoxy ~~coatining~~ coating on parts of floor in 'A' warehouse, can't be surveyed for γ.

Weather Conditions: Partly cloudy, warm, humid, wind ~5 mph Fm. South	Important Telephone Calls and Interactions: Call to GTS on Floor monitor.
Personnel on Site: Duff, Merkel, D. Smith, excavation contractors, SMC workers @ D111 Flexkleen baghouse.	
Name (print): R. A. Duff	Signature: RADuff

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 9/15/98	Time: 0730	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: 12 West Blvd., Newfield, NJ		
Description of Work 3rd Qtr. Surveillance		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

1400 Merkel at Haul Rd. to assist w/surveys.
1500 Walked w/ excavation contractor on areas outside fence on Haul Rd. that have been surveyed, pointed out areas requiring excavation.
1530 Completed survey of Haul Rd. outside fence, preparing to survey floors in 'A' warehouse.
1600 While source checking floor monitor, noted high background for alpha (instrument HV set for α/β), called GTS and reprogrammed datalogger for correct HV to monitor for α only.
1630 At ~~An~~ 'A' warehouse preparing for floor surveys.
1700 Commenced surveys of bays where pallets are stored. Noted aisleway & loading dock/ramp have been coated w/epoxy. These areas will require a different means of survey/sampling.
1830 Duff left site
2000 Merkel left site, 2 areas of floor noted w/spots > 600 dpm/100 cm² alpha by direct frisk. Areas marked w/tape & identified to workers. All other areas of floor not coated w/epoxy could not be distinguished from background.

No Further Entries This Date BRD

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

N/A (see pg. 1)

Weather Conditions:	Important Telephone Calls and Interactions:
Personnel on Site:	
Name (print): R. A. Duff	Signature: RADuff

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 9/16/98	Time: 0730	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: 12 West Blvd., Newfield, NJ		
Description of Work 3rd Qtr. Surveillance		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0730 On site, preparing instruments for today's use.
0800 Merkel issuing BEAS to SMC personnel working on Flexkleen baghouse. Duff @ Haul Rd. assisting contractor in removal of areas w/elevated readings outside fence.
0830 Contractor delayed, went back to instrument office for paperwork.
0900 Merkel @ "A" Warehouse, looking @ 2 floor locations to determine if loose or fixed, commencing survey of outside ground areas surrounding 'A' warehouse w/Floor monitor.
1000 Gave Doug @ Security gate our Bicron Microrem for surveying vehicles, removed instrument he had to return to calibration.
1200-1230 Lunch
1230 Merkel checking on work progress @ D111 Flexkleen baghouse, Duff exchanging finger ring FLDs
1315 Exchanging perimeter fence TLDs, Merkel @ 'A' whse. surveying outside areas
1430 Completed TLD change w/exception of Guest house FLD.
1530 Performing of surveys on interior walls of 'A' warehouse. Completed survey of outside ground areas surrounding 'A' whse.
1550 Boerner performing walkover survey of Former pumphouse location.
1830 Completed surveys in 'A' whse. w/exception of Beta floor surveys, left site.

No Further Entries

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
None

Weather Conditions: Hot, humid, partly cloudy, wind Fm. South ~5mph	Important Telephone Calls and Interactions: None
Personnel on Site: Duff, Merkel, 4 workers @ Flexkleen baghouse, D. Smith, excavation contractor, Boerner (1445)	
Name (print): R. A. Duff	Signature:

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC		
Date: 9/16/98	Time: 6:45a -	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation		
Address of Work Site: West Boulevard, Newfield, NJ		
Description of Work Fly to client site; survey former pumphouse area.		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

6:45a Left for Knoxville AP for flight to Philadelphia, PA.

2:45 pm Arrived onsite

2:45 - 3:50 pm Discussed project status w/ G. Duff and R. Merkel. Spoke w/ B. Kelly concerning survey of "A" warehouse (Re: Instrumentation Issues)

3:50 - 6:30 p Performed walkover of area where former pumphouse once stood. Taped off several areas for distance determinations. The excavated area where the pumphouse stood was essentially below the 13,500 cpm above bkg criterion established by C. Berger (Bkg ~ 6 kcpm). An exception includes a strip on the SE side of the excavated area reading above the criterion (this strip is bounded by slag/rocks.

The main area of concern was located north and west of the telephone poles. Readings of ~ 100 kcpm were noted in a dark area (this area had apparently been filled in w/ contaminated dirt and/or slag-like materials). Much of this area read at least 50 kcpm (the threshold reading of concern) and ranged up to ~ 100 kcpm. Spotty contamination also exists.

6:30 - 6:40p Discussed status w/ G. Duff, R. Merkel. Left site 6:40 pm.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: Sunny	Important Telephone Calls and Interactions: phone call to B. Kelly to discuss warehouse survey. Project status update - A. Duff.
Personnel on Site: G. Boerner, A. Duff, R. Merkel	
Name (print): Alex J. Boerner	Signature: Alex J. Boerner

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC NewField		
Date: 9/17/98	Time: 0730	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: 12 West Blvd., NewField, NJ		
Description of Work 3rd Qtr. Surveillance		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0730 On site, preparing instruments for use.
0800 Merkel issuing BZA samplers to Flexkleen workers, Duff @ Land Fill North of storage yard performing walkover survey/sampling.
0900-1300 - Boerner giving rad worker training.
0830 Merkel @ 'A' wing performing B⁻ Floor scans.
1100 Duff @ Haul Rd., performing verification surveys of areas identified during earlier walkover survey.
1200-1230 Lunch
1300 Located elevated readings @ Haul Road adjacent to culvert/water, up to 20' west of road. Stopped excavating in this area so as not to disturb wetland. Backfilled w/clean soil. Conducting soil sampling at Haul Rd.
1400-1530 A. Boerner looking at radiological postings throughout facility, generating a list of postings.
1600 Merkel collecting BZA samplers from Flexkleen workers.
1530-1800 A. Boerner conducting additional surveys at former pumphouse location.
1830 Left site.

No Further Entries

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
None

Weather Conditions: Partly cloudy, wind Fm. S 5 mph

Important Telephone Calls and Interactions:
None

Personnel on Site: Duff, Merkel, D. Smith, A. Boerner, Flexkleen baghouse workers, excavation subcontractors

Name (print): R.A. Duff

Signature: [signature]

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC		
Date: 9/17/98	Time: 8a - 6pm	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corporation		
Address of Work Site: West Boulevard, Newfield, NJ		
Description of Work RSC Training, Survey of Posted Areas, Further Measurements at Former Pumphouse		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

8 am - Arrived onsite. Met Paul Gonzalez, Safety Manager, who escorted me to conference room for morning training course. Also spoke w/ Fran Gilmartin who assisted me.

9:15a - 12:45pm: Conducted Radiation Safety Training for Paul Gonzalez, Bill Fox (maintenance manager) and Dave Smith (who sat in on most of the training.)

12:45 - 1:15 pm: Course followup discussion; also observed conversation between A. Duff and SMC personnel on elevated samples collected from the Newfield landfill. The landfill is located adjacent to the SMC site.

1:15 - 2:00pm: Lunch

2:10 - 3:30 - Recorded the location and nature of the postings in all restricted areas.

3:30 - 6:00 - Performed followup measurements and further defined the locations of elevated radiation in the former pumphouse area. Marked the general outline of the contamination pattern w/ rocks. Discussed status + findings w/ A. Duff, R. Merkel

6:00 - 6:10p - Discussed pumphouse area findings w/ D. Smith along w/ Duff, Merkel.

6:10p - Left site

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: Sunny	Important Telephone Calls and Interactions: Training course for SMC personnel
Personnel on Site: G. Boerner, A. Duff, R. Merkel	
Name (print): Alex J. Boerner	Signature: Alex J. Boerner

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 9/18/98	Time: 0630	Job/Task Number: 94005.05
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: 12 West Blvd., Newfield, NJ		
Description of Work 3rd Qtr. Surveillance		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0630 Duff on site. Merkel arr. @ 0730
0800 Merkel issuing BZAs to Flexkleen baghouse workers. Boerner performing contamination & radiation surveys in quarterly locations.
0830 Merkel conducting surveys @ haul road
0845 Duff @ AAF baghouse gathering information for decommissioning cost estimate
1100 Duff collecting background soil samples.
1200-1300 Lunch
1315 Duff collecting haul road soil samples inside fence
1500 Boerner off-site. Gave debrief to RSO on status of all surveys conducted, TLD exchange, instrument status, sample status. Completed erecting 3 "Radioactive Matl." signs at storage yard.
1600 Painted an outline of 5 areas to be excavated at Former pumphouse location, Merkel collected BZA samples.
1615 conducted quarterly surveillance surveys at D111.
1800 Left site.

No Further Entries

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
None

Weather Conditions: Cloudy, wind from SW ~ 5mph	Important Telephone Calls and Interactions: None
Personnel on Site: Duff, Merkel, D. Smith, D111 baghouse workers, excavation subcontractors, A. Boerner	
Name (print): R. A. Duff	Signature:

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC		
Date: 9/18/98	Time: 7:30a -	Job/Task Number: 9400 5.05
Client Name: Shieldalloy Metallurgical Corporation		
Address of Work Site: West Boulevard, Newfield, NJ		
Description of Work Wrapup & pumphouse survey; quarterly surveys in restricted areas		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

7:30a - Arrived onsite

7:30 - 8:45a : Checked out instruments and proceeded to former pumphouse area. Verified 2 main areas of contamination are 1) a 12' x 8' strip located in the excavated dirt area on the SE side starting close to the site access road; and 2) the fill area north + west of the excavated area the fill area essentially covers a contaminated area of ~50' x 70'. Egress measurement 1.

NOTE: Aside from walkovers + initial drawings of the site layout, nothing else was done this week at this location (no samples, cleanup, etc)

8:45a - Conducted quarterly surveys of all restricted areas except DIII (completed later by A. Duff). 1:50 pm

1:50 - 2:20 pm : Discussed project status w/ A. Duff.

2:20 - 2:45 : Wrapped up site activities and left site 2:45 pm. Drove to airport.

10:30 pm : Arrived home.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions: Overcast / slight breeze	Important Telephone Calls and Interactions:
Personnel on Site: A. Boerner, A. Duff, R. Merkel	
Name (print): Alex J. Boerner	Signature: Alex J. Boerner

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Appendix C - Surveillance Checklists

ACTIVITIES CHECKLIST FOR BAGHOUSE MAINTENANCE CAMPAIGN 1 QUARTER 3, 1998

Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Schedule on-site work with RSO and obtain final approval on checklist contents.	Once - prior to 6/29/98		AJB	6/26/98	
Confirm availability of disk smears, air filters, forms, instruments and other equipment/supplies.	Once - prior to on-site work	Contact RSO to determine availability of SMC equipment.	AJB	6/29/98	
Perform source and background check of all portable instrumentation used to perform surveys, as required.	Daily - Start of Shift	Document results and maintain as a project record.	AJB	6/29-7/2/98	
Obtain background and efficiency data for smear counter.	Daily - Start of Shift during Smear Counting	Document results and maintain as a project record.	AJB	7/1/98	Smear counter utilized once on this trip
Check flow rates and battery strengths for all Breathing Zone Samplers prior to use. Load membrane filters into the BZA filter holders. Note: If possible, do not use glass fiber filters.	Perform continuous monitoring for all employees while involved in baghouse maintenance.	RSO provides pumps, filters, and cartridges and calibrator. Document results and maintain documentation as a project record.	AJB	6/29-7/2/98	Cellulose used instead per B. Kelyl. Gilian calibrator non-functional.
Set up contamination control zone for workers entering/exiting baghouse during maintenance activities,	Once - prior to start of maintenance activities.		AJB	6/30/98	
Provide Tailgate Safety Training for baghouse maintenance workers	Daily - Start of shift	Document training and maintain as a project record.	AJB	6/30-7/2/98	
Collect Breathing Zone samples for employees designated by the RSO. At the end of the collection period, remove and label filters, hold for at least 48 hours, count filters, and record results. (Count sufficient background filters as well.)	Perform continuous monitoring for all employees while involved in baghouse maintenance.	Maintain documentation as a project record.	AJB	7/2/98	Fitlers counted at IEM
Perform and document gamma surveys and contamination surveys during baghouse maintenance activities. Locations should be selected through good health physics judgment. Count smears for gross alpha activity.	As necessary.	Document results and MDA calculation. Maintain documentation as a project record.	AJB	7/2/98	Amears and MDA calculations done at IEM
Perform and document personnel frisks for employees involved in baghouse maintenance activities.	Daily		AJB	7/2/98	
Perform and document final status survey of equipment, areas or other items designated by the RSO at the completion of baghouse maintenance.	Once at the end of baghosue maintenance activities.	Decontaminate equipment/areas, as necessary to ensure release for unrestricted use. If decontamination not possible or inefficient, post areas with residual contamination pursuant to 10 CFR 20, Subsection I.	AJB	7/2/98	No areas required decontamination.

Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Remove contamination control zone markings.	Once at the end of baghouse maintenance activities.		AJB	7/2/98	
Perform a confirmatory contamination survey of D111, D-115 and D-102 break room.	Once at the end of baghouse maintenance activities.		AJB	7/2/98	
Maintain daily log of activities.	Daily	Record on FADL and maintain as a project record.	AJB	7/2/98	
Ensure completeness of all documentation prepared during on-site activities.	One time		AJB	7/2/98	
Hold a close-out meeting with the RSO to discuss observations and findings.	One time on the last day of on-site work.	Document subjects discussed and action plan (if any) on FADL and maintain as a project record.	AJB	7/2/98	
Document special project activities for inclusion in Quarter 3, 1998 draft surveillance draft report, and attach all related forms and data.	One time	Forward originals to Carol Berger.	AJB	7/8/98	

ACTIVITIES CHECKLIST FOR LAGOON CLOSURE AND D-102 SURVEILLANCE QUARTER 3, 1998

Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Schedule on-site work with RSO and obtain final approval on checklist contents.	Once - prior to 8/3/98	Work must be completed during week of 8/3/98.	RAD	7/30/98	ARSO will be the technical contact while on site. RSO will be absent.
Confirm availability of disk smears, air filters, forms, instruments and other equipment/supplies.	Once - prior to on-site work	As necessary, contact RSO to determine availability of SMC equipment.	RAD	7/30/98	
Perform source and background check of all portable instrumentation used to perform surveys, as required.	Daily - Start of Shift	Document results and maintain as a project record.	RAD	8/4/98	
Obtain background and efficiency data for smear counter.	Daily - Start of Shift during Smear Counting	Document results and maintain as a project record.	RAD	8/4/98	
Check flow rates and battery strengths for all Breathing Zone Samplers prior to use. Load membrane filters into the BZA filter holders. Note: If possible, do not use glass fiber filters.	Perform continuous monitoring for all employees while involved in lagoon closure.	RSO provides pumps, filters, and cartridges and calibrator. Document results and maintain documentation as a project record.	RAD	8/4/98	
Provide Tailgate Safety Training for lagoon closure and D102 contractors to instruct them in reasons for monitoring and surveys.	Once prior to start of monitoring	Document training and maintain as a project record.	RAD	8/3/98	
Collect Breathing Zone samples for contractors designated by the RSO. At the end of the collection period, remove and label filters, hold for at least 48 hours, count filters, and record results. (Count sufficient background filters as well.)	Collect samples for two work shifts.	Maintain documentation as a project record.	RAD	8/4/98	
Field screen excavated materials from lagoon closure project.	Once	Record findings on SMC survey form (RSP-008).	RAD	8/4/98	
Collect 5 samples of soil that is representative of site background and forward to analytical laboratory for analysis.		Forward samples to Outreach laboratory (letter of specification attached)	RAD	8/4/98	Avoid sampling the Storage Yard, North fence area, and baghouse areas.
Collect samples of excavated materials and forward to analytical laboratory for analysis.	Once	Forward samples to Outreach laboratory (letter of specification attached)	RAD	8/4/98	Samples should be collected from areas with elevated exposure rates. If none identified. a minimum of three (3) confirmatory samples should be collected.
Perform release survey of steel removed from D-102 during demolition activities.	Once	Document results on release survey form (IEM RSP-009).	RAD	8/3/98	
Perform and document personnel frisks for employees involved in D102 demolition activities.	As employees exit work area.	Document results on release survey form (IEM RSP-009)	RAD	8/3/98	

Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Observe D102 demolition activities and determine all possible exposure pathways.	As necessary	Pathways might include direct exposure from residual CANAL, inhalation of dust or vapor, skin contamiantion, ingestion, etc.	RAD	8/3/98	
Acquire sufficient information A-Warehouse to prepare a fixed price cost estimate for performance of a final status survey.	Once	Basis for final status survey will be MARSSIM	RAD	8/4/98	
Check postings in storage yard.	Once	Re-mount or replace signs that have fallen or are damaged.	RAD	8/4/98	Sign near lime pile may require re-mounting.
Count air samples from 3/98 baghouse silo emptying.	Once	Document results on applicable forms (RSP-018)	RAD	8/13/98	Samples are located in HP office (on desk, in plastic bag)
Reconcile inventory of source material since Quarter 3, 1997	Once	Check shipping and receiving records with Lidia Stasiuk and add dates and information to attached form.			Delayed until routine surveillance
Provide training in use of shipping (RSP-015) and receiving (RSP-014) checklists to L. Stasiuk.	Once	Document training on her RSP training form (see Fran Gilmartin)		Not performed, L. Stasiuk not available	Emphasize need to forward copies of information to RSO for inventory reconciliation.
Maintain daily log of activities.	Daily	Record on FADL and maintain as a project record.	RAD	8/4/98	
Ensure completeness of all documentation prepared during on-site activities.	One time		RAD	8/4/98	
Hold a close-out meeting with the ARSO to discuss observations and findings.	One time on the last day of on-site work.	Document subjects discussed and action plan (if any) on FADL and maintain as a project record.	RAD	8/4/98	
Document these special project activities for inclusion in Quarter 3, 1998 draft surveillance draft report, and attach all related forms and data.	One time	Forward originals to Carol Berger.	RAD	8/14/98	

ACTIVITIES CHECKLIST FOR BAGHOUSE MAINTENANCE CAMPAIGN 2 QUARTER 3, 1998

Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Schedule on-site work with RSO and obtain final approval on checklist contents.	Once - prior to 7/12/98		AJB	7/10/98	
Confirm availability of disk smears, air filters, forms, instruments and other equipment/supplies.	Once - prior to on-site work	Contact RSO to determine availability of SMC equipment.	ABJ	7/7/98	Most of the supplies brought by IEM to the site
Perform source and background check of all portable instrumentation used to perform surveys, as required.	Daily - Start of Shift	Document results and maintain as a project record.	AJB	7/12-7/15/98	
Obtain background and efficiency data for smear counter.	Daily - Start of Shift during Smear Counting	Document results and maintain as a project record.	n.a.		
Check flow rates and battery strengths for all Breathing Zone Samplers prior to use. Load membrane filters into the BZA filter holders. Note: If possible, do not use glass fiber filters.	Perform continuous monitoring for all employees while involved in baghouse maintenance.	RSO provides pumps, filters, and cartridges and calibrator. Document results and maintain documentation as a project record.	AJB	7/15/98	SMC BZAs used for night shift. IEM for day shift. Continuous monitoring done on night shift.
Set up contamination control zone for workers entering/exiting baghouse during maintenance activities,	Once - prior to start of maintenance activities.		AJB	7/13/98	Aone surrounds baghosue but is not officially posted.
Provide Tailgate Safety Training for baghouse maintenance workers	Daily - Start of shift	Document training and maintain as a project record.	AJb	7/14/98	Performed once each day for both day and night shift personnel.
Collect Breathing Zone samples for employees designated by the RSO. At the end of the collection period, remove and label filters, hold for at least 48 hours, count filters, and record results. (Count sufficient background filters as well.)	Perform continuous monitoring for all employees while involved in baghouse maintenance.	Maintain documentation as a project record.	AJB	7/15/98	Filters counted at IEM
Perform and document gamma surveys and contamination surveys during baghouse maintenance activities. Locations should be selected through good health physics judgment. Count smears for gross alpha activity.	As necessary.	Document results and MDA calculation. Maintain documentation as a project record.	AJB	7/15/98	Gamma and total contaminatio measurements taken. No smears.
Perform and document personnel frisks for employees involved in baghouse maintenance activities.			AJB	7/15/98	Performed for night shift personnel only.
Perform and document final status survey of equipment, areas or other items designated by the RSO at the completion of baghouse maintenance.	Once at the end of baghosue maintenance activities.	Decontaminate equipment/areas, as necessary to ensure release for unrestricted use. If decontamination not possible or inefficient, post areas with residual contamination pursuant to 10 CFR 20, Subsection I.	AJB	--	All equipment checked during baghouse operations.
Remove contamination control zone markings.	Once at the end of baghouse maintenance activities.		n.a.		Verbal controls rather than physical markings used.

Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Perform a confirmatory contamination survey of D111 break room.	Once at the end of baghouse maintenance activities.		AJB	7/15/98	
Maintain daily log of activities.	Daily	Record on FADL and maintain as a project record.	AJB	7/16/98	
Ensure completeness of all documentation prepared during on-site activities.	One time		AJB	7/16/98	
Hold a close-out meeting with the RSO to discuss observations and findings.	One time on the last day of on-site work.	Document subjects discussed and action plan (if any) on FADL and maintain as a project record.	AJB	7/16/98	
Document special project activities for inclusion in Quarter 3, 1998 draft surveillance draft report, and attach all related forms and data.	One time	Forward originals to Carol Berger.	AJB	7/24/98	

ACTIVITIES CHECKLIST FOR ROUTINE QUARTERLY SURVEILLANCE ACTIVITIES QUARTER 3, 1998

Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Schedule on-site work with RSO and obtain final approval on checklist contents.	Once - prior to 8/21/98		RAD	9/2/98	
Determine whether there will be special projects other than those shown below (e.g., baghouse maintenance, CANAL crushing, contractor surveillance, training, final status surveys, etc.) to be performed during this quarter.	Once - prior to 8/21/98		RAD	9/2/98	If special projects are identified, incorporate requirements into this checklist.
Review new SMC procedure manual to ensure surveillance activities are consistent with their requirements.	Once prior to start of on-site work.	Obtain uncontrolled copy of manual from Carol Berger.	RAD	9/4/98	
Complete and sign RSP review form, showing those RSPs reviewed.	Once prior to start of on-site work.	Obtain form from F. Gilmartin. Deliver signed original to RSO for incorporation in Program Files.	RAD	9/14/98	
Complete and sign waiver of training for radiation surveyor.	Once prior to start of on-site work.	Obtain form from F. Gilmartin. Deliver signed original, with copy of NRRPT certificate attached, to RSO for signature and incorporation in Program Files.	RAD	9/14/98	
Confirm receipt of extremity and environmental dosimeters, and prepare deployment logs (see IEM RSP-029 for example deployment log).	Once - one week prior to on-site work	Health Physics Northwest, Inc. 11535 S.W. 67th Ave. Tigard, OR 97223 (503) 620-6617 Unused TLD will be shipped to IEM who will transport the TLD to Newfield.	RAD	9/4/98	Consider incorporating IEM log into SMC procedure.
Review newly-modified recordkeeping system and provide input, guidance or other assistance, as necessary.	Once - during site visit.	System being set up by F. Gilmartin	RAD	9/14/98	Their system is set up as a "License File" and a "Program File". In the Program File, everything is filed by RSP number, including documentation, forms, and the procedures themselves.
Ensure calibration certificates received since date of last surveillance effort have been received and filed.	Once - during site visit.	The original should be maintained in the HP office, with a copy made for F. Gilmartin.	n.a.	9/16/98	None at calibration past quarter
Contact instrument calibration facility and alert them of pending shipment.	As soon as on-site date is scheduled.	Ludlum Measurements 501 Oak Street Sweetwater, TX 17556 800-622-0828	RAD	9/4/98	
Confirm availability of disk smears, air filters, forms, instruments and other equipment/supplies.	Once prior to on-site work	Contact RSO to determine availability of SMC equipment.	RAD	9/4/98	If no membrane filters are available for BZA sampling, order some.

Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Confirm source material receipt since 7/1/98 & alert laboratory of pending confirmatory sample shipment, if necessary.	Once prior to on-site work	Address: General Activation Analysis, Inc 11575 Sorrento Valley Road #214 San Diego, California 92121 (800) 367-0526 Attn: Lawrence Kovar	RAD	9/14/98	None received
Perform source and background check of all portable instrumentation used to perform surveys, as required in RSP-008.	Daily - Start of Shift	Document results and maintain as a project record.	RAD	9/18/98	
Obtain background and efficiency data for smear counter as required in RSP-018 for smears counted at SMC, or as required in IEM RSP-019 for smears counted at IEM.	Daily - Start of Shift during Smear Counting	Document results and maintain as a project record.	RAD	10/8/98	
Perform and document final status survey of equipment, areas or other items designated by the RSO.	Once during site visit.	Check with RSO to determine equipment requiring surveys. Decontaminate equipment/areas, as necessary.	RAD	9/30/98	
Obtain the "Dosimeter Deployment Record" completed during the Quarter 2, 1998 surveillance.	One time		RAD	9/16/98	
Collect "used" and deploy "unused" TLD on the perimeter fence. Place new markers at TLD stations that have missing or broken markers.	One time	Note physical status and other observations on Deployment Record and maintain as a project record.	RAD	9/16/98	
Collect "used" and deploy "unused" extremity TLD to monitored individuals.	One time	Note physical status and other observations on Deployment Record and maintain as a project record.	RAD	9/16/98	
Package "used" TLD, transit dosimeters and deployment dosimeters. Ship dosimeters using overnight mail.	One time	Maintain airbill as a project record. Ship TLD to Health Physics Northwest, Inc.	RAD	9/16/98	
Obtain a listing (mass) of source material received at the Newfield facility since 7/1/98.	One time	Receiving records may be obtained from L. Stasiuk or D. Smith.	n.a.		
Inspect physical condition, battery status and calibration of instrument used in the guard house for truck surveys. As necessary, replace instrument and distribute Vehicle Survey Forms.	One time	Return completed Vehicle Survey Form to D. Smith. New Vehicle Survey Forms may be obtained from F. Gilmartin.	RAD	9/16/98	
Examine and document the physical condition, battery status, and calibration status of health physics instruments. Instruments that are damaged or due for calibration within three months of the date of the inspection should be packaged and shipped pursuant to the instructions of the RSO.	One time	The majority of the inventory. should be stored in a single location (instrument office) Complete Instrument Inventory Form. Maintain documentation and airbill for shipped instruments as project records. Provide list of instruments sent for calibration to RSO.	RAD	9/16/98	
Confirm operational status of Gilian BZA calibrator or return calibrator to vendor for repair/maintenance.	One time.		RAD	9/18/98	Returned for repair

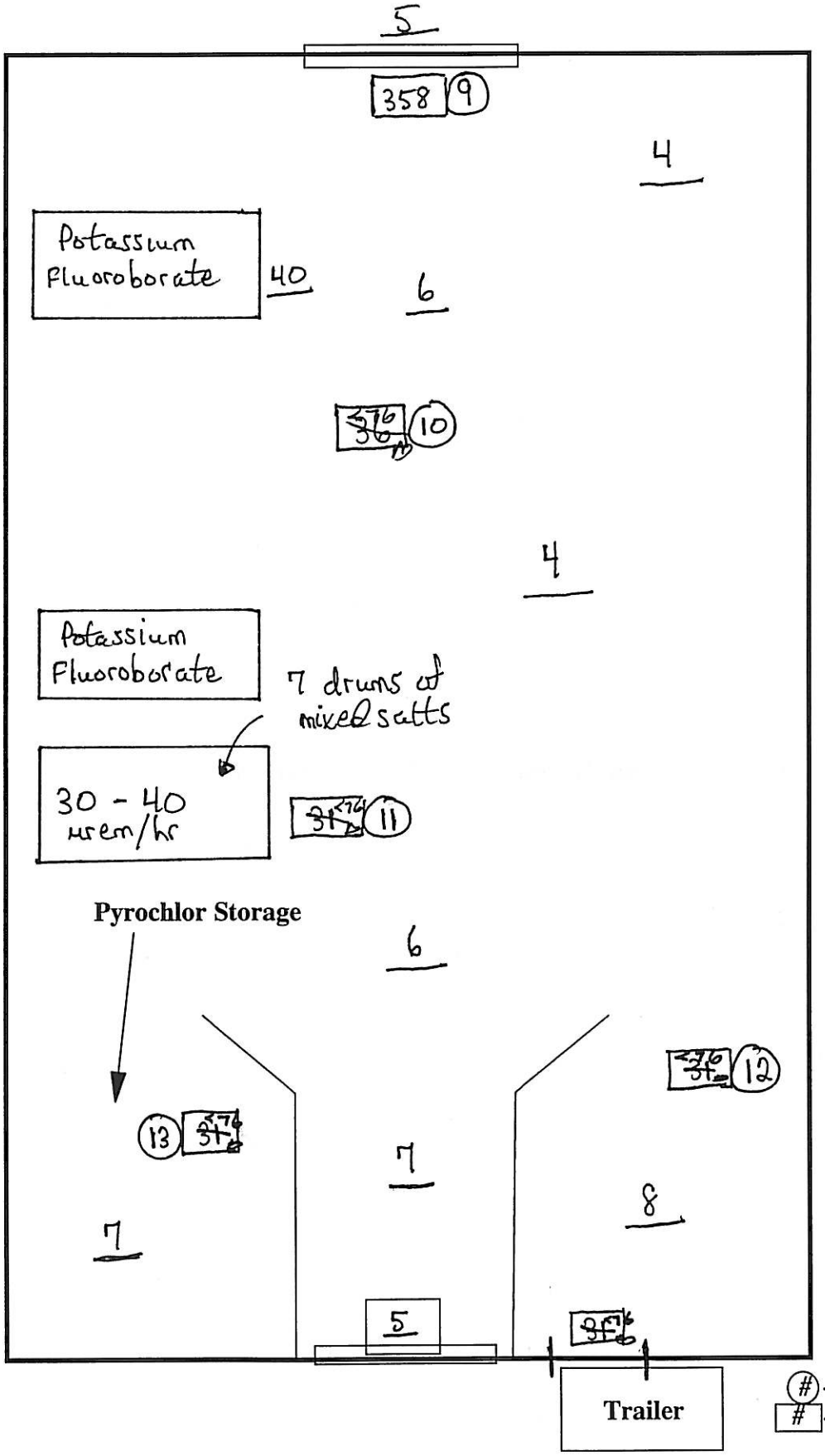
Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Survey and document contamination status of used D111 electrodes. As necessary, decontaminate and re-survey until unrestricted use is possible.	One time	See RSP-009 for release criteria and RSP-008 for survey method. Release Survey Forms may be obtained from F. Gilmartin.	RM	9/30/98	
Survey and document contamination status of as many accessible fork lifts and other loading vehicles as possible.	One time	RSO will identify applicable equipment.	RM	9/30/98	
Perform and document a gamma walkover survey of the landfill immediately north of the storage yard to determine if there are any sources of radioactivity present.	One time	Note findings on FADL and maintain as a project record. Any sources located should be documented on a standard survey form.	RAD	9/17/98	
Perform and document a visual inspection of the controlled and restricted areas to ensure proper storage and control of licensed material pursuant to RSP-011 posting requirements in light of survey findings.	One time	Note findings on FADL and maintain as a project record. Relay recommendations (if any) to RSO during close-out meeting. Generate a list of areas that are posted.	AJB	9/17/98	
Check posting in D-111 to ensure signs are located such that hazard is accurately reflected.	One time	Ask Alex J. Boerner for input on this issue.	AJB	9/17/98	
If breathing zone sampling is to be performed, check flow rates and battery strengths for all Breathing Zone Samplers prior to use. Load membrane filters into the BZA filter holders. Note: If possible, do not use glass fiber filters.	Three (3) sampling periods per employee.	RSO provides pumps, filters, and cartridges and calibrator. Document results and maintain documentation as a project record.	RM	9/18/98	
Collect Breathing Zone samples for employees designated by the RSO. At the end of the collection period, remove and label filters, hold for at least 48 hours, count filters, and record results. (Count sufficient background filters as well.)	Three (3) sampling periods per employee.	Maintain documentation as a project record.	RM	9/18/98	
If low volume air sampling is to be performed, ensure that Lo-Vol air samplers are operational at the locations designated by the RSO. Install membrane filters into each sampler. Start sampler. At the end of the collection period, remove and label filters, hold for 48 hours, count filters, and record results. Note the type of operations (FeCb production using columbium oxide as raw material, CANAL packaging, maintenance, or none) being performed during the sampling periods. Note: If possible, do not use glass fiber filters.	Three (3) sampling periods per location.	RSO provides pumps, filters and cartridges. Coordinate collection times with D111 supervisor. Document results and MDA calculation. Maintain documentation as a project record.	n.a.		
Enter BZA data into spreadsheet for trending and dose assessment.	One time		n.a.		
Enter area air sample results into a spreadsheet for trending.	One time		n.a.		
Perform and document ambient gamma surveys and contamination surveys at locations shown in RSP-008 and those selected through good health physics judgment. Count smears for gross alpha activity as described in RSP-018.	One time in each location.	Collection locations are as shown in RSP-008. Document results and MDA calculation. Maintain documentation as a project record.	RAD	9/18/98	

Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Perform and document an ambient gamma and contamination survey of tunnel that connects D-111 and Flex-Kleen baghouse.	One time	Confined space training required. Provide certificate of training to Safety Officer before start of work.	n.a.		Postponed until next quarter
Evaluate adequacy of pre-drawn survey maps in RSP-008 and provide RSO with recommendations on changes.	One time.		n.a.		Postponed until next quarter. Should these maps be deleted from RSP-008?
Enter ambient gamma survey and contamination survey results into a spreadsheet for trending.	One time		CDB	11/3/98	
Obtain work hours with source material since Quarter 2, 1998 surveillance for monitored (BZA) employees.	One time	Get this information from D111 Supervisor	n.a.		
Perform Final Status Survey of A-Warehouse.	One time, on off-shift(s)	See IEM Proposal dated 8/10/98. Secure forklift operator assistance from Lidia Stasiuk.	RAD	9/18/98	FSS report to be forwarded to RSO under separate cover.
Perform Final Status Survey of Haul Road.	One time.	See IEM Proposal dated 8/19/98.	RAD	9/18/98	FSS report to be forwarded to RSO under separate cover.
Perform and document contamination status of FeV lay-down area (east of restricted area in Storage Yard).	One time.	See IEM Proposal dated 8/19/98.	n.a.		Postponed until next quarter. Survey documentation to be forwarded to RSO under separate cover.
Perform scoping study of AAF baghouse in order to determine level of effort and cost of release for unrestricted use.	One time.	Confined space entry may be required. Safety Manager (Paul Gonzales) must be notified.	RAD	10/26/98	Proposal for release of AAF baghouse to be forwarded to RSO under separate cover.
Confirm number of students to receive Radiation Safety Committee training.	One time prior to the start of on-site work.		AJB	9/10/98	Prepare course manuals, sign-in sheet and supplemental materials.
Provide Radiation Safety Committee training to those individuals so designated by the RSO.	One time.	See C. Berger for course outline and documentation requirements.	AJB	9/17/98	C. Berger will provide the programmatic portion of RSC training (by phone).
Maintain daily log of activities.	Daily	Record on FADL and maintain as a project record.	RAD, AJB, RM	9/18/98	
Ensure completeness of all documentation prepared during on-site activities.	One time		RAD	10/20/98	
Determine the review status of all draft surveillance reports from previous quarters.			RAD	10/22/98	As of August 14, 1998, the Q2-98 report is still in draft form.

Activity	Schedule	Instructions	Completed by (Initials)	Date Completed	Comments
Hold a close-out meeting with the RSO and/or ARSO to discuss observations, findings, and proposed content of draft report.	One time on the last day of on-site work.	Document subjects discussed and action plan (if any) on FADL and maintain as a project record.	RAD	9/18/98	
Obtain results of TLD processing.	One time - two weeks after on-site work	Results should be sent to IEM by Health Physics Northwest	CDB	10/19/98	
Enter area and personnel TLD results into a spreadsheet for trending and dose assessment.	One time		CDB	11/3/98	
Obtain results of feed material sample analysis.	One time - within five days after on-site work.	Results should be sent to IEM by GAA.	n.a.		
Reconcile source material inventory for Quarter 3, 1998 using feed material analysis, receiving records for incoming inventory, and shipping records for outgoing inventory.	One time	Additions and deletions should be recorded on a "Radioactive Material Inventory Log" (see SMC Procedure No. RSP-014 and log from previous quarter).	CDB	11/3/98	
Confirm return of instruments sent off-site for calibration, plus their new calibration certificates, and enter dates into draft report.	One time	Verify instrument return with RSO. Ensure calibration certificates accompany returned instruments.	RAD	10/23/98	
Document special project activities (if any) in draft report, and prepare all related forms and data for inclusion in surveillance report.	One time		RAD	10/23/98	
Prepare draft surveillance report.	One time	Follow specific outline and forward to Carol Berger, along with originals of each attachment, for review.	RAD	10/25/98	
Submit one copy of draft surveillance report to the RSO for review. Note: Covers/bindings for draft reports are not necessary.	One time	David Smith Shieldalloy P.O. Box 768 Newfield, NJ 08344	CDB	11/3/98	RSO will secure RSC comments.
Contact RSO to resolve outstanding comments and finalize the report.	Two weeks after draft report is mailed.	David Smith 609-697-4200	--	--	
Forward one (1) unbound and two (2) bound copies of final report for Quarter 3 to the RSO.	10 business days after resolution of comments and SMC authorization to issue the final report.	David Smith Shieldalloy P.O. Box 768 Newfield, NJ 08344	CDB	09/08/99	

Appendix D - Ambient Gamma and Contamination Survey Records

Date 9/18/98



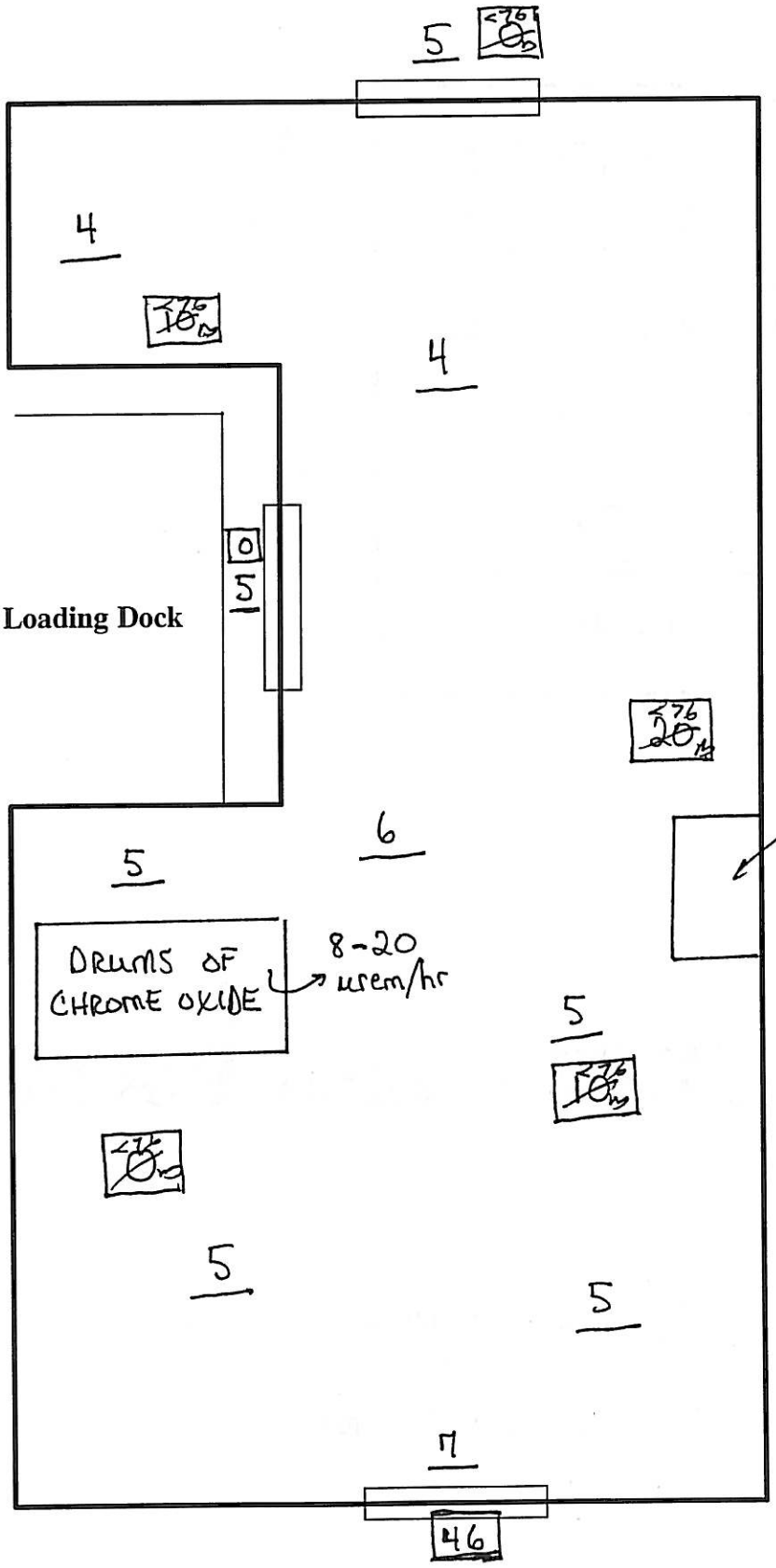
N

"G" Warehouse

(#) - denotes smear location number
[#] - denotes total alpha contamination in dpm/100cm2
_#_ - denotes exposure rate in microR/hr

Alex J. Boerner

Date 9/18/98



N →

"D" Warehouse

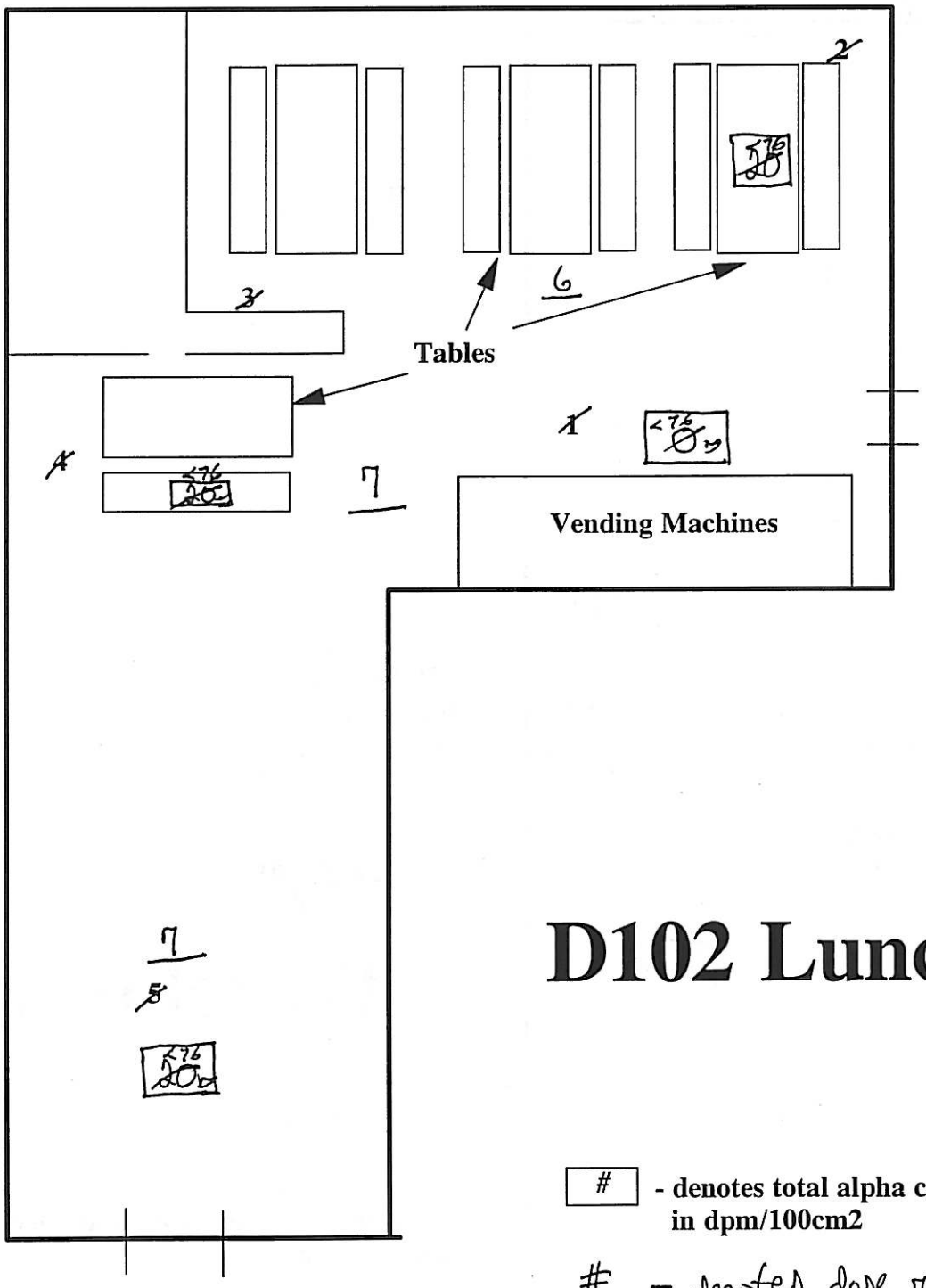
Surveys to be conducted as needed based on whether radioactive materials have been handled in the area

- denotes dose rate in mrem/hr

□ - denotes total alpha contamination level in dpm/100 cm²

Alex J. Boerner

Date 9/18/98



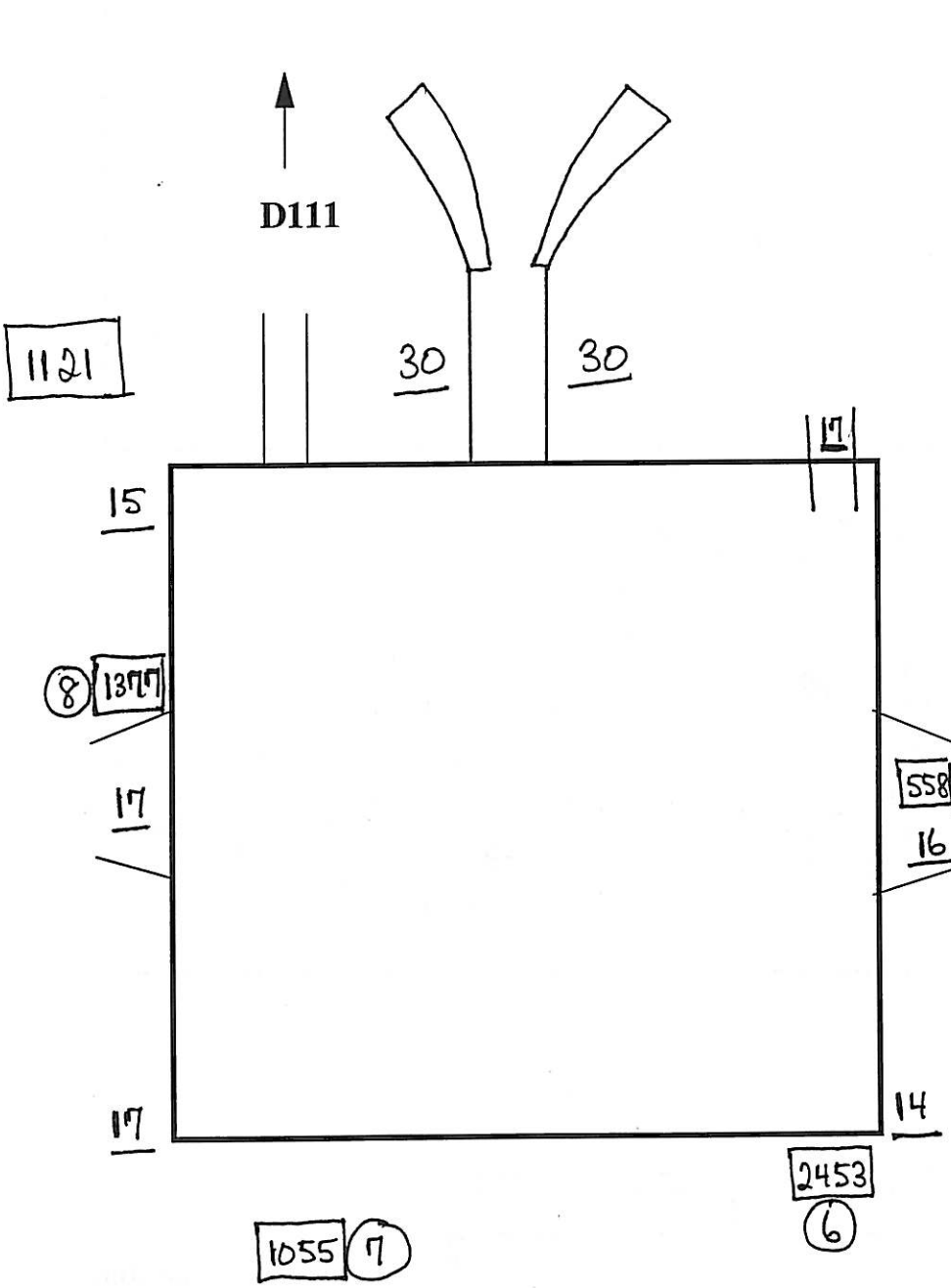
D102 Lunch Room

[#] - denotes total alpha contamination in dpm/100cm2

- denotes dose rate in mrem/hr

Alex J. Boerner

Date 9/18/98



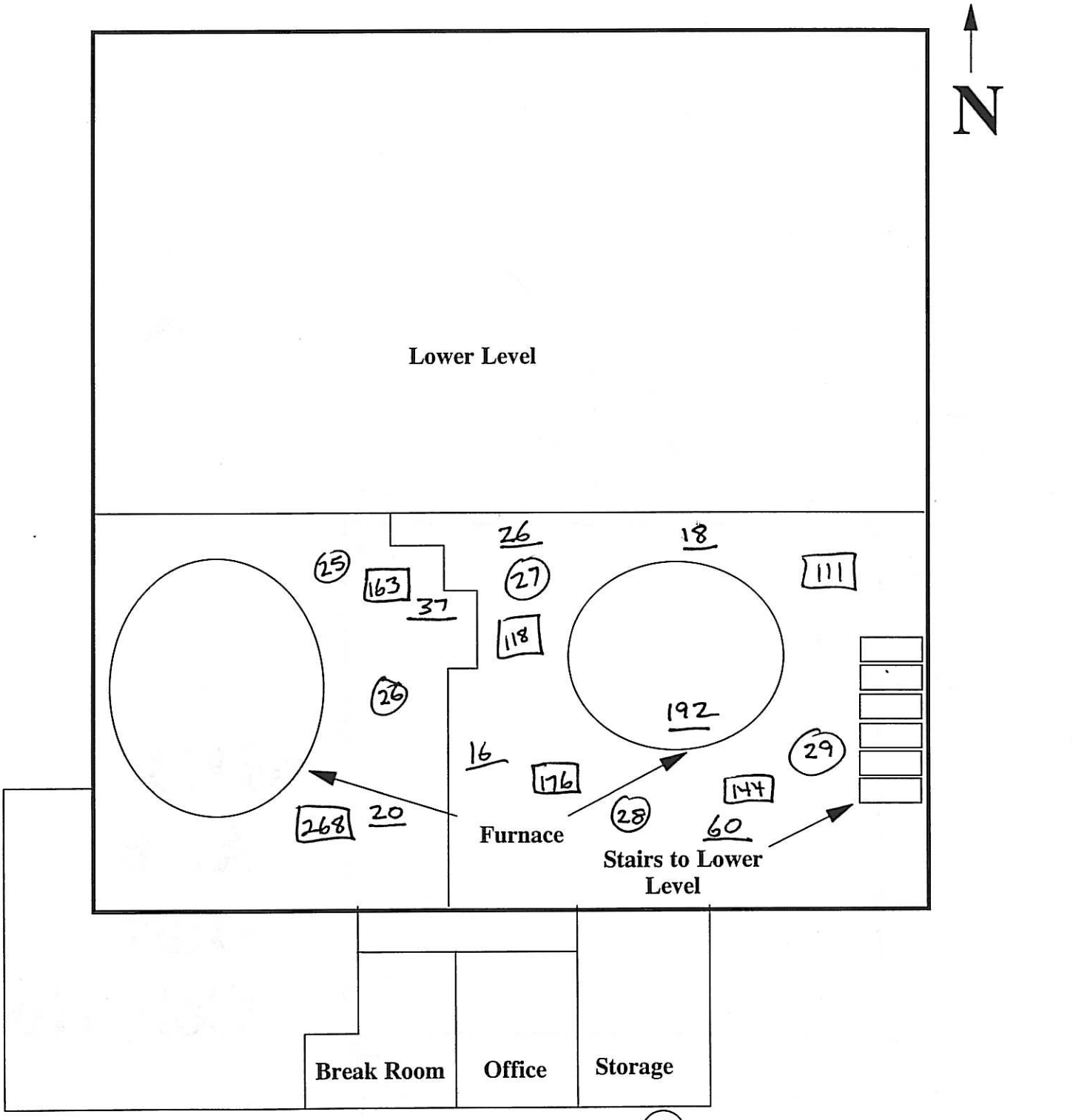
D111 AAF Dust Collector

Note: Elevated total contamination readings all taken on concrete surfaces

(#) - denotes smear location number
[#] - denotes total alpha contamination in dpm/100cm2
_#_ - denotes exposure rate in microR/hr

Alex J. Boerner

Date 9/18/98



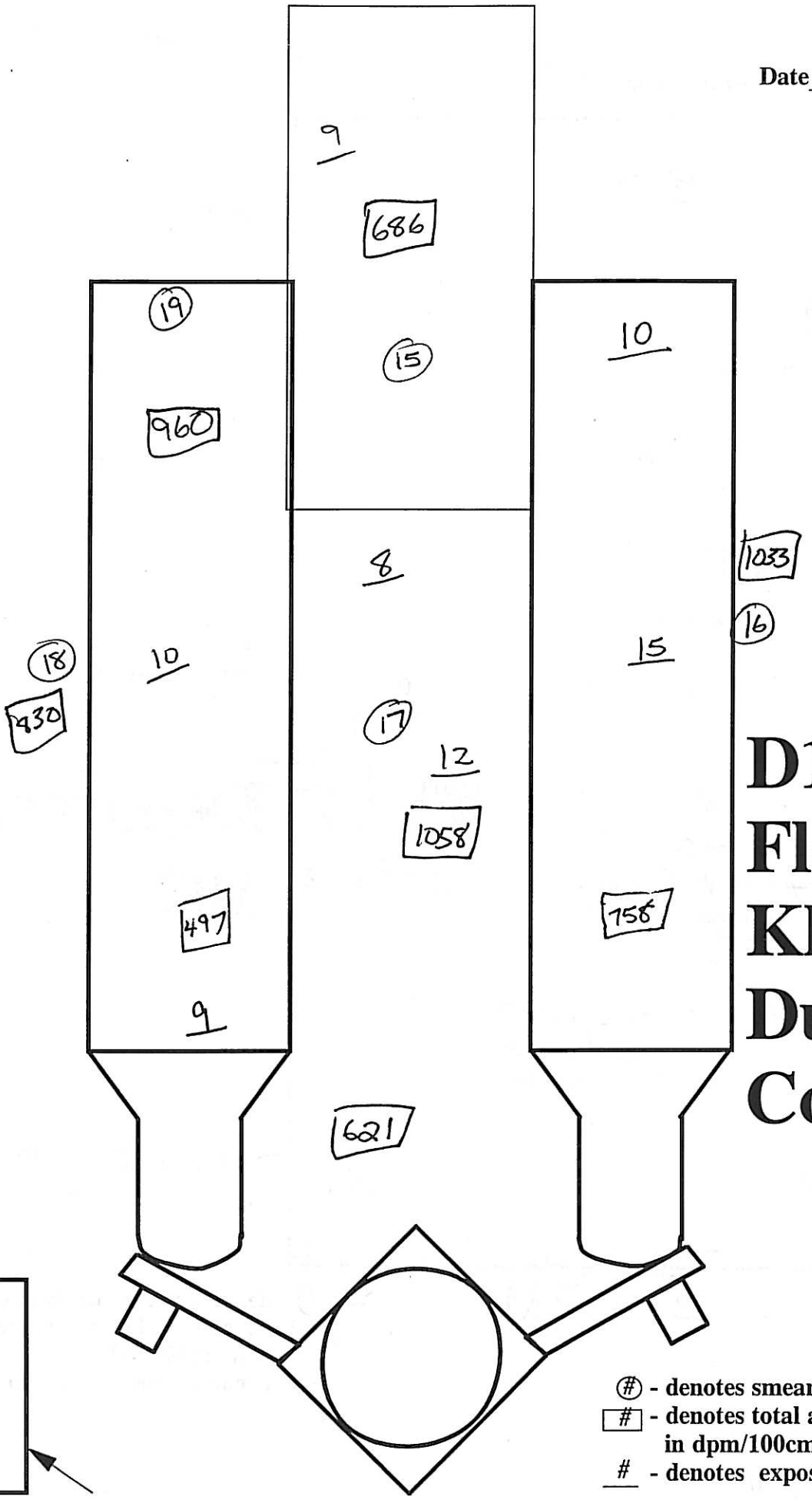
(#) - denotes smear location

[#] - denotes total alpha contamination in dpm/100cm2

- denotes exposure rate in microR/hr

D111 - Upper Level

Date 5m 9/18/98



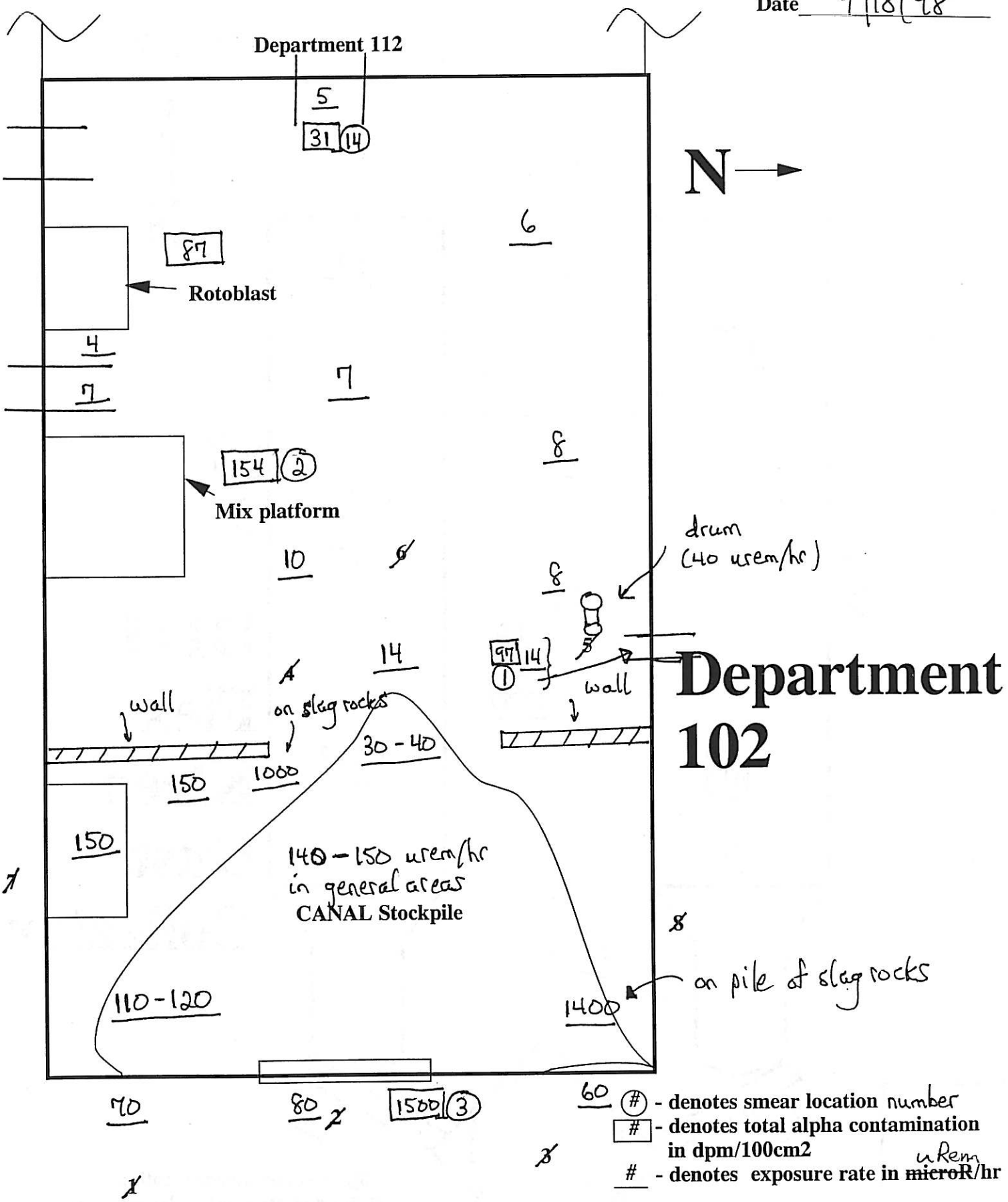
N

D111 Flex-Kleen Dust Collector

Control House

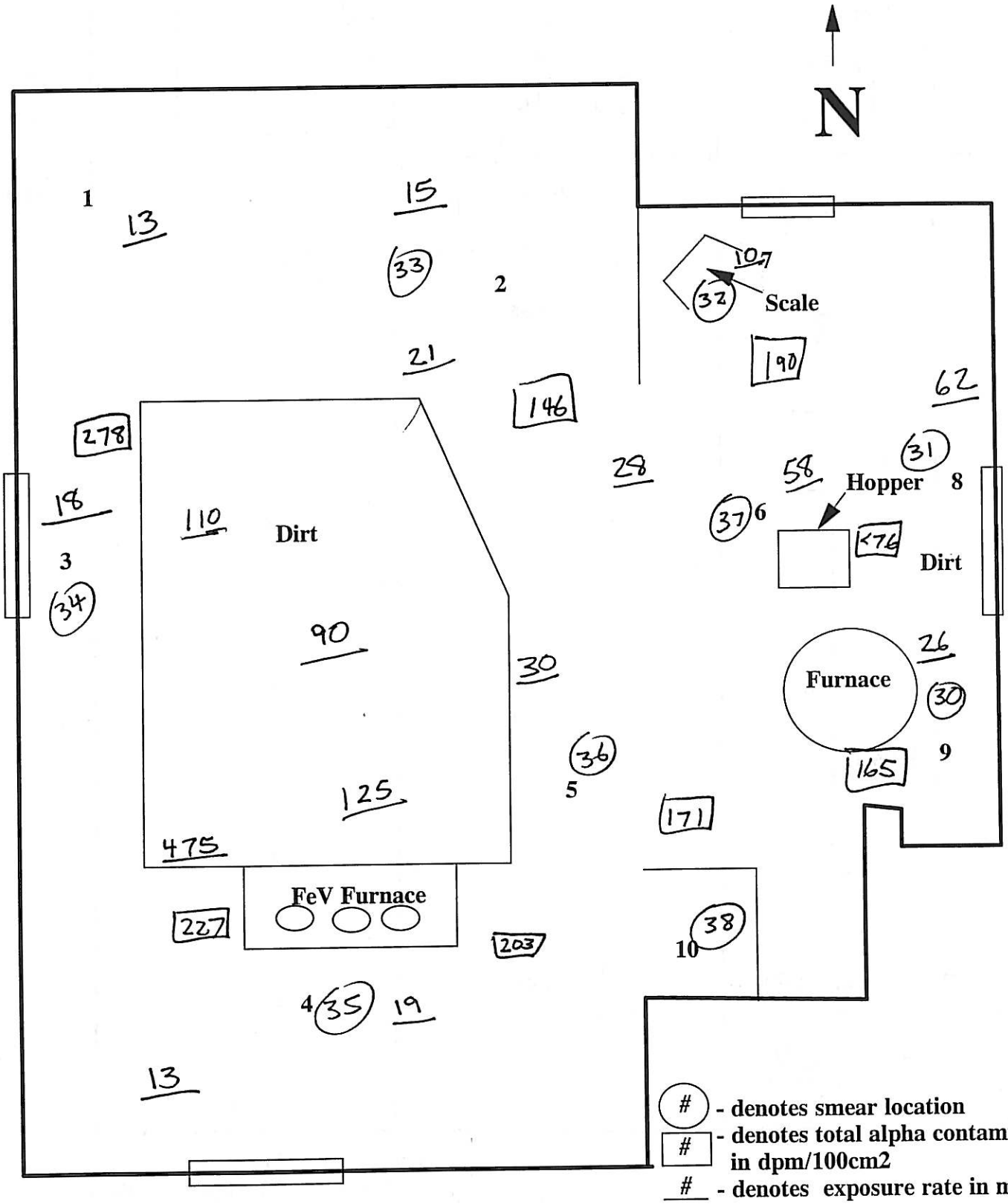
(#) - denotes smear location
[#] - denotes total alpha contamination in dpm/100cm2
- denotes exposure rate in microR/hr

Date 9/18/98

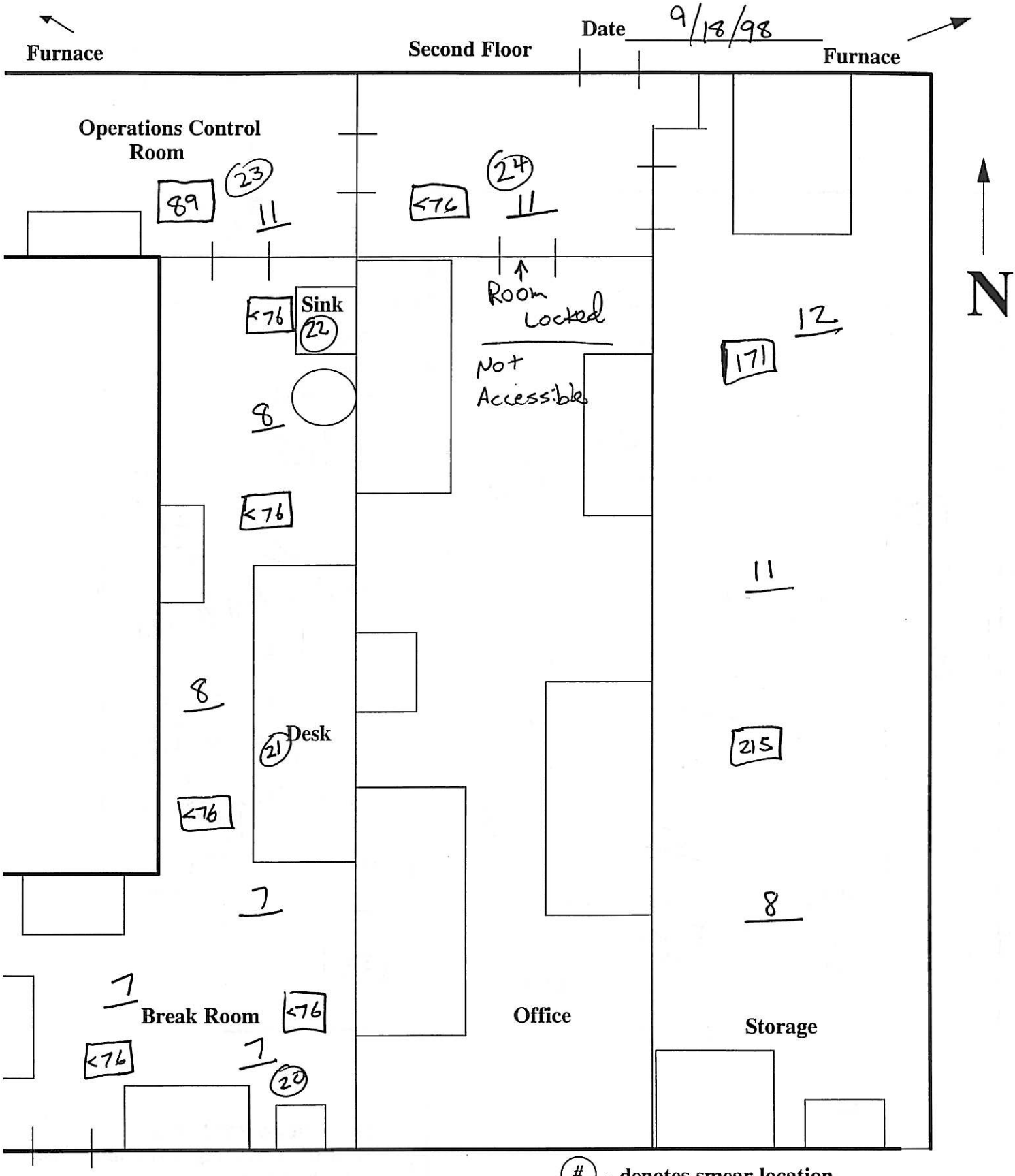


Alex J. Boerner

Date 9/18/98



D111 - Lower Level



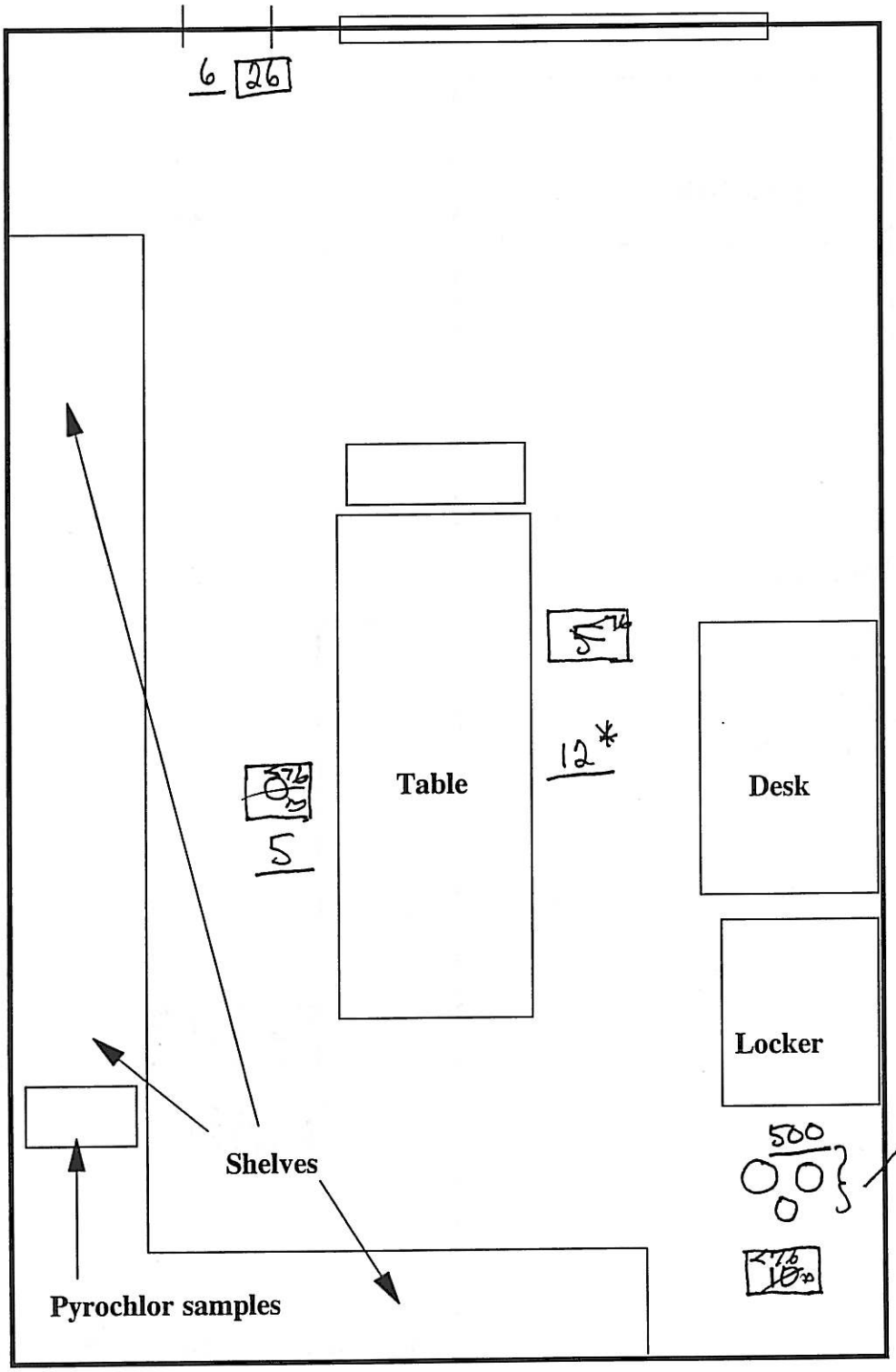
(#) - denotes smear location

[#] - denotes total alpha contamination in dpm/100cm2

- denotes exposure rate in microR/hr

D111 - Office and Break Room

Date 9/18/98



D117
The Cave

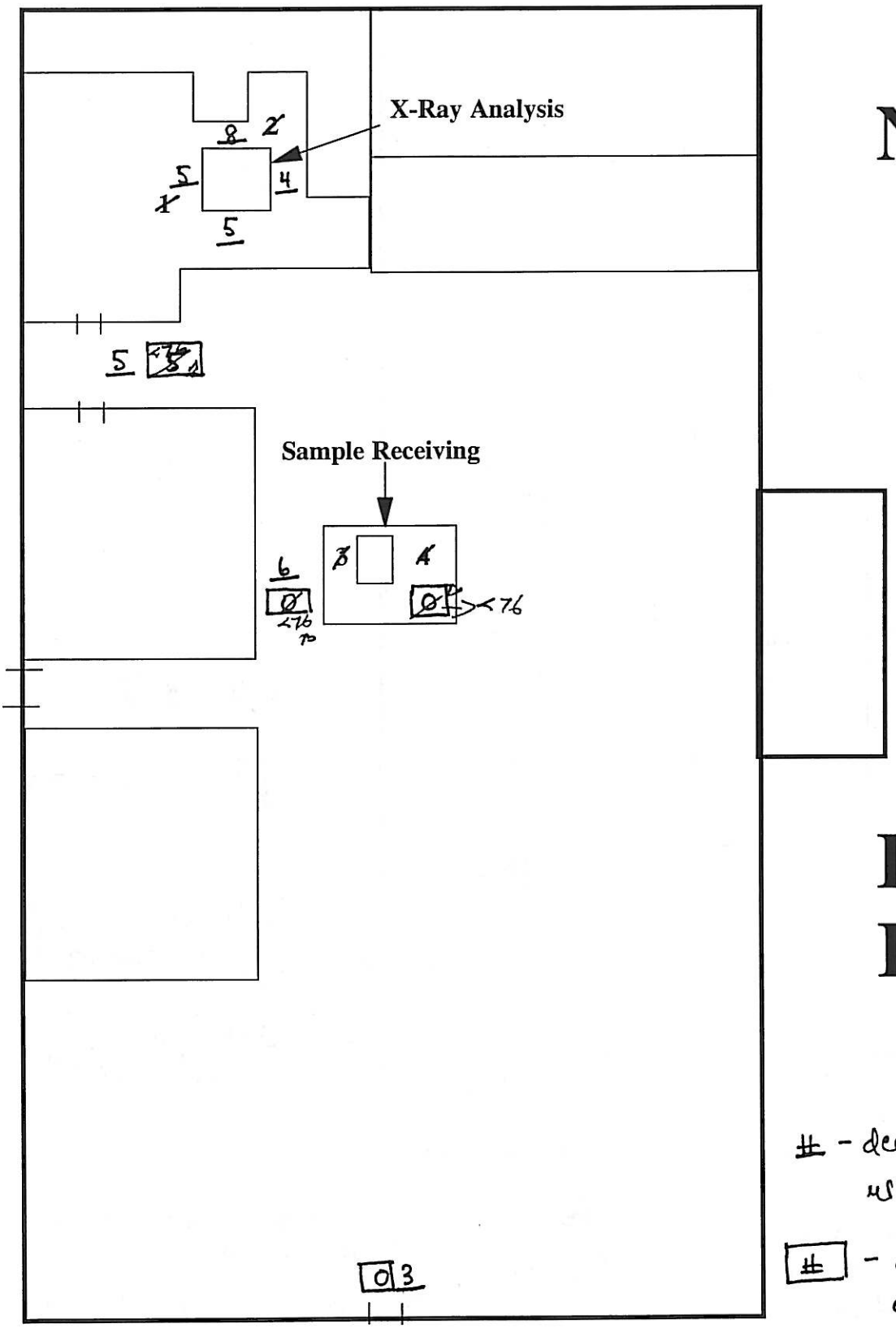
* Elevated urem/hr reading due to presence of CANAL a few feet south of this location.

[#] - denotes total alpha contamination in dpm/100cm2

- denotes dose rate in urem/hr

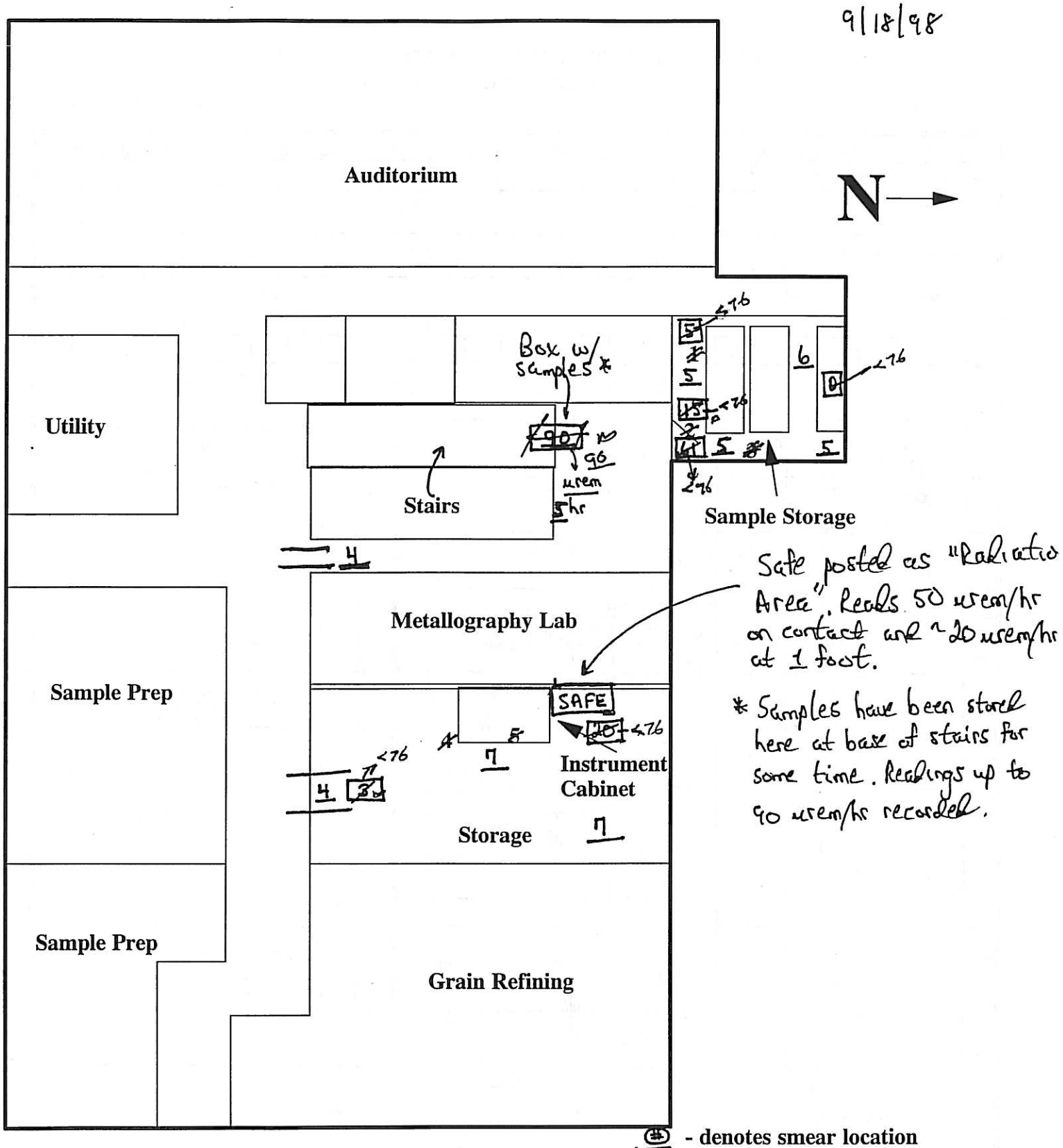
Alex J. Boerner

9/18/98



Alex J. Boerner

9/18/98



Safe posted as "Radiation Area". Reads 50 urem/hr on contact and ~20 urem/hr at 1 foot.

* Samples have been stored here at base of stairs for some time. Readings up to 90 urem/hr recorded.

(#) - denotes smear location

[#] - deontes total alpha contamination in dpm/100cm2

- denotes exposure rate in microrem/hr

D202 Lab - Lower Level

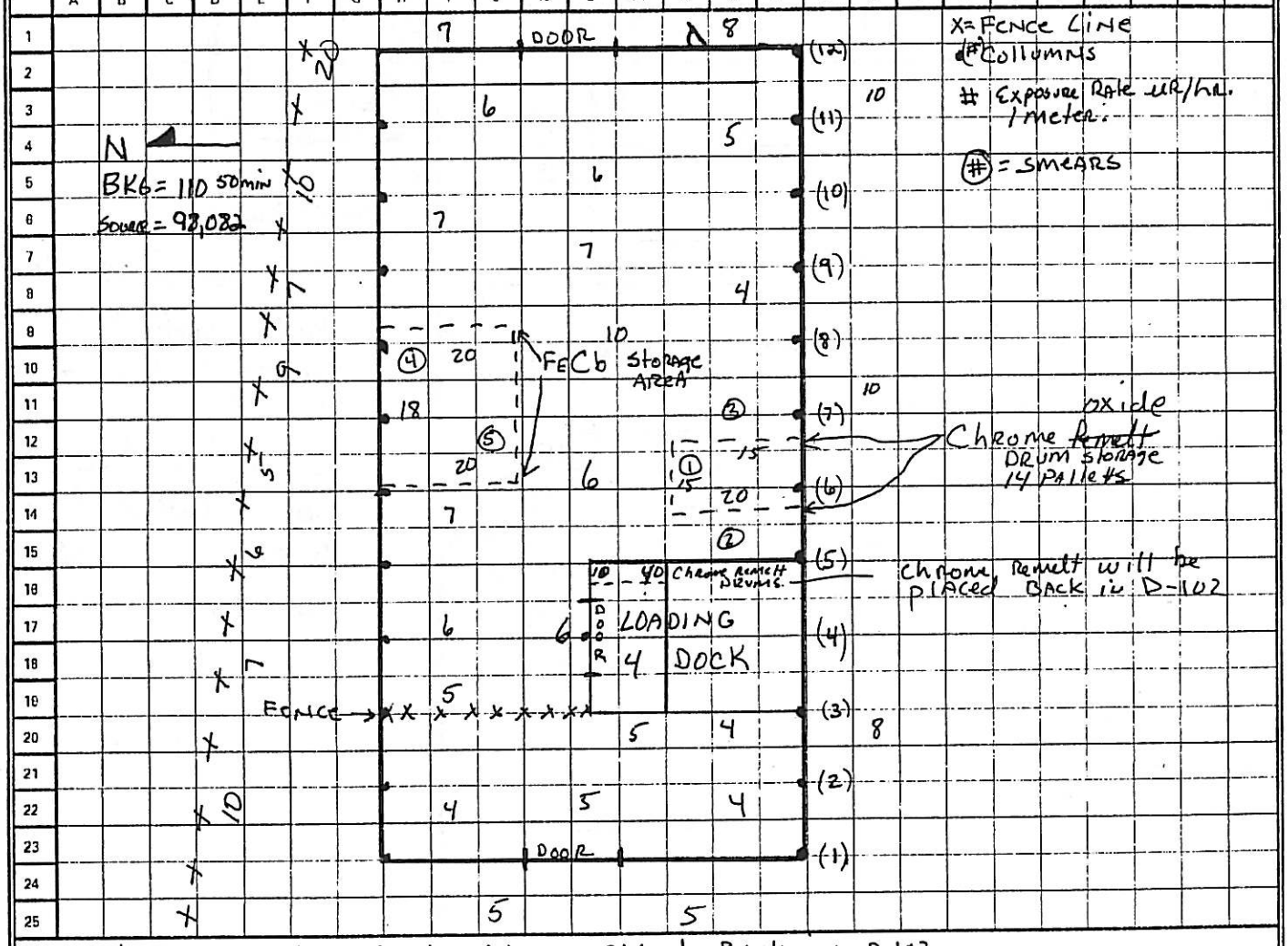
Glen J. Boerner

INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number _____ Page 1 of 1

Instrument/SN: B-295H Bicron Ebertline SAC-4 #868	Calibration Due: 01-16-98	Site Name: Sheild Alloy	Date 9-28 Time 1000
Instrument/SN	Calibration Due: 3-30-98	Location: (D203) D-warehouse	
Instrument/SN	Calibration Due:	Purpose:	
Survey Performed By (Print): Ron Merkel		Survey Performed By (Signature):	
☑ Battery OK ☑ HV OK ☑ Source Check OK		Grid Dimensions: N/A x N/A ☐ meters ☐ feet ☐ inches ☐ centimeters	



Notes: Chrome Remelt on Dock will be placed back in D-102
Chrome oxide will remain in place until purchased by outside source.
FeCb will remain in place.
ALL smears taken were < MDA

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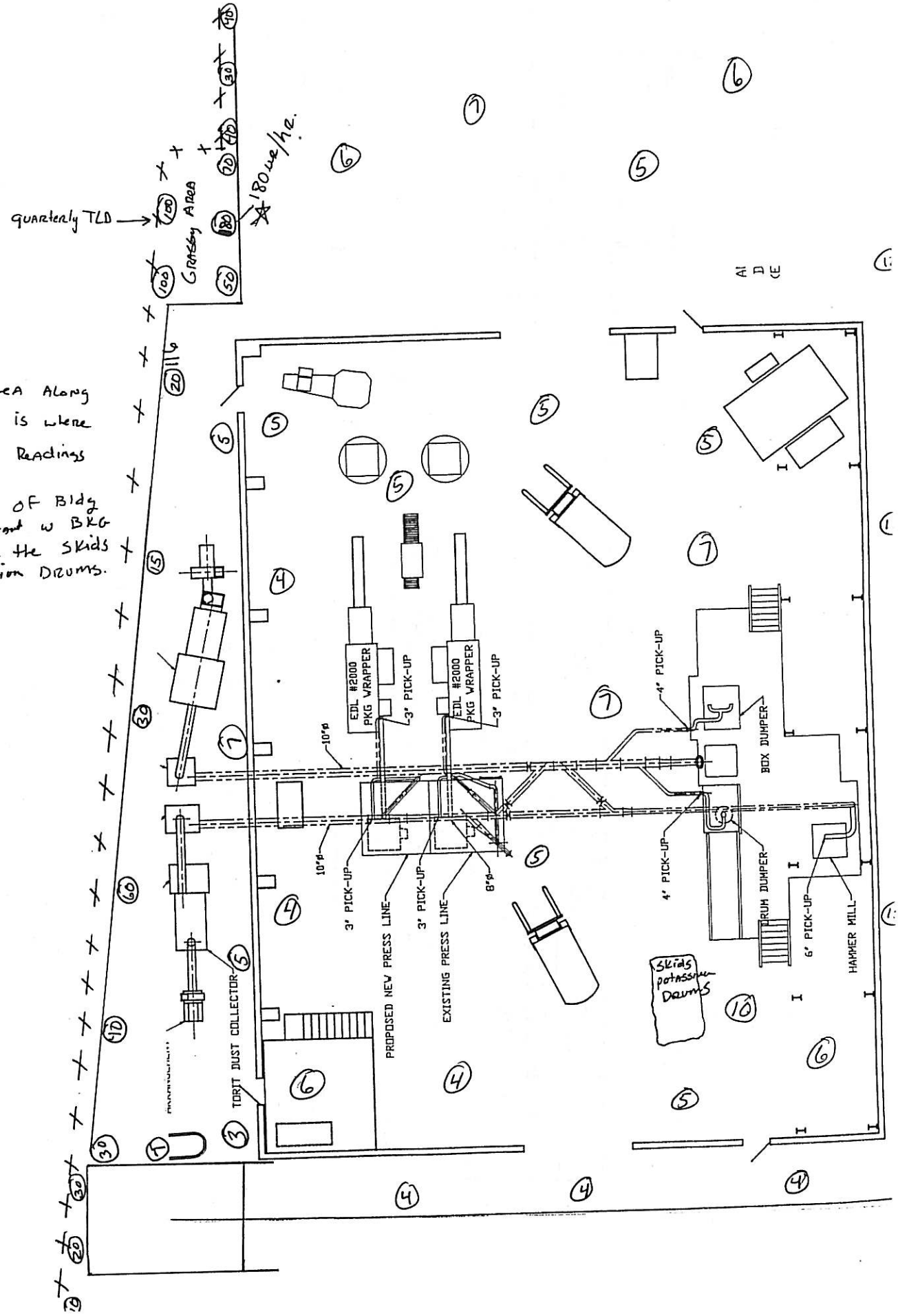
RSP-018 (Rev. 001) - Attachment 1

GENERAL AREA SURVEY D-116

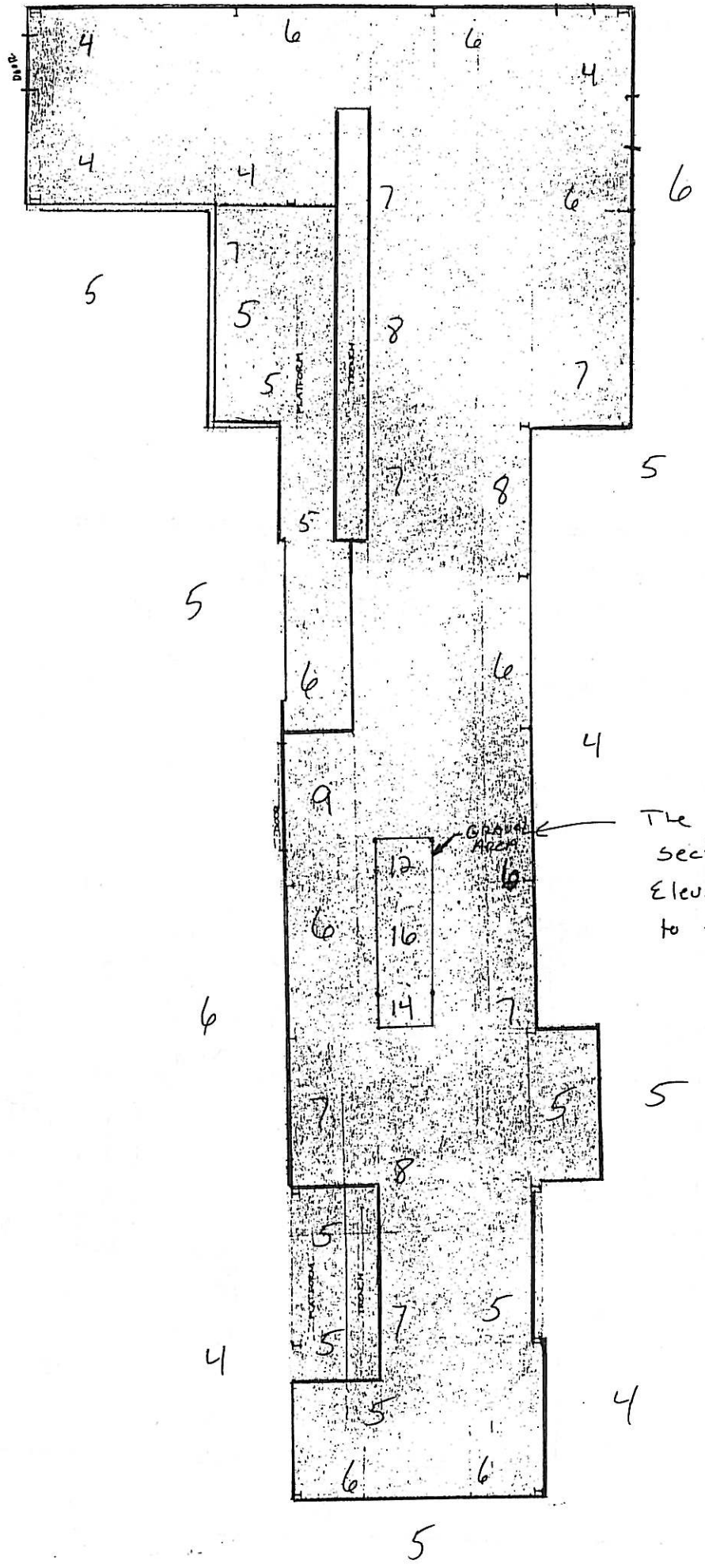
BICIRON B-295 W.

X XX = FENCE LINE

(#) = MR/HR.



Note: The AREA ALONG FENCE LINE is where The highest Readings were Noted. The inside OF Bldg WAS Consistant w BKG except FOR the SKids with Potassium DRUMS. ON them



Meter # B-295W
BKG 5-6 uR/hr
Source # 3788 Cs-137 1.24 uCi
Source check 700 uR/hr

Note: ALL READINGS ARE IN uR/hr. General AREA

THE GRAVEL AREA IN this section APPEARS to have ELEVATED EXPOSURE RATES COMPARED to the REST of Bldg ID-107.

SHIELDALLOY METALLURGICAL CORPORATION
SAMPLE COUNT RECORD
RSP-018

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2+3 - 1) cpm	(5) Activity (4 +Eff) dpm	MDA (see RSP-018)
1 D-102	9/18/98 1125	10/2/98 1415	Ludlum Model 2929 #126129	33.4%	0.3	4	1	3.7	11	~~15.8~~ 15.7 ~~1.1~~ dpm
2	1128	1418				1		0.7	2	
3	1132	1420				5		~~4.7~~ ~~4.3~~	14	
4	1137	1421				2		1.7	5	
5 AAF Baghouse	1150	1424				0		0	0	
6	1152	1428				1		0.7	2	
7	1155	1430				1		0.7	2	
8	1157	1431				4		3.7	11	
9 'G' Warehouse	1217	1433				0		0	0	
10	1220	1435				0		0	0	
11	1222	1440				0		0	0	
12	1225	1445				0		0	0	
13	1228	1447				0		0	0	
14 Lab basement	1350	1450				1		0.7	2	
15 Flexkleen Baghouse	9/18/98 0915	10/5/98 1300		33.2%	0.3	12	1	11.7	35	~~15.8~~ ~~1.1~~ dpm
16	0917	1302				3		2.7	8	
17	0918	1304				2		1.7	5	
18	0919	1306				3		2.7	8	
19	0920	1307				3		2.7	8	

Printed Name: Alan DuFF	**Project Description:** Quarterly surveillance	**Notes:** Counted @ IEM Knoxville office
Signature: Alan DuFF	**Project Location:** SMC New field	

SHIELDALLOY METALLURGICAL CORPORATION
SAMPLE COUNT RECORD
RSP-018

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2÷3 - 1) cpm	(5) Activity (4 ÷Eff) dpm	MDA (see RSP-018)
20 DIII Office	9/8/98 1710	10/8/98 1035	Ludlum Model 2929 #126129	33.3%	0.4	2	1	1.6	5	17 dpm
21	1711	1036				1		0.6	2	
22	1713	1038				3		2.6	8	
23	1715	1039				5		4.6	14	
24	1717	1042				2		1.6	5	
25 DIII Upper Level	1725	1044				22		21.6	65	
26	1726	1047				16		15.6	47	
27	1728	1049				10		9.6	29	
28	1730	1051				20		19.6	59	
29	1731	1055				12		11.6	35	
30 DIII Lower Level	1734	1058				36		35.6	107	
31	1736	1100				18		17.6	53	
32	1738	1102				6		5.6	17	
33	1739	1105				7		6.6	20	
34	1740 ++	1107				13		12.6	38	
35	1741	1110				8		7.6	23	
36	1742	1113				5		4.6	14	
37	1744	1115				10		9.6	29	
38	1745	1118				2		1.6	5	

Printed Name: Alan Duff	Project Description: Quarterly surveillance	Notes: Counted @ IEM Knoxville
Signature: Alan Duff	Project Location: SMC. New Field	

Appendix E - Dosimeter (Environmental and Extremity) Records

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
DOSIMETER DEPLOYMENT LOG

Dosimeter No.	Dosimeter Type (Ring, Body, Environmental)	Assigned to (Name or Location)	Deployment			Retrieval			Remarks
			Date	Time	Initials	Date	Time	Initials	
1	~~Fence~~ Environmental	Inst. office	9/16/98	1315	BD				
2		Fence	9/16/98	1425	BD				
3		Fence	9/16/98	1422	BD				
4		Fence	9/16/98	1418	BD				
5		Fence	9/16/98	1415	BD				
6		Fence	9/16/98	1413	BD				
7		Fence	9/16/98	1410	BD				
8		Fence	9/16/98	1407	BD				
9		Fence	9/16/98	1403	BD				
10		Fence	9/16/98	1400	BD				
11		Fence	9/16/98	1357	BD				
12		Fence	9/16/98	1353	BD				
13		Fence	9/16/98	1350	BD				
14		Fence	9/16/98	1340	BD				
15		Fence	9/16/98	1330	BD				
16		Guest house	9/18/98	1100	BD				
17	↓	JPV House	9/16/98	1800	BD				
1	Finger Ring	G. Palladino	9/16/98	1230	BD				
2	Finger Ring	R. Davis	9/16/98	1230	BD				
3	Finger Ring	G. Lucas	9/16/98	1230	BD				
4	Finger Ring	J. Braghoff	9/16/98	1230	BD				
5 & 6	Finger Ring	Spares	9/16/98	1230	BD				

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
DOSIMETER DEPLOYMENT RECORD

Dosimeter No.	Deployment Location	Date Deployed	Time Deployed	Signature	Date Retrieved	Time Retrieved	Condition on Retrieval	Signature
1	RSO Office	5/19/98	1035		9/16/98	1315	Good	
2	Perimeter Fence	5/19/98	1025			1425		
3		5/19/98	1016			1422		
4		5/19/98	1011			1418		
5		5/19/98	1008			1415		
6		5/19/98	1004			1413		
7		5/19/98	1000			1410		
8		5/19/98	0955			1407		
9		5/19/98	0952			1403		
10		5/19/98	0950			1400		
11		5/19/98	0947			1357		
12		5/19/98	0945			1353		
13		5/19/98	0942			1350		
14		5/19/98	0940			1340		
15		5/19/98	1040			1330		
16	Guest House	5/19/98	0930		9/18/98	1100		
17	JPV House	5/~~19~~ 20/98	1200		9/16/98	1800		
1 Ring	Palladino	5/19/98	1330			1230		
2	Davis	5/19/98	1330			1230		
3	Lucas	5/19/98	1330			1230		
4	Braghoff	5/19/98	1330			1230		
5	Spare	5/19/98	1330			1230		
6	Spare	5/19/98	1330			1230		

Health Physics Northwest

11535 S.W. 67th
Tigard, Oregon 97223
Phone (503) 620-6617 • (800) 762-8444

FACILITY: Attn: Alan Duff
Shieldalloy Metallurgical Corp
IEM
9040 Executive Park Dr #205
Knoxville, TN 37923

FACILITY NUMBER: 2624

EXPOSURE PERIOD: 4/1/98 thru 6/30/98

BADGE #	NAME	BADGE TYPE	For client use: BADGE ISSUED	For client use: BADGE RETURNED
00000	Control Job 94005.05	C		
00000	Control Job 94005.05	H		
00001	#1 Job #94005.05	B		
00001	#1 Palladino G	H		
00002	#2 Job #94005.05	B		
00002	#2 Davis R	H		
00003	#3 Job #94005.05	B		
00003	#3 Lucas G	H		
00004	#4 Job #94005.05	B		
00004	#4 Braghoff J	H		
00005	#5 Job #94005.05	B		
00005	#5 Job #94005.05	H		
00006	#6 Job #94005.05	B		
00006	#6 Spare Job #94005.05	H		
00007	#7 Job #94005.05	B		
00008	#8 Job #94005.05	B		
00009	#9 Job #94005.05	B		
00010	#10 Job #94005.05	B		
00011	#11 Job #94005.05	B		
00012	#12 Job #94005.05	B		
00013	#13 Job #94005.05	B		
00014	#14 Job #94005.05	B		
00015	#15 Job #94005.05	B		
00016	#16 Job #94005.05	B		
00017	#17 Job #94005.05	B		
00027	Transit Job #94005.05	A		

BADGE #	NAME	BADGE TYPE	For client use: BADGE ISSUED	For client use: BADGE RETURNED

- Badges are to be worn from the first through the last day of the **Exposure Period** shown above.
- **Badge Issued** and **Badge Returned** columns are provided to monitor distribution and collection of badges.
- **Badge Type** indicates the following: **A**-area; **B**-body; **C**-control; **E**-eye: **F**-fetus; **G**-leg; **H**-hand(ring); **K**-neck; **L**-left hand; **M**-arm badge; **R**-right hand; **T**-wrist badge; **W**-waist

ACCREDITED BY THE NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM FOR THE SPECIFIC SCOPE OF ACCREDITATION UNDER LAB CODE: 0567

NVLAP

RADIATION DOSE REPORT

ACCREDITED BY THE NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM FOR THE SPECIFIC SCOPE OF ACCREDITATION UNDER LAB CODE: 0567

NVLAP

RECEIVED 10/19/98

HPNW
11535 S.W. 67th
Tigard, Oregon 97223
Phone (503) 620-6617
(800) 762-8444
FAX (503) 684-5548
tld@hpnw.com

FACILITY NUMBER: 2624 FACILITY CODE:

FOR: IEM
1680 E Gude Dr., Suite 305
Rockville, MD 20850
Attn: Carol Berger

REPORT DATE: 9/29/98

FOR EXPOSURE PERIOD: 4/1/98 thru 6/30/98

Contact: **Ross Mercer, M. S.**
Health Physicist

					CURRENT DOSE (MILLIREM)				CUMULATIVE DOSE (MILLIREM)				
									CALENDAR QUARTER	YEAR TO DATE			LIFETIME
BADGE NO.	NAME	SOCIAL SECURITY NUMBER	BIRTHDATE	NOTES	NEUTRON	SDE	EDE	DDE	DDE	SDE	EDE	DDE	DDE
0000	Control Job 94005.0			C	m	m	m	m	m	m	m	m	m
0000	Control Job 94005.0			H		m				m			
0001	#1 Job #94005.05			B	m	m	m	m	m	m	m	m	m
0001	#1 Palladino G			H		m				m			
0002	#2 Job #94005.05			B	m	m	m	m	m	m	m	m	m
0002	#2 Davis R			H		m				m			
0003	#3 Job #94005.05			B	m	244	241	241	241	397	387	387	953
0003	#3 Lucas G			H		m				m			
0004	#4 Job #94005.05			B	m	13	12	12	12	13	12	12	12
0004	#4 Braghoff J			H		m				m			
0005	#5 Job #94005.05			B	m	249	245	245	245	426	417	417	1107
0005	#5 Job #94005.05			H		m				m			
0006	#6 Job #94005.05			B	m	546	519	519	519	888	853	853	2188
0006	#6 Spare Job #94005.			H		m				m			
0007	#7 Job #94005.05			B	m	22	22	22	22	22	22	22	35
0008	#8 Job #94005.05			B	m	48	43	43	43	78	70	70	167
0009	#9 Job #94005.05			B	m	104	98	98	98	187	168	168	412
0010	#10 Job #94005.05			B	m	78	69	69	69	112	103	103	220
0011	#11 Job #94005.05			B	m	66	66	66	66	119	114	114	294
0012	#12 Job #94005.05			B	m	107	94	94	94	161	144	144	319
0013	#13 Job #94005.05			B	m	m	m	m	m	m	m	m	m
0014	#14 Job #94005.05			B	m	m	m	m	m	m	m	m	m
0015	#15 Job #94005.05			B	m	m	m	m	m	m	m	m	m
0016	#16 Job #94005.05			B	m	m	m	m	m	m	m	m	m
0017	#17 Job #94005.05			B	m	m	m	m	m	m	m	m	m
0027	Transit Job #94005.05			A	m	m	m	m	m	m	m	m	m
①	②	③	④	⑤⑥⑦⑧⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱

EXPLANATION OF CODES AND TERMS ON REVERSE

Badge Type: M - Arm badge

Appendix F - Radioactive Materials Inventory

RADIOACTIVE MATERIALS INVENTORY LOG
November 3, 1998

Radionuclide: ☐ Uranium ☒ Thorium
License Limit: 303050 kg

Material Type and Description	Shipment		Amount Acquired			Amount Shipped			Current Inventory (kg)	% Limit
			Material Mass (kg)	Isotope Concentration (kg/kg)	Radioisotope Mass (kg)	Material Mass (kg)	Isotope Concentration (kg/kg)	Radioisotope Mass (kg)		
	Number	Date	a	b	c = (a X b)	d	e	f = (d X e)	g = Curr. + c - f	g ÷ Limit
	--	11/18/97	--	--	--	--	--	--	293366	0.968
Tantalite	P22466	11/21/97	20476	2.07e-03	42.39	--	--	0.00	293408	0.968
Pyrochlore	10984	11/24/97	18850	7.14e-03	134.59	--	--	0.00	293543	0.969
Coltan	P22361 (36)	12/01/97	15270	6.0e-4*	9.16	--	--	0.00	293552	0.969
Coltan	P22227 (22)	12/03/97	8326	2.52e-04	2.10	--	--	0.00	293554	0.969
Coltan	P22228 (24)	12/03/97	9064	1.15e-03	10.42	--	--	0.00	293565	0.969
Coltan	P22325 (30)	12/05/97	11540	2.98e-04	3.44	--	--	0.00	293568	0.969
Coltan	P22326 (32)	12/05/97	6468	3.27e-04	2.12	--	--	0.00	293570	0.969
Coltan	P22311 (28.1)	1/8/98	10660	0.0014*	14.92	--	--	0.00	293585	0.969
Coltan	P22313 (28.2)	1/12/98	7899	0.0023*	18.17	--	--	0.00	293603	0.969
Tantalite	7536/97 P22521	1/13/98	6377	1.3e-3*	8.29	--	--	0.00	293612	0.969
Coltan	P22419	1/15/98	19149	2.60e-04	4.98	--	--	0.00	293617	0.969
Tantalite	7901/97 P22521	1/20/98	6564	1.3e-3*	8.53	--	--	0.00	293625	0.969
Tin Slag	7900/97 P22345	1/20/98	3392	2.02e-3*	6.85	--	--	0.00	293632	0.969
Tantalite	88/98 P22597	2/26/98	10752	1.86e-3*	20.00	--	--	0.00	293652	0.969
Tin Slag	87/98 C22345	2/26/98	1511	2.02e-3*	3.05	--	--	0.00	293655	0.969
Tin Slag	P22471-01	3/31/98	3530	2.46e-3*	8.68	--	--	0.00	293664	0.969
Tantalite	P22466	5/12/98	--	--	0.00	20476	2.07e-03	42.39	293621	0.969
Tantalite	88/98 P22597	5/12/98	--	--	0.00	10752	1.86e-3*	20.00	293601	0.969
Coltan	P22227 (22)	5/13/98	--	--	0.00	8326	2.52e-04	2.10	293599	0.969
Coltan	P22228 (24)	5/13/98	--	--	0.00	9064	1.15e-03	10.42	293589	0.969

Coltan	P22325 (30)	5/13/98	--	--	0.00	11540	2.98e-04	3.44	293585	0.969
Coltan	P22326 (32)	5/13/98	--	--	0.00	6468	3.27e-04	2.12	293583	0.969
Coltan	P22313 (28.2)	5/14/98	--	--	0.00	7899	0.0023*	18.17	293565	0.969
Tin Slag	7900/97 P22345	5/14/98	--	--	0.00	3392	2.02e-3*	6.85	293558	0.969
Tin Slag	87/98 C22345	5/14/98	--	--	0.00	1511	2.02e-3*	3.05	293555	0.969
Tin Slag	P22471-01	5/15/98	--	--	0.00	3530	2.46e-3*	8.68	293546	0.969
Coltan	P22361 (36)	5/15/98	--	--	0.00	15270	6.0e-4*	9.16	293537	0.969
Coltan	P22419	5/15/98	--	--	0.00	19149	2.60e-04	4.98	293532	0.969
Coltan	P22311 (28.1)	5/18/98	--	--	0.00	10660	0.0014*	14.92	293517	0.969
Tantalite	7536/97 P22521	5/18/98	--	--	0.00	6377	1.3e-3*	8.29	293509	0.969
Tantalite	7901/97 P22521	5/18/98	--	--	0.00	6564	1.3e-3*	8.53	293501	0.968

*Taken from shipper records

RADIOACTIVE MATERIALS INVENTORY LOG
November 3, 1998

Radionuclide: ☒ Uranium ☐ Thorium
License Limit: 45000 kg

Material Type and Description	Shipment		Amount Acquired			Amount Shipped			Current Inventory (kg)	% Limit
			Material Mass (kg)	Isotope Concentration (kg/kg)	Radioisotope Mass (kg)	Material Mass (kg)	Isotope Concentration (kg/kg)	Radioisotope Mass (kg)		
	Number	Date	a	b	c = (a × b)	d	e	f = (d × e)	g = Curr. + c - f	g ÷ Limit
--	--	11/18/97	--	--	--	--	--	--	39409	0.876
Tantalite	P22466	11/21/97	20476	8.60e-04	17.61	--	--	0.00	39427	0.876
Pyrochlore	10984	11/24/97	18850	1.28e-03	24.13	--	--	0.00	39451	0.877
Coltan	P22361 (36)	12/01/97	15270	1.2e-3*	18.32	--	--	0.00	39469	0.877
Coltan	P22227 (22)	12/03/97	8326	1.10e-03	9.16	--	--	0.00	39478	0.877
Coltan	P22228 (24)	12/03/97	9064	9.90e-04	8.97	--	--	0.00	39487	0.877
Coltan	P22325 (30)	12/05/97	11540	1.14e-03	13.16	--	--	0.00	39500	0.878
Coltan	P22326 (32)	12/05/97	6468	9.20e-04	5.95	--	--	0.00	39506	0.878
Coltan	P22311 (28.1)	1/8/98	10660	2.3e-4*	2.45	--	--	0.00	39509	0.878
Coltan	P22313 (28.2)	1/12/98	7899	7.2e-4*	5.69	--	--	0.00	39514	0.878
Tantalite	7536/97 P22521	1/13/98	6377	4.8e-3*	30.61	--	--	0.00	39545	0.879
Coltan	P22419	1/15/98	19149	1.22e-03	23.36	--	--	0.00	39568	0.879
Tantalite	7901/97 P22521	1/20/98	6564	4.8e-3*	31.51	--	--	0.00	39600	0.880
Tin Slag	7900/97 P22345	1/20/98	3392	3e-3*	10.18	--	--	0.00	39610	0.880
Tantalite	88/98 P22597	2/26/98	10752	2.84e-3*	30.54	--	--	0.00	39641	0.881
Tin Slag	87/98 C22345	2/26/98	1511	3e-3*	4.53	--	--	0.00	39645	0.881
Tin Slag	P22471-01	3/31/98	3530	4.19e-3*	14.79	--	--	0.00	39660	0.131
Tantalite	P22466	5/12/98	--	--	0.00	20476	8.60e-04	17.61	39642	0.881
Tantalite	88/98 P22597	5/12/98	--	--	0.00	10752	2.84e-3*	30.54	39612	0.880
Coltan	P22227 (22)	5/13/98	--	--	0.00	8326	1.10e-03	9.16	39603	0.880
Coltan	P22228 (24)	5/13/98	--	--	0.00	9064	9.90e-04	8.97	39594	0.880

Coltan	P22325 (30)	5/13/98	--	--	0.00	11540	1.14e-03	13.16	39581	0.880
Coltan	P22326 (32)	5/13/98	--	--	0.00	6468	9.20e-04	5.95	39575	0.879
Coltan	P22313 (28.2)	5/14/98	--	--	0.00	7899	7.2e-4*	5.69	39569	0.879
Tin Slag	7900/97 P22345	5/14/98	--	--	0.00	3392	3e-3*	10.18	39559	0.879
Tin Slag	87/98 C22345	5/14/98	--	--	0.00	1511	3e-3*	4.53	39554	0.879
Tin Slag	P22471-01	5/15/98	--	--	0.00	3530	4.19e-3*	14.79	39539	0.130
Coltan	P22361 (36)	5/15/98	--	--	0.00	15270	1.2e-3*	18.32	39521	0.878
Coltan	P22419	5/15/98	--	--	0.00	19149	1.22e-03	23.36	39498	0.878
Coltan	P22311 (28.1)	5/18/98	--	--	0.00	10660	2.3e-4*	2.45	39495	0.878
Tantalite	7536/97 P22521	5/18/98	--	--	0.00	6377	4.8e-3*	30.61	39465	0.877
Tantalite	7901/97 P22521	5/18/98	--	--	0.00	6564	4.8e-3*	31.51	39433	0.876

*Taken from shipper records

Appendix G - Instrument Records

Instrument Inspection Log

Date	Instrument Type/Model Number	Serial Number	Location	Condition	Last Calibration Date	Action Taken
9/15/98	Eberline SAC-4	868	D201	Good	3/98	
9/15/98	Eberline SPA-3 (probe)	408462	D201	Good	3/98	
9/15/98	Eberline HP-210 (probe)	705797	D201	Good	3/98	
9/15/98	Eberline HP-210 (probe)	705796	D201	Good	9/97	Sent for calibration
9/15/98	Eberline AC-3 (probe)	407083-37	D201	Good	3/98	
9/15/98	Eberline AC-3 (probe)	407083-39	D201	Good	9/97	Sent for calibration
9/15/98	Eberline ESP-1	03047	D201	Good	3/98	
9/15/98	Eberline ESP-1	03049	D201	Good	9/97	Sent for calibration
9/15/98	Eberline SRM-100	313	D201	Good	9/97	Sent for calibration
9/15/98	Eberline SRM-100	314	D201	Good	3/98	
9/15/98	Eberline RAS-1	1	D117	Good	9/98	
9/15/98	Eberline RAS-1	2	D117	Good	9/98	
9/15/98	Eberline RAS-1	3	D117	Good	9/98	
9/15/98	Victoreen 489-55 (probe)	860428-3	D201	Good	9/97	Sent for calibration
9/15/98	Victoreen 450-P	195	D201	Good	9/97	Sent for calibration
9/15/98	Victoreen 490	5279	D201	Good	9/97	Sent for calibration
9/15/98	Victoreen 492	4888	D201	Good	3/98	
9/15/98	Bicron G2 (probe)	A199W	D201	Damaged	N/A	Out of service
9/15/98	Bicron Analyst	A004Q	D201	Good	3/98	
9/15/98	Bicron G2 (probe)	A119Q	D201	Damaged	N/A	Out of service
9/15/98	Gilian Gilibrator	8506-5	D117	Inoperable	3/98	Sent to calibration
9/15/98	Gilian Gil-Air Pump	8240	D117	Good	Daily while in use	
9/15/98	Gilian Gil-Air Pump	8241	D117	Good	Daily while in use	

Date	Instrument Type/Model Number	Serial Number	Location	Condition	Last Calibration Date	Action Taken
9/15/98	Gilian Gil-Air Pump	8242	D117	Good	Daily while in use	
9/15/98	Gilian Gil-Air Pump	8243	D117	Good	Daily while in use	
9/15/98	Gilian Gil-Air Pump	8244	D117	Good	Daily while in use	
9/15/98	Dosimeter 909	909/ 9441-010	D201	Good	N/A	
9/15/98	Dosimeter 862	3010846	D201	Good	Calibrate prior to use	Out of Service
9/15/98	Dosimeter 862	3010857	D201	Good	Calibrate prior to use	Out of Service
9/15/98	Dosimeter 862	3010856	D201	Good	Calibrate prior to use	Out of Service
9/15/98	SrY-90 source	0213	D201	Good	N/A	
9/15/98	Cs-137 source	3788	D201	Good	N/A	
9/15/98	Th-230 source	3786	D201	Good	N/A	
9/15/98	Th-230 source	3785	D201	Good	N/A	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.05	Detector			Meter		
Site Location/Background Location: Site- SMC Newfield Counted @ IEM Knoxville	Type: Ludlum 43-10-1	Serial No. 132239	Probe Area (cm²) N/A	Type: Ludlum Model 2929	Serial No: 126129	Operating Voltage: 725
Check Source No: 2401-98	Check Source No:			Check Source No:		
Radionuclide: Th-230 / Activity: 20,100 dpm / Date: 8/6/98	Radionuclide:	Activity:	Date:	Radionuclide:	Activity:	Date:

Date	Start of Shift Background (cpm for a 60 minute count)								End of Shift Background (cpm for a _____ minute count)								Daily Source Check (α)		Daily Source Check (β)		MDA** - Scaler Mode (dpm)		Bat. OK	HV OK	Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	α	β			
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.									
9/28/98	0.4	←	N/A	→	←	N/A		→	←	N/A		→	←	N/A		→	6713	33.4%	N/A	N/A	1.3	N/A	OK	OK	BKD
9/29/98	0.4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6702	33.3	↓	↓	1.4	↓	OK	OK	BKD
9/30/98	0.4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6686	33.3	↓	↓	1.4	↓	OK	OK	BKD
10/1/98	0.3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6695	33.3	↓	↓	1.1	↓	OK	OK	BKD
10/2/98	0.3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6716	33.4	↓	↓	1.1	↓	OK	OK	BKD
10/5/98	0.3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6672	33.2	↓	↓	1.1	↓	OK	OK	BKD
10/6/98	0.4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6658	33.1	↓	↓	1.3	↓	OK	OK	BKD
10/7/98	0.3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6681	33.2	↓	↓	1.1	↓	OK	OK	BKD
10/8/98	0.4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6697	33.3	↓	↓	1.4	↓	OK	OK	BKD

** $MDA = \dfrac{2.71 + 4.65\sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$

where MDA = the activity level (dpm/100 cm²), BKG_{avg} = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm²).

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.05			Detector			Meter		
Site Location/Background Location: SMC Newfield - Instrument Office			Type: Ludlum 43-89	Serial No. 141225	Probe Area (cm²) 100	Type: Ludlum 2224	Serial No: 146712	Operating Voltage: 0.8KV
Check Source No: 3785			Check Source No:			Check Source No:		
Radionuclide: Th-230	Activity: 6500dpm	Date: 9/18/91	Radionuclide:	Activity:	Date:	Radionuclide:	Activity:	Date:

Date	Start of Shift Background (cpm for a 1 minute count)								End of Shift Background (cpm for a 1 minute count)								Daily Source Check (α)		Daily Source Check (β)		MDA** - Scaler Mode (dpm)		Bat. OK	HV OK	Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	α	β			
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.									
9/14	0	0	0	0	← N/A →				0	1	0	0.3	← N/A →				996	15.3%	N/A	N/A	17.7	N/A	✓	✓	RAD
9/15	2	1	1	1.3					3	1	2	2					1047	16.1%			52.3		✓	✓	RAD
9/16	3	1	2	2					2	1	2	1.7					1064	16.4%			~~58.8~~ 56.6		✓	✓	RAD
9/17		NOT USED																							RAD
~~9/18~~																							✓		
9/18	6	4	3	4	← N/A →				3	4	3	3	← N/A →				1027	15.8%	N/A	N/A	7.6	N/A	✓	✓	RAD

$$** \quad MDA = \frac{2.71 + 4.65\sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$$

where MDA = the activity level (dpm/100 cm²), BKG_{avg} = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm²).

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.05	Detector			Meter		
Site Location/Background Location: SMC New Field - Instrument Office	Type: Ludlum 43-89	Serial No. 132118	Probe Area (cm^2) ~~100~~ 126	Type: Ludlum 2224	Serial No: 119791	Operating Voltage: 0.8kV
Check Source No: 3785	Check Source No:			Check Source No:		
Radionuclide: Th-230 / Activity: 6500dpm / Date: 9/18/91	Radionuclide:	Activity:	Date:	Radionuclide:	Activity:	Date:

Date	Start of Shift Background (cpm for a ___ minute count)								End of Shift Background (cpm for a ___ minute count)								Daily Source Check (α)		Daily Source Check (β)		MDA** - Scaler Mode (dpm)		Bat. OK	HV OK	Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	α	β			
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.									
9/14	0	1	2	1	← N/A →				1	2	0	1	← N/A →				1074	0.165	N/A	N/A	35	N/A	✓	✓	BKD
9/15	1	2	1	1.3					0	1	1	0.7					1086	0.167			38		✓	✓	BKD
9/16	1	1	1	1					0	1	1	0.7					1102	0.17			34		✓	✓	BKD
9/17	1	0	1	0.7					1	2	1	1.3					1089	0.168			31		✓	✓	BKD
9/18	4	3	0	2.3					Not Performed - BKG →								1009	0.155	↓	↓	50	↓	✓	✓	GJB

** $MDA = \frac{2.71 + 4.65\sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$

where MDA = the activity level (dpm/100 cm^2), BKG_{avg} = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm^2).

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.	Detector			Meter		
Site Location/Background Location: "A" Warehouse SMC Newfield	Type: Ludlum 43-37	Serial No. 094974	Probe Area (cm^2) ~~126~~ 582	Type: Ludlum Datalogger 2350-1	Serial No: 117570	Operating Voltage: α-1200 / β-1800
Check Source No: 3785	Check Source No: 0213			Check Source No:		
Radionuclide: Th-230 / Activity: 6500 dpm / Date: 9/18/91	Radionuclide: Sr-90 / Activity: (Today 52,326) 62,000 dpm / Date: 9/18/91			Radionuclide: / Activity: / Date:		

Date	Start of Shift Background (cpm for a 1 minute count)								End of Shift Background (cpm for a 1 minute count)								Daily Source Check (α)		Daily Source Check (β)		MDA** - Scaler Mode (dpm)		Bat. OK	HV OK	Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	α	β			
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.									
9/15	6	12	8	8.7	← N/A →				8	10	5	7.7	← N/A →				814	0.125	N/A	N/A	23	N/A	✓	✓	BM
9/16	7	13	16	12	← N/A →				10	12	16	12.7	← N/A →				795	0.122	N/A	N/A	27	N/A	✓	✓	PM
~~9/17~~	~~← N/A →~~				~~← Not used →~~				~~← N/A →~~				~~← Not used →~~				~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~✓~~	~~✓~~	~~PM~~
9/17 DO	← N/A →				1137	1062	1041	1080	← N/A →				1012	987	1021	1007	N/A	N/A	20,362	37.4	N/A	71.5	✓	✓	PM

** $MDA = \frac{2.71 + 4.65\sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$

where MDA = the activity level (dpm/100 cm^2), BKG_{avg} = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm^2).

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
EXPOSURE RATE SURVEY INSTRUMENT DATA SHEET

Project No. 94005.17	Detector		Meter		
Site Location/Background Location: SMC Newfield Instrument Office	Type: Ludlum 44-10	Serial No. 151704	Type: Ludlum 2241	Serial No: 143562	Operating Voltage: OK

Check Source Number	Radionuclide:	Calibration Activity and Date:
3788	Cs-137	1.24 uC 9/12/91

Date	Units	Start of Shift Background				End of Shift Background				Daily Response ~~uR/hr~~ cpm	Initials
		1	2	3	Avg.	1	2	3	Ave.		
9/14/98	cpm	6500	6300	6000	6267	6300	6100	6200	6200	348,000	RM
9/15	cpm	6400	6100	6500	6333	6200	6200	6500	6300	345,000	RM
9/16	cpm	6100	6300	6500	6300	~~6400~~ 6200 RM	5900	6100	6067	350,000	RM
9/17	cpm	5900	5700	5900	5830	6000	5900	5900	5933	341,000	RM
9/18	cpm	6500	6100	6200	6266	6100	6000	6200	6100	341,000	GB

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
EXPOSURE RATE SURVEY INSTRUMENT DATA SHEET

Project No. 94005	Detector		Meter		
Site Location/Background Location: SMC Newfield Instrument Office	Type: Ludlum 44-10	Serial No. 151705	Type: Ludlum 2241	Serial No: 119737	Operating Voltage: OK

Check Source Number	Radionuclide:	Calibration Activity and Date:
3788	Cs-137	1.27 uC: 9/12/91

Date	Units	Start of Shift Background				End of Shift Background				Daily Response (uR/hr)	Initials
		1	2	3	Avg.	1	2	3	Ave.		
9/14/98	cpm	5300	5700	5300	5433	5900	6400	6000	6100	344,000	BRO
9/15/98	cpm	6000	6200	5700	5967	5800	5600	5600	5667	341,000	BRO
9/16/98	cpm	6000	5900	6600	6167	6100	5800	5900	5933	337,000	BRO
9/17/98	cpm	6400	6300	5900	6200	6100	6000	6200	6100	337,000	BRO
9/18/98	cpm	6300	6500	6200	6333	6200	6300	6100	6200	340,000	BRO

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
EXPOSURE RATE SURVEY INSTRUMENT DATA SHEET

Project No. 94005.05	Detector		Meter		
Site Location/Background Location: SMC Newfield Instrument office	Type: N/A	Serial No. N/A	Type: Bicron MicroRem	Serial No: B295W	Operating Voltage: OK

Check Source Number	Radionuclide:	Calibration Activity and Date:
3788	Cs-137	1.24 uC: 9/12/91

Date	Units	Start of Shift Background				End of Shift Background				Daily Response (μR/hr)	Initials
		1	2	3	Avg.	1	2	3	Ave.		
9/15/98	uRem	7	6	5	6	8	6	7	7	756	~~BD~~
9/16/98	"	5	6	5	5	7	6	6	6	750	~~BD~~
9/17/98	"	7	6	6	6	5	6	6	6	750	~~BD~~
9/18/98	"	5	6	6	6	6	7	6	6	750	~~BD~~

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ENCLOSURE 9.2
M2350 DETECTOR CALIBRATION DATA SHEET
(Example)

Initials/Date CWM 16/22/98

Detector Model 43-37A Detector ID 094974 Instrument ID 126212

Nuclide	Source ID	Certification Date	Activity
1/ Th-230	099602	8-8-96	24659
2/		N	
3/		A	
4/			

Detector Efficiency/Response Data				Precision Test	
Parameter	As Found	As Left	Remarks	Parameter	Units CPM or MR/HR (circle one)
Count 1	3318	3319	Source # 1	Count 1 3314	TOE
Count 2	3288	3288		Count 2 3284	MID
Count 3	3275	3275		Count 3 3271	HEEL
Average	3294	3294		Average 3290	
Background	4	4		Pass/Fail	P / F
Net counts	3290	3290			Tollerance ±10%
Efficiency	13.3%	13.3%			Min 2961 Max 3619

Dead Time and Cal Constant Mark NA as appropriate

LOW Sample activity Source #	HIGH Sample activity Source #	Dead Time (DT)	Cal. Constant (CC)
		1e-6	1.0

Detector Data: Dose Rate Probes Mark NA as appropriate

Desired Exposure (mR/hr)	Tolerance (± 10%) (mR/hr)	As Found (mR/hr)	As Left (mR/hr)
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr

N A N A

[signature]
6-24-98

DURATEK

ENCLOSURE 9.2
M2350 DETECTOR CALIBRATION DATA SHEET
(Example)

Initials/Date CWH 16/22/98

Detector Model 43-37 B Detector ID 094974 Instrument ID 126212

Nuclide	Source ID	Certification Date	Activity
1/ Tc-99	079501	7-1-95	2249
2/ Tc-99	079502	7-1-95	22398
3/ Tc-99	079503	7-1-95	226020
4/ Tc-99	079504	7-1-95	2215800

Detector Efficiency/Response Data / Precision Test

Parameter	As Found	As Left	Remarks	Parameter	Units: CPM or MR/HR (circle one)
Count 1	3866	3866	Source # 2	Count 1 3044	TOE
Count 2	4025	4025		Count 2 3203	MID
Count 3	3982	3982		Count 3 3160	HEEL
Average	3958	3958		Average 3136	
Background	822	822		Pass/Fail	P / F
Net counts	3136	3136			Tollerance ±10%
Efficiency	14%	14%			Min 2822 Max 3450

Dead Time and Cal Constant Mark NA as appropriate

LOW Sample activity Source # 1	HIGH Sample activity Source # 4	Dead Time (DT)	Cal. Constant (CC)
229	57071	1e-6 ~~1.572371e-4~~	1.0 ~~5.106478e~~ NF 6-24-98

Detector Data: Dose Rate Probes Mark NA as appropriate

NF 6-24-98

Desired Exposure (mR/hr)	Tolerance (± 10%) (mR/hr)	As Found (mR/hr)	As Left (mR/hr)
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr
mR/hr	mR/hr	mR/hr	mR/hr

N A N A

Thomas F. Scott

6-24-98

ORIGINAL

ENCLOSURE 9.1 (Page 1 of 1)

LUDLUM MODEL 2350 CALIBRATION DATA SHEET (example)

Instrument ID 117570

M&TE Description	M&TE ID Number	M&TE Cal Due Date
Pulse Generator	683	7-1-98
Electrostatic Voltmeter	ES-17442	5-19-98
Atmospheric Monitor	2772	10-21-98

Other Tests & Calibration Parameters		
Physical Condition Sat (✓) Unsat ( )	Memory Reset Yes (✓) No ( )	Atm. Press. (mmHg): 738
EPROM Number: (as available) NA	Battery Voltage: 6.0 VDC	Temperature (°Celsius): 23.1
Startup Test Sat (✓) Unsat ( )	Battery Check OK (✓) Replaced ( )	Humidity (%RH):
Overload value_____ Result: Sat ( ) Unsat ( ) Adjusted ( )	"Display-to-mV" ratio: 100 to 4 mV	

Parameter	Tolerance (±10%)	As Found (mVDC)	As Left (mVDC)
Low End Threshold	4 ± (3.6 to 4.4) mVDC	4	4
Midpoint Threshold	20 ± (18 to 22) mVDC	20	20
High End Threshold	40 ± (36 to 44) mVDC	40	40
Window Width	4 ± (3.6 to 4.4) mVDC	4	4

HV Cal Values (M2350 HV Entry)	Desired HV (Voltmeter) (VDC)	Tolerance (Voltmeter) (VDC)	As Found (Voltmeter) (VDC)	As Left (Voltmeter) (VDC)
600	600	540 to 660	600	600
1200	1,200	1,080 to 1,320	1220	1220
1800	1,800	1,620 to 1,980	1820	1820

Pulser Input (CPM)	Desired M2350 Reading (CPM)	Tolerance M2350 Reading (CPM)	As Found M2350 Reading (CPM)	As Left M2350 Reading (CPM)
400K	400,000	360,000 to 440,00	400,000	400,000
40K	40,000	36,000 to 44,000	40,002	40,002
4K	4,000	3,600 to 4,400	4001	4001
400	400	360 to 440	400	400

Note: As found pulser readings checked with DT set to 1.0E-6

Remarks: _____

CW McCall 5-14-98 James P. Scott 5-15-98

Performed by Date Reviewed by Date

ORIGINAL

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER INTEGRATED ENVIRONMENTAL MGMT ORDER NO. 231818 / 213871

Mfg. Ludlum Measurements, Inc. Model 2224 Serial No. 119791

Mfg. Ludlum Measurements, Inc. Model 43-89 Serial No. PR 132118

Cal. Date 5-Mar-98 Cal Due Date 5-Mar-99 Cal. Interval 1 Year Meterface 202-783

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 73 °F RH 20 % Alt 698.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☑ F/S Resp. ck ☑ Reset ck. ☑ Window Operation ☑ Geotropism
☑ Audio ck. ☐ Alarm Setting ck. ☑ Batt. ck. (Min. Volt) 2.2 VDC
☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 800 V Input Sens. Comment mV Det. Oper. 800 V at Comment mV Threshold Dial Ratio = mV

☑ HV Readout (2 points) Ref./Inst. 500 / 500 V Ref./Inst. 2011 / 2000 V

COMMENTS:

```
Firmware: 390063
Alpha Threshold: 120mV
 Beta Threshold: 3.5mV
    Beta Window: 30mV
```

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
X1000	400 K cpm	400	400
X1000	100 K cpm	100	100
X100	40 K cpm	400	400
X100	10 K cpm	100	100
X10	4 K cpm	400	400
X10	1 K cpm	100	100
X1	400cpm	400	400
X1	100cpm	100	100

*Uncertainty within ± 10% C.F. within ± 20%

ALL **Range(s) Calibrated Electronically**

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400 K cpm	399497	399497
	40 K cpm	39952	39952
	4 K cpm	3994	3994
	400 cpm	400	400
	40 cpm	40	40

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Log Scale			

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/N T-304

☑ Alpha S/N Pu-239 12800cpm ☐ Beta S/N ☐ Other

☑ m 500 S/N 134709 ☐ Oscilloscope S/N ☑ Multimeter S/N 57390613

Calibrated By: Conrad Salcido Date 5 Mar 98

Reviewed By: Rhonda Harris Date 7 Mar 98

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 43-89 Serial No. PR 132118 Order #. 231818 / 213871

Customer INTEGRATED ENVIRONMENTAL MGMT Alpha Input Sensitivity 120 mV

Counter 2224 Serial No. 119791 Beta Input Sensitivity 35 mV

Count Time 1Minute Beta Window 30 mV

Other _____ Distance Source to Detector Surface

High Voltage	Background		Isotope Pu-239 Size 12800cpm		Isotope Tc 99 Size 14300cpm		Isotope Sr90/Y90 Size 0.01112uCi	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
775	0	186	4837	331	8	2329	2	9369
800	0	263	4986	444	4	3087	0	11284
825	0	288	5163	532	8	4002	1	12437
850	3	374	5149	648	7	4884	3	13705

☐ Gas Proportional detector count rate decreased ≤ 10% after 15 hour static test using 39" cable.

☐ Gas proportional detector count rate decreased ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter.

Signature Conrad Salinas Date 5 Mar 98

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER INTEGRATED ENVIRONMENTAL MGMT ORDER NO. 214909 / 232282

Mfg. Ludlum Measurements, Inc. Model 2929 Serial No. 126129

Mfg. Ludlum Measurements, Inc. Model 43-10-1 Serial No. PR 132239

Cal. Date 12-Mar-98 Cal Due Date 12-Mar-99 Cal. Interval 1 Year Meterface 202-014

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 73 °F RH 20 % Alt 715.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Window Operation

☑ Audio ck.

☑ Meter Zeroed Alpha Sensitivity 175 mV Beta Sensitivity 4 mV Beta Window 50 mV

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 725 V = 2.98 on High Voltage dial. High Voltage set with detector connected.

☑ HV Readout (2 points) Ref./Inst. 500 / 500 V Ref./Inst. 2000 / 2000 V

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Alpha Channel Digital Readout	400K cpm	400021	400021
	40K cpm	40002	40002
	4K cpm	4002	4002
	400 cpm	400	400
	40 cpm	40	40
	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Beta/Gamma Channel Digital Readout	400K cpm	399975	~~+400023~~ 399975
	40K cpm	40007	40007
	4K cpm	4001	4001
	400 cpm	400	400
	40 cpm	40	40

*Uncertainty within ± 10% C.F. within ± 20%

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-196.

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/N T-30

☑ Alpha S/N Pu 239 12.8 Kcpm ☑ Beta S/N Tc 99 ~1.3Kcpm; C14 183/50 cpm ☐ Other _____

☑ m 500 S/N 121025 ☐ Oscilloscope S/N _____ ☑ Multimeter S/N 64100257

Calibrated By: V. Lee Alvarado Date 12 Mar 98

Reviewed By: Conrad Salinas Date 13 Mar 98

FORM C25 09/08/97

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 43-10-1 Serial No. PR132239 Order #. 214909 / 232282

Customer INTEGRATED ENVIRONMENTAL MGMT Alpha Input Sensitivity 175 mV

Counter 2929 Serial No. 126129 Beta Input Sensitivity 4 mV

Count Time 1Minute Beta Window 50 mV

Other _____ Distance Source to Detector Tray

High Voltage	Background		Isotope Pu239 Size 12.8Kcpm		Isotope C14 Size 153150cpm		Isotope Tc99 Size 14.3Kcpm	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
700	0	32	10169	301	0	25781	11	7542
J.V.C 725	0	49	10200	294	0	29390	7	8305
750	0	93	10258	313	0	36230	8	8830
775	0	120	10332	431	0	39735	10	9397

☐ Gas Proportional detector count rate decreased ≤ 10% after 15 hour static test using 39" cable.

☐ Gas proportional detector count rate decreased ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter.

Signature V. Ca Alvarado Date 12 Nov 98

Designer and Manufacturer of Scientific and Industrial instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CERTIFICATE OF CALIBRATION

CUSTOMER SHIELDALLOY METALLURGICAL ORDER NO. 232198/214727

Mfg. Eberline Model SAC-4 Serial No. 868

Mfg. _____ Model _____ Serial No. _____

Cal. Date 30-Mar-98 Cal Due Date 30-Mar-99 Cal. Interval 1 Year Meterface SAC-4

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 73 °F RH 45 % Alt 692.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☐ Mechanical ck. ☐ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☐ F/S Resp. ck ☐ Reset ck. ☐ Window Operation ☐ Geotropism
☐ Audio ck. ☐ Alarm Setting ck. ☐ Batt. ck. (Min. Volt) _____VDC

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 900 V Input Sens. 10 mV Det. Oper. _____ V at _____ mV Threshold Dial Ratio _____ = _____ m

☐ HV Readout (2 points) Ref./Inst. _____ / _____ V Ref./Inst. _____ / _____ V

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*

*Uncertainty within ± 10% C.F. within ± 20%

ALL **Range(s) Calibrated Electronically**

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400 K cpm	40027 (0)	40027 (0)	Log Scale			
	40 K cpm	4004	4004				
	4 K cpm	400	400				
	400 cpm	40	40				
	40 cpm	4	4				

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/N T-3

☑ Alpha S/N Th230#1619 ☐ Beta S/N _____ ☐ Other _____

☐ m 500 S/N _____ ☐ Oscilloscope S/N _____ ☐ Multimeter S/N _____

Calibrated By: Lonie Martin Date 30-Mar-98

Reviewed By: Rhonda Hann Date 30 Mar 98

FORM C22A 09/08/97

Designer and Manufacturer of Scientific and Industrial Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CERTIFICATE OF CALIBRATION

CUSTOMER SHIELDALLOY METALLURGICAL ORDER NO. 232198/214727

Mfg. Bicron Model ANALYST Serial No. A0049

Mfg. Eberline Model AC-3-7 Serial No. 407083

Cal. Date 30-Mar-98 Cal Due Date 30-Mar-99 Cal. Interval 1 Year Meterface 0-500

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 73 °F RH 45 % Alt 692.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☑ F/S Resp. ck ☐ Reset ck. ☐ Window Operation ☐ Geotropism
☑ Audio ck. ☐ Alarm Setting ck. ☐ Batt. ck. (Min. Volt) _____ VDC

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 1050 V Input Sens. 40 mV Det. Oper. 1050 V at 40 mV Threshold Dial Ratio _____ = _____ mV

☑ HV Readout (2 points) Ref./Inst. 400 / 400 V Ref./Inst. 1624 / 1600 V

COMMENTS:

Instrument calibrated with a 5'cable, and analyzer in the out position

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
X 1000	400 K cpm	400	400
X 1000	100 K cpm	100	100
X 100	40 K cpm	400	400
X 100	10 K cpm	100	100
X 10	4 K cpm	400	400
X 10	1 K cpm	100	100
X 1	400 cpm	400	400
X 1	100 cpm	100	400
			100

*Uncertainty within ± 10% C.F. within ± 20%

ALL Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400K cpm		/
	40K cpm		N/A
	4K cpm		
	400 cpm		
	40 cpm		/

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Log Scale			

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/N T-30

☑ Alpha S/N Pu239#8743 ☐ Beta S/N _____ ☐ Other _____

☑ m 500 S/N 121036 ☐ Oscilloscope S/N _____ ☑ Multimeter S/N 61730074

Calibrated By: Dawn Martin Date 30-Mar-98

Reviewed By: Rhonda Harris Date 30 Mar 98

FORM C22A 09/08/97

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector Int. Serial No. N/A

Customer SHIELDALLOY METALLURGICAL Order #. 232198/214727

Counter SAC-4 Serial No. 868 Counter Input Sensitivity 10 mV

Count Time 1 min background / 1 min source Distance Source to Detector Tray

Other Eff. for Th 230 @ 900V ≈ 32.3% 4π

High Voltage	Background	Isotope Th 230 Size 6677 dpm	Isotope Size	Isotope Size	Isotope Size
700	1	166			
750	0	201			
800	1	216			
850	2	214			
900	2	216			
950	1	216			
1000	1	226			
1050	5	221			

Signature Lori Martin Date 30-Mar-98

DESIGNER AND MANUFACTURER
OF
Scientific and Industrial Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810
501 OAK STREET
SWEETWATER, TEXAS 79556, U.S.A.
PH. 915-235-5494
FAX NO. (915) 235-4672

RETURNED GOODS FORM

(PLEASE FILL IN THE APPROPRIATE INFORMATION FOR EACH SHIPMENT)

Date 9/18/98

Item(s) returned for:
☒ Calibration ☐ Repair ☐ Other _____

Company Name Shieldalloy Metallurgical Corp.

Contact Person Dave Smith (Technical or User) Phone (609) 692-4200

Bill to Address:
Shieldalloy Metallurgical Corp.
12 West Blvd.,
Newfield, NJ
Attn: Dave Smith

Ship to Address: ~~Ship~~ SAME

Ship Via Least Expensive

INSTRUMENT/PROBE MODEL NUMBER	SERIAL NUMBER	INSTRUMENT/PROBE MODEL NUMBER	SERIAL NUMBER
SEM-100/HP-210	#813/#705796		
		Victoreen 450P	~~#5~~ #195
ESP-1/AC-3	#3049/407063-39		
Victoreen Model 490	#5279	→ Vic. 489-55	860428-3

Purchase Order # _____ ☒ Call for PO# ☐ Call with Estimate

Contact Person Dave Smith (Purchasing) Phone (609) 692-4200

Malfunction Symptoms, Special Instructions, etc.
Annual Caibration

Designer and Manufacturer of Scientific and Industrial Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CERTIFICATE OF CALIBRATION

CUSTOMER INTERGRATED ENVIRONMENTAL MGT ORDER NO. 214833

Mfg. Ludlum Measurements, Inc. Model 2241 Serial No. 143562

Mfg. Ludlum Measurements, Inc. Model 44-10 Serial No. PR151704

Cal. Date 16-Mar-98 Cal Due Date 16-Mar-99 Cal. Interval 1 Year Meterface 44-10

Check mark ✓ applies to applicable instr. and/or detector IAW mfg. spec. T. 76 °F RH 48 % Atl 695.8 mm Hg

☑ New Instrument Instrument Received ☐ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☐ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☑ F/S Resp. ck ☑ Reset ck. ☐ Window Operation
☐ Audio ck. ☑ Alarm Setting ck. ☑ Batt. ck. (Min. Volt) 2.2 VDC
☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 1200 V Input Sens. 10 mV Det. Oper. 1200 V at 10 mV Threshold Dial Ratio ____ = ____ mV

COMMENTS:

Firmware: P-04-05 Cs137 check source s/n 3354 reads ≈23351 cpm using 6 sec counts and 235Kcpm using ratemeter with crystal end of probe placed flat against source with door open.

	Det #1 cpm	
Deadtime:	no deadtime	Overload checked but not set.
Cal constant:	100e-2	
Alert:	800kcpm	
Alarm:	900kcpm	

Gamma Calibration GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
AUTO			
AUTO			
"			
"			
"			
"			
"			
"			
"			

*Uncertainty within ± 10% C.F. within ± 20%

All Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Ratemeter Readout	800K cpm		800 Kcpm
	200K cpm		200 Kcpm
	80K cpm		80.0 Kcpm
	20K cpm		20.0 Kcpm
	8K cpm		8.00 Kcpm
	2K cpm		2.00 Kcpm
	800 cpm		0.80 Kcpm
	200 cpm		0.20 Kcpm

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Scaler Readout	800K cpm		80113 (0)
	200K cpm		20122 (0)
	80K cpm		8013 (0)
	20K cpm		1998 (0)
	8K cpm		802 (0)
	2K cpm		201 (0)
	800 cpm		80 (0)
	200 cpm		20 (0)

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/N T-304

☐ Alpha S/N ____ ☐ Beta S/N ____ ☑ Other Am241 ≈1.6μCi

☑ m 500 S/N 104535 ☐ Oscilloscope S/N ____ ☑ Multimeter S/N 956210389

Calibrated By: Rhonda Hannin Date 16 Mar 98

Reviewed By: Armando D. Loera Date 16 Mar 98

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 44-10 Serial No. PR151704

Customer INTERGRATED ENVIRONMENTAL MGT Order #. 214833

Counter 2241 Serial No. 143562 Counter Input Sensitivity 10 mV

Count Time 60 sec Distance Source to Detector surface

Other

High Voltage	Background	Isotope Am241 Size ≈1.6μC	Isotope ____ Size ____	Isotope ____ Size ____	Isotope ____ Size ____
850	894	7833			
900	912	10103			
950	981	11155 ~~10947~~			
1000	969	11769			
1050	980	11708			
1100	917	11905			
1150	965	11892			
→ 1200	950	11876			
1250	990	11844			
1300	946	11981			
1350	992	12022			
1400	979	11971			
1450	1102	12117			

Signature Rhonda Harris Date 16 Mar 98

FORM C4A 02/23/94

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER INTERGRATED ENVIRONMENTAL MGT ORDER NO. 214833

Mfg. Ludlum Measurements, Inc. Model 2241 Serial No. 119737

Mfg. Ludlum Measurements, Inc. Model 44-10 Serial No. PR151705

Cal. Date 16-Mar-98 Cal Due Date 16-Mar-99 Cal. Interval 1 Year Meterface 44-10

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 76 °F RH 48 % All 695.8 mm Hg

☑ New Instrument Instrument Received ☐ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☐ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity

☑ F/S Resp. ck ☑ Reset ck. ☐ Window Operation

☐ Audio ck. ☑ Alarm Setting ck. ☑ Batt. ck. (Min. Volt) 2.2 VDC

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 1150 V Input Sens. 10 mV Det. Oper. 1150 V at 10 mV Threshold Dial Ratio = mV

COMMENTS:

Firmware: P-04-05 Cs137 check source s/n3347 reads ≈21799cpm using 6 sec counts and 223kcpm using ratemeter with crystal end of probe placed flat against source with door open.

	Det #1 cpm
Deadtime:	no deadtime
Cal constant:	100e-2
Alert:	800kcpm
Alarm:	900kcpm

Overload checked but not set.

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
AUTO			
AUTO			
"			
"			
"			
"			
"			
"			
"			

*Uncertainty within ± 10% C.F. within ± 20%

All Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Ratemeter Readout	800K cpm		800Kcpm
	200K cpm		200Kcpm
	80K cpm		80.1Kcpm
	20K cpm		20.0Kcpm
	8K cpm		8.00Kcpm
	2K cpm		2.01Kcpm
	800 cpm		0.78Kcpm
	200 cpm		0.20Kcpm

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Scaler Readout	800K cpm		80081 (0)
	200K cpm		19949 (0)
	80K cpm		8009 (0)
	20K cpm		2008 (0)
	8K cpm		801 (0)
	2K cpm		200 (0)
	800 cpm		80 (0)
	200 cpm		20 (0)

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/N T-304

☐ Alpha S/N ☐ Beta S/N ☑ Other Am241 ≈1.6μCi

☑ m 500 S/N 104535 ☐ Oscilloscope S/N ☑ Multimeter S/N 956210389

Calibrated By: Rhonda Hann Date 16 Mar 98

Reviewed By: Armando DeToro Date 16 Mar 98

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 44-10 Serial No. PR151705

Customer INTERGRATED ENVIRONMENTAL MGT Order #. 214833

Counter 2241 Serial No. 119737 Counter Input Sensitivity 10 mV

Count Time 1 sec Distance Source to Detector surface

Other

High Voltage	Background	Isotope Am241 Size ≈1.6 nCi	Isotope ____ Size ____	Isotope ____ Size ____	Isotope ____ Size ____
950	954	10852			
1000	912	11136			
1050	931	11226			
1100	929	11212			
→ 1150	914	11279			
1200	939	11222			
1250	957	11229			
1300	986	11132			
1350	1146	11525			

Signature Rhonda Hamm Date 16 Mar 98

Appendix H - Records from Special Project 1

Campaign 1

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
TAILGATE SAFETY MEETING

Facility: Shieldalloy Metallurgical Corporation		
Date: 7/2/98	Time: 12:35a - 12:40a	Job Number: 94005.05
Client Name: Shieldalloy		
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344		
Type of Work: Changing Bags in Flex-Kleen Baghouse		
Hazardous/Radioactive Materials Used: Uranium/thorium present in baghouse dust		

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: Tyvek coveralls; dust mask; safety glasses; work gloves		
Chemical Hazards: Lime contained on bags - potential eye and skin irritant		
Radiological Hazards: Low-level uranium and thorium concentrations in baghouse dust		
Physical Hazards: Slipping, tripping, falling		
Emergency Procedures: Contact security office for EMT response		
Hospital/Clinic: Newcomb Hospital	Phone: 911	Paramedic Phone: 911
Hospital Address: 65 State Street, Vineland, NJ		
Special Equipment: None		
Other:		

ATTENDEES

NAME PRINTED	SIGNATURE
Eddie L. Jordan	Eddie Jordan
Steffan C. Govan	Steffan C. Govan
Milton White, Jr.	Milton White Jr.
William T. Chew	William T. Chew

Meeting Conducted by:	Alex J. Boerner
Signature:	Alex J. Boerner, CHP

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
TAILGATE SAFETY MEETING

Facility: Shieldalloy Metallurgical Corporation		
Date: 7/1/98	Time: 12:05 - 12:15a	Job Number: 94005.05
Client Name: Shieldalloy		
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344		
Type of Work: Changing bags in Flex-Kleen Baghouse		
Hazardous/Radioactive Materials Used: Uranium / thorium present in baghouse dust		

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: Tyvek coveralls; dust mask. safety glasses		
Chemical Hazards: Lime contained on bags - potential eye and skin irritant		
Radiological Hazards: Low-level uranium and thorium concentrations in baghouse dust		
Physical Hazards: Slipping, Tripping, Falling		
Emergency Procedures: Contact security office for EMT response		
Hospital/Clinic: Newcomb Hospital	Phone: 911	Paramedic Phone: 911
Hospital Address: 65 State Street, Vineland, NJ		
Special Equipment: None		
Other: Reminder that no eating, drinking, smoking, chewing allowed in the immediate vicinity of the Flex-Kleen Baghouse		

ATTENDEES

NAME PRINTED	SIGNATURE
Eddie L. Jordan	Eddie L. Jordan
William T. Chew	William T. Chew
Milton White Jr.	Milton White Jr.
Steffen E Govan	Steffen E Govan

Meeting Conducted by:	Alex J. Boerner
Signature:	Alex J. Boerner, CHP

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
TAILGATE SAFETY MEETING

Facility: Shieldalloy Metallurgical Corporation

Date: 6/~~28~~29/98 | Time: 12:10 - 12:50a | Job Number: 94005.05

Client Name: Shieldalloy

Address of Work Site: 12 West Boulevard, Newfield, NJ 08344

Type of Work: Changing bags in Flex-Kleen Baghouse

Hazardous/Radioactive Materials Used: Uranium/thorium present in baghouse dust

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: Tyvek coveralls; dust mask; consider goggles (see chemical hazards)

Chemical Hazards: Lime contained on bags - potential eye and skin irritant

Radiological Hazards: Low-level uranium and thorium concentrations in baghouse dust

Physical Hazards: Slipping, Tripping, Falling

Emergency Procedures: Contact security office for EMT response

Hospital/Clinic: Newcomb Hospital | Phone: 911 | Paramedic Phone: 911

Hospital Address: 65 State Street, Vineland, NJ

Special Equipment:

None

Other: No eating, drinking, smoking, chewing in area around baghouse

ATTENDEES

NAME PRINTED	SIGNATURE
Steffoni E. Govan	Steffoni E. Govan
Milton White Jr.	Milton White Jr.
William T. Chew	William T. Chew
Eddie L. Jordan	Eddie L. Jordan

Meeting Conducted by: Alex J. Boerner

Signature: Alex J. Boerner, CHP

RADIATION WORK PERMIT

Permit No: *0009-98*	Type: ✓ Job Specific ☐ Extended
Start Date: *June 29, 1998*	Expiration Date: *July 3, 1998*

Location of Work: *Department 111*

Description of Work: *Removal and replacement of bags in Flex Kleen Baghouse*

Involved Personnel: *E. Jordan, L. Bastic, Stephen Gouan, Milton White, Michael Shaud, William Chew*

Tools Required: *Hand tools - utility knives, pliers, wrenches, hammers, etc.*

SURVEY INFORMATION

General Area Dose Rates (mR/hr):

Maximum Accessible Dose Rates (mR/hr):

Removable Contamination (dpm/100 cm^2):

ALARA REVIEW

Estimated Total Dose:	Actual Total Dose:

Dose Reduction Techniques to be Employed:
Minimize amount of time workers are in the baghouse to complete the removal and replacement of bags

DOSIMETRY REQUIREMENTS

☐ TLD Badge	☐ Finger Ring	☐ Pocket Dosimeter	✓ BZA	☐ Stay-Time Estimate
☐ Other (Specify):				

PROTECTIVE EQUIPMENT

✓ Coveralls	☐ Lab Coat	☐ Hood	☐ Rubber Gloves	☐ Booties
☐ Rubbers	✓ Respirator	☐ Taped Seams	✓ HP Coverage	✓ Air Sampling
☐ Pre-job Bioassay	☐ Post-job Bioassay	☐ Special Briefing in:		
Other Precautions and Special Instructions:				

Requested by: *Hugo K. Nieves*	Date: *June 29, 1998*
Authorized by: *Dan R Smith*	Date: *June 29, 1998*
Terminated by:	Date:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.05			Detector			Meter		
Site Location/Background Location: HP office (Bldg 4)			Type: Ludlum 43-89	Serial No. 132117	Probe Area (cm²) 126	Type: Ludlum 2224	Serial No: 125607	Operating Voltage: 800v
Check Source No:			Check Source No: 1640			Check Source No:		
Radionuclide:	Activity:	Date:	Radionuclide: Th-230	Activity: 18,600 dpm	Date: 5/24/96	Radionuclide:	Activity:	Date:

Date	Start of Shift Background (cpm for a 1 minute count)								End of Shift Background (cpm for a 1 minute count)								Daily Source Check (α)		Daily Source Check (β)		MDA** - Scaler Mode (dpm)		Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	α	β	
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.							
6/29/98	2	1	1	1.3	-	-	-	-	2	0	3	1.7	-	-	-	-	3381	0.18	-	-			GJB
(11:25p)									↳ 6/30/98														
6/30/98	4	1	1	2	-	-	-	-	0	3	2	1.7	-	-	-	-	3255	0.175	-	-			GJB
(10:55p)									↳ 7/1/98														
7/1/98	2	1	0	1	-	-	-	-	1	2	2	1.7	-	-	-	-	3208	0.17	-	-			GJB
(11:00p)									↳ 7/2/98														

** $MDA = \frac{2.71 + 4.65\sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$, where MDA = the activity level (dpm/100 cm²), BKG_{avg} = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm²).

6/29/98

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

INSTRUMENT RESPONSE CHECK

Location: SMC - Newfield	Meter Model No.: Ludlum 2224	Probe Model No.: Ludlum 43-89
Check Source No.: 1640 (Th-230 : 18,600 dpm 5/24/98)	Meter Serial No.: 125607	Probe Serial No.: 132117
Scaler Count Time (Min): 1 min	Response Switch:	Name: A. Boerner

Meas. Number	Radiation Type (check): ☑ Alpha ☐ Beta ☐ Beta/Gamma				Radiation Type (check): ☐ Alpha ☐ Beta ☐ Beta/Gamma			
	Background (counts per minute)	$(x - x_{ave})^2$	Check Source (counts per minute)	$(x - x_{ave})^2$	Background (total counts)	$(x - x_{ave})^2$	Check Source (total counts)	$(x - x_{ave})^2$
1	3	1.96	3251	256				
2	1	0.36	3262	25				
3	4	5.76	3134	17689				
4	3	1.96	3251	256				
5	0	0	3312	2025				
6	0	0	3267	0				
7	2	0.16	3341	5476				
8	0	0	3303	1296				
9	0	0	3340	5329				
10	3	1.96	3211	3136				
Sum $a = (x-x_{ave})^2$	12.16			35488				
Mean $b = (x_{ave})$	1.6		3267					
σ^2 $c = a + [n - 1]$	1.35			3943				
σ $d = c^{1/2}$	1.16			63				
2σ $e = 2 \times d$	2.32			126				
3σ $f = 3 \times d$	3.48			189				

Acceptable Check Source Ranges			Notes/Calculations:
Range	Alpha	Beta	
2σ	3141 to 3393	— to —	
3σ	3078 to 3456	to	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

EXPOSURE RATE SURVEY INSTRUMENT DATA SHEET

Project No.	Detector		Meter		
94005.05	Type:	Serial No:	Type:	Serial No:	Operating Voltage:
Site Location/Background Location: Health Physics Office (Bldg 4)	T.E. Scintillator	NA (internal)	Bicron µrem	B295W	Internally Set

Check Source Number	Radionuclide:	Calibration Activity and Date:
0314	Cs-137	1 µCi 3/98

Date	Units	Start of Shift Background				End of Shift Background				Daily Response (µR/hr)	Initials
		1	2	3	Avg.	1	2	3	Ave.		
6/29/98	µrem/hr	14	16	15	15*	-	-	-	-	550	GJB
6/29/98	"	6	5	7	6	6	5	8	6	550	GJB
(11:20 pm)						↳ 6/30/98					
6/30/98	"	7	5.5	7	6	7	7	6	7	600	GJB
(11:00 pm)						↳ 7/1/98					
7/1/98	"	6	7	6	6	4	4	5	4	600	GJB
(11:00p)						↳ 7/2/98 (8:15a)					

* Elevated bkg due to the presence of nine buckets in the room containing "canal" (canal read ~60-70 µrem/hr. Instrument was moved to a different location in the room and the bkg determination repeated

GJB 6/29/98

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
INSTRUMENT FIELD CHECK FORM

Site: SMC - Newfield, NJ	Probe Type: ZnS/plastic scintillator	Probe Number 132117 (model 43-89)
Meter Number: 125607 (Ludlum 2224)	Suggested Operating Voltage: 800 v	Check Source Number: Th-230 18,600 dpm 5/24/96

Number	Date	Location	Battery OK	Operating Voltage	Background cpm	Check Source cpm	Name	Remarks
1	6/25/98	IEM - Knoxville, TN	✓	800v	1 (2)	3157	A. Boerner	Pre-Trip Check
2	6/29/98	SMC - Newfield	✓	800v	3 (2)	3202	A. Boerner	Pre-Operational Check
3	6/29/98	" - "	✓	800v	1	3381	A. Boerner	" " Check (11:25)
4	6/30/98	" - "	✓	800v	2	3255	A. Boerner	" " Check (10:55)
5	7/1/98	" - "	✓	800v	1	3208	A. Boerner	" " " (11:00)
6	~~7/6/98~~							
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
INSTRUMENT FIELD CHECK FORM

Site: SMC - Newfield, NJ	Probe Type: Tissue Equivalent Scintillator	Probe Number NA (internal probe)
Meter Number: B295W (Bicron μrem)	Suggested Operating Voltage: Internally Set	Check Source Number: 0314 (Cs-137)

Number	Date	Location	Battery OK	Operating Voltage	Background ~~cpm~~ μrem/hr	Check Source ~~cpm~~ μrem/hr	Name	Remarks
1	6/25/98	IEM - Knoxville, TN	✓	w/in parameters	6	550	C. Boerner	Pre-trip check
2	6/29/98	SMC - Newfield, NJ	✓	" "	6	550	C. Boerner	Pre-operational check
3	(11:20p)							
4								
5	6/30/98	SMC - Newfield	✓	w/in parameters	7	600	C. Boerner	Pre-shift check
6	(11:00p)							
7								
8	7/1/98	SMC - Newfield	✓	w/in parameters	6	600	C. Boerner	Pre-shift check
9	(11:00p)							
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

Designer and Manufacturer of Scientific and Industrial Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CERTIFICATE OF CALIBRATION

CUSTOMER SHIELDALLOY METALLURGICAL ORDER NO. 232198/214727

Mfg. Eberline Model SAC-4 Serial No. 868

Mfg. _____ Model _____ Serial No. _____

Cal. Date 30-Mar-98 Cal Due Date 30-Mar-99 Cal. Interval 1 Year Meterface SAC-4

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 73 °F RH 45 % Alt 692.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☐ Mechanical ck. ☐ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☐ F/S Resp. ck ☐ Reset ck. ☐ Window Operation ☐ Geotropism
☐ Audio ck. ☐ Alarm Setting ck. ☐ Batt. ck. (Min. Volt) _____ VDC

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 900 V Input Sens. 10 mV Det. Oper. _____ V at _____ mV Threshold Dial Ratio _____ = _____ mV

☐ HV Readout (2 points) Ref./Inst. _____ / _____ V Ref./Inst. _____ / _____ V

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*

*Uncertainty within ± 10% C.F. within ± 20%

ALL Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400 K cpm	40027 (0)	40027 (6)
	40 K cpm	4004	4004
	4 K cpm	400	400
	400 cpm	40	40
	40 cpm	4	4

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Log Scale			

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/N T-304

☑ Alpha S/N Th230#1619 ☐ Beta S/N _____ ☐ Other _____

☐ m 500 S/N _____ ☐ Oscilloscope S/N _____ ☐ Multimeter S/N _____

Calibrated By: Lonie Martin Date 30-Mar-98

Reviewed By: Rhonda Hamm Date 30 Mar 98

FORM C22A 09/08/97

Designer and Manufacturer of Scientific and Industrial Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CERTIFICATE OF CALIBRATION

CUSTOMER INTEGRATED ENVIRONMENTAL MGMT ORDER NO. 231041 / 212187

Mfg. Bicron Model MICRO REM Serial No. B295W

Mfg. _____ Model _____ Serial No. _____

Cal. Date 16-Jan-98 Cal Due Date 16-Jan-99 Cal. Interval 1 Year Meterface 0-200urem/

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 71 °F RH 20 % Alt 697.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☐ F/S Resp. ck ☑ Reset ck. ☐ Window Operation ☐ Geotropism
☐ Audio ck. ☐ Alarm Setting ck. ☐ Batt. ck. (Min. Volt) _____ VDC

☐ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☑ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set _____ V Input Sens. _____ mV Det. Oper. _____ V at _____ mV Threshold Dial Ratio _____ = _____ m

☐ HV Readout (2 points) Ref./Inst. _____ / _____ V Ref./Inst. _____ / _____ V

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
x 1000	150 mR/hr	145	150
x 1000	50 mR/hr	50	50
x 100	15 mR/hr	140	150
x 100	5 mR/hr	47	50
x 10	1500 uR/hr	140	150
x 10	500 uR/hr	45	50
x 1	150 uR/hr	145	150
x 1	100 uR/hr	95	100
x0.1	15 uR/hr	150	150
x0.1			

*Uncertainty within ± 10% C.F. within ± 20% _____ **Range(s) Calibrated Electronically**

Digital Readout	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*

Log Scale	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☑ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☑ E551 ☐ Neutron Am-241 Be S/N T-30

☐ Alpha S/N _____ ☐ Beta S/N _____ ☐ Other _____

☐ m 500 S/N _____ ☐ Oscilloscope S/N _____ ☐ Multimeter S/N _____

Calibrated By: Conrad Taludo Date 16 Jan 98

Reviewed By: V. Lee Alvarado Date 16 Jan 98

FORM C22A 09/08/97

Designer and Manufacturer of Scientific and Industrial Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CERTIFICATE OF CALIBRATION

CUSTOMER INTEGRATED ENVIRONMENTAL MGMT ORDER NO. 231041 / 212187

Mfg. Ludlum Measurements, Inc. Model 2224 Serial No. 125607

Mfg. Ludlum Measurements, Inc. Model 43-89 Serial No. PR 132117

Cal. Date 16-Jan-98 Cal Due Date 16-Jan-99 Cal. Interval 1 Year Meterface 202-783

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 71 °F RH 20 % Alt 697.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☑ F/S Resp. ck ☑ Reset ck. ☑ Window Operation ☑ Geotropism
☑ Audio ck. ☐ Alarm Setting ck. ☑ Batt. ck. (Min. Volt) 2.2 VDC

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 825 V Input Sens. Comments mV Det. Oper. 825 V at Comments mV Threshold Dial Ratio r =

☑ HV Readout (2 points) Ref./Inst. 505 / 500 V Ref./Inst. 2000 / 2000 V

COMMENTS:

Alpha Threshold: 120mV
Beta Threshold: 3.5mV
Beta Window: 30mV
Overload checked but not set
Firmware 390063
High Voltage set with detector disconnected

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
X1000	400 K cpm	400	400
X1000	100 K cpm	100	100
X100	40 K cpm	400	400
X100	10 K cpm	100	100
X10	4 K cpm	400	400
X10	1 K cpm	100	100
X1	400cpm	400	400
X1	100cpm	100	100

*Uncertainty within ± 10% C.F. within ± 20% ALL Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400 K cpm	399148	399148	Log Scale			
	40 K cpm	39917	39917				
	4 K cpm	3992	3992				
	400 cpm	400	400				
	40 cpm	40	40				

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-15

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/N T-3

☑ Alpha S/N Pu-239 12800cpm ☐ Beta S/N ☐ Other

☑ m 500 S/N 134709 ☐ Oscilloscope S/N ☑ Multimeter S/N 57390613

Calibrated By: [signature] Date 16 Jan 98

Reviewed By: V. Lee Alvarado Date 16 Jan 98

FORM C22A 09/08/97

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 43-89 Serial No. PR 132117 Order #. 231041 / 212187

Customer INTEGRATED ENVIRONMENTAL MGMT Alpha Input Sensitivity 120 mV

Counter 2224 Serial No. 125607 Beta Input Sensitivity 3.5 mV

Count Time 1Minute Beta Window 30 mV

Other _____ Distance Source to Detector Surface

High Voltage	Background		Isotope Pu239 Size 12800cpm		Isotope Tc 99 Size 14300cpm		Isotope Sr 90 Y90 Size 0.01112uCi	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
775	0	120	4896	367	5	2385	0	9243
800	0	183	5154	345	2	2492	0	9950
825	0	250	5244	403	12	3594	1	12091
850	0	274	5361	555	6	4397	0	13167
875	0	393	5238	756	2	5592	5	13785

☐ Gas Proportional detector count rate decreased ≤ 10% after 15 hour static test using 39" cable.

☐ Gas proportional detector count rate decreased ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter.

Signature Conrad Jalundo Date 16 Jan 98

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER INTEGRATED ENVIRONMENTAL MGMT ORDER NO. 234274/219184

Mfg. Ludlum Measurements, Inc. Model 2929 Serial No. 126126

Mfg. Ludlum Measurements, Inc. Model 43-10-1 Serial No. PR132238

Cal. Date 18-Jun-98 Cal Due Date 18-Jun-99 Cal. Interval 1 Year Meterface 122

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 75 °F RH 42 % Alt 699.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Window Operation

☑ Audio ck.

☑ Meter Zeroed Alpha Sensitivity 175 mV Beta Sensitivity 4 mV Beta Window 50 mV

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 750 V = 3.98 on High Voltage dial. High Voltage set with detector connected.

☑ HV Readout (2 points) Ref./Inst. 510 / 500 V Ref./Inst. 2015 / 2000 V

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Alpha Channel Digital Readout	400K cpm	400575	400575
	40K cpm	40054	40054
	4K cpm	4005	4005
	400 cpm	400	400
	40 cpm	40	40
Beta/Gamma Channel Digital Readout	400K cpm	400444	400444
	40K cpm	40052	40052
	4K cpm	4005	4005
	400 cpm	400	400
	40 cpm	40	40

*Uncertainty within ± 10% C.F. within ± 20%

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-196

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/N T-

☑ Alpha S/N Pu-239 12800cpm ☑ Beta S/N C-14 0.165uCi Tc-99 1670cpm ☐ Other

☑ m 500 S/N 121025 ☐ Oscilloscope S/N ☑ Multimeter S/N 64100257

Calibrated By: Ronald Hall Date 18-Jun-98

Reviewed By: Rhonda Harris Date 20 Jun 98

FORM C25 09/08/97

Certificate of Calibration

for

A.P. BUCK, INC. mini-BUCK CALIBRATOR™

Serial No. 031077 **Date Calibrated:** 3-26-98 **Next Calibration due date** 3-26-99

Model No. M-1 ☐ M-5 ☐ M-30 ☒ STD ☐

Applicable Measurement Standards

	Description	MFR.	Model	Serial #	Calibration Due Date	N. I. S. T.
☐	0-100 Buret	Kimble	17027F-100	1219	02/26/2001	Special 17027F
☐	0-1000 Buret	Kimble	17081	1003	10/22/2002	Special 17081
☐	0-1000 Buret	Kimble	17081	1004	10/22/2002	Special 17081
☒	0-1000 Buret	Kimble	17081	2087	02/07/1999	Special 17081
☒	Stopwatch	CMS	387-621	0996596	10/29/1998	Loran "C"
☐	Stopwatch	CMS	387-621	0996605	10/29/1998	Loran "C"
☐	Stopwatch	CMS	387-621	1078246	04/15/1998	Loran "C"

This calibrator as received on 3-19-98 at A.P. Buck, Inc.'s facility was found to be:

☐ Unable to calibrate as received due to condition of unit.

☒ Within specifications of ± 0.5% of the display reading.

☐ not in specification by % High_____% Low_____ of the display.

This is to certify that the instrument listed above was calibrated against National Institute of Standards & Technology (NIST) test no. IR-74-461 utilizing a 1,000 ml buret, and an electronic digital stop watch which are traceable to NIST. The accuracy of the instruments used to perform calibration is greater than 4 to 1. The A.P. Buck, Inc. Calibration system is in compliance with ANSI Z540-1, ISO / IEC guide 25.

Calibration was conducted with A.P. Buck, Inc. Calibration Procedure APB-1 Rev. 6.0 with a constant flow pump using the Bubble-meter method. A.P. Buck, Inc. guarantees the accuracy and repeatability of ± 0.5% for any display reading as described under the instruction manual "Principles of Operation". Responsibilities shall in no event, nor for any cause whatsoever, exceed the price charged for the calibration represented by this certification.

Connie S. Mullis
Calibration Technician

Al Buck
Al Buck, President

A.P. BUCK, INC.
7101 PRESIDENTS DR.
SUITE 110
ORLANDO, FL 32809
Phone: 407-851-8602
Fax: 407-851-8910

ATTACHMENT 1

Breathing Zone Sampler Flow Rate Check Sheet

Sampler Number	DATE	Flow Rate - Start of Shift ~~(cu. cm./minute)~~ (lpm)	Flow Rate - End of Shift ~~(cu. cm./minute)~~ (lpm)
8240	6/30/98	2.6	2.6
8241	↓	2.7	2.6
8242		2.4	2.3
8243	↓	2.5	2.5
8240	7/1/98	2.6	2.6
8241	↓	2.7	2.7
8242		2.3	2.3
8243	↓	2.5	2.5
8240	7/2/98	2.6	2.6
8241	↓	2.7	2.7
8242		2.3	2.3
8243	↓	2.5	2.5

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flux-Kleen Baghouse)

Sampler Number	Employee	Date	Time In	TIme Out
8240	Tim Chew	6/30/98	1:40 am	2:05 am
8241	Steffan Govan	6/30/98	↓	↓
8242	Eddie Jordan	6/30/98	↓	↓
8243	Milton White	6/30/98	↓	↓
8240	Tim Crew	6/30/98	2:36 a	3:48 a
8241	Steffan Govan	↓	↓	↓
8242	Eddie ~~Johnson~~ Jordan	↓	↓	↓
8243	Milton White	↓	↓	↓
8240	Tim Crew	6/30/98	5:03a	5:53 a
8241	Steffan Govan	↓	↓	↓ *
8242	Eddie Jordan	↓	↓	↓
8243	Milton White	↓	↓	↓
8240	Tim Crew	6/30/98	6:20a	7:20a
8241	Steffan Govan	↓	↓	7:22a
8242	Eddie Jordan	↓	↓	7:19a
8243	Milton White	↓	↓	7:20a

* Govan's tubing connection to the BZA separated sometime during this 50 minute time frame.

afb
6/30/98

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flux-Kleen Baghouse)

Sampler Number	Employee	Date	Time In	TIme Out
8240	Tim Chew	7/1/98	12:52a	1:55a
8241	Steffan Govan	↓	↓	↓ *
8242	Eddie Jordan	↓	↓	↓
8243	Milton White	↓	↓	↓
8240	T. Chew	7/1/98	2:30a	3:35a
8241	S. Govan	↓	↓	↓
8242	E. Jordan	↓	↓	↓
8243	M. White	↓	↓	↓
8240	T. Chew	7/1/98	5:08a	6:05a
8241	S. Govan	↓	↓	↓
8242	E. Jordan	↓	↓	↓
8243	M. White	↓	↓	↓
8240	T. Chew	7/1/98	6:35a	7:40a
8241	S. Govan	↓	6:37a	↓
8242	E. Jordan	↓	6:28a	↓
8243	M. White	↓	6:35a	↓

* Tubing was disconnected sometime during this period. Govan did not know when this occurred.

CJB 7/1/98

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flux-Kleen Baghouse)

Sampler Number	Employee	Date	Time In	TIme Out
8240	Tim Chew	7/2/98	12:44a	1:44a
8241	Steffen Govan	↓	↓	↓
8242	Eddie Jordan	↓	↓	↓
8243	Milton White	↓	↓	↓
8240	T. Chew	7/2/98	3:04a	3:42a
8241	S. Govan	↓	3:03a	~~3:42~~ gfB
8242	E. Jordan	↓	↓	↓
8243	M. White	↓	↓	↓
8240	T. Chew	7/2/98	4:57a	5:53a
8241	S. Govan	↓	↓	Tubing came loose at 5:28a; restarted 5:32a
8242	E. Jordan	↓	↓	5:53a *
8243	M. White	↓	↓	5:53a
8240	T. Chew	7/2/98	6:45a	7:20a
8241	S. Govan	↓	6:25a **□	7:25a
8242	E. Jordan	↓	↓ **	↓
8243	M. White	↓	↓ **	↓

* E. Jordan's pump had accidentally been turned off during this particular sampling run. He did not know when this occurred.

gfB 7/2/98

** Between 6:25-6:45, no work at the baghouse essentially took place. Instead, additional radiation issues were discussed at the worker's request. The first 20 minutes of this sampling period ~~are~~ will not provide useful air monitoring information.

□ During the aforementioned discussion, Mr. Govan tapped on the air sampling filter holder and also blew onto the filter itself, potentially invalidating the air sample count to follow in a few days.

6/29/98

← before 6/30 shift

BEFORE (pre-shift calibration)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average
8240[a]	2.6	2.425 2.444 2.456	2.44
8241[b]	2.6	2.551 2.552 2.553	2.55
8242[a]	2.5	2.344 2.355 2.344	2.35
8243[c]	2.4	2.502 2.451 2.397	2.45
8244[c]	2.4	2.422 2.473 2.474	2.46

a = last calibration on BZA pump performed 3/12/98

b = " " " " " " 4/1/96

c = " " " " " " 6/20/97

after 6/30 shift

6/30/98
(8:30 am)

AFTER (post-shift calibration)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average Flow Rate	Cal. Factor (True/Observed)
8240	2.6	2.452 2.502 2.488	2.481	0.95
8241	2.6	2.517 2.504 2.529	2.520	0.97
8242	2.3	2.200 2.230 2.185	2.205	0.96
8243	2.5	2.396 2.439 2.441	2.425	0.97

6/30/98
(11:15pm)

BEFORE (pre-shift calibration) ← before 7/1/98 shift

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average Flow Rate	Cal. Fact. True/Obs
8240	2.6	2.423 2.513 2.499	2.478	0.95
8241	2.7	2.561 2.553 2.550	2.555	0.95
8242	2.3	2.229 2.219 2.211	2.220	0.96
8243	2.5	2.443 2.441 2.441	2.442	0.98
8244	2.5	2.459 2.452 2.455	2.455	0.98

← after 7/1/98 shift

7/1/98
8:35a

AFTER (post-shift calibration)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average Flow Rate	Cal. Factor (True/Obs.)
8240	2.6	2.485 2.504 2.485	2.491	0.96
8241	2.7	2.565 2.555 2.547	2.556	0.95
8242	2.3	2.238 2.172 2.216	2.209	0.96
8243	2.5	2.506 2.483 2.491	2.493	~1.0

11:15 pm

7/1/98

before 7/2/98 shift

BEFORE (pre-shift calibration)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average Flow Rate	Calibration Factor (true)
8240	2.6	2.521 2.509 2.505	2.512	0.97
8241	2.7	2.566 2.549 2.547	2.554	0.95
8242	2.3	2.246 2.235 2.234	2.238	0.97
8243	2.5	2.484 2.477 2.471	2.477	0.99
~~8245~~ 8244	2.5	2.457 2.449 2.455	2.454	0.98

7/2/98
(9:00 am)

after 7/2/98 shift

AFTER (post-shift calibration)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average Flow Rate	Cal. Factor (True/Obs.)
8240	2.6	2.537 2.519 2.504	2.52	0.97
8241	2.7	2.530 2.521 2.525	2.52	0.93
8242	2.3	2.244 2.227 2.196	2.22	0.96
8243	2.5 (adj) ~~2.4~~	2.480 2.470 2.457	2.47	0.99

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 6/30/98

Sample No. 1

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8240	Calibration Due: calibrated daily (pre- and post-sh...	
Filter Type: Cellulose CPH-47	Filter Size: 47mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 6/30/98	Time: Four different in/out times	Flow Rate (lpm): 2.44
Sample End Date: 6/30/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.48
Total Sample Time (T) in minutes: 207		
Average Flow Rate (F) in liters per minute: 2.46		
Sample Volume (V) = T 207 (min) x F 2.46 (lpm) x 1000 = 509,000 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: William (Tim) Chew	General Area and Specific Location:
Type of Work Performed: Removing used baghouse bags from cages	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg D-III at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other DUST MASK	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 6/30/98

Sample No. 2

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8241	Calibration Due: calibrated daily (pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 6/30/98	Time: Four different in/out times	Flow Rate (lpm): 2.55
Sample End Date: 6/30/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.52
Total Sample Time (T) in minutes: 209 *		
Average Flow Rate (F) in liters per minute: 2.54		
Sample Volume (V) = T 209 (min) x F 2.54 (lpm) x 1000 = 530,860 milliliters		

* Tubing became disconnected sometime during the 56 minute monitoring period. The maximum sampling time = 209 minutes, the minimum time = 153 minutes

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steffon Govan	General Area and Specific Location:
Type of Work Performed: Removing used baghouse bags from cages	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg. D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other Dust mask	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 6/30/98

Sample No. 3

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8242	Calibration Due: calibrated daily (pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 6/30/98	Time: Four different in/out times	Flow Rate (lpm): 2.35
Sample End Date: 6/30/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.20
Total Sample Time (T) in minutes: 206		
Average Flow Rate (F) in liters per minute: 2.28		
Sample Volume (V) = T 206 (min) x F 2.28 (lpm) x 1000 = 469,680 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Eddie ~~Johnson~~ Jerdan (CJB)	General Area and Specific Location:
Type of Work Performed: Removing used baghouse bags from cages.	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other DUST MASK	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 6/30/98

Sample No. 4

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial No: 8243	Calibration Due: calibrated daily (pre- and post-shift)	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 6/30/98	Time: Four different in/out times	Flow Rate (lpm): 2.45
Sample End Date: 6/30/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.42

Total Sample Time (T) in minutes: 207

Average Flow Rate (F) in liters per minute: 2.44

Sample Volume (V) = T 207 (min) x F 2.44 (lpm) x 1000 = 505,080 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: Removing used baghouse bags from cages	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg. D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other Dust mask	Names of Workers in Area:

Monitoring Conducted by: Alex J. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 7/1/98

Sample No. 5

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air			
Serial No: 8240	Calibration Due: calibrated daily (pre- and post-shift)		
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA	

SAMPLING PARAMETERS

Sample Start Date: 7/1/98	Time: Four different in/out times	Flow Rate (lpm): 2.48
Sample End Date: 7/1/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.49
Total Sample Time (T) in minutes: 250		
Average Flow Rate (F) in liters per minute: 2.48		
Sample Volume (V) = T 250 (min) x F 2.48 (lpm) x 1000 = 620,000 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: William (Tim) Chew	General Area and Specific Location:
Type of Work Performed: Removing used bags from cages	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other Dust Mask	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 7/1/98

Sample No. 6

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8241	Calibration Due: calibrated daily (pre- and post-shift)	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/1/98	Time: Four different in/out times	Flow Rate (lpm): 2.55
Sample End Date: 7/1/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.56
Total Sample Time (T) in minutes: 248 *		
Average Flow Rate (F) in liters per minute: 2.56		
Sample Volume (V) = T 248 (min) x F 2.56 (lpm) x 1000 = 634,880 milliliters		

* Tubing was disconnected sometime during the 63 minute monitoring period. The maximum sampling time = 248 minutes; the minimum time = 185 minutes.

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steffan Govan	General Area and Specific Location:
Type of Work Performed: Removing used baghouse bags from cages.	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other DUST MASK	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 7/1/98

Sample No. 7

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8242	Calibration Due: calibrated daily (pre-ark post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/1/98	Time: Four different in/out times	Flow Rate (lpm): 2.22
Sample End Date: 7/1/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.21
Total Sample Time (T) in minutes: 257		
Average Flow Rate (F) in liters per minute: 2.21		
Sample Volume (V) = T 257 (min) x F 2.21 (lpm) x 1000 = 567,970 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE (ABE)	GENERAL AIR
Name of Worker Monitored: ~~Ernie~~ Eddie ~~Johnson~~ Jordan	General Area and Specific Location:
Type of Work Performed: Removing used baghouse bags from cages	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg D-III at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other Dust mask	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 7/1/98

Sample No. 8

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8243	Calibration Due: calibrated daily (pre- and post-shift)	
Filter Type: *	Filter Size: 47 mm	Filter Lot No. NA

* Filter was supposed to be cellulose medium, but during sample counting on 7/7/98, it was noted that it appeared to have the appearance/touch of a glass fiber filter.

SAMPLING PARAMETERS

Sample Start Date: 7/1/98	Time: Four different in/out times	Flow Rate (lpm): 2.44
Sample End Date: 7/1/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.49
Total Sample Time (T) in minutes: 250		
Average Flow Rate (F) in liters per minute: 2.47		
Sample Volume (V) = T 250 (min) x F 2.47 (lpm) x 1000 = 617,500 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: Removing used baghouse bags from cages.	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg. D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other Dust mask	Names of Workers in Area:

Monitoring Conducted by: Alex J. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 7/2/98

Sample No. 9

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8240	Calibration Due: calibrated daily (pre- and post-shift)	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/2/98	Time: Four different in/out times	Flow Rate (lpm): 2.51
Sample End Date: 7/2/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.52
Total Sample Time (T) in minutes: 189		
Average Flow Rate (F) in liters per minute: 2.52		
Sample Volume (V) = T 189 (min) x F 2.52 (lpm) x 1000 = 476,280 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: William (Tim) Chew	General Area and Specific Location:
Type of Work Performed: Replacing clean baghouse bags on cages..	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other Dust mask	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 7/2/98

Sample No. 10

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8241	Calibration Due: calibrated daily (pre- and post-shift)	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/2/98	Time: Four different in/out times	Flow Rate (lpm): 2.55
Sample End Date: 7/2/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.52

Total Sample Time (T) in minutes: 215

Average Flow Rate (F) in liters per minute: 2.54

Sample Volume (V) = T 215 (min) x F 2.54 (lpm) x 1000 = 546,100 milliliters

NOTE: Worker tapped on air filter holder and blew onto the filter towards the close of the shift.

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steffon Govan	General Area and Specific Location:
Type of Work Performed: Replacing clean baghouse bags on cages.	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other Dust mask	Names of Workers in Area:

Monitoring Conducted by: Alex J. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 7/2/98

Sample No. 11

AIR SAMPLING EQUIPMENT

Pump Type: ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8242	Calibration Due: calibrated daily (pre- and post-shift)	
Filter Type: Cellulose cPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/2/98	Time: Four different in/out times	Flow Rate (lpm): 2.24
Sample End Date: 7/2/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.22
Total Sample Time (T) in minutes: 215*		
Average Flow Rate (F) in liters per minute: 2.23		
Sample Volume (V) = T 215 (min) x F 2.23 (lpm) x 1000 = 479,450 milliliters		

* Tubing became disconnected sometime during the 56 minute sampling period. The maximum sampling time = 215 minutes; the minimum sampling time = 159 minutes

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Eddie Jordan (EJB)	General Area and Specific Location:
Type of Work Performed: Replacing clean baghouse bags on cages.	
Work Permit No.: 0009-98	
General Area and Specific Work Location: South of Bldg D-11 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other Dust mask	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 7/2/98

Sample No. 12

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8243	Calibration Due: calibrated daily (pre- and post-shift)	
Filter Type: Cellulose CPH - 47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/2/98	Time: Four different in/out times	Flow Rate (lpm): 2.48
Sample End Date: 7/2/98	Time: (See supporting documentation)	Flow Rate (lpm) 2.47

Total Sample Time (T) in minutes: 215

Average Flow Rate (F) in liters per minute: 2.47

Sample Volume (V) = T 215 (min) x F 2.47 (lpm) x 1000 = 531,050 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: Replacing clean baghouse bags in cages..	
Work Permit No.: 0009 - 98	
General Area and Specific Work Location: South of Bldg D-III at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other Dust mask	Names of Workers in Area:

Monitoring Conducted by: Alex J. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.05			Detector			Meter		
Site Location/Background Location: SMC Newfield, bkgd. at IEM Knoxville office			Type: 43-10-1	Serial No. PR132238	Probe Area (cm^2) N/A	Type: Ludlum 2929	Serial No: 126126	Operating Voltage: 0.75 kV
Check Source No: 96TH470-2598			Check Source No:			Check Source No:		
Radionuclide: Th-230	Activity: 18,800 dpm	Date: 9/12/96	Radionuclide:	Activity:	Date:	Radionuclide:	Activity:	Date:

Date	Start of Shift Background (cpm for a 60 minute count)								End of Shift Background (cpm for a 60 minute count)								Daily Source Check (α)		Daily Source Check (β)		MDA** - Scaler Mode (dpm)		Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	α	β	
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.							
7/6/98	0.2	NA	NA	0.2	NA	NA	NA	NA	0.2	NA	NA	0.2	NA	NA	NA	NA	5827	31%	NA	NA	1	NA	
7/7/98	0.2	NA	NA	0.2	NA	NA	NA	NA	0.2	NA	NA	0.2	NA	NA	NA	NA	5894	31.4%	NA	NA	1	NA	
7/8/98	0	NA	NA	0	NA	NA	NA	NA	0.1	NA	NA	0.1	NA	NA	NA	NA	5873	31.2%	NA	NA	0.1	NA	

** $MDA = \frac{2.71 + 4.65\sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$, where MDA = the activity level (dpm/100 cm^2), BKG_{avg} = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm^2).

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLE COUNT RECORD

Sample No.	Date/time of Sample	Date/Time of count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Bkg counts	(2) Bkg count time (min)	(3) Bkg count rate (1/2) (cpm)	(4) Sample counts	(5) Sample count time (min)	(6) Sample count rate (4/5) (cpm)	(7) Net sample count rate (6-3) (cpm)	(8) Sample volume (ml)	(9)Airborne radioactivity ((7/eff x2.22E-6)/8)(uCi/ml)
1	6/30/98 0720	7/6/98 1100	Ludlum 2929 #126126	31%	12	60	0.2	42	60	0.7	0.5	509,000	1.43E-12
2	6/30/98 0722	7/6/98 1300		31%	12	60	0.2	60	60	1	0.8	530,860	2.19E-12
3	6/30/98 0719	7/6/98 1400		31%	12	60	0.2	22	60	0.4	0.2	469,680	6.19E-12
4	6/30/98 0720	7/6/98 1500		31%	12	60	0.2	26	60	0.4	0.2	505,080	5.75E-12
5	7/1/98 0740	7/7/98 0800		31.4%	13	60	0.2	78	60	1.3	1.1	620,000	2.54E-12
6	7/1/98 0740	7/7/98 0900		31.4%	13	60	0.2	116	60	1.9	1.7	634,880	3.84E-12
7	7/1/98 0740	7/7/98 1000		31.4%	13	60	0.2	31	60	0.5	0.3	567,970	7.58E-13
8	7/1/98 0740	7/7/98 1100		31.4%	13	60	0.2	319*	60	5.3	5.1	617,500	1.18E-11
9	7/2/98 0720	7/7/98 1300		31.4%	13	60	0.2	12	60	0.2	0	476,280	<9.46E-13
10	7/2/98 0725	7/7/98 1400		31.4%	13	60	0.2	25	60	0.4	0.2	546,100	5.25E-13
11	7/2/98 0725	7/8/98 0800		31.2%	2	60	0	39	60	0.7	0.7	479,450	2.11E-12
12	7/2/98 0725	7/8/98 0900		31.2%	2	60	0	29	60	0.5	0.5	531,050	1.36E-12

Printed Name: R.A.DUFF / A. J. Boerner

Signature: [illegible] / Alex J. Boerner

* This air sample was recounted twice more for 60 minutes each time, resulting in 255 and 243 counts. This equates to 9.47E-12 uCi/ml and 9.26E-12 uCi/ml, respectively (prior to

Sample No.	Airborne Concentration (see previous page)	Correction Factor (thorium to gross alpha ratio)	Corrected Airborne Concentration (μCi/ml)
1	1.43E-12	0.076	1.09E-13
2	2.19E-12	0.076	1.66E-13
3	6.19E-12	0.076	4.70E-13
4	5.75E-12	0.076	4.37E-13
5	2.54E-12	0.076	1.93E-13
6	3.84E-12	0.076	2.92E-13
7	7.58E-13	0.076	5.76E-14
8	1.18E-11	0.076	8.97E-13
9	<9.46E-13	0.076	<7.19E-14
10	5.25E-13	0.076	3.99E-14
11	2.11E-12	0.076	1.60E-13
12	1.36E-12	0.076	1.03E-13

Alex J. Boerner
7/9/98

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/ Time of sample	Date/ Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Bkg counts	(2) Bkg count time (min)	(3) Bkg count rate (1/2) cpm	(4) Sample counts	(5) Sample count time (min)	(6) Sample count rate (4/5) cpm	(7) Net sample count rate (6-3)	(8) dpm (7/Eff)
1. D111 breakroom, SW side at door to baghouse	7/2/98 0110	7/8/98 1430	Ludlum 2929 # 126126	31.2%	2	60	0	1	1	1	1	3.2
2. D111 breakroom, front of desk	0115	1432		31.2%	2	60	0	1	1	1	1	3.2
3. D111 breakroom, door, north side	0120	1433		31.2%	2	60	0	0	1	0	0	0
4. D115 breakroom, west side near wall	0225	1436		31.2%	2	60	0	0	1	0	0	0
5. Inside Flexkleen, east side, north end	0500	1438		31.2%	2	60	0	5	1	5	5	16
6. Inside Flexkleen, east side, center sect.	0500	1440		31.2%	2	60	0	6	1	6	6	19.2
7. Railing, upper catwalk on Flexkleen	0500	1441		31.2%	2	60	0	1	1	1	1	3.2
8. Used baghouse bag	0500	1442		31.2%	2	60	0	0	1	0	0	0
9. Catwalk on Flexkleen baghouse	0505	1443		31.2%	2	60	0	0	1	0	0	0
10.Top of forklift	0518	1445		31.2%	2	60	0	4	1	4	4	12.8
11. Front forklift tire	0519	1448		31.2%	2	60	0	0	1	0	0	0
12. Under flexkleen, NE side concrete pad	0550	1449		31.2%	2	60	0	0	1	0	0	0
13. Base of ladder, NE side	0551	1451		31.2%	2	60	0	1	1	1	1	3.2

Printed Name: R.A.DUFF / A.J. Boerner

Signature: [signature] / Alex J. Boerner

$$MDA = \frac{3 + 4.65\sqrt{0 \times 60}}{(0.31 \text{ cpm/dpm})(1 \text{ min})} = 9.6 \text{ dpm}/100 \text{ cm}^2$$

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
SAMPLE COUNT RECORD

Sample No./Location	Date/ Time of sample	Date/ Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Bkg counts	(2) Bkg count time (min)	(3) Bkg count rate (1/2) cpm	(4) Sample counts	(5) Sample count time (min)	(6) Sample count rate (4/5) cpm	(7) Net sample count rate (6-3)	(8) dpm (7/Eff)
14. Under baghouse, equidistant between hoppers, north side	7/2/98 0610	7/8/98 1454	Ludlum 2929 # 126126	31.2%	2	60	0	0	1	0	0	0
15. Hopper-like device on top NE side	0612	1455		31.2%	2	60	0	2	1	2	2	6.4
16. South central end under baghouse between 2 hoppers	0615	1458		31.2%	2	60	0	1	1	1	1	3.2
17. Under baghouse near motor, SE side	0618	1459		31.2%	2	60	0	0	1	0	0	0
18. NE side concrete pad	0622	1501		31.2%	2	60	0	1	1	1	1	3.2
19. NW side under baghouse at underside of hopper	0757	1503		31.2%	2	60	0	0	1	0	0	0
20.SW side under baghouse on concrete	0758	1504		31.2%	2	60	0	0	1	0	0	0
21. SE side on horizontal surface of column support	0800	1506		31.2%	2	60	0	2	1	2	2	6.4

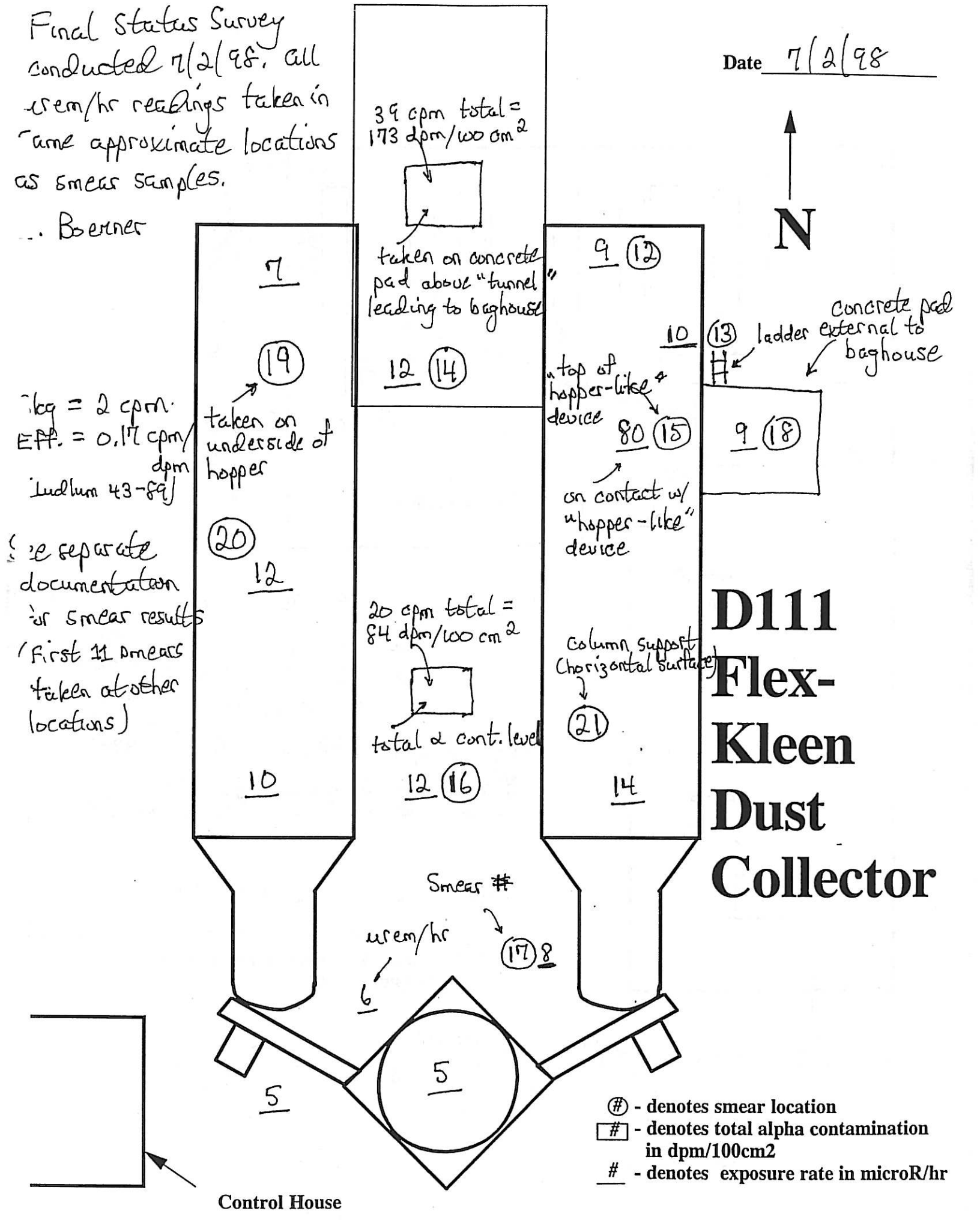
Printed Name: R.A. DUFF / A. J. Boerner

Signature: ~~R.A. Duff~~ / Alex J. Boerner

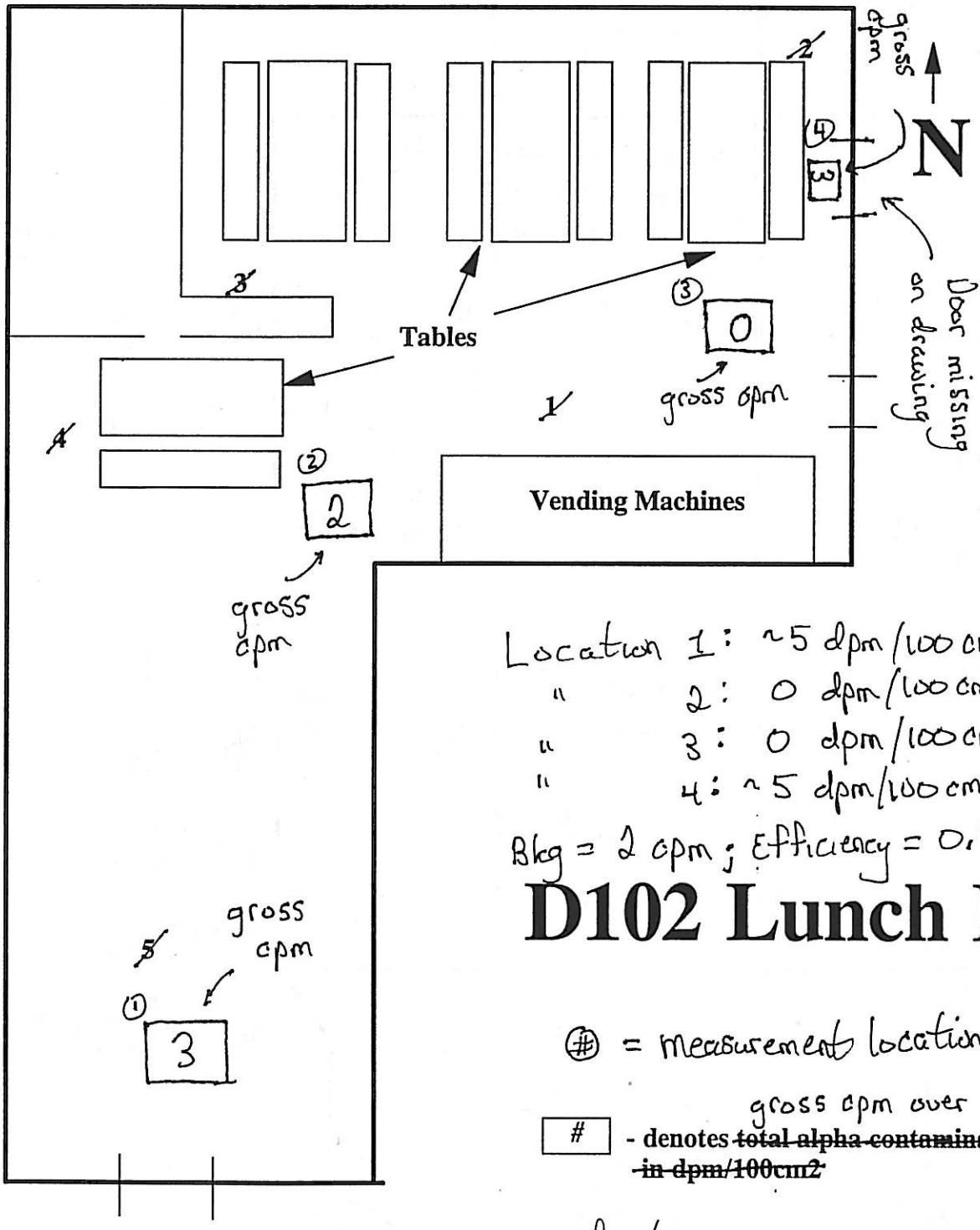
Final Status Survey conducted 7/2/98. All urem/hr readings taken in same approximate locations as smear samples.

.. Boerner

Date 7/2/98



Date 7/2/98



Location 1: ~5 dpm/100 cm² (MDA = 43 dpm/100 cm²)
" 2: 0 dpm/100 cm² (< MDA)
" 3: 0 dpm/100 cm² (< MDA)
" 4: ~5 dpm/100 cm² (< MDA)

Bkg = 2 cpm; Efficiency = 0.17 [Ludlum 43-89]

D102 Lunch Room

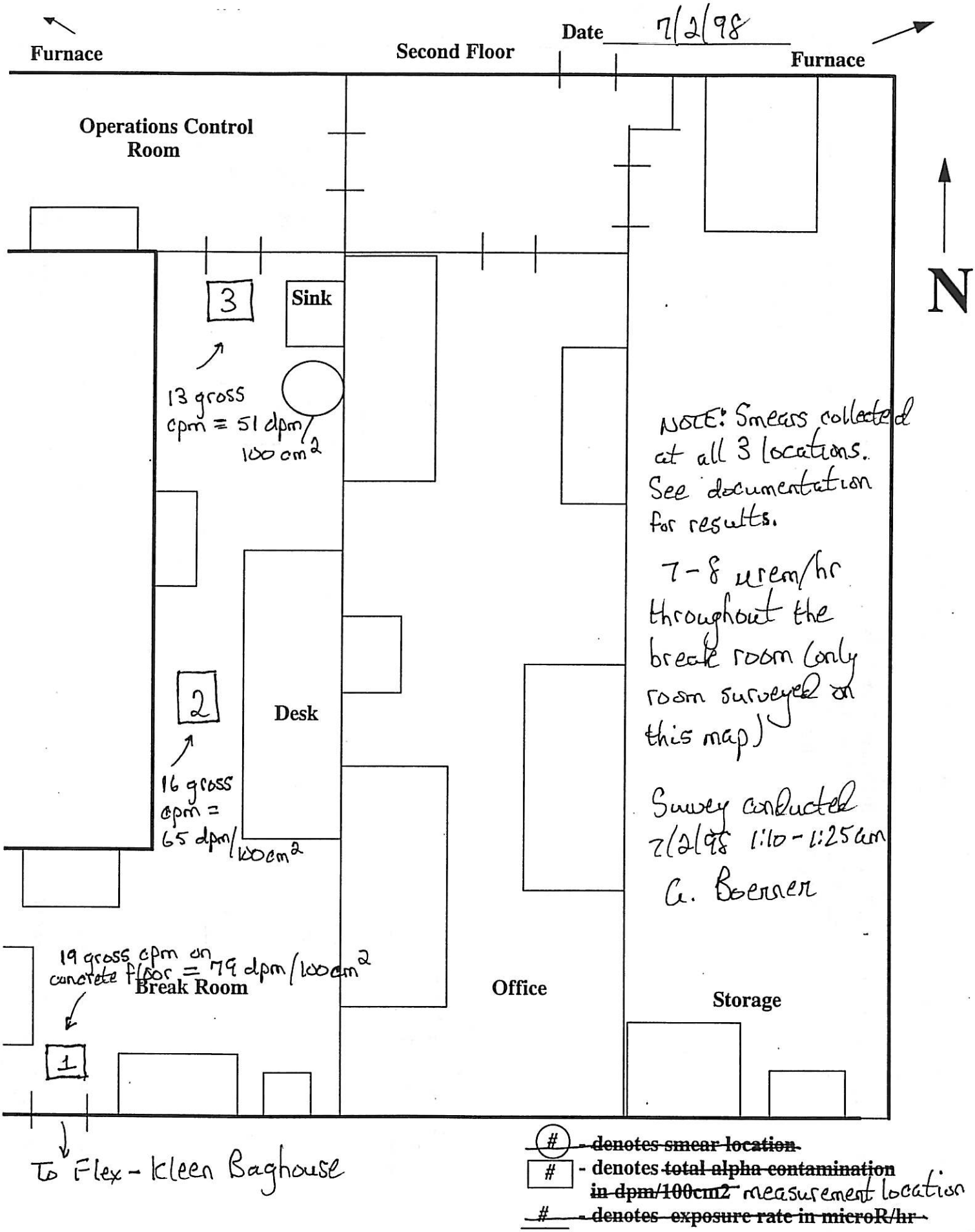
(#) = measurement location number.

gross cpm over a 1 minute count

[#] - denotes ~~total alpha contamination in dpm/100cm2~~

NOTE: 5-8 mrem/hr throughout the lunch room. No smears taken due to low total contamination levels.

G. Boerner
7/2/98



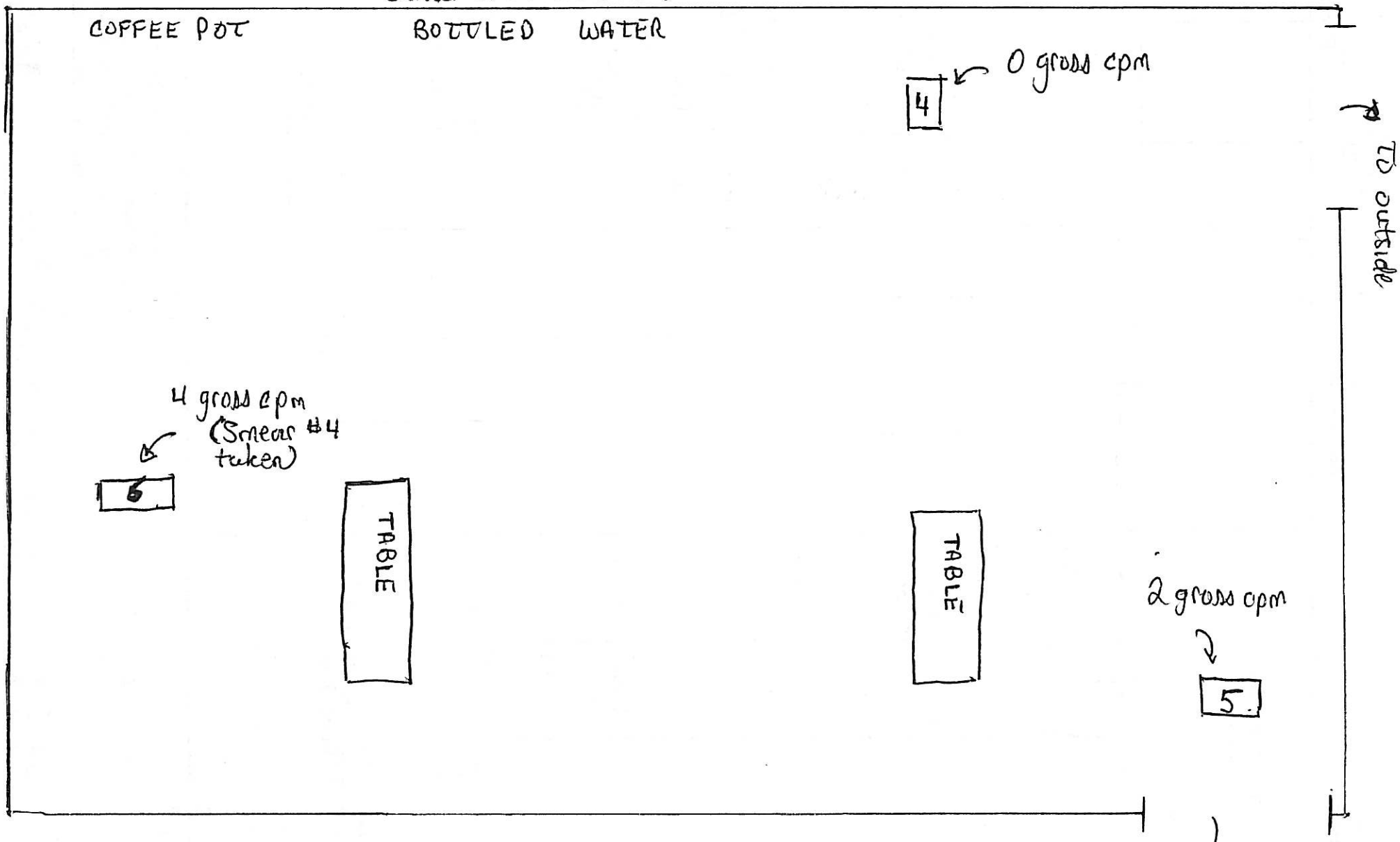
D111 - Office and Break Room

4-5 μrem/hr in room

D-115 Break Room

N

[#] = Measurement No. (first 3 measurements were taken earlier in D111 break room)



Survey conducted 7/2/98
G. Boerner

Campaign 2

RADIATION WORK PERMIT

Permit No: *00010-98*	Type: ✓ Job Specific ☐ Extended
Start Date: *July 13, 1998*	Expiration Date: *July 17, 1998*

Location of Work: *Department 111*
Description of Work: *Rreplacement of bags in Flex Kleen Baghouse*
Involved Personnel: *E. Jordan, L.Remsen, L.Cordero, M.Ojeda, C.boyd, J.Cortez, K. Schoole, G. Serrano III*
Tools Required: *Hand tools - utility knives, pliers, wrenches, hammers, etc.*

SURVEY INFORMATION

General Area Dose Rates (mR/hr):
Maximum Accessible Dose Rates (mR/hr):
Removable Contamination (dpm/100 cm^2):

ALARA REVIEW

Estimated Total Dose:	Actual Total Dose:
Dose Reduction Techniques to be Employed: *Minimize amount of time workers are in the baghouse to complete the removal and replacement of bags*	

DOSIMETRY REQUIREMENTS

☐ TLD Badge	☐ Finger Ring	☐ Pocket Dosimeter	✓ BZA	☐ Stay-Time Estimate
☐ Other (Specify):				

PROTECTIVE EQUIPMENT

✓ Coveralls	☐ Lab Coat	☐ Hood	☐ Rubber Gloves	☐ Booties
☐ Rubbers	✓ Respirator	☐ Taped Seams	☐ HP Coverage	✓ Air Sampling
☐ Pre-job Bioassay	☐ Post-job Bioassay	☐ Special Briefing in:		
Other Precautions and Special Instructions:				

Requested by: Hugo L. Nieves	Date: *June 3, 1998*
Authorized by: David R. Smith *David R Smith*	Date: *July 10, 1998*
Terminated by:	Date:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
TAILGATE SAFETY MEETING

Facility: Shieldalloy Metallurgical Corporation

Date: 7/13/98 | Time: 12:30a (↳night shift); 8:30a (↳day shift) | Job Number: 94005.05

Client Name: Shieldalloy

Address of Work Site: 12 West Boulevard, Newfield, NJ 08344

Type of Work: Changing Bags in Flex-Kleen Baghouse

Hazardous/Radioactive Materials Used: Uranium/Thorium present in baghouse dust

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: Tyvek coveralls; dust mask; safety glasses; work gloves

Chemical Hazards: Lime contained in bags - potential eye and skin irritant

Radiological Hazards: Low-level uranium and thorium concentrations in baghouse dust

Physical Hazards: Slipping, tripping, falling

Emergency Procedures:
Contact security office for EMT response

Hospital/Clinic: Newcomb Hospital | Phone: 911 | Paramedic Phone: 911

Hospital Address: 65 State Street, Vineland, NJ

Special Equipment:

None

Other:

ATTENDEES

NAME PRINTED	SIGNATURE
Ken Schooley	Ken Schooley
Carnell Boyd	Carnell Boyd
Eddie L. Jordan SR.	Eddie L. Jordan Sr.
Milton White JR.	Milton White Jr.
LEMUEL CORDERO	Lemuel Cordero
GEORGE L. SERRANO III	George L. Serrano III
Juan Cortés	Juan Cortés
STEFFON E GOVAN	Steffon E Govan

Meeting Conducted by: Alex J. Boerner

Signature: Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
TAILGATE SAFETY MEETING

Facility: Shieldalloy Metallurgical Corporation		
Date: 7/13-14/98	Time: 8:15p	Job Number: 94005.05
Client Name: Shieldalloy (SMC)		
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344		
Type of Work		
Hazardous/Radioactive Materials Used: Uranium/thorium present in baghouse dust		

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: tyvek coveralls; dust mask; safety glasses; work gloves		
Chemical Hazards: Lime, dolomite on bags - potential eye and skin irritant		
Radiological Hazards: Low-level Uranium + thorium concentrations in baghouse dust		
Physical Hazards: slipping, tripping, falling; possible heat stress		
Emergency Procedures: Contact security office for EMT response		
Hospital/Clinic: Newcomb Hospital	Phone: 911	Paramedic Phone: 911
Hospital Address 65 State Street, Vineland, NJ		
Special Equipment: None		
Other:		

ATTENDEES

NAME PRINTED	SIGNATURE
Eddie L. Jordan Sr.	Eddie L. Jordan Sr.
Larry Roncan	
Ken Schadley	
Carnel Boyd	Carnel Boyd

Meeting Conducted by:	Alex J. Boerner
Signature:	Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
TAILGATE SAFETY MEETING

Facility: Shieldalloy Metallurgical Company		
Date: 7/14/98	Time: 8:00a - 8:15a	Job Number: 94005.05
Client Name: Shieldalloy (SMC)		
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344		
Type of Work		
Hazardous/Radioactive Materials Used: Uranium / thorium present in baghouse dust		

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: Tyvek coveralls; dust mask; safety glasses; work gloves		
Chemical Hazards: Lime and dolomite contained on bags - potential eye and skin irritant		
Radiological Hazards: Low-level uranium and thorium concentrations in baghouse dust		
Physical Hazards: Slipping, tripping, falling; possible heat stress		
Emergency Procedures: Contact security office for EMT response		
Hospital/Clinic: Newcomb Hospital	Phone: 911	Paramedic Phone: 911
Hospital Address 65 State Street, Vineland, NJ		
Special Equipment: None		
Other:		

ATTENDEES

NAME PRINTED	SIGNATURE
LEMUEL CORDERO	
GEORGE L. SERRANO III	
Juan Cotto	
MARCELINO OJEDA	

Meeting Conducted by:	Alex J. Boerner
Signature:	Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
TAILGATE SAFETY MEETING

Facility: Shieldalloy Metallurgical Corporation		
Date: 7/~~13~~ 14/98 (AJB)	Time: 08:10p	Job Number: 94005.05
Client Name: Shieldalloy		
Address of Work Site: 12 West Boulevard, Newfield, NJ 08344		
Type of Work Changing Bags in Flex-Kleen Baghouse		
Hazardous/Radioactive Materials Used: Uranium/Thorium present in baghouse dust		

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: Tyvek coveralls; dust mask; safety glasses; work gloves		
Chemical Hazards: Lime and dolomite contained on bags - potential eye and skin irritant		
Radiological Hazards: Low-level uranium and thorium concentrations in baghouse dust		
Physical Hazards: Slipping, tripping, falling		
Emergency Procedures: Contact security office for EMT Response		
Hospital/Clinic: Newcomb Hospital	Phone: 911	Paramedic Phone: 911
Hospital Address 65 State Street, Vineland, NJ		
Special Equipment: None		
Other:		

ATTENDEES

NAME PRINTED	SIGNATURE
Eddie L. Jordan Sr.	Eddie L. Jordan Sr.
Carmel Boyd	Carmel Boyd
Ken Schooley	Ken Schooley
Larry Remsen	Larry Remsen

Meeting Conducted by:	Alex J. Boerner
Signature:	Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.05			Detector			Meter		
Site Location/Background Location: HP office			Type: Ludlum 43-89	Serial No. 132117	Probe Area (cm^2) 126	Type: Ludlum 2224	Serial No: 125607	Operating Voltage: 800V
Check Source No:			Check Source No:			Check Source No:		
Radionuclide:	Activity:	Date:	Radionuclide:	Activity:	Date:	Radionuclide:	Activity:	Date:
			Th-230	18,600 dpm	5/24/96			

Date	Start of Shift Background (cpm for a 1 minute count)								End of Shift Background (cpm for a 1 minute count)								Daily Source Check (α)		Daily Source Check (β)		MDA** - Scaler Mode (dpm)		Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	α	β	
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.							
7/12/98	0	2	3	1.7	-	-	-	-	3	0	1	1.3	-	-	-	-	3365	0.18	-	-			GJB
↳10:18p									↳ 7/13/98 (9:35a)														
7/13/98	0	1	2	1	-	-	-	-	3	2	0	1.7	-	-	-	-	3210	0.17					GJB
↳6:10p									↳ 7/14/98 7:45a														
7/14/98	1	1	2	1.3	-	-	-	-	2	0	1	1	-	-	-	-	3201	0.17					GJB
6:40p									↳ 7/16/98 7:40a				-	-	-	-							

** $MDA = \frac{2.71 + 4.65\sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$, where MDA = the activity level (dpm/100 cm^2), BKG_{avg} = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm^2).

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

INSTRUMENT RESPONSE CHECK

Location: SMC - Newfield, NJ	Meter Model No.: Ludlum 2224	Probe Model No.: Ludlum 43-89
Check Source No.: 1640 (Th-230 : 18,600 dpm 5/24/96	Meter Serial No.: 125607	Probe Serial No.: 132117
Scaler Count Time (Min): 1 minute	Response Switch:	Name: A. Boerner

Meas. Number	Radiation Type (check): ☑ Alpha ☐ Beta ☐ Beta/Gamma				Radiation Type (check): ☐ Alpha ☐ Beta ☐ Beta/Gamma			
	Background (counts per minute)	$(x - x_{ave})^2$	Check Source (counts per minute)	$(x - x_{ave})^2$	Background (total counts)	$(x - x_{ave})^2$	Check Source (total counts)	$(x - x_{ave})^2$
1	0	1	3173	841				
2	0	1	3219	289				
3	2	1	3174	784				
4	3	4	3263	3721				
5	0	1	3158	1936				
6	2	1	3197	25				
7	0	1	3235	1089				
8	1	0	3190	144				
9	2	1	3233	961				
10	0	1	3180	484				
Sum $a = (x-x_{ave})^2$	12		10274					
Mean $b = (x_{ave})$	1		3202					
σ^2 $c = a + [n - 1]$	1.3		1142					
σ $d = c^{\frac{1}{2}}$	1.14		34					
2σ $e = 2 \times d$	2.28		68					
3σ $f = 3 \times d$	3.42		102					

Acceptable Check Source Ranges			Notes/Calculations:
Range	Alpha	Beta	
2σ	3134 to 3270	- to -	
3σ	3100 to 3304	- to -	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
INSTRUMENT FIELD CHECK FORM

Site: SMC - Newfield, NJ	Probe Type: ZnS/plastic scintillator	Probe Number 132117 (Model 43-89)
Meter Number: 125607 (Ludlum 2224)	Suggested Operating Voltage: 800V	Check Source Number: Th-230 18,600 dpm (5/24/96)

Number	Date	Location	Battery OK	Operating Voltage	Background cpm	Check Source cpm	Name	Remarks
1	7/7/98	IEM - Knoxville, TN	✓	800V	2	3246	A. Boerner	Pre-Trip Check
2	7/12/98	SMC - Newfield, NJ	✓	800V	0	3365	A. Boerner	Pre-shift check
3	7/13/98	SMC - Newfield, NJ	✓	800V	1	3210	A. Boerner	Pre-shift check
4	7/14/98	SMC - Newfield, NJ	✓	800V	1	3201	A. Boerner	Pre-shift check
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

EXPOSURE RATE SURVEY INSTRUMENT DATA SHEET

Project No. 94005.05	Detector		Meter		
Site Location/Background Location: HP office	Type: T.E. Scintillator	Serial No. NA (internal probe)	Type: Bicron µsem	Serial No: B295W	Operating Voltage: Internally Set

Check Source Number 0314	Radionuclide: Cs-137	Calibration Activity and Date: 1 µCi (3/98)

Date	Units	Start of Shift Background				End of Shift Background				Daily Response (µR/hr)	Initials
		1	2	3	Avg.	1	2	3	Ave.		
7/12/98 ↳10:15p	µsem/hr	5	7	7	6	5	4	5	5	600	GJB
7/13/98 ↳6:10p	µsem/hr	5	4	4	4	6	5	5	5	556	GJB
7/14/98 ↳6:40p	µsem/hr	7	6	5	6	7	7	8	7	600	GJB

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
INSTRUMENT FIELD CHECK FORM

Site: SMC - Newfield, NJ	Probe Type: Tissue Equivalent Scintillator	Probe Number NA (internal probe)
Meter Number: B295W (Bicron μrem)	Suggested Operating Voltage: Internally Set	Check Source Number: 0314 (Cs-137)

Number	Date	Location	Battery OK	Operating Voltage	Background ~~cpm~~ μrem/hr	Check Source ~~cpm~~ μrem/hr	Name	Remarks
1	7/7/98	IEM - Knoxville, TN	✓	w/in parameters	7	600	G. Boerner	Pre-trip check
2	7/12/98	SMC - Newfield, NJ	✓	" "	6	600	G. Boerner	Pre-shift check
3	7/13/98	SMC - Newfield, NJ	✓	" "	4	550	G. Boerner	Pre-shift check
4	7/14/98	SMC - Newfield, NJ	✓	" "	6	600	G. Boerner	Pre-shift check
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

Designer and Manufacturer of Scientific and Industrial Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CERTIFICATE OF CALIBRATION

CUSTOMER SHIELDALLOY METALLURGICAL ORDER NO. 232198/214727

Mfg. Eberline Model SAC-4 Serial No. 868

Mfg. _____ Model _____ Serial No. _____

Cal. Date 30-Mar-98 Cal Due Date 30-Mar-99 Cal. Interval 1 Year Meterface SAC-4

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 73 °F RH 45 % Alt 692.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☐ Mechanical ck. ☐ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☐ F/S Resp. ck ☐ Reset ck. ☐ Window Operation ☐ Geotropism
☐ Audio ck. ☐ Alarm Setting ck. ☐ Batt. ck. (Min. Volt) _____ VDC

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 900 V Input Sens. 10 mV Det. Oper. _____ V at _____ mV Threshold Dial Ratio _____ = _____ m

☐ HV Readout (2 points) Ref./Inst. _____ / _____ V Ref./Inst. _____ / _____ V

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*

*Uncertainty within ± 10% C.F. within ± 20% ALL Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400 K cpm	40027 (0)	40027 (0)	Log Scale			
	40 K cpm	4004	4004				
	4 K cpm	400	400				
	400 cpm	40	40				
	40 cpm	4	4				

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/N T-3C

☑ Alpha S/N Th230#1619 ☐ Beta S/N _____ ☐ Other _____

☐ m 500 S/N _____ ☐ Oscilloscope S/N _____ ☐ Multimeter S/N _____

Calibrated By: Lonie Martin Date 30-Mar-98

Reviewed By: Rhonda Hanni Date 30 Mar 98

FORM C22A 09/08/97

Designer and Manufacturer of Scientific and Industrial Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-46;
SWEETWATER, TEXAS 79556, U.S.A.

CERTIFICATE OF CALIBRATION

CUSTOMER INTEGRATED ENVIRONMENTAL MGMT ORDER NO. 231041 / 212187

Mfg. Bicron Model MICRO REM Serial No. B295W

Mfg. _____ Model _____ Serial No. _____

Cal. Date 16-Jan-98 Cal Due Date 16-Jan-99 Cal. Interval 1 Year Meterface 0-200uren

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 71 °F RH 20 % Alt 697.8 mm

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☐ F/S Resp. ck ☑ Reset ck. ☐ Window Operation ☐ Geotropism
☐ Audio ck. ☐ Alarm Setting ck. ☐ Batt. ck. (Min. Volt) _____VDC

☐ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☑ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set _____ V Input Sens. _____ mV Det. Oper. _____ V at _____ mV Threshold Dial Ratio _____ = _____

☐ HV Readout (2 points) Ref./Inst. _____ / _____ V Ref./Inst. _____ / _____ V

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
x 1000	150 mR/hr	145	150
x 1000	50 mR/hr	50	50
x 100	15 mR/hr	140	150
x 100	5 mR/hr	47	50
x 10	1500 uR/hr	140	150
x 10	500 uR/hr	45	50
x 1	150 uR/hr	145	150
x 1	100 uR/hr	95	100
x0.1	15 uR/hr	150	150
x0.1			

*Uncertainty within ± 10% C.F. within ± 20% _____ Range(s) Calibrated Electronicall

Digital Readout	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*	Log Scale	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniqu The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO-1

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☑ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☑ E551 ☐ Neutron Am-241 Be S/N T

☐ Alpha S/N _____ ☐ Beta S/N _____ ☐ Other _____

☐ m 500 S/N _____ ☐ Oscilloscope S/N _____ ☐ Multimeter S/N _____

Calibrated By: Conrad Jaloub Date 16 Jan 98

Reviewed By: V. Lee Alvarado Date 16 Jan 98

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-46
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER INTEGRATED ENVIRONMENTAL MGMT ORDER NO. 231041 / 212187

Mfg. Ludlum Measurements, Inc. Model 2224 Serial No. 125607

Mfg. Ludlum Measurements, Inc. Model 43-89 Serial No. PR 122117

Cal. Date 16-Jan-98 Cal Due Date 16-Jan-99 Cal. Interval 1 Year Meterface 202-783

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 71 °F RH 20 % Alt 697.8 mm

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☑ F/S Resp. ck ☑ Reset ck. ☑ Window Operation ☑ Geotropism
☑ Audio ck. ☐ Alarm Setting ck. ☑ Batt. ck. (Min. Volt) 2.2 VDC
☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 12/19/89.

Instrument Volt Set 825 V Input Sens. Comments mV Det. Oper. 825 V at Comments mV Threshold Dial Ratio =

☑ HV Readout (2 points) Ref./Inst. 505 / 500 V Ref./Inst. 2000 / 2000

COMMENTS:

Alpha Threshold: 120mV
Beta Threshold: 3.5mV
Beta Window: 30mV
Overload checked but not set
Firmware 390063
High Voltage set with detector disconnected

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
X1000	400 K cpm	400	400
X1000	100 K cpm	100	100
X100	40 K cpm	400	400
X100	10 K cpm	100	100
X10	4 K cpm	400	400
X10	1 K cpm	100	100
X1	400cpm	400	400
X1	100cpm	100	100

*Uncertainty within ± 10% C.F. within ± 20% ALL Range(s) Calibrated Electronic

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READIN
Digital Readout	400 K cpm	399148	399148	Log Scale			
	40 K cpm	39917	39917				
	4 K cpm	3992	3992				
	400 cpm	400	400				
	40 cpm	40	40				

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techni The calibration system conforms to the requirements of MIL-STD-45662A and ANSI N323-1978. State of Texas Calibration License No. LO

Reference Instruments and/or Sources:

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ Neutron Am-241 Be S/I

☑ Alpha S/N Pu-239 12800cpm ☐ Beta S/N ☐ Other

☑ m 500 S/N 134709 ☐ Oscilloscope S/N ☑ Multimeter S/N 57390613

Calibrated By: Conrad Salinas Date 16 Jan 98

Reviewed By: V. Lee Alvarado Date 16 Jan 98

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5494
501 OAK STREET FAX NO. 915-235-467
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 43-89 Serial No. PR 132117 Order #. 231041 / 212187

Customer INTEGRATED ENVIRONMENTAL MGMT Alpha Input Sensitivity 120 mV

Counter 2224 Serial No. 125607 Beta Input Sensitivity 3.5 mV

Count Time 1Minute Beta Window 30 mV

Other _____ Distance Source to Detector Surface

High Voltage	Background		Isotope Pu239 Size 12800cpm		Isotope Tc 99 Size 14300cpm		Isotope Sr 90 Y90 Size 0.01112uCi	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
775	0	120	4896	363	5	2385	0	9243
800	0	183	5154	345	2	2492	0	9950
825	0	250	5244	403	12	3594	1	12091
850	0	274	5361	555	6	4397	0	13167
875	0	393	5238	756	2	5592	5	13785

☐ Gas Proportional detector count rate decreased ≤ 10% after 15 hour static test using 39" cable.

☐ Gas proportional detector count rate decreased ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter.

Signature Conrad Galindo Date 16 Jan 98

HAZCO

Equipment Rental Checklist

MSA ESCORT SAMPLING PUMP

Part Number: ESCORT

Contract #: 1020077 **Date Shipped:** 7/09/98

Serial #: 10985 **Quality Checked:** BV

Items shipped with this order include:

Quantity Shipped	Item Description	Unit of Measure
1	PELICAN 1400 CARRYING CASE	EA
1	MSA OMEGA CHARGER, PASSPORT	EA
2	MSA ESCORT BATTERY PACK	EA
1	MSA LAPEL CLIP ASSEMBLY	EA
1	HAZCO SCREWDRIVER STD. - MSA, ISC	EA
1	MSA ESCORT PUMP INSTRUCTION MANUAL	EA
3	TYGON TUBING (1/4 ID X 7/16 OD)	FT

Thank you for selecting HAZCO for your instrument rental needs—we appreciate and value your business.

As part of our continued Quality Assurance program, this document indicates the component parts of this rental so that you can easily identify each. To avoid any unexpected charges, please make certain that all equipment items listed are returned with the rental with the exception of obvious disposable items such as solutions, gas, etc.

A detailed quality assurance procedure has been specifically performed on the unit to ensure safe and reliable operation before being shipped to you. We take pride in the quality of our products and workmanship, and stand behind our guarantee 100%!

HAZCO also provides a complete line of calibration and maintenance products for each rental such as gases, tubing, regulators, batteries, solutions, etc. If additional supplies are required based on your rental term, please let us know.

Should you have any questions or concerns regarding the rental or operation of this equipment, just give us a call—that's why we're here!

Again, thanks for the order. We look forward to serving you again real soon!

Declared Insurance Value: $597.00

Please return equipment to:

HAZCO Services, Inc. • 6501 Centerville Business Parkway • Dayton, Ohio 45459

1-800-332-0435

HAZCO

Equipment Rental Checklist

MSA ESCORT SAMPLING PUMP

Part Number: ESCORT

Contract #: 1020077 **Date Shipped:** 7/09/98

Serial #: 5835 **Quality Checked:** BW

Items shipped with this order include:

Quantity Shipped	Item Description	Unit of Measure
1	PELICAN 1400 CARRYING CASE	EA
1	MSA OMEGA CHARGER, PASSPORT	EA
2	MSA ESCORT BATTERY PACK	EA
1	MSA LAPEL CLIP ASSEMBLY	EA
1	HAZCO SCREWDRIVER STD. - MSA, ISC	EA
1	MSA ESCORT PUMP INSTRUCTION MANUAL	EA
3	TYGON TUBING (1/4 ID X 7/16 OD)	FT

Thank you for selecting HAZCO for your instrument rental needs—we appreciate and value your business.

As part of our continued Quality Assurance program, this document indicates the component parts of this rental so that you can easily identify each. To avoid any unexpected charges, please make certain that all equipment items listed are returned with the rental with the exception of obvious disposable items such as solutions, gas, etc.

A detailed quality assurance procedure has been specifically performed on the unit to ensure safe and reliable operation before being shipped to you. We take pride in the quality of our products and workmanship, and stand behind our guarantee 100%!

HAZCO also provides a complete line of calibration and maintenance products for each rental such as gases, tubing, regulators, batteries, solutions, etc. If additional supplies are required based on your rental term, please let us know.

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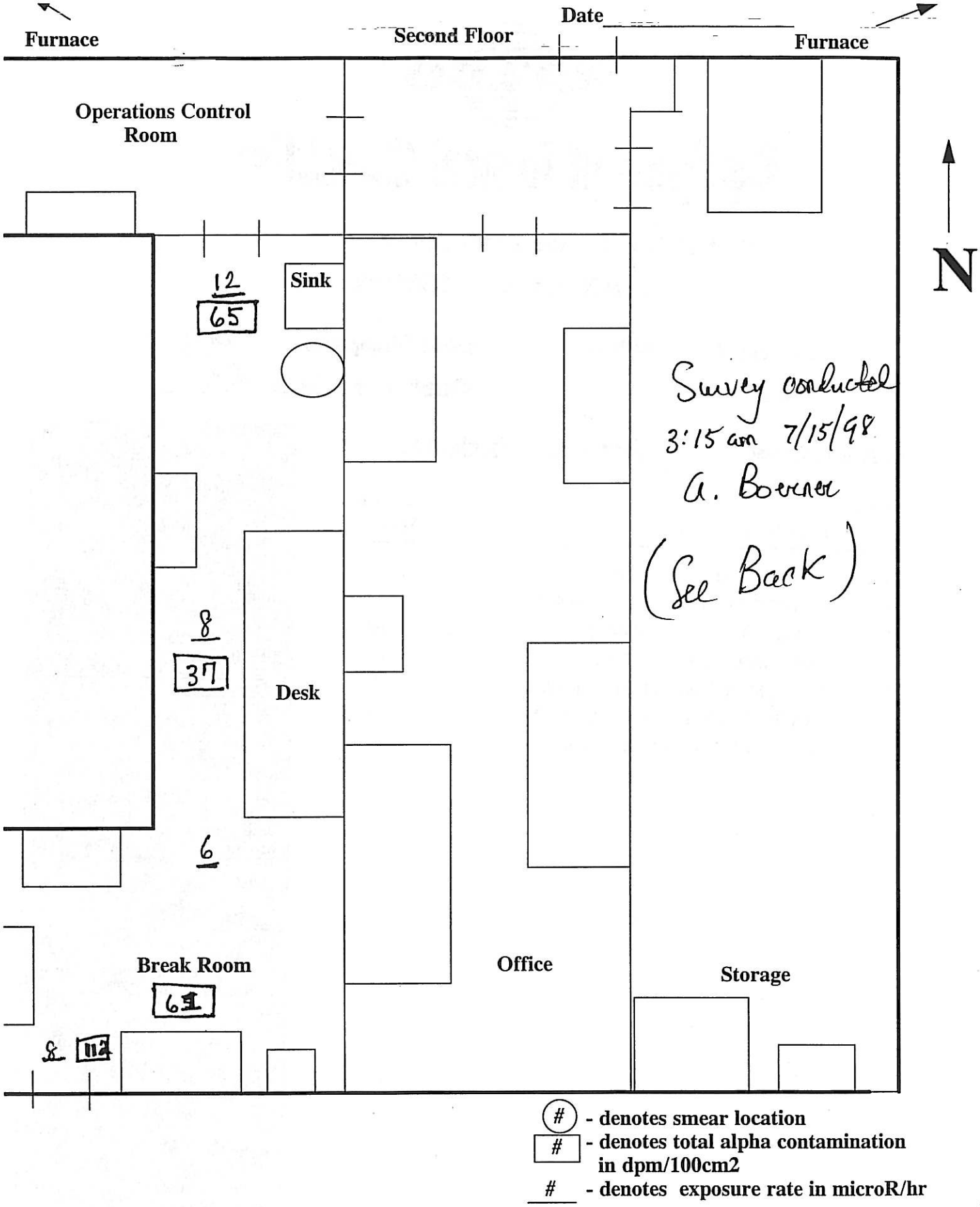
Again, thanks for the order. We look forward to serving you again real soon!

Declared Insurance Value: $597.00

Please return equipment to:

HAZCO Services, Inc. • 6501 Centerville Business Parkway • Dayton, Ohio 45459

1.800.332.0435



(#) - denotes smear location

[#] - denotes total alpha contamination in dpm/100cm2

- denotes exposure rate in microR/hr

D111 - Office and Break Room

(See Back)

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.05			Detector			Meter		
Site Location/Background Location: SMC Newfield, NJ/IEM Knoxville office			Type: Ludlum 43-10-1	Serial No. 132238	Probe Area (cm^2) N/A	Type: Ludlum Model 2929	Serial No: 126126	Operating Voltage: 0.75 kV
Check Source No: 2598			Check Source No:			Check Source No:		
Radionuclide: Th-230	Activity: 18,800 dpm	Date: 9/12/96	Radionuclide:	Activity:	Date:	Radionuclide:	Activity:	Date:

Date	Start of Shift Background (cpm for a __60___ minute count)								End of Shift Background (cpm for a ___60____ minute count)								Daily Source Check (α)		Daily Source Check (β)		MDA** - Scaler Mode (dpm)		Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	α	β	
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.							
7/20/98	0.2	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	5823	31.0%	-	-	1.0	-	
7/21/98	0.2	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	5857	31.2%	-	-	1.0	-	
7/22/98	0.2	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	5816	31.0%	-	-	1.0	-	
7/23/98	0.2	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	5818	31.0%	-	-	1.0	-	

** $MDA = \frac{2.71 + 4.65\sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$, where MDA = the activity level (dpm/100 cm^2), BKG_{avg} = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm^2).

MSA BZAD
(DAY SHIFT)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/12/98
Time: 11:00 am
Circle One: (Pre-shift) Post-shift

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
1	2.50	1. 2.485	2.484	0.99
		2. 2.447		
		3. 2.521		
2	2.50	1. 2.539	2.551	1.02
		2. 2.613		
		3. 2.502		
3	2.50	1. 2.508	2.512	1.00
		2. 2.509		
		3. 2.518		
(GB) "5" 5835 (on front of pump)	2.1	1. 2.099	2.092	~1.00
		2. 2.105		
		3. 2.073		
(GB) 10985 (on side of pump)	2.25	1. 2.415	2.409	1.07
		2. 2.406		
		3. 2.405		

MSA BZAs
(day shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/13/98
Time: 7:30 pm
Circle One: Pre-shift (Post-shift)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
1	2.5	1. 2.454	2.479	0.99
		2. 2.505		
		3. 2.478		
2	2.5	1. 2.465	2.472	0.99
		2. 2.497		
		3. 2.454		
3	2.5	1. 2.536	2.533	1.01
		2. 2.531		
		3. 2.533		
5835	2.1	1. 2.277	2.237	1.06
(# on front		2. 2.243		
of pump)		3. 2.190		
		1.		
		2.		
		3.		

MSA BZAs
(day shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/14/98
Time: 4:05 am
Circle One: (Pre-shift) Post-shift

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
1	2.5	1. 2.460	2.475	0.99
		2. 2.482		
		3. 2.484		
2	2.5	1. 2.502	2.506	1.0
		2. 2.473		
		3. 2.544		
3	2.5	1. 2.517	2.514	1.01
		2. 2.511		
		3. 2.513		
5835	2.1	1. 2.206	2.200	1.05
		2. 2.155		
		3. 2.239		
..				
		1.		
		2.		
		3.		

MSA BZAs
(day shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/14/98
Time: 9:40p
Circle One: Pre-shift (Post-shift)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
1	2.50	1. 2.490	2.499	~1.0
		2. 2.521		
		3. 2.485		
2	2.50	1. 2.422	2.459	0.98
		2. 2.475		
		3. 2.479		
3	2.50	1. 2.469	2.500	1.00
		2. 2.521		
		3. 2.510		
5835	2.1	1. 2.153	2.138	1.02
		2. 2.132		
		3. 2.130		
		1.		
		2.		
		3.		

MSA BZAD
(day shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/15/98
Time: 9:30 am
Circle One: (Pre-shift) Post-shift

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
1	2.50	1. 2.544	2.525	1.01
		2. 2.536		
		3. 2.495		
2	2.50	1. 2.498	2.493	~1.0
		2. 2.482		
		3. 2.499		
3	2.50	1. 2.499	2.53	1.01
		2. 2.565		
		3. 2.534		
5835	2.1	1. 2.118	2.11	1.0
		2. 2.112		
		3. 2.102		
..				
		1.		
		2.		
		3.		

MSA BZAD
(day shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/16/98
Time: 0800a
Circle One: Pre-shift (Post-shift)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
1	2.50	1. 2.544	2.554	1.02
~~1~~ (GLB)		2. 2.557		
~~3~~ (GLB)		3. 2.562		
2	2.50	1. 2.457	2.469	0.99
		2. 2.481		
		3. 2.469		
3	2.50	1. 2.476	2.501	1.00
		2. 2.489		
		3. 2.539		
5835	- *	1. -	-	-
		2. -		
		3. -		
...				
		1.		
		2.		
		3.		

* BZA was not used on this shift; therefore, post-shift calibration was not performed.

C. Boerner
7/16/98

MSA BZAS
(day shift)

ATTACHMENT 1

Breathing Zone Sampler Flow Rate Check Sheet

Sampler Number	DATE	Flow Rate - Start of Shift (~~cu. cm.~~ liters/minute)	Flow Rate - End of Shift (~~cu. cm.~~ liters/minute)
1	7/13/98	2.5	2.5
2	↓	2.5	2.5
3		2.5	2.5
5835		2.1	2.1
1	7/14/98	2.5	2.5
2	↓	2.5	2.5
3		2.5	2.5
5835		2.1	2.1
1	7/15/98	2.5	2.5
2	↓	2.5	2.5
3		2.5	2.5
5835		2.1	

MSA BZAs
(day shift)

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flex-Kleen Baghouse)

Sampler Number	Employee	Date	Time In *	TIme Out *
1	Lem Cordero	7/13/98	0900a	0945a
2	Juan Cortez	↓	↓	↓
3	Steffan Govan	↓	↓	↓
5835	George Serrano	↓	↓	↓
1	L. Cordero	7/13/98	1015a	11:45a
2	J. Cortez	↓	↓	↓
3	S. Govan	↓	↓	↓
5835	G. Serrano	↓	↓	↓
1	L. Cordero	7/13/98	12:30p	2:50p
2	J. Cortez	↓	↓	↓
5835	G. Serrano	↓	↓	↓
1	L. Cordero	7/13/98	3:15p	4:05p
2	J. Cortez	↓	↓	↓
5835	G. Serrano	↓	↓	↓

* Information provided by day shift personnel and subsequently transcribed.

A. Boerner
7/13/98

MSA BZAs
(day shift)

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flex-Kleen Baghouse)

Sampler Number	Employee	Date	Time In *	TIme Out *
1	Lem Cordero	7/14/98	8:30a	9:57a
2	Juan Cortez	↓		
3	Marcellina Ojeda			
5835	George Serrano			
1	L. Cordero	7/14/98	10:20a	11:55a
2	J. Cortez	↓		
3	M. Ojeda			
5835	G. Serrano			
1	L. Cordero	7/14/98	12:40p	2:00p
2	J. Cortez	↓		
3	M. Ojeda			
5835	G. Serrano			
1	L. Cordero	7/14/98	2:20p	3:20p
2	J. Cortez	↓		
3	M. Ojeda			
5835	G. Serrano			

* Information provided by day shift personnel and subsequently transcribed.

A. Boerner
7/14/98

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flex-Kleen Baghouse)

Sampler Number	Employee	Date	Time In *	TIme Out *
1	L. Cordero	7/14/98	3:40 p	5:40 p
2	J. Cortez			
3	M. Ojeda			
5835	G. Serrano			
1	L. Cordero	7/14/98	6:05 p	7:20 p
2	J. Cortez			
3	M. Ojeda			
5835	G. Serrano			

* Information provided by day shift personnel and subsequently subscribed.

A. Boerner
7/14/98

MSA BZAs
(day shift)

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flux-Kleen Baghouse)

Sampler Number	Employee	Date	Time In *	TIme Out *
1	Lem Cordera	7/15/98	11:40a	12:00p
2	Juan Cortez		↓	↓
3	George Serrano			
8240	Eddie Jordan	7/15/98	11:40a	12:00p
1	Lem Cordera	7/15/98	12:35p	12:50p
2	J. Cortez	↓	↓	↓
3	G. Serrano	↓		
	NOTE: BZAs used during dye test activities. Longest			
	stay times were 35 minutes. Consideration should be given to			
	not using this data since sampling times were so short.			
			G. Boerner	
			7/16/98	

Gillian BZA

* Information provided by day shift personnel and subsequently transcribed.

G. Boerner
7/16/98

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT)
Sample No. 1

Date: 7/13/98

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8240	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.47
Sample End Date: 7/13/98	Time: See above comment	Flow Rate (lpm) 2.54
Total Sample Time (T) in minutes: 191		
Average Flow Rate (F) in liters per minute: 2.50		
Sample Volume (V) = T 191 (min) x F 2.5 (lpm) x 1000 = 477,500 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Carnel Boyd	General Area and Specific Location:
Type of Work Performed: Changing out clean bags in baghouse; placing wire cages inside bags.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT) Date: 7/13/98

Sample No. 2

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8241	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.50
Sample End Date: 7/13/98	Time: See above comment	Flow Rate (lpm) 2.55
Total Sample Time (T) in minutes: 191		
Average Flow Rate (F) in liters per minute: 2.525		
Sample Volume (V) = T 191 (min) x F 2.525 (lpm) x 1000 = 482,275 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Eddie Jordan	General Area and Specific Location:
Type of Work Performed: Changing out clean bags in baghouse; placing wire cages inside bags.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT)
Sample No. 3

Date: 7/13/98

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8242	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.22
Sample End Date: 7/13/98	Time: See above comment	Flow Rate (lpm) 2.27
Total Sample Time (T) in minutes: 191		
Average Flow Rate (F) in liters per minute: 2.25		
Sample Volume (V) = T 191 (min) x F 2.25 (lpm) x 1000 = 429,750 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Ken Schooley	General Area and Specific Location:
Type of Work Performed: Changing out clean bags in baghouse; placing wire cages inside bags.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT) Date: 7/13/98

Sample No. 4

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8243	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.45
Sample End Date: 7/13/98	Time: See above comment	Flow Rate (lpm) 2.56
Total Sample Time (T) in minutes: 191		
Average Flow Rate (F) in liters per minute: 2.51		
Sample Volume (V) = T 191 (min) x F 2.51 (lpm) x 1000 = 479,410 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: Changing out clean bags in baghouse; placing wire cages inside bags.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT) Date: 7/13/98

Sample No. 5

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 1	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.48
Sample End Date: 7/13/98	Time: See above comment	Flow Rate (lpm) 2.48
Total Sample Time (T) in minutes: 325		
Average Flow Rate (F) in liters per minute: 2.48		
Sample Volume (V) = T 325 (min) x F 2.48 (lpm) x 1000 = 806,000 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Lem Cordera	General Area and Specific Location:
Type of Work Performed: Placing wire cages inside clean baghouse bags; removing used bags from hopper.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT) Date: 7/13/98

Sample No. 6

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 2	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.55
Sample End Date: 7/13/98	Time: See above comment	Flow Rate (lpm) 2.47
Total Sample Time (T) in minutes: 325		
Average Flow Rate (F) in liters per minute: 2.51		
Sample Volume (V) = T 325 (min) x F 2.51 (lpm) x 1000 = 815,750 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Juan Cortez	General Area and Specific Location:
Type of Work Performed: Placing wire cages inside clean baghouse bags; removing used bags from hopper.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

COAT SHIFT/ Date: 7/13/98

Sample No. 7

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 3	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.51
Sample End Date: 7/13/98	Time: See above comment	Flow Rate (lpm) 2.53
Total Sample Time (T) in minutes: 325		
Average Flow Rate (F) in liters per minute: 2.52		
Sample Volume (V) = T 325 (min) x F 2.52 (lpm) x 1000 = 819,000 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steffan Govan	General Area and Specific Location:
Type of Work Performed: Placing wire cages inside clean baghouse bags; removing used bags from hopper.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT)

Date: 7/13/98

Sample No. 8

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 5835	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.09
Sample End Date: 7/13/98	Time: See above comment	Flow Rate (lpm) 2.24
Total Sample Time (T) in minutes: 325		
Average Flow Rate (F) in liters per minute: 2.16		
Sample Volume (V) = T 325 (min) x F 2.16 (lpm) x 1000 = 702,000 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: George Serrano	General Area and Specific Location:
Type of Work Performed: Placing wire cages inside clean baghouse bags; removing used bags from hopper.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT)

Date: 7/14/98

Sample No. 13

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 2	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/14/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.51
Sample End Date: 7/14/98	Time: See above comment	Flow Rate (lpm) 2.46
Total Sample Time (T) in minutes: 517		
Average Flow Rate (F) in liters per minute: 2.485		
Sample Volume (V) = T 517 (min) x F 2.485 (lpm) x 1000 = 1,284,745 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Juan Cortez	General Area and Specific Location:
Type of Work Performed: Scraping accumulated baghoused dust from hopper walls; completion of placing wire cages inside new bags on east side of baghouse.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT) Date: 7/14/98

Sample No. 14

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 1	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/14/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.48
Sample End Date: 7/14/98	Time: See above comment	Flow Rate (lpm) 2.50
Total Sample Time (T) in minutes: 517		
Average Flow Rate (F) in liters per minute: 2.49		
Sample Volume (V) = T 517 (min) x F 2.49 (lpm) x 1000 = 1,287,330 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Lem Cordero	General Area and Specific Location:
Type of Work Performed: Scraping accumulated baghoused dust from hopper walls; completion of placing wire cages inside new bags on east side of baghouse.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT) Date: 7/14/98

Sample No. 15

AIR SAMPLING EQUIPMENT

Pump Type: ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 5835	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/14/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.20
Sample End Date: 7/14/98	Time: See above comment	Flow Rate (lpm) 2.14
Total Sample Time (T) in minutes: 517		
Average Flow Rate (F) in liters per minute: 2.17		
Sample Volume (V) = T 517 (min) x F 2.17 (lpm) x 1000 = 1,121,890 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: George Serrano	General Area and Specific Location:
Type of Work Performed: Scraping accumulated baghoused dust from hopper walls; completion of placing wire cages inside new bags on east side of baghouse.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☒ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT) Date: 7/14/98

Sample No. 16

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 3	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/14/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.51
Sample End Date: 7/14/98	Time: See above comment	Flow Rate (lpm) 2.50
Total Sample Time (T) in minutes: 517		
Average Flow Rate (F) in liters per minute: 2.51		
Sample Volume (V) = T 517 (min) x F 2.51 (lpm) x 1000 = 1,297,670 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Marcellina Ojeda	General Area and Specific Location:
Type of Work Performed: Scraping accumulated baghoused dust from hopper walls; completion of placing wire cages inside new bags on east side of baghouse.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT)

Date: 7/15/98

Sample No. 21

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 1	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/15/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.55
Sample End Date: 7/15/98	Time: See above comment	Flow Rate (lpm) 2.52
Total Sample Time (T) in minutes: 35		
Average Flow Rate (F) in liters per minute: 2.54		
Sample Volume (V) = T 35 (min) x F 2.54 (lpm) x 1000 = 88,900 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Lem Cordero	General Area and Specific Location:
Type of Work Performed: Preparation for baghouse dye test.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT) Date: 7/15/98

Sample No. 22

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 2	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/15/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.49
Sample End Date: 7/15/98	Time: See above comment	Flow Rate (lpm) 2.47
Total Sample Time (T) in minutes: 35		
Average Flow Rate (F) in liters per minute: 2.48		
Sample Volume (V) = T 35 (min) x F 2.48 (lpm) x 1000 = 86,800 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Juan Cortez	General Area and Specific Location:
Type of Work Performed: Preparation for baghouse dye test.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT)

Date: 7/15/98

Sample No. 23

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 3	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/15/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.53
Sample End Date: 7/15/98	Time: See above comment	Flow Rate (lpm) 2.50
Total Sample Time (T) in minutes: 35		
Average Flow Rate (F) in liters per minute: 2.52		
Sample Volume (V) = T 35 (min) x F 2.52 (lpm) x 1000 = 88,200 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: George Serrano	General Area and Specific Location:
Type of Work Performed: Preparation for baghouse dye test.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(DAY SHIFT)

Date: 7/15/98

Sample No. 24

AIR SAMPLING EQUIPMENT

Pump Type: ☐ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8240	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/15/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.62 ~~2.54~~ (AB)
Sample End Date: 7/15/98	Time: See above comment	Flow Rate (lpm) 2.62
Total Sample Time (T) in minutes: 15		
Average Flow Rate (F) in liters per minute:		
Sample Volume (V) = T 15 (min) x F 2.62 (lpm) x 1000 = 39,300 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Eddie Jordan	General Area and Specific Location:
Type of Work Performed: Preparation for baghouse dye test.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

Gillian BZAs
(night shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/12/98
Time: 10:30 pm
Circle One: (Pre-shift) Post-shift

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
8240	2.5	1. 2.490	2.466	0.99
		2. 2.477		
		3. 2.430		
8241	2.6	1. 2.484	2.497	0.96
		2. 2.504		
		3. 2.504		
8242	2.3	1. 2.229	2.225	0.97
		2. 2.226		
		3. 2.220		
8243	2.5	1. 2.449	2.447	0.98
		2. 2.451		
		3. 2.442		
8244	2.5	1. 2.453	2.489	1.0
		2. 2.451		
		3. 2.564		

Gillian BZAs
(night shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/13/98
Time: 0920a
Circle One: Pre-shift (Post-shift)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
8240	2.6	1. 2.416	2.543	0.98
		2. 2.616		
		3. 2.597		
8241	2.6	1. 2.612	2.553	0.98
		2. 2.529		
		3. 2.519		
8242	2.3	1. 2.208	2.273	0.99
		2. 2.315		
		3. 2.297		
8243	2.5	1. 2.597	2.565	1.03
		2. 2.505		
		3. 2.594		
8244	- *	1. -	-	-
		2. -	-	-
		3. -	-	-

* BZA was not used during shift.

Gillian BZAs
(Night shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/13/98
Time: 0625 pm
Circle One: (Pre-shift) Post-shift

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
8240	2.6	1. 2.478	2.475	0.95
		2. 2.478		
		3. 2.469		
8241	2.6	1. 2.518	2.517	0.97
		2. 2.518		
		3. 2.515		
8242	2.3	1. 2.216	2.210	0.96
		2. 2.207		
		3. 2.207		
8243	2.5	1. 2.469	2.504	1.00
		2. 2.543		
		3. 2.501		
		1.		
		2.		
		3.		

Gillian BZAs
(night shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/14/98
Time: 7:35a
Circle One: Pre-shift (Post-shift)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
8240	2.6	1. 2.508	2.493	0.96
		2. 2.495		
		3. 2.477		
8241	2.6	1. 2.521	2.521	0.97
		2. 2.513		
		3. 2.528		
8242	2.3	1. 2.246	2.204	0.96
		2. 2.186		
		3. 2.180		
8243	2.5	1. 2.476	2.462	0.98
		2. 2.461		
		3. 2.449		
		1.		
		2.		
		3.		

Gillian B2A
(night shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/14/98
Time: 6:30 p
Circle One: (Pre-shift) Post-shift

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
8240	2.6	1. 2.557	2.542	0.98
		2. 2.539		
		3. 2.530		
8241	2.6	1. 2.531	2.544	0.98
		2. 2.576		
		3. 2.526		
8242	2.3	1. 2.305	2.265	0.98
		2. 2.204		
		3. 2.286		
8243	2.5	1. 2.599	2.515	1.0
		2. 2.504		
		3. 2.442		
..				
		1.		
		2.		
		3.		

Gillian BZAs
(night shift)

BREATHING ZONE AIR MONITORING
(Observed Response vs. Calibrator Response)

Date: 7/15/98
Time: 10:10 a
Circle One: Pre-shift (Post-shift)

Sampler No.	Observed Reading (lpm)	True Reading (lpm)	Average True Flow Rate (lpm)	Cal. Factor (Observed/True)
8240	2.6	1. 2.542	2.517	0.97
		2. 2.478		
		3. 2.530		
8241	2.6	1. 2.601	2.618	1.01
		2. 2.615		
		3. 2.637		
8242	2.2	1. 2.242	2.191	~1.0
		2. 2.187		
		3. 2.144		
8243	2.5	1. 2.548	2.512	1.00
		2. 2.551		
		3. 2.438		
..				
		1.		
		2.		
		3.		

Gillian BZAs
(night shift)

ATTACHMENT 1

Breathing Zone Sampler Flow Rate Check Sheet

Sampler Number	DATE	Flow Rate - Start of Shift (~~cu. cm.~~ liters/minute)	Flow Rate - End of Shift (~~cu. cm.~~ liters/minute)
8240	7/13/98	2.6	2.6
8241	↓	2.6	2.6
8242		2.3	2.3
8243	↓	2.5	2.5
8240	7/13-14/98	2.6	2.6
8241	↓	2.6	2.6
8242		2.3	2.3
8243	↓	2.5	2.5
8240	7/14-15/98	2.6	2.6
8241	↓	2.6	2.6
8242		2.3	2.2
8243	↓	2.5	2.5

Gillian BZAs
(night shift)

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flex-Kleen Baghouse)

Sampler Number	Employee	Date	Time In	TIme Out
8240	Carnel Boyd	7/13/98	1:35am	2:00 am
8241	Eddie Jordan	↓	↓	↓
8242	Ken Schooley			
8243	Milton White			
8240	C. Boyd	7/13/98	2:30 am	3:45 am
8241	E. Jordan	↓	↓	↓
8242	K. Schooley			
8243	M. White			
8240	C. Boyd	7/13/98	4:57a	5:50a
8241	E. Jordan	↓	↓	↓
8242	K. Schooley			
8243	M. White			
8240	C. Boyd	7/13/98	6:35a	7:13a
8241	E. Jordan	↓	↓	7:30a
8242	K. Schooley			7:28a
8243	M. White			7:30a

Gillian BZAs
(night shift)

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flux-Kleen Baghouse)

Sampler Number	Employee	Date	Time In	TIme Out
8240	Carnel Boyd	7/13/98	8:25p	9:25p
8241	Eddie Jordan	↓	↓	↓
8242	Larey Remson	↓	↓	9:22p
8243	ken Schooley	↓	↓	9:25p
8240	C. Boyd	7/13/98	11:05p	11:55p
8241	E. Jordan	↓	10:40p	↓
8242	L. Remson	↓	10:33p	↓
8243	K. Schooley	↓	11:05p	↓
8240	C. Boyd	7/14/98	1:05am	2:05am
8241	E. Jordan	↓	↓	↓
8242	L. Remson	↓	↓	↓
8243	K. Schooley	↓	1:00am	↓
8240	C. Boyd	7/14/98	3:25am	3:40am
8241	E. Jordan	↓	↓	↓
8242	L. Remson	↓	↓	↓
8243	K. Schooley	↓	↓	↓

Gillian BZAs
(night shift)
[continued]

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flux-Kleen Baghouse)

Sampler Number	Employee	Date	Time In	TIme Out
8240	C. Boyd	7/14/98	5:08a	6:00a
8241	E. Jordan	↓	5:05a	↓
8242	L. Remson		5:07a	
8243	K. Schooley	↓	5:10a	↓
8240	C. Boyd	7/14/98	6:40a	7:20a
8241	E. Jordan	↓	↓	↓
8242	L. Remson			
8243	K. Schooley	↓	↓	↓

Gillian BZAD
(night shift)

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flex-Kleen Baghouse)

Sampler Number	Employee	Date	Time In	TIme Out
8240	Carnel Boyd	7/14/98	8:35 p	9:35 p
8241	Eddie Jordan	↓	8:35 p	↓
8242	Larry Remsen	↓	8:35 p	↓
8243	ken Schooley	↓	8:40 p	9:28 p
8240	C. Boyd	7/14/98	10:30 p	11:50 p
8241	E. Jordan	↓	10:30 p	11:50 p
8242	L. Remsen	↓	10:40 p	11:45 p
8243	K. Schooley	↓	10:40 p	11:45 p
8240	C. Boyd	7/15/98	12:50 a	1:50 a
8241	E. Jordan	↓	↓	↓
8242	L. Remsen	↓	↓	↓
8243	K. Schooley	↓	↓	↓
8240	C. Boyd	7/15/98	3:05 a	3:40 a
8241	E. Jordan	↓	2:57 a	↓
8242	L. Remsen	↓	2:57 a	↓
8243	K. Schooley	↓	3:05 a	↓

Gillian BZAs
Cright shift

BREATHING ZONE AIR SAMPLING

Record of Stay Times
(Flex-Kleen Baghouse)

Sampler Number	Employee	Date	Time In	TIme Out
8240	C. Boyd	7/15/98	-	-
8241	E. Jordan		5:53a; 6:42a	6:25a; 7:20 am
8242	L. Remsen		-	-
8243	K. Schooley		6:42a	7:15a
8240	C. Boyd	7/15/98	-	-
8241	E. Jordan		-	-
8242	L. Remsen		-	-
8243	K. Schooley		-	-

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT) Date: 7/13-14/98

Sample No. 9

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8240	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.48
Sample End Date: 7/14/98	Time: See above comment	Flow Rate (lpm) 2.49
Total Sample Time (T) in minutes: ~~268~~ 277 (B)		
Average Flow Rate (F) in liters per minute: 2.48		(B) 686,960
Sample Volume (V) = T ~~268~~ (B) 277 (min) x F 2.48 (lpm) x 1000 = ~~662,160~~		milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Carnel Boyd	General Area and Specific Location:
Type of Work Performed: Removing used bags from hopper and placings bags in nearby roll-off box.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT) Date: 7/13-14/98

Sample No. 10

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8241	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.52
Sample End Date: 7/14/98	Time: See above comment	Flow Rate (lpm) 2.52
Total Sample Time (T) in minutes: 305		
Average Flow Rate (F) in liters per minute: 2.52		
Sample Volume (V) = T 305 (min) x F 2.52 (lpm) x 1000 = 768,600 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Eddie Jordan	General Area and Specific Location:
Type of Work Performed: Removing used bags from hopper and placings bags in nearby roll-off box.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT) Date: 7/13-14/98

Sample No. 11

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8242	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.21
Sample End Date: 7/14/98	Time: See above comment	Flow Rate (lpm) 2.20
Total Sample Time (T) in minutes: 307		
Average Flow Rate (F) in liters per minute: 2.21		
Sample Volume (V) = T 307 (min) x F 2.21 (lpm) x 1000 = 678,470 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Larry Remsen	General Area and Specific Location:
Type of Work Performed: Removing used bags from hopper and placings bags in nearby roll-off box.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT)

Date: 7/13-14/98

Sample No. 12

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8243	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/13/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.50
Sample End Date: 7/14/98	Time: See above comment	Flow Rate (lpm) 2.46
Total Sample Time (T) in minutes: 280		
Average Flow Rate (F) in liters per minute: 2.48		
Sample Volume (V) = T 280 (min) x F 2.48 (lpm) x 1000 = 694,400 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Ken Schooley	General Area and Specific Location:
Type of Work Performed: Removing used bags from hopper and placings bags in nearby roll-off box.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	
Signature: Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT) Date: 7/14-15/98

Sample No. 17

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8240	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/14/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.54
Sample End Date: 7/15/98	Time: See above comment	Flow Rate (lpm) 2.52
Total Sample Time (T) in minutes: 235		
Average Flow Rate (F) in liters per minute: 2.53		
Sample Volume (V) = T 235 (min) x F 2.53 (lpm) x 1000 = 594,550 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Carnel Boyd	General Area and Specific Location:
Type of Work Performed: Scraping accumulated baghouse dust from hopper walls; transporting baghouse dust to roll-off box; re-positioning pipe rack over new bags.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT) Date: 7/14-15/98

Sample No. 18

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8241	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/14/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.54
Sample End Date: 7/15/98	Time: See above comment	Flow Rate (lpm) 2.62
Total Sample Time (T) in minutes: 347		
Average Flow Rate (F) in liters per minute: 2.58		
Sample Volume (V) = T 347 (min) x F 2.58 (lpm) x 1000 = 895,260 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Eddie Jordan	General Area and Specific Location:
Type of Work Performed: Scraping accumulated baghouse dust from hopper walls; transporting baghouse dust to roll-off box; re-positioning pipe rack over new bags.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT)

Date: 7/14-15/98

Sample No. 19

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8242	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/14/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.26
Sample End Date: 7/15/98	Time: See above comment	Flow Rate (lpm) 2.19
Total Sample Time (T) in minutes: 228		
Average Flow Rate (F) in liters per minute: 2.23		
Sample Volume (V) = T 228 (min) x F 2.23 (lpm) x 1000 = 508,440 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Larry Remsen	General Area and Specific Location:
Type of Work Performed: Scraping accumulated baghouse dust from hopper walls; transporting baghouse dust to roll-off box; re-positioning pipe rack over new bags.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner Alex J. Boerner	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(NIGHT SHIFT) Date: 7/14-15/98

Sample No. 20

AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8243	Calibration Due: calibrated pre- and post-shift	
Filter Type: Cellulose CPH-47	Filter Size: 47 mm	Filter Lot No. NA

SAMPLING PARAMETERS

Sample Start Date: 7/14/98	Time: Several in/out times - See supporting documentation	Flow Rate (lpm): 2.5l
Sample End Date: 7/15/98	Time: See above comment	Flow Rate (lpm) 2.5l
Total Sample Time (T) in minutes: 241		
Average Flow Rate (F) in liters per minute: 2.5l		
Sample Volume (V) = T 241 (min) x F 2.5l (lpm) x 1000 = 604,910 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Ken Schooley	General Area and Specific Location:
Type of Work Performed: Scraping accumulated baghouse dust from hopper walls; transporting baghouse dust to roll-off box; re-positioning pipe rack over new bags.	
Work Permit No.: 00010-98	
General Area and Specific Work Location: South of Building D-111 at Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☐ Full Face ☐ Half Face ☑ Other (Dust Mask)	Names of Workers in Area:
Monitoring Conducted by: Alex J. Boerner	Alex J. Boerner

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLE COUNT RECORD

Sample No.	Date/time of Sample	Date/Time of count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Bkg counts	(2) Bkg count time (min)	(3) Bkg count rate (1/2) (cpm)	(4) Sample counts	(5) Sample count time (min)	(6) Sample count rate (4/5) (cpm)	(7) Net sample count rate (6-3) (cpm)	(8) Sample volume (ml)	(9)Airborne radioactivity ((7/eff x2.22E-6)/8)(uCi/ml)
1	7/13/98 (night shift)	7/20/98 1020	Ludlum 2929 #126126	0.31	10	60	0.2	16	60	0.3	0.1	477,500	3.04E-13
2	7/13/98 (night shift)	7/20/98 1120		0.31	10	60	0.2	15	60	0.3	0.1	482,275	3.01E-13
3	7/13/98 (night shift)	7/20/98 1220		0.31	10	60	0.2	18	60	0.3	0.1	429,750	3.38E-13
4	7/13/98 (night shift)	7/20/98 1320		0.31	10	60	0.2	9	60	0.2	0	479,410	0 (<9.40E-13)
5	7/13/98 (day shift)	7/20/98 1420		0.31	10	60	0.2	42	60	0.7	0.5	806,000	9.01E-13
6	7/13/98 (day shift)	7/20/98 1620		0.31	14	60	0.2	66	60	1.1	0.9	815,750	1.60E-12
7	7/13/98 (day shift)	7/21/98 0920		0.312	14	60	0.2	48	60	0.8	0.6	819,000	1.06E-12
8	7/13/98 (day shift)	7/21/98 1025		0.312	14	60	0.2	28	60	0.5	0.3	702,000	6.17E-13
9	7/13-14/98 (night shift)	7/21/98 1125		0.312	14	60	0.2	80	60	1.3	1.1	686,960	2.31E-12
10	7/13-14/98 (night shift)	7/21/98 1310		0.312	14	60	0.2	14	60	0.2	0	768,600	0 (<5.89E-13)

Sample No.	Date/time of Sample	Date/Time of count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Bkg counts	(2) Bkg count time (min)	(3) Bkg count rate (1/2) (cpm)	(4) Sample counts	(5) Sample count time (min)	(6) Sample count rate (4/5) (cpm)	(7) Net sample count rate (6-3) (cpm)	(8) Sample volume (ml)	(9)Airborne radioactivity ((7/eff x2.22E-6)/8)(uCi/ml)
11	7/13-14/98 (night shift)	7/21/98 1410	Ludlum 2929 #126126	0.312	14	60	0.2	22	60	0.4	0.2	678,470	4.26E-13
12	7/13-14/98 (night shift)	7/21/98 1510		0.312	14	60	0.2	15	60	0.3	0.1	694,400	2.08E-13
13	7/14/98 (day shift)	7/21/98 1615		0.312	14	60	0.2	27	60	0.5	0.3	1,284,745	3.37E-13
14	7/14/98 (day shift)	7/22/98 0905		0.31	14	60	0.2	34	60	0.4	0.2	1,287,330	2.26E-13
15	7/14/98 (day shift)	7/22/98 1010		0.31	14	60	0.2	21	60	0.4	0.2	1,121,890	2.59E-13
16	7/14/98 (day shift)	7/22/98 1115		0.31	14	60	0.2	44	60	0.7	0.5	1,297,670	5.60E-13
17	7/14-15/98 (night shift)	7/22/98 1340		0.31	14	60	0.2	18	60	0.3	0.1	594,550	2.44E-13
18	7/14-15/98 (night shift)	7/22/98 1445		0.31	14	60	0.2	15	60	0.3	0.1	895,260	1.62E-13
19	7/14-15/98 (night shift)	7/22/98 1545		0.31	14	60	0.2	14	60	0.2	0	508,440	0 (<8.95E-13)
20	7/14-15/98 (night shift)	7/23/98 0910		0.31	13	60	0.2	53	60	0.9	0.7	604,910	1.68E-12
21	7/15/98 (day shift)	7/23/98 1015		0.31	13	60	0.2	14	60	0.2	0	88,900	0 (<5.12E-12)

Sample No.	Date/time of Sample	Date/Time of count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Bkg counts	(2) Bkg count time (min)	(3) Bkg count rate (1/2) (cpm)	(4) Sample counts	(5) Sample count time (min)	(6) Sample count rate (4/5) (cpm)	(7) Net sample count rate (6-3) (cpm)	(8) Sample volume (ml)	(9)Airborne radioactivity ((7/eff x2.22E-6)/8)(uCi/ml)
22	7/15/98 (day shift)	7/23/98 1145	Ludlum 2929 #126126	0.31	13	60	0.2	10	609	0.2	0	86,800	0 (<5.25E-12)
23	7/15/98 (day shift)	7/23/98 1315		0.31	13	60	0.2	17	60	0.3	0.1	88,200	1.65E-12
24	7/15/98 (day shift)	7/23/98 1415		0.31	13	60	0.2	18	60	0.3	0.1	39,300	3.70E-12

Printed Name:	Alex J. Boerner	counted by R.A. Duff
Signature:	Alex J. Boerner	

Campaign 3

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
TAILGATE SAFETY MEETING DOCUMENTATION

Facility/Location: SMC Newfield		
Date: 9/14/98	Time: 0815	Job Number: 94005.05
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: 12 West Blvd., Newfield, NJ		
Type of Work: Flextkleen baghouse work		
Hazardous/Radioactive Materials Used: Radioactive Materials in baghouse.		

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: Tyvek coveralls, dust mask		
Chemical Hazards: None		
Radiological Hazards: Uranium & Thorium (Natural) w/daughters		
Physical Hazards: Slip, trip, fall		
Emergency Procedures: Exit area, notify supervison & HP technician		
Hospital/Clinic: O	Phone: 254 Night 458 (Guard house) -O	Paramedic Phone: O
Hospital Address		
Special Equipment: BZA samplers		
Other: Hard hat, safety glasses, steel toed boots		

ATTENDEES

NAME (print)	SIGNATURE
STEFFEN E GOVAN	Steffen E Govan
Milton White JR.	Milton White Jr.
LARRY A. BOSTIC	Larry A. Bostic
Tim Chew	Tim Chew
Steven J. Madi	Steven Madi
Ron Merkel	Ron Merkel
Eddie L. Jordan	Eddie L Jordan

Meeting Conducted by: R.A. Duff

Signature: R.A. Duff

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8240	Calibration Due: Daily upon use
Filter Type: F+J CPH-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#05~~ 1

B. SAMPLING PARAMETERS

Sample Start Date:	9-14-98	Time:	8:45 AM	Flow Rate (L/min):	2.532
Sample End Date:	9-14-98	Time:	4:00 PM	Flow Rate (L/min):	2.492

Total Sample Time (T): 525 (Minutes)

Average Flow Rate (F): 2.512 ~~+2.767~~ Rdm (Liters/Minute)

Sample Volume (V) = 525 (min) x F 2.512 (L/min) x 1000 (ml/L) = 1,318,800 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: LARRY Bostic	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse change, Empty hopper.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: Bldg D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N A
Respiratory Protection Used: ~~Disposable Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkl	Signature: Ron Merkl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): X Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8241	Calibration Due: Daily prior to use
Filter Type: F+J CPH-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#01~~ & #2

B. SAMPLING PARAMETERS

Sample Start Date:	9/14/98	Time:	8:45 AM	Flow Rate (L/min):	2.514
Sample End Date:	9/14/98	Time:	4:00 PM	Flow Rate (L/min):	2.468

Total Sample Time (T): 8:45 — 525 (Minutes)

Average Flow Rate (F): 2.491 (Liters/Minute)

Sample Volume (V) = 525 (min) x F 2.491 (L/min) x 1000 (ml/L) = 1,307,775 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Tim Chew	General Area and Specific Location:
Type of Work Performed: Flexkleen baghouse bag change, empty hopper	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number: N/A
General Area and Specific Work Location: Bldg. D111, Flexkleen baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ~~Respirator Particulate Disposable~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature:

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8242	Calibration Due: DAily Prior to use
Filter Type: F+J (PH)-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#02~~ #3

B. SAMPLING PARAMETERS

Sample Start Date:	9-14-98	Time:	8:45 AM	Flow Rate (L/min):	2.190
Sample End Date:	9-14-98	Time:	4:00 PM	Flow Rate (L/min):	2.188

Total Sample Time (T): 525 (Minutes)

Average Flow Rate (F): 2.189 (Liters/Minute)

Sample Volume (V) = 525 (min) x F 2.189 (L/min) x 1000 (ml/L) = 1,149,225 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: STEVEN MADI	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Change, Empty hopper.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: Bldg D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N A
Respiratory Protection Used: ~~Disposable Particulate Respirator~~ no Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature: R Merkel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8243	Calibration Due: Daily Prior to use
Filter Type: F+J CPh-47	Filter Size: 47.M
Filter Lot: N/A	Air Sample Number: ~~#03~~ #4

B. SAMPLING PARAMETERS

Sample Start Date:	9-14-98	Time:	8:45 AM	Flow Rate (L/min):	2.429
Sample End Date:	9-14-98	Time:	4:50 PM	Flow Rate (L/min):	2.439

Total Sample Time (T): 525 (Minutes)

Average Flow Rate (F): 2.434 (Liters/Minute)

Sample Volume (V) = 525 (min) x F 2.434 (L/min) x 1000 (ml/L) = 1,277,850 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Change, Empty hopper	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: Bldg D111 Flex Kleen Bag House	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Disposable Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature:

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): [X] Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily Before use
Filter Type: F+J CPh-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~BOX~~ #5

B. SAMPLING PARAMETERS

Sample Start Date:	9-14-98	Time:	8:45 AM	Flow Rate (L/min):	2.446
Sample End Date:	9-14-98	Time:	4:00 pm	Flow Rate (L/min):	2.410

Total Sample Time (T): 525 (Minutes)

Average Flow Rate (F): 2.428 (Liters/Minute)

Sample Volume (V) = 525 (min) x F 2.428 (L/min) x 1000 (ml/L) = 1,274,700 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Stephan Govan	General Area and Specific Location:
Type of Work Performed: Flexkleen Bag house change, Empty hopper	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: Bldg 111 Flexkleen Bag house.	Type of Operation/Equipment in Area: N A
Respiratory Protection Used: ~~Disposable particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkl	Signature: R Merkl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8240	Calibration Due: Daily Prior to use
Filter Type: F+J CPH-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#05~~ to #6

B. SAMPLING PARAMETERS

Sample Start Date:	9-15-98	Time:	8:50 AM	Flow Rate (L/min):	2.530
Sample End Date:	9-15-98	Time:	1:10	Flow Rate (L/min):	2.404

Total Sample Time (T): 260 (Minutes)

Average Flow Rate (F): 2.467 (Liters/Minute)

Sample Volume (V) = 260 (min) x F 2.467 (L/min) x 1000 (ml/L) = 641,420 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Larry Bostic	General Area and Specific Location:
Type of Work Performed: Flex Kleen Bag house Change, Empty hopper.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 Flex Kleen baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ronny Merkel	Signature:

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8242	Calibration Due: Daily Prior to use
Filter Type: F+J CPH-47	Filter Size: 47 mm.
Filter Lot: N/A	Air Sample Number: ~~#07~~ #7

B. SAMPLING PARAMETERS

Sample Start Date: 9-15-98	Time: 8:50 AM	Flow Rate (L/min): 2.203
Sample End Date: 9-15-98	Time: 4:00 pm	Flow Rate (L/min): 2.189

Total Sample Time (T): 430 (Minutes)

Average Flow Rate (F): 2.196 (Liters/Minute)

Sample Volume (V) = 430 (min) x F 2.196 (L/min) x 1000 (ml/L) = 944,280 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steve Madi	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 Flex Kleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ronn Merkel	Signature: Ronn Merkel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 3243	Calibration Due: Daily Prior to use
Filter Type: ~~N/A~~ RM F+J CPH-47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: # 08

B. SAMPLING PARAMETERS

Sample Start Date:	9-15-98	Time:	8:50 AM	Flow Rate (L/min):	2.494
Sample End Date:	9-15-98	Time:	1:00 PM	Flow Rate (L/min):	2.440

Total Sample Time (T): 4:30 (Minutes)

Average Flow Rate (F): 2.467 (Liters/Minute)

Sample Volume (V) = 430 (min) x F 2.440 (L/min) x 1000 (ml/L) = 1,060,810 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 Flex Kleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature: RMerkel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily Prior to use
Filter Type: FHJ CPH-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: # 09

B. SAMPLING PARAMETERS

Sample Start Date:	9-15-98	Time:	8:50 AM	Flow Rate (L/min):	2.450
Sample End Date:	9-15-98	Time:	4:00 PM	Flow Rate (L/min):	2.421

Total Sample Time (T): 430 (Minutes)

Average Flow Rate (F): 2.4355 (Liters/Minute)

Sample Volume (V) = 430 (min) x F 2.4355 (L/min) x 1000 (ml/L) = 1,047,265 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Stephan Govan	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D14 Flex Kleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ronn Merkl	Signature:

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8241	Calibration Due: Daily Prior to use
Filter Type: F+J CPH-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#01~~ #10

B. SAMPLING PARAMETERS

Sample Start Date:	9-16-98	Time:	8:10 AM	Flow Rate (L/min):	2.543
Sample End Date:	9-16-98	Time:	4:00 PM	Flow Rate (L/min):	2.421

Total Sample Time (T): 470 (Minutes)

Average Flow Rate (F): 2.482 (Liters/Minute)

Sample Volume (V) = 470 (min) x F 2.482 (L/min) x 1000 (ml/L) = 1,166,540 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Tim Chew	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag Change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Respirators Particulate~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Markel	Signature: Ron Markel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.

AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8242	Calibration Due: Daily Prior to use
Filter Type: F+J CPH-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#07~~ #11

B. SAMPLING PARAMETERS

Sample Start Date:	9-16-98	Time:	8:10 AM	Flow Rate (L/min):	2.198
Sample End Date:	9-16-98	Time:	4:00 PM	Flow Rate (L/min):	2.183

Total Sample Time (T): 470 (Minutes)

Average Flow Rate (F): 2.1905 (Liters/Minute)

Sample Volume (V) = 470 (min) x F 2.1905 (L/min) x 1000 (ml/L) = 1,029535 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steve. MAd.	General Area and Specific Location:
Type of Work Performed: Flexkleen Baghouse Bag Removal.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 Flexkleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Particulate Respirators~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Markel	Signature: Ron Markel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8243	Calibration Due: Daily Prior to Use
Filter Type: F+J GPH-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#03 To~~ #12

B. SAMPLING PARAMETERS

Sample Start Date:	9-16-98	Time:	8:10 am	Flow Rate (L/min):	2.455
Sample End Date:	9-16-98	Time:	4:00 pm	Flow Rate (L/min):	2.454

Total Sample Time (T): 470 (Minutes)

Average Flow Rate (F): 2.4545 (Liters/Minute)

Sample Volume (V) = 470 (min) x F 2.4545 (L/min) x 1000 (ml/L) = 1,153,615 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag Removal	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~PARTICULATE RESPIRATORS~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Markel	Signature: Ron Markel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily Prior to use
Filter Type: F+J CPH-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~# 04-10~~ #13

B. SAMPLING PARAMETERS

Sample Start Date:	9-16-98	Time:	8:10 AM	Flow Rate (L/min):	2.430
Sample End Date:	9-16-98	Time:	4:00 PM	Flow Rate (L/min):	2.4105

Total Sample Time (T): 470 (Minutes)

Average Flow Rate (F): 2.4175 (Liters/Minute)

Sample Volume (V) = 470 (min) x F 2.4175 (L/min) x 1000 (ml/L) = 1,136,225 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Stephan GOUAN	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Removal	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 Flex Kleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Particulate Respirators~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkl	Signature: R Merkl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # # 8240	Calibration Due: Daily Prior to use
Filter Type: FLJ CPH 47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#05~~ #14

B. SAMPLING PARAMETERS

Sample Start Date:	9-17-98	Time:	8:00 AM	Flow Rate (L/min):	2.512
Sample End Date:	9-17-98	Time:	4:00 pm	Flow Rate (L/min):	2.537

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.525 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.525 (L/min) x 1000 (ml/L) = 1,211,760 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Larry Bostick	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag Change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 Flex Kleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Mehl	Signature: RMehl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8241	Calibration Due: Daily Prior to use
Filter Type: F+J CPH-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#01~~ #15

B. SAMPLING PARAMETERS

Sample Start Date:	9-17-98	Time:	8:00 AM	Flow Rate (L/min):	2.498
Sample End Date:	9-17-98	Time:	4:00 PM	Flow Rate (L/min):	2.506

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.502 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.502 (L/min) x 1000 (ml/L) = 1,200,960 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Tim Chew	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag Removal.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D11 FlexKleen Baghouse	Type of Operation/Equipment in Area: N A
Respiratory Protection Used: ~~Half Resp~~ Dust Mask	Names of Workers:
Sampling performed by (print): Don Merkel	Signature:

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8242	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47 mm
Filter Lot:	Air Sample Number: ~~#02~~ #16

B. SAMPLING PARAMETERS

Sample Start Date:	9-17-98	Time:	8:00 Am	Flow Rate (L/min):	2.205
Sample End Date:	9-17-98	Time:	~~Or~~ 4:00 pm	Flow Rate (L/min):	2.235

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.220 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.220 (L/min) x 1000 (ml/L) = 1,065,600 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steve Madi	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Removal	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N A
Respiratory Protection Used: ~~Port. Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Markel	Signature: Ron Markel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ~~☐~~ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8243	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~#05~~ #17

B. SAMPLING PARAMETERS

Sample Start Date:	9-17-98	Time:	8:00 AM	Flow Rate (L/min):	~~2.499~~ 2.499 ~~2.438~~
Sample End Date:	9-17-98	Time:	4:00 PM	Flow Rate (L/min):	2-517

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.508 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.508 (L/min) x 1000 (ml/L) = 1,203840 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag change.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D11 FlexKleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Paint Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Mehl	Signature: RMehl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily PRIOR to USE
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~#04~~ #18

B. SAMPLING PARAMETERS

Sample Start Date: 9-17-98	Time: 8:00 AM	Flow Rate (L/min): 2.438	
Sample End Date: 9-17-98	Time: 4:00 PM	Flow Rate (L/min): 2.468	

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.453 (Liters/Minute)

Sample Volume (V) = _____ (min) x F 2.453 (L/min) x 1000 (ml/L) = 1,177,440 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Stephen GOUAN	General Area and Specific Location:
Type of Work Performed: Flexkleen Baghouse Bag Change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 Flexkleen Baghouse	Type of Operation/Equipment in Area: N A
Respiratory Protection Used: ~~Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkl	Signature: R Merkl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8240	Calibration Due: Daily upon use
Filter Type: F+J CHP-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#05~~ #19

B. SAMPLING PARAMETERS

Sample Start Date:	9-18-98	Time:	8:00 am	Flow Rate (L/min):	2.509
Sample End Date:	9-18-98	Time:	4:00 pm	Flow Rate (L/min):	2.574

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.541 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.541 (L/min) x 1000 (ml/L) = 1219920 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Larry Bostick	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D(1) Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Mabe	Signature: Ron Mabe

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8241	Calibration Due: Daily Prior to use
Filter Type: F+J CPH.47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~#07~~ #20

B. SAMPLING PARAMETERS

Sample Start Date:	9-18-98	Time:	8:00 AM	Flow Rate (L/min):	2.512
Sample End Date:	9-18-98	Time:	4:00 PM	Flow Rate (L/min):	2.506

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.509 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.509 (L/min) x 1000 (ml/L) = 1204320 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Tim Chew	General Area and Specific Location:
Type of Work Performed: Flex Klean Baghouse Bag change	Type of Work On-going:
Radiation Work Permit Number: ~~Tim Chew~~	Radiation Work Permit Number:
General Area and Specific Work Location: D117 Bag House	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Mabe	Signature: Ron Mabe

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8242	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~# 02~~ #2)

B. SAMPLING PARAMETERS

Sample Start Date:	9-18-98	Time:	8:00 AM	Flow Rate (L/min):	2.225
Sample End Date:	9-18-98	Time:	4:00 PM	Flow Rate (L/min):	2.258

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.242 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.242 (L/min) x 1000 (ml/L) = 1,075,920 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steve. Madi	General Area and Specific Location:
Type of Work Performed: 1-Flex Kleen Baghouse Bag change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D11 Flex Kleen Bag House	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkl	Signature: Ron Merkl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8243	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~# 035~~ #22

B. SAMPLING PARAMETERS

Sample Start Date:	9-18-98	Time:	8:00 A	Flow Rate (L/min):	2.523
Sample End Date:	9-18-98	Time:	4:00 P	Flow Rate (L/min):	2.520

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.522 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2522 (L/min) x 1000 (ml/L) = 1,210,320 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merke	Signature:

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~#04~~ #23

B. SAMPLING PARAMETERS

Sample Start Date:	9-18-98	Time:	8:00 A	Flow Rate (L/min):	2.478
Sample End Date:	9-18-98	Time:	4:00 P	Flow Rate (L/min):	2.450

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.464 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.464 (L/min) x 1000 (ml/L) = 1,182720 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Stephan Govan	General Area and Specific Location:
Type of Work Performed: Flex Klean Baghouse Bag change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D 111 Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Nuehl	Signature: Ron Nuehl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8240	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~#05~~ #24

B. SAMPLING PARAMETERS

Sample Start Date:	9-23-98	Time:	12:25 AM	Flow Rate (L/min):	2.567
Sample End Date:	9-23-98	Time:	7:45 AM	Flow Rate (L/min):	2.587

Total Sample Time (T): 440 (Minutes)

Average Flow Rate (F): 2.577 (Liters/Minute)

Sample Volume (V) = 440 (min) x F 2.577 (L/min) x 1000 (ml/L) = 1,133,880 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Larry Bostic	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag Removal.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Muhl	Signature: Ron Muhl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 82411	Calibration Due: Daily Prior to use
Filter Type: F+J LPH 47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#01~~ #25

B. SAMPLING PARAMETERS

Sample Start Date:	9-23-98	Time:	12:00 Am	Flow Rate (L/min):	2.544
Sample End Date:	9-23-98	Time:	7:45 Am	Flow Rate (L/min):	2.543

Total Sample Time (T): 465 (Minutes)

Average Flow Rate (F): 2.544 (Liters/Minute)

Sample Volume (V) = 465 (min) x F 2.543 (L/min) x 1000 (ml/L) = 1,182,727 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Tim Chew	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag change out.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number: N/A
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ray Merkel	Signature: for R. Merkel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8247	Calibration Due: Daily Prior to Use
Filter Type: F+J CPH 417	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~# 02~~ #26

B. SAMPLING PARAMETERS

Sample Start Date:	9-23-98	Time:	12:25 A.M.	Flow Rate (L/min):	2.258
Sample End Date:	9-23-98	Time:	7:45 AM	Flow Rate (L/min):	2.252

Total Sample Time (T): 440 (Minutes)

Average Flow Rate (F): 2.255 (Liters/Minute)

Sample Volume (V) = 440 (min) x F 2.255 (L/min) x 1000 (ml/L) = 992,200 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steve Madi	General Area and Specific Location:
Type of Work Performed: Flexkleen Baghouse Bag Change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 Flexkleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Wurld	Signature: For R. Merkel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ~~☐~~ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8243	Calibration Due: Daily upon use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~#03~~ #27

B. SAMPLING PARAMETERS

Sample Start Date:	9-23-98	Time:	12:00 AM	Flow Rate (L/min):	2.565
Sample End Date:	9-23-98	Time:	7:45 AM	Flow Rate (L/min):	2.583

Total Sample Time (T): 465 (Minutes)

Average Flow Rate (F): 2.574 (Liters/Minute)

Sample Volume (V) = 465 (min) x F 2.574 (L/min) x 1000 (ml/L) = 1,196910 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D III Flex Kleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature: For R. Merkel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ~~☐ Breathing Zone~~ ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily Prior to use
Filter Type: F+J CPH47	Filter Size: 47 mm.
Filter Lot: N/A	Air Sample Number: ~~#04~~ #28

B. SAMPLING PARAMETERS

Sample Start Date:	9-23-98	Time:	12:00 A	Flow Rate (L/min):	2.496
Sample End Date:	9-23-98	Time:	7:45 AM	Flow Rate (L/min):	2.512

Total Sample Time (T): 465 (Minutes)

Average Flow Rate (F): 2.504 (Liters/Minute)

Sample Volume (V) = 465 (min) x F 2.504 (L/min) x 1000 (ml/L) = 1,164 360 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Stephan Govan	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Change out	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number: N/A
General Area and Specific Work Location: D-111 BAGhouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ~~Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature: For R. Merkel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8240	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~I-05~~ #29

B. SAMPLING PARAMETERS

Sample Start Date:	9-24-98	Time:	12:00	Flow Rate (L/min):	2.561
Sample End Date:	9-24-98	Time:	2:13	Flow Rate (L/min):	2.581

Total Sample Time (T): 133 (Minutes)

Average Flow Rate (F): 2.571 (Liters/Minute)

Sample Volume (V) = 133 (min) x F 2.571 (L/min) x 1000 (ml/L) = 341,943 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Larry Bostic	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag Removal.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature: For R. Merkel

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 82411	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#01~~ #30

B. SAMPLING PARAMETERS

Sample Start Date:	9-24-98	Time:	12:00 Am	Flow Rate (L/min):	2.519
Sample End Date:	9-24-98	Time:	2:13 Am	Flow Rate (L/min):	2.554

Total Sample Time (T): 133 (Minutes)

Average Flow Rate (F): 2.537 (Liters/Minute)

Sample Volume (V) = 133 (min) x F 2.537 (L/min) x 1000 (ml/L) = 337,421 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Tim Chew	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag change out.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Muhl	Signature: Ron Muhl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8242	Calibration Due: Daily Prior to Use
Filter Type: F+J CPH 417	Filter Size: 47 mm
Filter Lot: NVA	Air Sample Number: ~~#02~~ #31

B. SAMPLING PARAMETERS

Sample Start Date:	9-24-98	Time:	12:00 p.m.	Flow Rate (L/min):	2.271
Sample End Date:	9-24-98	Time:	2:13	Flow Rate (L/min):	2.259

Total Sample Time (T): 133 (Minutes)

Average Flow Rate (F): 2.265 (Liters/Minute)

Sample Volume (V) = 133 (min) x F 2.265 (L/min) x 1000 (ml/L) = 301,245 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steve Madi	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bagchange	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Rahe	Signature: R. Rahe

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8243	Calibration Due: Daily upon use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~# 03 no~~ #32

B. SAMPLING PARAMETERS

Sample Start Date: 9-24-98	Time: 12:00 AM	Flow Rate (L/min): 2.502	
Sample End Date: 9-24-98	Time: 2:13 PM	Flow Rate (L/min): 2.598	

Total Sample Time (T): 133 (Minutes)

Average Flow Rate (F): 2.550 (Liters/Minute)

Sample Volume (V) = 133 (min) x F 2.550 (L/min) x 1000 (ml/L) = 339,150 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: Dill Flex Kleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Muhl	Signature: Ron Muhl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ~~☐ Breathing Zone~~ ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily Prior to use
Filter Type: F+J CPH47	Filter Size: 47 mm.
Filter Lot: W/A	Air Sample Number: ~~#04~~ #33

B. SAMPLING PARAMETERS

Sample Start Date:	9-24-98	Time:	12:00 A	Flow Rate (L/min):	2.439
Sample End Date:	9-24-98	Time:	2:13 A	Flow Rate (L/min):	2.458

Total Sample Time (T): 133 (Minutes)

Average Flow Rate (F): 2.448 (Liters/Minute)

Sample Volume (V) = 133 (min) x F 2.448 (L/min) x 1000 (ml/L) = 325,651 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Stephan Govan	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Change out	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Particulate Respirator~~ Dust mask	Names of Workers:
Sampling performed by (print): Ron Muhl	Signature: Ron Muhl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8241	Calibration Due: Daily Prior to use
Filter Type: F+J LPH 47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#0+5~~ #34

B. SAMPLING PARAMETERS

Sample Start Date:	9-25-98	Time:	12:00 AM	Flow Rate (L/min):	2.521
Sample End Date:	9-25-98	Time:	6:50 PM	Flow Rate (L/min):	2.440

Total Sample Time (T): 410 (Minutes)

Average Flow Rate (F): 2.481 (Liters/Minute)

Sample Volume (V) = 410 (min) x F 2.481 (L/min) x 1000 (ml/L) = 1,017,005 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Tim Chew	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag change out.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number: N/A
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: Dust mask	Names of Workers:
Sampling performed by (print): Ron Mehe	Signature: RMehe

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8247	Calibration Due: Daily Prior to Use
Filter Type: FTJ CPH 417	Filter Size: 47 mm
Filter Lot: NVA	Air Sample Number: ~~#02~~ #35

B. SAMPLING PARAMETERS

Sample Start Date:	9-25-98	Time:	12:40 A	Flow Rate (L/min):	2.213
Sample End Date:	9-25-98	Time:	6:50 A	Flow Rate (L/min):	2.252

Total Sample Time (T): 410 (Minutes)

Average Flow Rate (F): 2.233 (Liters/Minute)

Sample Volume (V) = 410 (min) x F 2.233 (L/min) x 1000 (ml/L) = 915,325 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steve Madi	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bagchange	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merkl	Signature:

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8243	Calibration Due: Daily upon use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~# 03~~ #36

B. SAMPLING PARAMETERS

Sample Start Date: 9-25-98	Time: 12:00 AM	Flow Rate (L/min):	2.526
Sample End Date: 9-25-98	Time: 6:50 ~~pm~~ am	Flow Rate (L/min):	2.579

Total Sample Time (T): 410 (Minutes)

Average Flow Rate (F): 2.553 (Liters/Minute)

Sample Volume (V) = 410 (min) x F 2.553 (L/min) x 1000 (ml/L) = 1,046,525 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Milton White	General Area and Specific Location:
Type of Work Performed: Flex-Kleen Baghouse Bag change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number: N/A
General Area and Specific Work Location: D III Flex-Kleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): Ron Merle	Signature: Ron Merle

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ~~☐ Breathing Zone~~ ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily Prior to use
Filter Type: F+J CPH47	Filter Size: 47 mm.
Filter Lot: W/A	Air Sample Number: ~~#04~~ #37

B. SAMPLING PARAMETERS

Sample Start Date:	9-25-98	Time:	12:00 A	Flow Rate (L/min):	2.483
Sample End Date:	9-25-98	Time:	6:50 ~~pm~~ am	Flow Rate (L/min):	2.513

Total Sample Time (T): 410 (Minutes)

Average Flow Rate (F): 2.498 (Liters/Minute)

Sample Volume (V) = 410 (min) x F 2.498 (L/min) x 1000 (ml/L) = 1,024,180 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Stephan Govan	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Change out	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Mahl	Signature: R Mahl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8240	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~#05~~ #38

B. SAMPLING PARAMETERS

Sample Start Date:	9-28-98	Time:	8:00 AM	Flow Rate (L/min):	2.562
Sample End Date:	9-28-98	Time:	3:00 PM	Flow Rate (L/min):	2.488

Total Sample Time (T): 420 (Minutes)

Average Flow Rate (F): 2.525 (Liters/Minute)

Sample Volume (V) = 420 (min) x F 2.525 (L/min) x 1000 (ml/L) = 1,060,500 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Larry Bostic	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag Removal.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number: N/A
General Area and Specific Work Location: D-111 FlexKleen Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ~~Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Markel	Signature:

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8247	Calibration Due: Daily Prior to Use
Filter Type: F+J CPH 417	Filter Size: 47 mm
Filter Lot: NVA	Air Sample Number: ~~#02~~ #39

B. SAMPLING PARAMETERS

Sample Start Date:	9-28-98	Time:	8:00 am	Flow Rate (L/min):	2.240
Sample End Date:	9-28-98	Time:	3:00 pm	Flow Rate (L/min):	2.261

Total Sample Time (T): 420 (Minutes)

Average Flow Rate (F): 2.201 (Liters/Minute)

Sample Volume (V) = 420 (min) x F 2.201 (L/min) x 1000 (ml/L) = 945210 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steve Madl	General Area and Specific Location:
Type of Work Performed: Flexkleen Baghouse Bagchange	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 Flexkleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Particulate Respirator~~ Dust mask	Names of Workers:
Sampling performed by (print): Ronny Meakel	Signature:

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ~~☐ Breathing Zone~~ ☐ Low Volume General Air ☐ High Volume General Air

Serial #: 8244	Calibration Due: Daily Prior to use
Filter Type: F+J CPH47	Filter Size: 47 mm.
Filter Lot: W1A	Air Sample Number: ~~#04~~ #40

B. SAMPLING PARAMETERS

Sample Start Date:	9-28-98	Time:	~~12:00 AM~~ 8:00 am	Flow Rate (L/min):	2.471
Sample End Date:	9-28-98	Time:	3:00 pm	Flow Rate (L/min):	2.414

Total Sample Time (T): 420 (Minutes)

Average Flow Rate (F): 2.443 (Liters/Minute)

Sample Volume (V) = 420 (min) x F 2.443 (L/min) x 1000 (ml/L) = 1,025,850 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Stephan Govan	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Change out	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: ~~Particulate Respirator~~ Dust Mask	Names of Workers:
Sampling performed by (print): Ron Mehl	Signature: R Mehl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8240	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~I-05~~ #41

B. SAMPLING PARAMETERS

Sample Start Date:	9-29-98	Time:	8:00 AM	Flow Rate (L/min):	2.484
Sample End Date:	9-29-98	Time:	3:30	Flow Rate (L/min):	2.522

Total Sample Time (T): 450 (Minutes)

Average Flow Rate (F): 2.503 (Liters/Minute)

Sample Volume (V) = 450 (min) x F 2.503 (L/min) x 1000 (ml/L) = 1,126,350 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Larry Bostic	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Removal.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 Flex Kleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask ~~Particulate Resp.~~	Names of Workers:
Sampling performed by (print): Ron Merkl	Signature: Ron Merkl

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 82417	Calibration Due: Daily Prior to Use
Filter Type: F+J CPH 417	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#02~~ #42

B. SAMPLING PARAMETERS

Sample Start Date:	9-29-98	Time:	8:00 am	Flow Rate (L/min):	2.262
Sample End Date:	9-29-98	Time:	3:30 pm	Flow Rate (L/min):	2.197

Total Sample Time (T): 450 (Minutes)

Average Flow Rate (F): 2.229 (Liters/Minute)

Sample Volume (V) = 450 (min) x F 2.229 (L/min) x 1000 (ml/L) = 1,003,050 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steve Madi	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag Change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number: N
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: A
Respiratory Protection Used: Particulate Respirator	Names of Workers:
Sampling performed by (print): David R Smith	Signature: For D.R. Smith

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ~~☐ Breathing Zone~~ ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily Prior to use
Filter Type: F+J CPH47	Filter Size: 47 mm.
Filter Lot: W/A	Air Sample Number: ~~#044~~ #43

B. SAMPLING PARAMETERS

Sample Start Date:	9-29-98	Time:	~~12:00~~ PM 8:00 AM	Flow Rate (L/min):	2.421
Sample End Date:	9-29-98	Time:	3:30 ~~A~~ PM	Flow Rate (L/min):	2.434

Total Sample Time (T): 450 (Minutes)

Average Flow Rate (F): 2.427 (Liters/Minute)

Sample Volume (V) = 450 (min) x F 2.427 (L/min) x 1000 (ml/L) = 1,092,375 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Stephan Govan	General Area and Specific Location:
Type of Work Performed: Flex Kleen Baghouse Bag Change out	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number: N/A
General Area and Specific Work Location: D-111 Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: Particulate Respirator	Names of Workers:
Sampling performed by (print): David R. Smith	Signature: For D.R. Smith

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ~~☒~~ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8240	Calibration Due: Daily upon use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: W/A	Air Sample Number: ~~# 03~~ #44

B. SAMPLING PARAMETERS

Sample Start Date:	9-30-98	Time:	8:00 am	Flow Rate (L/min):	2.528
Sample End Date:	9-30-98	Time:	3:45 pm	Flow Rate (L/min):	2.552

Total Sample Time (T): 465 (Minutes)

Average Flow Rate (F): 2.54 ~~2.552~~ (Liters/Minute)

Sample Volume (V) = 465 (min) x F 2.54 (L/min) x 1000 (ml/L) = 1,181,100 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Larry Bostick	General Area and Specific Location:
Type of Work Performed: Flex-Kleen Baghouse Bag change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: Dill Flex-Kleen Baghouse	Type of Operation/Equipment in Area: A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): David R Smith	Signature: David R Smith

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8262	Calibration Due: Daily Prior to use
Filter Type: F+J CPH 47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: ~~#OT~~ #45

B. SAMPLING PARAMETERS

Sample Start Date:	9-30-98	Time:	8:00 AM	Flow Rate (L/min):	2.212
Sample End Date:	9-30-98	Time:	3:45 PM	Flow Rate (L/min):	2.246

Total Sample Time (T): 465 (Minutes)

Average Flow Rate (F): 2.229 (Liters/Minute)

Sample Volume (V) = 465 (min) x F 2.229 (L/min) x 1000 (ml/L) = 1,036,485 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Steve Madi	General Area and Specific Location:
Type of Work Performed: FlexKleen Baghouse Bag change out.	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D111 FlexKleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): David R Smith	Signature: David R Smith

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ~~☒~~ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily when use
Filter Type: F+J CPH 47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: ~~# 03~~ to #46

B. SAMPLING PARAMETERS

Sample Start Date: 9-30-98	Time: 8:00 AM	Flow Rate (L/min): 2.435	
Sample End Date: 9-30-98	Time: 3:45 pm	Flow Rate (L/min): 2.465	
Total Sample Time (T):		465	(Minutes)
Average Flow Rate (F):		2.45	(Liters/Minute)

Sample Volume (V) = ~~465~~ (min) x F 2.45 (L/min) x 1000 (ml/L) = 1,139,250 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: ~~Milton~~ Stephan Govan	General Area and Specific Location:
Type of Work Performed: Flex-Kleen Baghouse Bag change	Type of Work On-going:
Radiation Work Permit Number:	Radiation Work Permit Number:
General Area and Specific Work Location: D III Flex-Kleen Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust Mask	Names of Workers:
Sampling performed by (print): David R Smith	Signature: David R Smith

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

AIR SAMPLE COUNT RECORD

Site/Location: Site-SMC Newfield Counted @ IEM Knoxville	Project No.: 94005.05
Emission Type (check): ☒ α ☐ β ☐ β/γ	Instrument Model/Serial No.: Ludlum Model 2929 #126129

Sample Number & Description	Date & Time of Sample Collection	Date and Time of Count	Instrument Efficiency (c/d) %	Background Counts	Background Count Time (min)	Background Rate (cpm)	Sample Gross Counts	Sample Count Time (min)	Sample Gross Rate (cpm)	Net Sample Rate[a] (cpm)	Sample Volume (ml)[b]	Activity Conc. (μCi/ml)[c]	MDA[d] (dpm)
1-Bostic	9/14/98 1600	9/29/98 1245	33.3	24	60	0.4	18	60	0.3	0	1,318,800	0	1.4
2-Chew		9/29/98 1400	33.3	24		0.4	26	60	0.4	0	1,307,775	0	1.4
3-Mad:		9/29/98 1145	33.3	24		0.4	20	60	0.3	0	1,149,225	0	1.4
4-White		9/29/98 1045	33.3	24		0.4	29	60	0.5	0.1	1,277,850	1.1×10^{-13}	1.4
5-Govan	9/ ↓	9/28/98 1415	33.4	22		0.4	25	60	0.4	0	1,274,700	0	1.2
6-Bostic	9/15/98 1310	9/30/98 0830	33.3	25		0.4	16	60	0.3	0	641,420	0	1.4
7-Mad:	9/15/98 1600	9/30/98 0930	33.3	25		0.4	15	60	0.3	0	944,280	0	1.4
8-White		10/1/98 0830	33.3	18		0.3	22	60	0.4	0.1	1,060,810	1.3×10^{-13}	1.1
9-Govan	↓	9/30/98 1030	33.3	~~0.4~~ 25 no		0.4	12	60	0.2	0	1,047,265	0	1.4
10-Chew	9/16/98 1600	10/1/98 0930	33.3	18		0.3	10	60	0.2	0	1,166,540	0	1.1
11-Mad:		10/1/98 1030	33.3	18		0.3	24	60	0.4	0.1	1,029,535	1.3×10^{-13}	1.1
12-White		10/1/98 1130	33.3	18		0.3	31	60	0.5	0.2	1,153,615	2.3×10^{-13}	1.1
13-Govan	↓	10/1/98 1300	33.3	18		0.3	36	60	0.6	0.3	1,136,225	3.6×10^{-13}	1.1
14 Bostic	9/17/98 1600	10/2/98 0845	33.4	17		0.3	17	60	0.3	0	1,211,760	0	1.1
15-Chew		10/2/98 0945	33.4	17		0.3	23	60	0.4	0.1	1,200,960	1.1×10^{-13}	1.1
16-Mad:	↓	10/2/98 1100	33.4	17	↓	0.3	15	60	0.3	0	1,065,600	0	1.1

[a] Net Sample Count Rate = Sample Gross Count Rate - Background Count Rate

[b] From Attachment 3 of this RSP (Air Sampling Data Sheet)

[c] Net Sample Count Rate ÷ $2.22 \times 10^6 \times V \times$ Efficiency

[d] $$MDA = \frac{2.71 + 4.65\sqrt{B_R\, t}}{t \text{ eff} \frac{A}{100}}$$

Health Physics Technician: _____

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLE COUNT RECORD

Site/Location: Site - SMC Newfield Counted @ IEM Knoxville	Project No.: 94005.05
Emission Type (check): ☒ α ☐ β ☐ β/γ	Instrument Model/Serial No.: Ludlum Model 2929 #126129

Sample Number & Description	Date & Time of Sample Collection	Date and Time of Count	Instrument Efficiency (c/d) ε	Background Counts	Background Count Time (min)	Background Rate (cpm)	Sample Gross Counts	Sample Count Time (min)	Sample Gross Rate (cpm)	Net Sample Rate[a] (cpm)	Sample Volume (ml)[b]	Activity Conc. (μCi/ml)[c]	MDA[d] (dpm)
17 - White	9/17/98 1600	10/2/98 1200	33.4	17	60	0.3	41	60	0.7	0.4	1,203,840	4.5×10^{-13}	1.1
18 - Govan	↓	10/2/98 1315	33.4	17	↓	0.3	13	60	0.2	0	1,177,440	0	1.1
19 - Bostick	9/18/98 1600	10/5/98 0830	33.2	19		0.3	26	60	0.4	0.1	1,219,920	1.1×10^{-13}	1.1
20 - Chew	↓	10/5/98 0930	33.2	19		0.3	29	60	0.5	0.2	1,204,320	2.3×10^{-13}	1.1
21 - Madi		10/5/98 1030	33.2	19		0.3	40	60	0.7	0.4	1,075,920	5.0×10^{-13}	1.1
22 - White		10/5/98 1145	33.2	19		0.3	35	60	0.6	0.3	1,210,320	3.4×10^{-13}	1.1
23 - Govan	↓	10/5/98 1320	33.2	19		0.3	46	60	0.8	0.5	1,182,720	5.7×10^{-13}	1.1
24 - Bostic	9/23/98 0745	10/5/98 1420	33.2	19		0.3	28	60	0.5	0.2	1,133,880	2.4×10^{-13}	1.1
25 - Chew		10/5/98 1520	33.2	19		0.3	16	60	0.3	0	1,182,727	0	1.1
26 - Madi		10/5/98 1630	33.2	19		0.3	24	60	0.4	0.1	992,200	1.4×10^{-13}	1.1
27 - White		10/6/98 0830	33.1	22		0.4	16	60	0.3	0	1,196,910	0	1.3
28 - Govan	↓	10/6/98 0930	33.1	22		0.4	17	60	0.3	0	1,164,360	0	1.3
29 - Bostic	9/24/98 0213	10/6/98 1030	33.1	22		0.4	12	60	0.2	0	341,943	0	1.3
30 - Chew		10/6/98 1130	33.1	22		0.4	14	60	0.2	0	337,421	0	1.3
31 - Madi		10/6/98 1300	33.1	22		0.4	32	60	0.5	0.1	301,245	4.5×10^{-13}	1.3
32 - White	↓	10/6/98 1400	33.1	22	↓	0.4	15	60	0.3	0	339,150	0	1.3

[a] Net Sample Count Rate = Sample Gross Count Rate - Background Count Rate
[b] From Attachment 3 of this RSP (Air Sampling Data Sheet)
[c] Net Sample Count Rate ÷ $2.22 \times 10^6 \times V \times$ Efficiency

[d] $$MDA = \frac{2.71 + 4.65\sqrt{B_R\, t}}{t\ eff \frac{A}{100}}$$

Health Physics Technician: _____

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

AIR SAMPLE COUNT RECORD

Site/Location: Site - SMC Neufield counted @ IEM Knoxville	Project No.: 94005.05
Emission Type (check): ☒ α ☐ β ☐ β/γ	Instrument Model/Serial No.: Ludlum Model 2929 #126129

Sample Number & Description	Date & Time of Sample Collection	Date and Time of Count	Instrument Efficiency (c/d) %	Background Counts	Background Count Time (min)	Background Rate (cpm)	Sample Gross Counts	Sample Count Time (min)	Sample Gross Rate (cpm)	Net Sample Rate[a] (cpm)	Sample Volume (ml)[b]	Activity Conc. (μCi/ml)[c]	MDA[d] (dpm)
33 Govan	9/24/98 0213	10/6/98 1500	33.1	22	60	0.4	28	60	0.5	0.1	325,651	4.2×10^{-13}	1.3
34 Chew	9/25/98 0650	10/6/98 1460	33.1	22	↓	0.4	26	60	0.4	0	1,017,005	0	1.3
35 Madi	↓	10/6/98 1700	33.1	22	↓	0.4	20	60	0.3	0	915,325	0	1.3
36 White	↓	10/7/98 0930	33.2	19	↓	0.3	29	60	0.5	0.2	1,046,529	2.6×10^{-13}	1.1
37 Govan	↓	10/7/98 0930	33.2	19	↓	0.3	27	60	0.5	0.2	1,024,180	2.6×10^{-13}	1.1
38 Bostic	9/28/98 1500	10/7/98 1030	33.2	19	↓	0.3	27	60	0.5	0.2	1,060,500	2.6×10^{-13}	1.1
39 Madi	↓	10/7/98 1130	33.2	19	↓	0.3	28	60	0.5	0.2	945,210	2.9×10^{-13}	1.1
40 Govan	↓	10/7/98 1300	33.2	19	↓	0.3	18	60	0.3	0	1,025,850	0	1.1
41 Bostic	9/29/98 1530	10/7/98 1400	33.2	19	↓	0.3	15	60	0.3	0	1,126,350	0	1.1
42 Madi	↓	10/7/98 1500	33.2	19	↓	0.3	10	60	0.2	0	1,003,050	0	1.1
43 Govan	↓	10/7/98 1600	33.2	19	↓	0.3	25	60	0.4	0.1	1,092,375	1.2×10^{-13}	1.1
44 Bostic	9/30/98 1545	10/7/98 1700	33.2	19	↓	0.3	13	60	0.2	0	1,181,100	0	1.1
45 Madi	↓	10/8/98 0830	33.3	22	↓	0.4	23	60	0.4	0	1,036,485	0	1.4
46 Govan	↓	10/8/98 0930	33.3	22	↓	0.4	20	60	0.3	0	1,139,250	0	1.4

[a] Net Sample Count Rate = Sample Gross Count Rate - Background Count Rate

[b] From Attachment 3 of this RSP (Air Sampling Data Sheet)

[c] Net Sample Count Rate ÷ $2.22 \times 10^6 \times V \times$ Efficiency

[d] $$MDA = \frac{2.71 + 4.65\sqrt{B_R\, t}}{t\ eff \frac{A}{100}}$$

Health Physics Technician: _____

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Appendix I - Records from Special Project 2 and 3

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
TAILGATE SAFETY MEETING

Facility: SMC Newfield		
Date: 8/3/98	Time:	Job Number: 9405.05
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: West Blvd., Newfield, NJ		
Type of Work: Excavation of lagoon soils, work in D102		
Hazardous/Radioactive Materials Used: None hazardous, U/Th in slag		

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: Hard hat, steel toes, safety glasses		
Chemical Hazards: None		
Radiological Hazards: U & Th in some slag		
Physical Hazards: Heavy Equipment, excavation, pressure washing.		
Emergency Procedures: Notify guard @ front gate / Dave Smith ~~Jim~~ or Jim Valent. Exit area.		
Hospital/Clinic:	Phone:	Paramedic Phone: Call guard shack
Hospital Address		
Special Equipment: Breathing zone air samplers.		
Other: None		

ATTENDEES

NAME PRINTED	SIGNATURE
Brian Taylor	
Rob Bennett	

Meeting Conducted by: R. A. DuFF

Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 8/3/98 Sample # 1

AIR SAMPLING EQUIPMENT

Pump Type: ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8241	Calibration Due: Daily	
Filter Type: F&J CPH-47	Filter Size: 47mm	Filter Lot No. N/A

SAMPLING PARAMETERS

Sample Start Date: 8/3/98	Time: 0820	Flow Rate (lpm): 2.483
Sample End Date: 8/3/98	Time: 1515	Flow Rate (lpm) 2.449

Total Sample Time (T) in minutes: 415

Average Flow Rate (F) in liters per minute: 2.466

Sample Volume (V) = T 415 (min) x F 2.466 (lpm) x 1000 = 1,023,390 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Brian Taylor	General Area and Specific Location: N/A
Type of Work Performed: ~~Excavation by lagoons~~ Cleaning up in D102	
Work Permit No.:	
General Area and Specific Work Location: SMC New Field - D102 Steel washdown area.	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☒ None ☐ Full Face ☐ Half Face ☐ Other	Names of Workers in Area:

Monitoring Conducted by: R.A. Duff

Signature: [signature]

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 8/3/98 Sample #2

AIR SAMPLING EQUIPMENT

Pump Type: ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8240	Calibration Due: Daily	
Filter Type: F+J CPH-47	Filter Size: 47mm	Filter Lot No. N/A

SAMPLING PARAMETERS

Sample Start Date: 8/3/98	Time: ~~0840~~ 0900	Flow Rate (lpm): 2.548
Sample End Date: 8/3/98	Time: 1515	Flow Rate (lpm) 2.485
Total Sample Time (T) in minutes: 375		
Average Flow Rate (F) in liters per minute: 2.517		
Sample Volume (V) = T 375 (min) x F 2.517 (lpm) x 1000 = 943,875 milliliters		

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Rob Bennett	General Area and Specific Location: N/A
Type of Work Performed: Excavation of soil by lagoon	
Work Permit No.:	
General Area and Specific Work Location: SMC Newfield / by lagoons	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☒ None ☐ Full Face ☐ Half Face ☐ Other	Names of Workers in Area:
Monitoring Conducted by:	
Signature:	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 8/4/98

Sample #3

AIR SAMPLING EQUIPMENT

Pump Type: ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air		
Serial No: 8240	Calibration Due: Daily	
Filter Type: F+J CPH-47	Filter Size: 47 mm	Filter Lot No. N/A

SAMPLING PARAMETERS

Sample Start Date: 8/4/98	Time: 0730	Flow Rate (lpm): 2.484
Sample End Date: 8/4/98	Time: 1330	Flow Rate (lpm) 2.432

Total Sample Time (T) in minutes: 360

Average Flow Rate (F) in liters per minute: 2.458

Sample Volume (V) = T 360 (min) x F 2.458 (lpm) x 1000 = 884,880 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Rob Bennett	General Area and Specific Location:
Type of Work Performed: Excavation of soil by lagoon	
Work Permit No.:	N/A
General Area and Specific Work Location: SMC Newfield / By lagoons	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☒ None ☐ Full Face ☐ Half Face ☐ Other	Names of Workers in Area:

Monitoring Conducted by: R.A. Duff

Signature: [signature]

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
PUMP FLOW RATE VERIFICATION

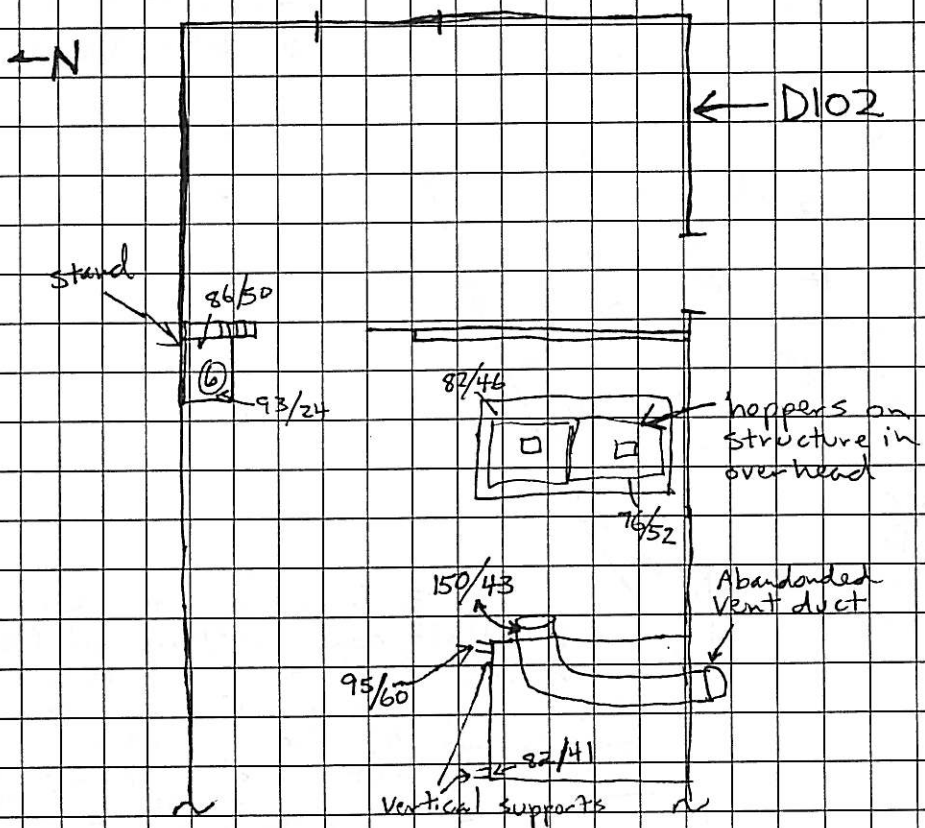
Sampler Number	DATE	Flow Rate - Start of Shift (cu. cm./minute)	Flow Rate - End of Shift (cu. cm./minute)	Initials
8240	8/3/98	2.483	2.449	[illegible]
8241	8/3/98	2.548	2.485	[illegible]
8240	8/4/98	2.484	2.432	[illegible]

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number 080398-004 Page 1 of 1

Instrument/SN: Ludlum Model 2224 # 125607	Calibration Due: 1/16/99	Site Name: SMC - Newfield	Date: 8/3/98 / Time: 1640
Instrument/SN Eberline SAC-4 #868	Calibration Due: 3/30/99	Location: Bldg. D102	
Instrument/SN	Calibration Due:	Purpose: Determine contamination levels on equipment	
Survey Performed By (Print): R.A. Duff		Survey Performed By (Signature):	
☒ Battery Check OK	☒ Source Check OK	Grid Dimensions: N/A x ☐ meters ☐ feet ☐ inches ☐ centimeters	

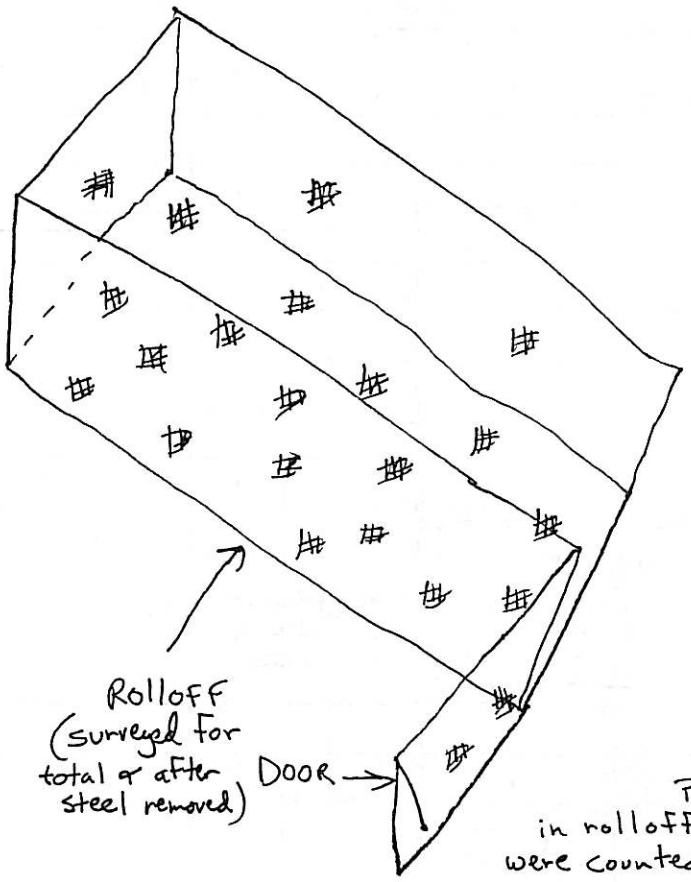
	Survey Results		
	Location	Units +	Units +



Notes: (#) - denotes Smear location
Conducted contamination surveys of equipment proposed to be taken apart. All equipment had ~ 1/2" of dust on horizontal surfaces. Numbers shown above represent direct reading in cpm for the 1ST number. The second number represents the direct or reading in cpm after removing the 1/2" of dust.

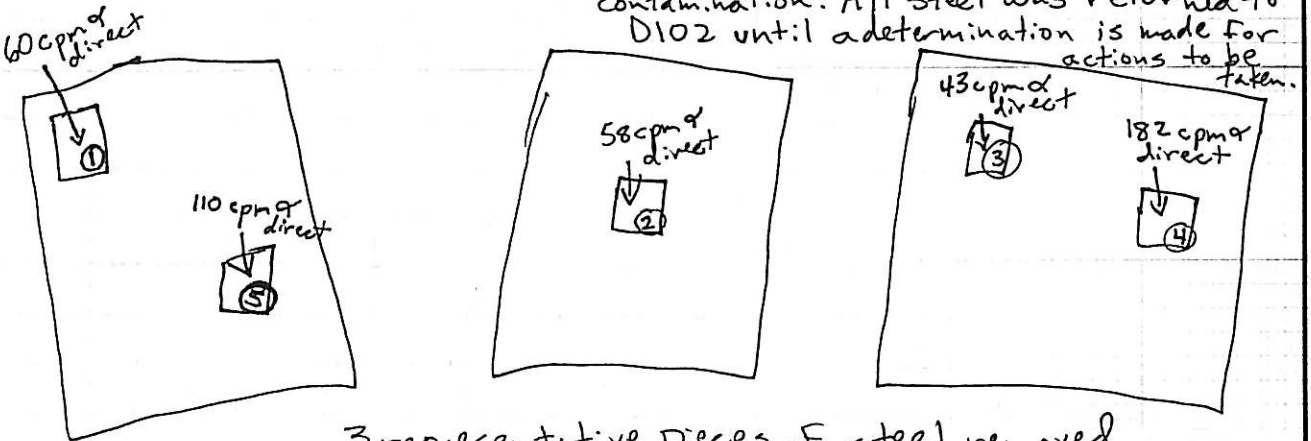
IEM
Integrated Environmental Management, Inc.

Project No:	94005.05	Page	1 of 1
Subject:	Survey of rolloff & steel by D102		
Performed by:	R.A. Duff	Date:	8/3/98
Checked by:		Date:	



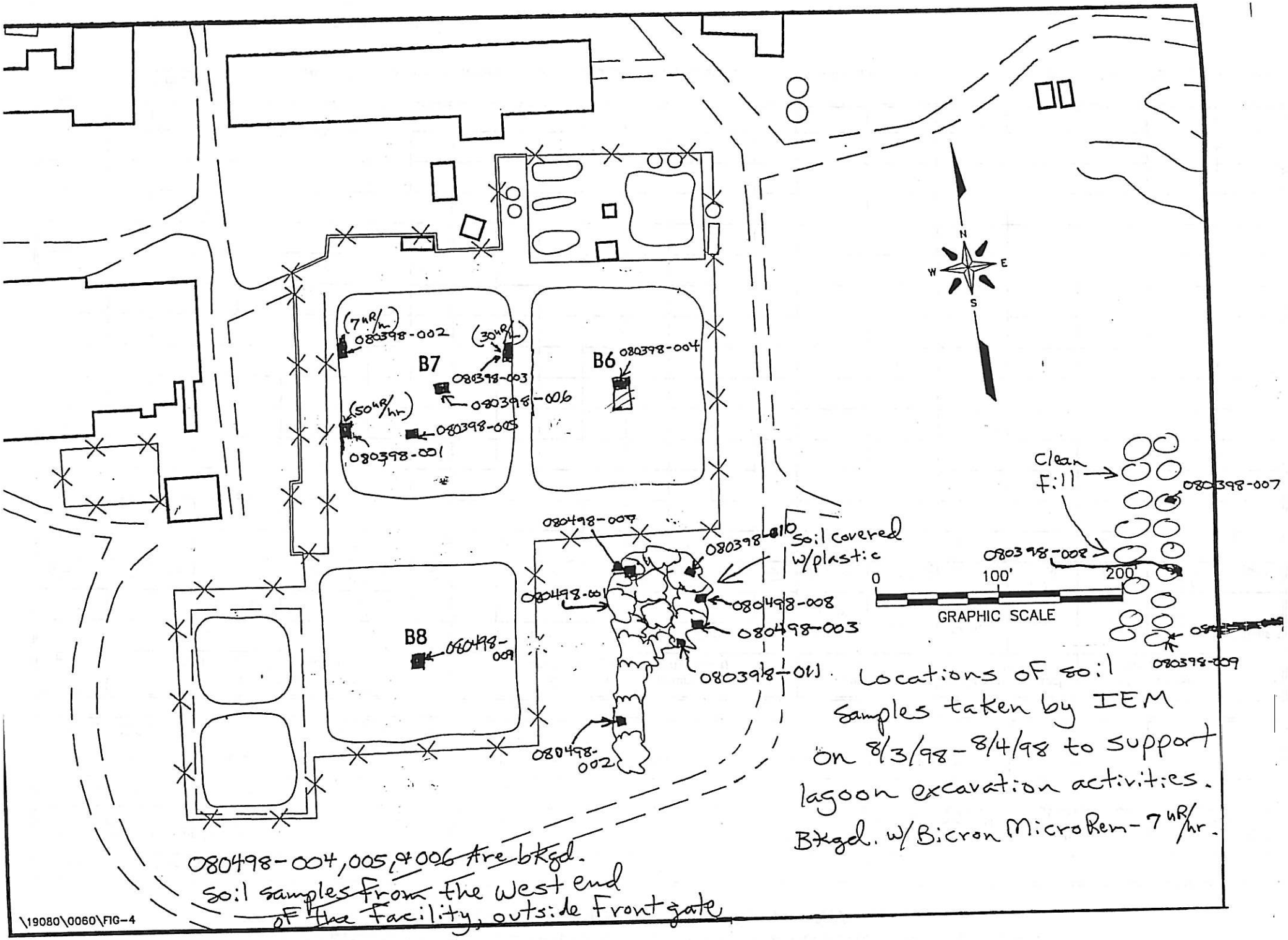
#- denotes surveyed by direct frisk w/ no detectable α.

Performed α scan of steel pieces in rolloff container. Areas noted below were counted w/model 2224 for 1 min. & then each area was smeared for removable contamination. All steel was returned to D102 until a determination is made for actions to be taken.



3 representative pieces of steel removed from rolloff container

(#) denotes smear location



Locations of soil samples taken by IEM on 8/3/98-8/4/98 to support lagoon excavation activities. Bkgd. w/ Bicron MicroRem - 7 uR/hr.

080498-004, 005, & 006 ~~Are~~ bkgd. soil samples ~~from~~ the West end of the facility, outside Front gate.

\19080\0060\FIG-4

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.05	Detector			Meter		
Site Location/Background Location: SMC New Field / HP office	Type: Ludlum 43-89	Serial No. 132117	Probe Area (cm^2) 100	Type: Ludlum 2224	Serial No: 125607	Operating Voltage: 0.8 kV
Check Source No: 3785	Check Source No:			Check Source No:		
Radionuclide: Th-230 / Activity: 6500 dpm / Date: 09/18/91	Radionuclide:	Activity:	Date:	Radionuclide:	Activity:	Date:

Date	Start of Shift Background (cpm for a 1 minute count)								End of Shift Background (cpm for a 1 minute count)								Daily Source Check (α)		Daily Source Check (β)		MDA** - Scaler Mode (dpm)		Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	α	β	
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.							
8/3/98	1	0	0	0	← N/A →				0	1	0	0	← N/A →				1148	17.7%	N/A	N/A	41	N/A	MD
8/4/98	0	1	0	0	← N/A →				0	0	0	0	← N/A →				1162	17.9%	N/A	N/A	41	N/A	MD

** $MDA = \frac{2.71 + 4.65\sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$, where MDA = the activity level (dpm/100 cm^2), BKG_{avg} = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm^2).

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.05	Detector			Meter 3/30/98		
Site Location/Background Location: SMC Newfield / HP Office	Type: ←	Serial No. N/A →	Probe Area (cm^2)	Type: Eberline SAC-4	Serial No: 868	Operating Voltage: 750
Check Source No: 3785	Check Source No:			Check Source No:		
Radionuclide: Th-230 / Activity: 6500 dpm / Date: 09/18/91	Radionuclide:	Activity:	Date:	Radionuclide:	Activity:	Date:

Date	Start of Shift Background (cpm for a 50 minute count)								End of Shift Background (cpm for a 50 minute count)								Daily Source Check (α)		Daily Source Check (β)		MDA** - Scaler Mode (dpm)		Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	Eff.	Source (cpm)	Eff.	α	β	
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.							
8/3/98	←		→	2.1	←	N/A	→		←		→	2.0	←	N/A	→		1984	30.5%	N/A	N/A	~~3.1~~ 3.3	N/A	NO
8/4/98	←		→	2.0	←	N/A	→		←		→	2.0	←	N/A	→		1992	30.6%	N/A	N/A	3.2	N/A	NO

** $MDA = \frac{2.71 + 4.65\sqrt{BKG_{avg} \times t}}{t \times E \times \frac{A}{100}}$, where MDA = the activity level (dpm/100 cm^2), BKG_{avg} = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm^2).

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
EXPOSURE RATE SURVEY INSTRUMENT DATA SHEET

Project No. 94005.05	Detector		Meter	last Cal 4/1/98	
Site Location/Background Location SMC Newfield / HP Office	Type: N/A	N/A Serial No.	Type: Bicron Micro Rem	Serial No: B296 W	Operating Voltage: OK

Check Source Number 3788	Radionuclide: Cs-137	Calibration Activity and Date: 1.24 uCi 9/12/91

Date	Units	Start of Shift Background				End of Shift Background				Daily Response (μR/hr)	Initials
		1	2	3	Avg.	1	2	3	Ave.		
8/3/98	uRem	5	4	5	5	5	5	5	5	800	[initials]

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

SAMPLE COUNT RECORD

Sample No./Location	Date/Time Collected	Date/Time of Count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Avg. Daily Bkg. Rate (cpm)	(2) Sample counts	(3) Sample count time (min)	(4) Net Sample count rate (2÷3 - 1) cpm	(5) dpm (4 ÷ Eff)	MDA
1 D102 "chamber" Steel in roll off	8/3/98 1400	8/3/98 1630	Eberline SAC-4 #868	30.5%	2.1	2	1	0	0	31
2						2	1	0	0	
3						4	1	2	7	
4						3	1	1	3	
5						2	1	0	0	
6 D102 / Metal Stand	8/3/98 1640	8/3/98 1700				22	1	20	66	31

Printed Name: (R.A. DUFF)	Project No.: 94005.05	Notes:
Signature:	Project Location: SMC Newfield.	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLE COUNT RECORD

Sample No.	Date/time of Sample	Date/Time of count	Inst. Model and Serial No.	Inst. Efficiency (c/d)	(1) Bkg counts	(2) Bkg count time (min)	(3) Bkg count rate (1/2) (cpm)	(4) Sample counts	(5) Sample count time (min)	(6) Sample count rate (4/5) (cpm)	(7) Net sample count rate (6-3) (cpm)	(8) Sample volume (ml)	(9)Airborne radioactivity ((7/eff x2.22E+6)/8)(uCi/ml)
1	8/3/98 1515	8/10/98 1110	Ludlum 2929 #126126	31.6%	15	60	0.3	10	60	0.2	0	1,023,390	$< 5.3 \times 10^{-13}$
2	8/3/98 1515	8/10/98 1300	↓	↓	↓	↓	↓	16	↓	0.3	0	943,875	~~$< 5.7 \times 10^{-13}$~~
3	8/4/98 1338	8/10/98 1400	↓	↓	↓	↓	↓	13	↓	0.2	0	884,480	$< 6.1 \times 10^{-13}$
							$MDA_{(dpm)} = \frac{2.71 + 4.65\sqrt{bkgd \times t}}{t \times eff \times A/100}$				$\frac{2.71 + 4.65\sqrt{0.3 \times 60}}{60 \times 0.316}$		$= 1.2$ dpm

Printed Name: R. A. Duff

Signature: [signature]

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RELEASE SURVEY DOCUMENTATION

Survey Number 080398-03

Instrument/SN: Ludlum Model 2224 # 125607	Calibration Due: 1/16/99	Site Name: Shieldalloy - Newfield	
Instrument/SN	Calibration Due:	Location of Equipment/Personnel to be Released: Immediatly south of Bldg. D-102	
Instrument/SN	Calibration Due:	Reason for Release Survey: Survey of various steel removed from D102	
☒ Battery Check OK	☒ Source Check OK	☒ HV Check OK	☐ Other (specify):

Radionuclide (s): U+Th	Release Criteria: ☐ Background (indistinguishable) ☒ Other (specify): SMB-7 43 600 dpm/100cm²	Basis for Release Criteria: ☒ Procedure No. (specify): RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached ☐ NUREG-1500 ☐ Other (specify):	
Background Data: 0 cpm	Efficiency Data: 17.7%	Scan Speed: ☐ Calculation Attached	Action Level (cpm, stationary): (1 min count) ☐ Calculation Attached 106 cpm (600dpm)

Results

With the exception of items listed on the right, the following materials, equipment and personnel were surveyed and meet the criteria for release:

Surveyed direct or of approx. 200 misc. pieces of steel removed from the D-102, primarily structural steel, piping, etc. No detectable alpha was noted. Items were ~~to~~ loaded onto truck for removal from site.

☐ Continuation Sheet Attached

Item/Person	Initial Level of Contamination (include units)	Action Taken	Final Level of Contamination (include units)

Notes, Calculations, Drawings, etc.

☐ Continuation Sheet Attached

Survey performed by (print): R.A. Duff	Signature: R.A. Duff	Date: 8/3/98
RSO Approval (print): R.A. Duff	Signature: R.A. Duff	Date: 8/3/98

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Outreach Laboratory

311 North Aspen
Broken Arrow, Ok 74012
(918) 251-2515
FAX (918) 251-0008

RECEIVED 9/19/98

PROJECT NO: 980715
CLIENT: IEM, Inc
CLIENT PROJECT: 94005.05
DATE SUBMITTED: 5-Aug-98
DATE REPORTED: 13-Aug-98

		PARAMETER	METHOD	ACTIVITY pCi/g			MDA
LAB ID:	980715-01	K-40	HASL 300	4.8	+/-	5.9	9.6
CLIENT ID:	080398-001	Tl-208	HASL 300	13.1	+/-	1.8	5.5
DATE:	8/3/98	Pb-212	HASL 300	37.2	+/-	2.9	2.0
MATRIX:	soil	Pb-214	HASL 300	4.5	+/-	1.9	2.8
WEIGHT:	526	Bi-212	HASL 300	18.1	+/-	6.1	7.9
		Bi-214	HASL 300	3.7	+/-	1.4	2.0
		Ac-228	HASL 300	35.9	+/-	5.4	6.0
		Th-234	HASL 300	6.7	+/-	8.0	10.0
		Pa-234	HASL 300	1.1	+/-	2.3	4.0
LAB ID:	980715-02	K-40	HASL 300	3.8	+/-	2.1	2.1
CLIENT ID:	080398-002	Tl-208	HASL 300	0.3	+/-	0.2	0.2
DATE:	8/3/98	Pb-212	HASL 300	1.9	+/-	2.5	4.1
MATRIX:	soil	Pb-214	HASL 300	0.8	+/-	0.4	0.5
WEIGHT:	1178	Bi-212	HASL 300	2.1	+/-	1.2	1.5
		Bi-214	HASL 300	0.8	+/-	0.4	0.5
		Ac-228	HASL 300	1.2	+/-	0.6	0.8
		Th-234	HASL 300	2.1	+/-	1.8	2.8
		Pa-234	HASL 300	0.2	+/-	0.4	1.0
LAB ID:	980715-03	K-40	HASL 300	3.3	+/-	3.3	5.3
CLIENT ID:	080398-003	Tl-208	HASL 300	10.4	+/-	1.4	0.6
DATE:	8/3/98	Pb-212	HASL 300	35.0	+/-	1.5	1.2
MATRIX:	soil	Pb-214	HASL 300	7.9	+/-	1.4	1.8
WEIGHT:	944	Bi-212	HASL 300	20.0	+/-	5.3	5.1
		Bi-214	HASL 300	6.5	+/-	1.5	2.8
		Ac-228	HASL 300	32.3	+/-	3.4	3.0
		Th-234	HASL 300	22.0	+/-	3.8	5.2
		Pa-234	HASL 300	2.3	+/-	2.0	3.2
LAB ID:	980715-04	K-40	HASL 300	2.5	+/-	1.9	2.4
CLIENT ID:	080398-004	Tl-208	HASL 300	0.1	+/-	0.1	0.2
DATE:	8/3/98	Pb-212	HASL 300	0.1	+/-	0.3	0.4
MATRIX:	soil	Pb-214	HASL 300	0.5	+/-	0.3	0.4
WEIGHT:	1100	Bi-212	HASL 300	0.1	+/-	1.1	2.5
		Bi-214	HASL 300	0.5	+/-	0.3	1.6
		Ac-228	HASL 300	0.7	+/-	0.8	1.3
		Th-234	HASL 300	2.6	+/-	1.5	2.4
		Pa-234	HASL 300	0.4	+/-	1.0	1.9

Outreach Laboratory

311 North Aspen
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PROJECT NO:	980715
CLIENT:	IEM, Inc
CLIENT PROJECT:	94005.05
DATE SUBMITTED:	5-Aug-98
DATE REPORTED:	13-Aug-98
PAGE:	2 of 6

		PARAMETER	METHOD	ACTIVITY pCi/g			MDA
LAB ID:	980715-05	K-40	HASL 300	1.2	+/-	1.3	2.1
CLIENT ID:	080398-005	Tl-208	HASL 300	1.0	+/-	0.2	0.2
DATE:	8/3/98	Pb-212	HASL 300	3.1	+/-	0.4	1.0
MATRIX:	soil	Pb-214	HASL 300	2.3	+/-	1.1	1.0
WEIGHT:	1178	Bi-212	HASL 300	1.7	+/-	1.0	1.3
		Bi-214	HASL 300	0.7	+/-	0.3	1.2
		Ac-228	HASL 300	2.4	+/-	0.8	1.2
		Th-234	HASL 300	2.9	+/-	1.5	2.3
		Pa-234	HASL 300	0.8	+/-	0.7	1.0
LAB ID:	980715-06	K-40	HASL 300	2.1	+/-	1.7	2.4
CLIENT ID:	080398-006	Tl-208	HASL 300	0.3	+/-	0.2	0.2
DATE:	8/3/98	Pb-212	HASL 300	0.5	+/-	0.3	0.4
MATRIX:	soil	Pb-214	HASL 300	0.4	+/-	0.3	0.5
WEIGHT:	1372	Bi-212	HASL 300	0.4	+/-	1.0	1.9
		Bi-214	HASL 300	0.6	+/-	0.3	1.9
		Ac-228	HASL 300	1.1	+/-	0.6	0.7
		Th-234	HASL 300	2.9	+/-	1.5	2.4
		Pa-234	HASL 300	0.4	+/-	0.6	1.1
LAB ID:	980715-07	K-40	HASL 300	1.4	+/-	1.1	1.5
CLIENT ID:	080398-007	Tl-208	HASL 300	0.2	+/-	0.1	0.1
DATE:	8/3/98	Pb-212	HASL 300	0.6	+/-	0.2	0.2
MATRIX:	soil	Pb-214	HASL 300	0.7	+/-	0.3	0.5
WEIGHT:	1175	Bi-212	HASL 300	0.5	+/-	0.8	1.3
		Bi-214	HASL 300	0.2	+/-	0.2	0.3
		Ac-228	HASL 300	0.2	+/-	0.4	0.7
		Th-234	HASL 300	1.7	+/-	1.3	2.1
		Pa-234	HASL 300	0.1	+/-	0.5	1.0
LAB ID:	980715-08	K-40	HASL 300	5.3	+/-	2.6	2.6
CLIENT ID:	080398-008	Tl-208	HASL 300	0.3	+/-	0.2	0.2
DATE:	8/3/98	Pb-212	HASL 300	0.1	+/-	0.4	0.5
MATRIX:	soil	Pb-214	HASL 300	0.7	+/-	0.4	0.5
WEIGHT:	1064	Bi-212	HASL 300	1.8	+/-	1.6	2.4
		Bi-214	HASL 300	0.5	+/-	0.3	0.4
		Ac-228	HASL 300	1.3	+/-	0.3	1.5
		Th-234	HASL 300	3.4	+/-	1.8	2.7
		Pa-234	HASL 300	0.7	+/-	0.8	1.3

Outreach Laboratory

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PROJECT NO:	980715
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DATE SUBMITTED:	5-Aug-98
DATE REPORTED:	13-Aug-98
PAGE:	3 of 6

		PARAMETER	METHOD	ACTIVITY pCi/g			MDA
LAB ID:	980715-09	K-40	HASL 300	2.6	+/-	1.4	1.4
CLIENT ID:	080398-009	Tl-208	HASL 300	0.1	+/-	0.1	0.1
DATE:	8/3/98	Pb-212	HASL 300	0.2	+/-	0.2	0.3
MATRIX:	soil	Pb-214	HASL 300	0.4	+/-	0.2	0.2
WEIGHT:	964	Bi-212	HASL 300	0.2	+/-	0.7	1.4
		Bi-214	HASL 300	0.4	+/-	0.2	0.2
		Ac-228	HASL 300	0.9	+/-	0.4	0.5
		Th-234	HASL 300	1.1	+/-	1.3	2.2
		Pa-234	HASL 300	0.3	+/-	0.5	0.9
LAB ID:	980715-10	K-40	HASL 300	2.2	+/-	2.7	4.4
CLIENT ID:	080398-010	Tl-208	HASL 300	0.9	+/-	0.3	0.4
DATE:	8/3/98	Pb-212	HASL 300	2.7	+/-	0.5	0.5
MATRIX:	soil	Pb-214	HASL 300	3.2	+/-	0.8	1.0
WEIGHT:	1170	Bi-212	HASL 300	3.3	+/-	1.8	2.6
		Bi-214	HASL 300	3.4	+/-	1.1	1.0
		Ac-228	HASL 300	3.2	+/-	1.2	1.5
		Th-234	HASL 300	5.9	+/-	2.3	3.4
		Pa-234	HASL 300	1.2	+/-	1.3	2.0
LAB ID:	980715-11	K-40	HASL 300	2.4	+/-	1.3	1.2
CLIENT ID:	080398-011	Tl-208	HASL 300	0.3	+/-	0.1	0.2
DATE:	8/3/98	Pb-212	HASL 300	0.6	+/-	0.2	0.3
MATRIX:	soil	Pb-214	HASL 300	0.8	+/-	0.3	0.5
WEIGHT:	1163	Bi-212	HASL 300	0.4	+/-	0.9	1.6
		Bi-214	HASL 300	0.6	+/-	0.2	0.3
		Ac-228	HASL 300	0.6	+/-	0.4	1.0
		Th-234	HASL 300	1.7	+/-	1.6	2.5
		Pa-234	HASL 300	0.1	+/-	0.4	0.8
LAB ID:	980715-12	K-40	HASL 300	5.3	+/-	3.4	4.7
CLIENT ID:	080498-001	Tl-208	HASL 300	4.9	+/-	0.8	2.3
DATE:	8/4/98	Pb-212	HASL 300	13.3	+/-	0.9	0.8
MATRIX:	soil	Pb-214	HASL 300	16.6	+/-	1.8	2.0
WEIGHT:	1067	Bi-212	HASL 300	6.8	+/-	2.9	4.2
		Bi-214	HASL 300	14.9	+/-	2.2	3.0
		Ac-228	HASL 300	13.0	+/-	2.5	2.5
		Th-234	HASL 300	15.0	+/-	4.5	6.9
		Pa-234	HASL 300	1.1	+/-	1.2	2.0

Outreach Laboratory

311 North Aspen
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PROJECT NO: 980715
CLIENT: IEM, Inc
CLIENT PROJECT: 94005.05
DATE SUBMITTED: 5-Aug-98
DATE REPORTED: 13-Aug-98

		PARAMETER	METHOD	ACTIVITY pCi/g			MDA
LAB ID:	980715-13	K-40	HASL 300	3.1	+/-	1.4	0.4
CLIENT ID:	080498-002	Tl-208	HASL 300	0.2	+/-	0.1	0.2
DATE:	8/4/98	Pb-212	HASL 300	0.5	+/-	0.2	0.3
MATRIX:	soil	Pb-214	HASL 300	0.7	+/-	0.4	0.6
WEIGHT:	991	Bi-212	HASL 300	0.3	+/-	0.8	1.5
		Bi-214	HASL 300	0.4	+/-	0.2	0.3
		Ac-228	HASL 300	0.6	+/-	0.3	0.1
		Th-234	HASL 300	1.6	+/-	1.2	1.9
		Pa-234	HASL 300	0.1	+/-	0.4	0.7
LAB ID:	980715-14	K-40	HASL 300	4.2	+/-	2.3	2.4
CLIENT ID:	080498-003	Tl-208	HASL 300	0.1	+/-	0.1	0.2
DATE:	8/4/98	Pb-212	HASL 300	0.1	+/-	0.4	0.4
MATRIX:	soil	Pb-214	HASL 300	0.6	+/-	0.3	0.4
WEIGHT:	962	Bi-212	HASL 300	0.2	+/-	1.1	2.1
		Bi-214	HASL 300	0.6	+/-	0.3	0.4
		Ac-228	HASL 300	0.7	+/-	1.0	1.8
		Th-234	HASL 300	2.1	+/-	1.8	2.9
		Pa-234	HASL 300	0.9	+/-	0.7	1.8
LAB ID:	980715-15	K-40	HASL 300	2.9	+/-	1.4	0.4
CLIENT ID:	080498-004	Tl-208	HASL 300	0.2	+/-	0.1	0.2
DATE:	8/4/98	Pb-212	HASL 300	0.9	+/-	0.3	0.3
MATRIX:	soil	Pb-214	HASL 300	0.9	+/-	0.4	0.5
WEIGHT:	927	Bi-212	HASL 300	0.9	+/-	0.7	1.0
		Bi-214	HASL 300	0.7	+/-	0.6	0.3
		Ac-228	HASL 300	0.9	+/-	0.5	0.5
		Th-234	HASL 300	2.6	+/-	1.2	1.8
		Pa-234	HASL 300	0.5	+/-	0.5	0.9
LAB ID:	980715-16	K-40	HASL 300	5.0	+/-	2.7	3.3
CLIENT ID:	080498-005	Tl-208	HASL 300	0.3	+/-	0.2	0.2
DATE:	8/4/98	Pb-212	HASL 300	0.3	+/-	0.3	0.3
MATRIX:	soil	Pb-214	HASL 300	0.6	+/-	0.3	0.4
WEIGHT:	1055	Bi-212	HASL 300	0.2	+/-	1.3	2.4
		Bi-214	HASL 300	0.6	+/-	1.0	1.7
		Ac-228	HASL 300	1.1	+/-	1.1	1.8
		Th-234	HASL 300	3.0	+/-	1.6	2.3
		Pa-234	HASL 300	0.2	+/-	0.5	1.0

Outreach Laboratory

311 North Aspen
Broken Arrow, Ok 74012
(918) 251-2515
FAX (918) 251-0008

PROJECT NO: 980715
CLIENT: IEM, Inc
CLIENT PROJECT: 94005.05
DATE SUBMITTED: 5-Aug-98
DATE REPORTED: 13-Aug-98

		PARAMETER	METHOD	ACTIVITY pCi/g			MDA
LAB ID:	980715-17	K-40	HASL 300	2.4	+/-	1.5	1.8
CLIENT ID:	080498-006	Tl-208	HASL 300	0.2	+/-	0.1	0.1
DATE:	8/4/98	Pb-212	HASL 300	0.3	+/-	0.2	0.3
MATRIX:	soil	Pb-214	HASL 300	0.6	+/-	0.4	0.7
WEIGHT:	1132	Bi-212	HASL 300	0.0	+/-	0.2	1.4
		Bi-214	HASL 300	0.4	+/-	0.2	0.3
		Ac-228	HASL 300	0.8	+/-	0.4	0.5
		Th-234	HASL 300	2.0	+/-	2.0	2.7
		Pa-234	HASL 300	0.3	+/-	0.5	0.8
LAB ID:	980715-18	K-40	HASL 300	2.8	+/-	2.1	2.9
CLIENT ID:	080498-007	Tl-208	HASL 300	0.2	+/-	0.2	0.3
DATE:	8/4/98	Pb-212	HASL 300	2.2	+/-	3.5	5.9
MATRIX:	soil	Pb-214	HASL 300	1.0	+/-	0.3	0.4
WEIGHT:	1069	Bi-212	HASL 300	1.2	+/-	1.4	2.3
		Bi-214	HASL 300	0.7	+/-	0.4	0.4
		Ac-228	HASL 300	0.6	+/-	0.6	1.0
		Th-234	HASL 300	2.9	+/-	1.8	2.8
		Pa-234	HASL 300	1.3	+/-	1.0	1.4
LAB ID:	980715-19	K-40	HASL 300	2.3	+/-	1.5	1.7
CLIENT ID:	080498-008	Tl-208	HASL 300	0.3	+/-	0.1	0.1
DATE:	8/4/98	Pb-212	HASL 300	0.8	+/-	0.3	0.4
MATRIX:	soil	Pb-214	HASL 300	0.6	+/-	0.3	0.5
WEIGHT:	1104	Bi-212	HASL 300	0.3	+/-	0.8	1.4
		Bi-214	HASL 300	0.8	+/-	0.3	0.3
		Ac-228	HASL 300	0.6	+/-	0.5	0.7
		Th-234	HASL 300	1.5	+/-	1.5	2.5
		Pa-234	HASL 300	0.5	+/-	0.7	1.1
LAB ID:	980715-20	K-40	HASL 300	2.9	+/-	1.8	2.0
CLIENT ID:	080498-009	Tl-208	HASL 300	0.2	+/-	0.2	0.2
DATE:	8/4/98	Pb-212	HASL 300	1.3	+/-	1.5	2.3
MATRIX:	soil	Pb-214	HASL 300	2.4	+/-	1.5	2.3
WEIGHT:	1159	Bi-212	HASL 300	0.6	+/-	1.4	2.4
		Bi-214	HASL 300	0.6	+/-	0.3	0.3
		Ac-228	HASL 300	1.0	+/-	1.0	1.2
		Th-234	HASL 300	1.2	+/-	1.5	2.5
		Pa-234	HASL 300	0.1	+/-	0.5	1.0

Outreach Laboratory

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DATE SUBMITTED:	5-Aug-98
DATE REPORTED:	13-Aug-98
PAGE:	6 of 6

QUALITY CONTROL

	BLANK	LCS % REC	LCSD % REC	LCSD % RPD	DUP RPD
Th-234	.3 +/- 1.1	100	100	0.1	NC
Pb-214	.8 +/- 1.2	100	100	0.2	NC
Bi-214	.1 +/- .8	100	100	0.1	NC

Analysis	Method	Tech	Date
Sample Preparation	HASL300	A. Melrose	8/7/98
Gamma Spectroscopy	HASL 300	R. Eidson	8/12/98

BDL - BELOW DETECTION LIMIT

Laboratory Approvals:

QA/QC Officer

Laboratory Director

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference No 94005.05

(1) Client Name Shieldalloy	(7) Samples Shipment Date 8/4/98	(5) Bill to: IEM / Attn: Brian Kelly
(2)Collected By: R.A. Duff	(8) Lab Destination Outreach	9040 Executive Park Dr, Ste. 205
(3) Job/Task No: 94005.05	(9) Lab Contact Ron Eidson	Knoxville, TN 37923
(4) Project Manager: Carol Berger	(12) IEM Technical Contact/Phone Alan Duff (423) 531-9145	(10) Report to: IEM / Carol Berger
(6) Purchase Order No. N/A	(13) Carrier/Waybill No. FedEx	East Gude Dr., Ste. 305
(11) Required Report Date Prelim. results w/in 5 days	# 800162573355	Rockville, MD

ONE CONTAINER PER LINE

(14) Sample Number	(15) Sample Description/Type	(16) Date/Time Collected	(17) Container Type	(18) Sample Volume	(19) Preservative	(20) Requested Testing Program
080398-001	Lagoon Soil	8/3/98 1100	Plastic Jug	~1 KG	NONE	γ spectroscopy
080398-002		8/3/98 1105				
080398-003		8/3/98 1110				
080398-004		8/3/98 1115				
080398-005		8/3/98 1120				
080398-006		8/3/98 1125				
080398-007	~~1500~~	8/3/98 1500				
080398-008	~~1505~~	8/3/98 1505				
080398-009	~~1510~~	8/3/98 1510				

(23) Special Instructions: Potential trace qty. of Uranium / Thorium

(24) Possible Hazard Identification
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

(25) Sample Disposal
Return to Client ☐ Disposal by Lab ☒ Archive _____ months

(26) Turnaround Time Required: Normal ☐ Rush ☐

(27) QC Level: I ☒ II ☐ III ☐ Project Specific _____

(28) Relinquished by: (signature, date, time): 8/4/98 1100	Received by: (signature, date, time) 8/5/98 0600
Relinquished by: (signature, date, time):	Received by: (signature, date, time)
Relinquished by: (signature, date, time):	Received by: (signature, date, time)

(See Reverse for Instructions)

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference No 94005.05

(1) Client Name	(7) Samples Shipment Date	(5) Bill to:
(2)Collected By:	(8) Lab Destination	
(3) Job/Task No:	(9) Lab Contact SEE	
(4) Project Manager:	(12) IEM Technical Contact/Phone PG. 1	(10) Report to:
(6) Purchase Order No.	(13) Carrier/Waybill No.	
(11) Required Report Date		

ONE CONTAINER PER LINE

	(14) Sample Number	(15) Sample Description/Type	(16) Date/Time Collected	(17) Container Type	(18) Sample Volume	(19) Preservative	(20) Requested Testing Program
19	080498-008	Lagoon Soil	8/4/98 1040	Plastic Jug	~1 Kg	None	γ spec.
20	080498-009	↓	8/4/98 1045	↓	↓	↓	↓

(23) Special Instructions: Potential Trace Amts. of U/Th

(24) Possible Hazard Identification
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

(25) Sample Disposal
Return to Client ☐ Disposal by Lab ☒ Archive _____ months

(26) Turnaround Time Required: Normal ☐ Rush ☐

(27) QC Level: I ☒ II ☐ III ☐ Project Specific _____

(28) Relinquished by: (signature, date, time): [signature] 8/4/98 1100	Received by: (signature, date, time) [signature] 8/5/98 0500
Relinquished by: (signature, date, time):	Received by: (signature, date, time)
Relinquished by: (signature, date, time):	Received by: (signature, date, time)

(See Reverse for Instructions)

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference No 94005.05

(1) Client Name	(7) Samples Shipment Date	(5) Bill to:
(2)Collected By:	(8) Lab Destination	
(3) Job/Task No:	(9) Lab Contact	
(4) Project Manager:	(12) IEM Technical Contact/Phone SEE PG. 1	(10) Report to:
(6) Purchase Order No.	(13) Carrier/Waybill No.	
(11) Required Report Date		

ONE CONTAINER PER LINE

(14) Sample Number	(15) Sample Description/Type	(16) Date/Time Collected	(17) Container Type	(18) Sample Volume	(19) Preservative	(20) Requested Testing Program
080398-010	Lagoon Soil	8/3/98	Plastic Jug	~1 Kg	None	γ Spec.
080398-011	↓	8/3/98	↓	↓	↓	↓
080498-001	Lagoon Soil	8/4/98 0930				
080498-002	↓	8/4/98 0935				
080498-003	↓	8/4/98 0940				
080498-004	Soil @ front of site	8/4/98 1005				
080498-005	↓	8/4/98 1010				
080498-006	↓	8/4/98 1015	↓	↓	↓	↓
080498-007	Lagoon Soil	8/4/98 1035				

(23) Special Instructions: Potential trace quantity of Uranium/Thorium

(24) Possible Hazard Identification
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

(25) Sample Disposal
Return to Client ☐ Disposal by Lab ☒ Archive _____ months

(26) Turnaround Time Required: Normal ☐ Rush ☐

(27) QC Level: I ☒ II ☐ III ☐ Project Specific _____

(28) Relinquished by: (signature, date, time): 8/4/98 1100	Received by: (signature, date, time) 8/5/98 0900
Relinquished by: (signature, date, time):	Received by: (signature, date, time)
Relinquished by: (signature, date, time):	Received by: (signature, date, time)

(See Reverse for Instructions)

Appendix J - Records from Special Project 4

INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number 092298-02

Page 1 of 1

Instrument/SN: 2224 119791	Calibration Due: 3-5-99	Site Name:	Date: 9-22 Time: 1300
Instrument/SN 43-89 132118	Calibration Due: 3-5-99	Location: BACK STOCK YARD	
Instrument/SN	Calibration Due:	Purpose: Release Pallet# of Electrodes.	
Survey Performed By (Print): RONN MERKL		Survey Performed By (Signature):	
☒ Battery OK ☒ HV OK ☒ Source Check OK		Grid Dimensions: N/A x N/A ☐ meters ☐ feet ☐ inches ☐ centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																						Source # 3785 Th230 6500 PPM				
3																										
4																										
5																						Source Check 1077				
6			Electrodes Ranged in Size																			1187				
7			From 2-4 Feet Long.																			1127				
8								10-12 inches in diameter														BKG				
9								To the Smaller Ones.														4				
10								Being 4" Diameter - 1-3 Feet Long																		
11																										
12																										
13																										
14																										
15																										
16																										
17																										
18																										
19																										
20																										
21																										
22																										
23																										
24																										
25																										

Notes: 7 pallets of Electrodes surveyed Direct Frisk No Activity detected above BKG. BKG = 5cpm.

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INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number 092298-01

Page 1 of 1

Instrument/SN: 2224 # 119791	Calibration Due: 3-5-99	Site Name: Shield Alloy	Date: 9-22 Time: 1100
Instrument/SN 132 118 Swear Counter	Calibration Due: 3-5-99	Location: OHsite	
Instrument/SN 868	Calibration Due: 3-30-99	Purpose: Transport to OHIO Facility	
Survey Performed By (Print): Ronn Meekl		Survey Performed By (Signature):	
☑ Battery OK ☑ HV OK ☑ Source Check OK		Grid Dimensions: ____ x ____ ☐ meters ☐ feet ☐ inches ☐ centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2			Pallet #					1	SKR # 7543																	
3																										
4			Pallet #					2	Model 5100 (Green)																	
5																										
6			Pallet #					3	CEL 150 Cast America (Blue)																	
7																										
8			Pallet #					4	10 Steel Plates.																	
9																				Source # 3785 TH230 6500 DPM						
10																				Source Check						
11																				1077						
12																				1187						
13																				1127						
14																				BKG						
15																				4						
16																				2						
17																				1						
18																				Avg 3						
19																										
20																										
21																										
22																										
23																										
24																										
25																										

Notes: ALL Pallets of Equipt were Surveyed Directly 100% of All Accessible Areas. NO Activity Above BKG detected. {BKG = 3} Smears taken on ALL Equiptment ONly Pallet # 3 had 7cpm Smearable the Rest were < BKG.

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INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number _____ Page 1 of 1

Instrument/SN: 2224 # 146712	Calibration Due: 3-17-99	Site Name: Shield alloy N.J.	Date: 9/29/98 Time: 0930
Instrument/SN 4389 # 191225	Calibration Due: 3-17-99	Location: Shield Alloy Plant	
Instrument/SN N/A	Calibration Due: N/A	Purpose: Survey Loaders, Fork Trucks et.	
Survey Performed By (Print): Dawn Merkel		Survey Performed By (Signature): Dawn Merkel	
✓ Battery OK ✓ HV OK ✓ Source Check OK		Grid Dimensions: N/A × _____ ☐ meters ☐ feet ☐ inches ☐ centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																	Dept									
2		TRUCK #															LOCATION									
3																										
4		1		# 26													107									
5		2		# 3													115									
6		3		# 5													115									
7		4		# 8													115									
8		5		# 15													118									
9		6		# 2													203									
10		7		# 10													203									
11		8		# 14													203									
12		9		# 16													203									
13		10		0722314													A Warehouse									
14		11		#62		ARIAL LIFT											Beside D-104									
15																										
16																										
17																										
18			Note: ALL equptment Listed Above WAS Surveyed by direct																							
19			Frisk. Wheels, Forks, Buckets Cabs. Any other Accessible																							
20			Areas which MAY be in Reach or Touched under Normal																							
21			Operations. NO Activity Above BKG was detected.																							
22																										
23																										
24																										
25																										

Notes: 2224 # 146712
4389 # 191225

BKG	Source
2	1068
3	1120
3	1076
Avg. 3	Avg 1088

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RSP-018 (Rev. 001) - Attachment 1

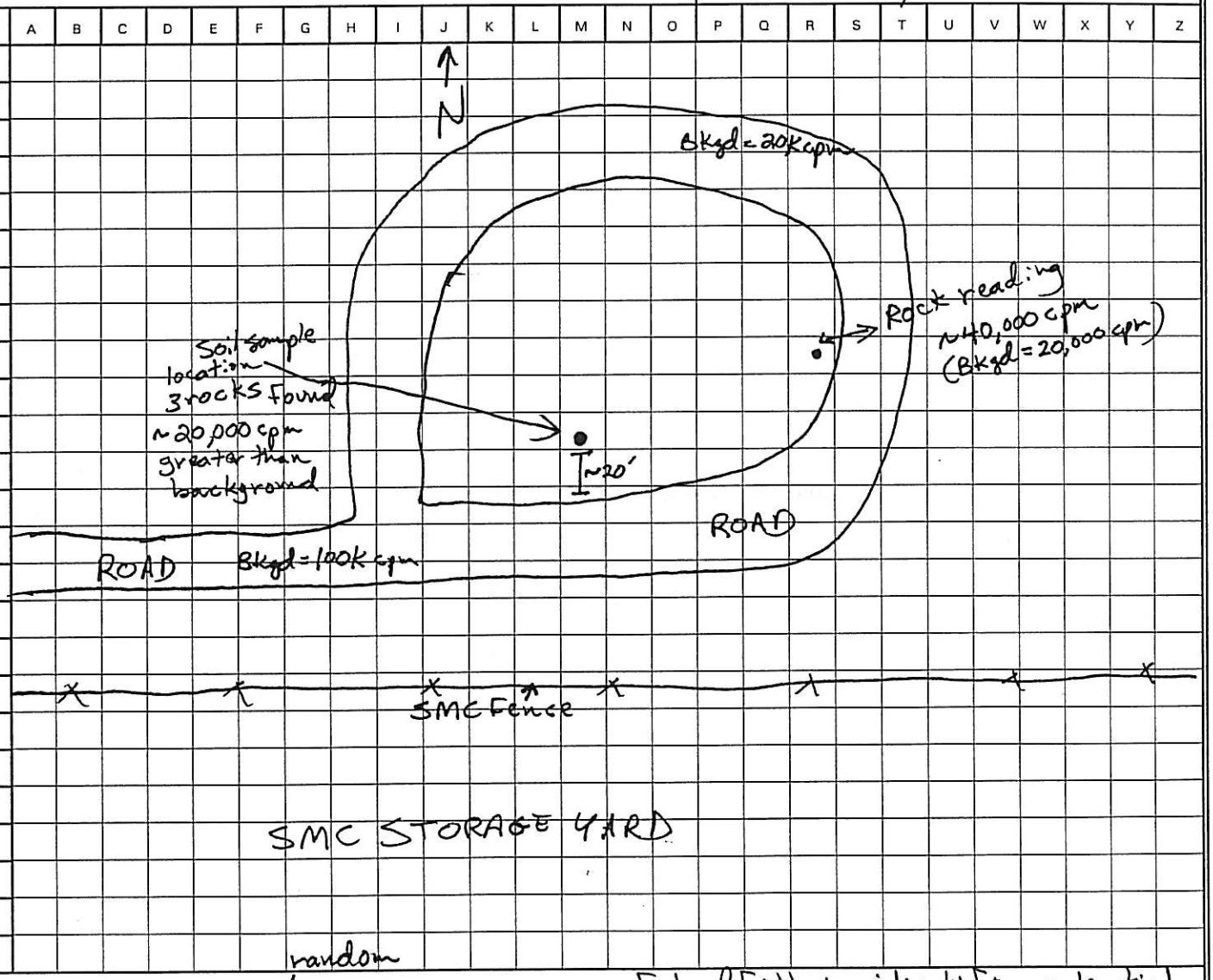
Appendix K - Records from Special Project 5

INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number 091798-01

Instrument/SN:	Calibration Due:	Site Name: SMC Newfield	Date: 9/17/98 Time: 0900
Instrument/SN	Calibration Due:	Location: SMC Newfield / Landfill	
Instrument/SN Ludlum 2241 #143562 Ludlum 44-10 # 151794	Calibration Due: 16 MAR 99	Purpose: γ walkover of Newfield landfill	
Survey Performed By (Print): R.A. DUFF		Survey Performed By (Signature): RA Duff	
☒ Battery OK ☒ HV OK ☒ Source Check OK		Grid Dimensions: N/A x ____ ☐ meters ☐ feet ☐ inches ☐ centimeters	



Notes: Conducted a γ walkover survey of landfill to identify potential sources of radioactivity. Obtained soil sample & rock samples from suspect areas. Rocks turned over to SMC for analysis. Soil sample forwarded to offsite lab for analysis. No other areas of elevated γ readings noted. Probe was held w/in ½" of ground surface for all measurements.

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Outreach
Laboratory

11 North Aspen
Broken Arrow, Ok 74012
(918) 251-2515
FAX (918) 251-0008

Lab Project Number: 94005.17
Client: Shieldalloy
Client Project Number: Haul Road
Site Description: Sep 21, 1998
Site Location: 10/22/98
Date Submitted: 2 of 2
Date Reported:
Page:

LAB ID	CLIENT ID	SAMPLE DATE	MATRIX	PARAMETER		MDA	UNITS
980905-15	091798- 015	9/17/98	soil	Ac-228	20.3 +/- 3.7	2.5	pCi/g
				Bi-212	11.9 +/- 4.7	6.7	pCi/g
				Bi-214	18.9 +/- 2.5	1.6	pCi/g
				Tl-208	9.2 +/- 1.3	0.9	pCi/g
				Pb-212	42.4 +/- 3.6	2.2	pCi/g
				Pb-214	25.1 +/- 2.3	1.9	pCi/g
				Th-232	4.1 +/- 0.4	0.3	pCi/g
				Th-230	112 +/- 1.9	0.3	pCi/g
				Uranium	16.8	1.0	ug/g

QUALITY CONTROL

	BLANK	LCS % Rec	MS DUP % Rec		METHOD	DATE ANALYZED
Bi-214	0.3+/-0.2	95.5%	nc		HASL 300	10/8/98 RE
Th-232	0.6 +/- 0.1	92.7	11.5	78.7	ER200M	10/19/98 RE
U	BDL	107	0.6	102	ASTM 5174M	10/20/98 RE

LABORATORY APPROVALS:

QA/QC Officer

Laboratory Director

Appendix L - Records from Special Project 6

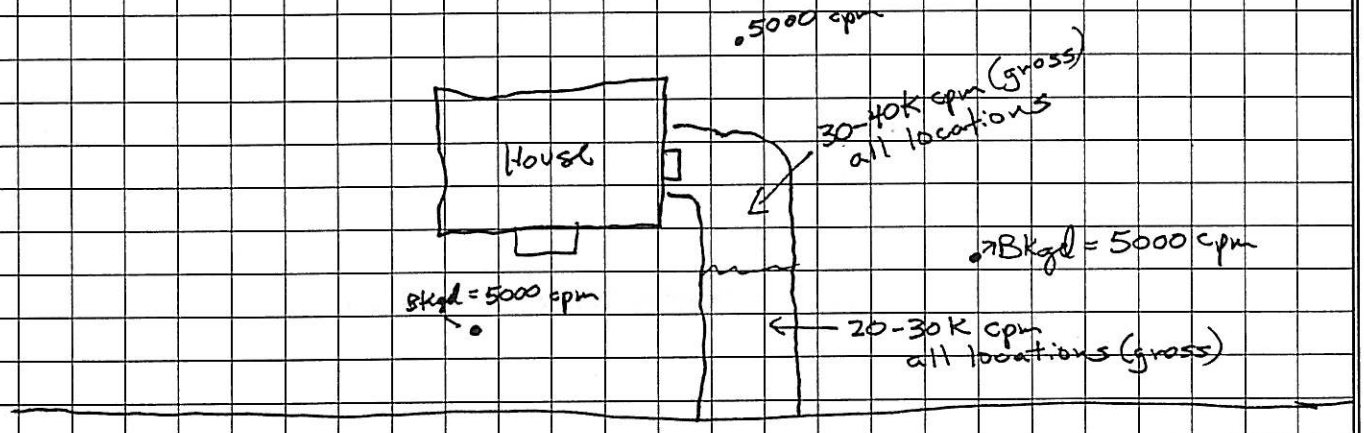
INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number 091598-01

Page 1 of 1

Instrument/SN:	Calibration Due:	Site Name: SMC Newfield	Date: 9/15/98 Time: 0830
Instrument/SN 2241 #143562/44-10 #151704	Calibration Due: 16 MAR 99	Location: Charlie Williams House	
Instrument/SN	Calibration Due:	Purpose: Survey slag in driveway to determine if radioactive	
Survey Performed By (Print): R.A. DUFF		Survey Performed By (Signature):	
☒ Battery OK ☒ HV OK ☒ Source Check OK		Grid Dimensions: N/A x ☐ meters ☐ feet ☐ inches ☐ centimeters	



Notes: Conducted γ walkover survey w/probe w/in ½" of driveway surface. Based on survey results, Dave Smith determined the slag used in the driveway was not licensable material and was not a concern.

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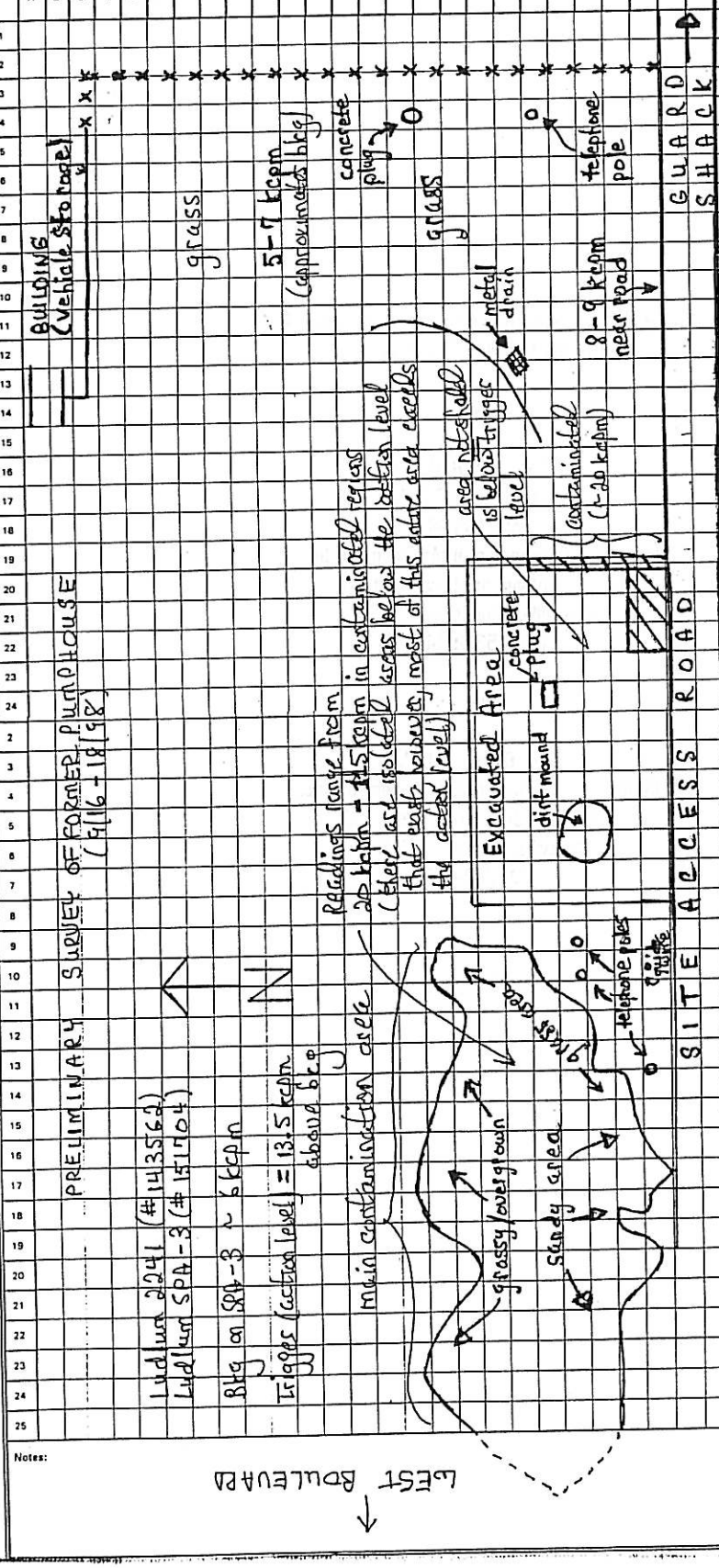
Appendix M - Records from Special Project 7

Survey Number _____

Instrument/SN: See drawing	Calibration Due:	Site Name: SMC	Date:	Time:
Instrument/SN	Calibration Due:	Location: Former Pumphouse Area		
Instrument/SN	Calibration Due:	Purpose: Characterization of Radioactivity Levels		
Survey Performed By (Print): Alex J. Boerner		Survey Performed By (Signature): Alex J. Boerner		
☑ Battery Check OK	☑ Source Check OK	Grid Dimensions: ** ☐ meters ☑ feet x ☐ inches ☐ centimeters		



Survey Results

Location	Units +	Units +

** Drawn approximately to scale (each square running north-south represents 6 feet; each square running east-west represents 4 feet)

Notes:

This report was prepared under the direction of
Shieldalloy Metallurgical Corporation

by

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A. J. Boerner, C.H.P.
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