SHIELDALLOY METALLURGICAL CORPORATION

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DAVID R. SMITH
ENVIRONMENTAL MANAGER
NEWFIELD OPERATIONS

040 - 07102

January 14, 2000

Ms. Marie Miller
U. S. Nuclear Regulatory Commission
Region I
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety
475 Allendale Road
King of Prussia, PA 19406-1415

Subject: Demolition and Final Survey of AAF Baghouse
USNRC License SMB-743, Shieldalloy Metallurgical Corp.
Newfield, New Jersey

Dear Ms Miller:

Please find enclosed a copy of the report prepared for Shieldalloy Metallurgical Corporation (SMC) by our contractor, Integrated Environmental Management, Inc. regarding the subject demolition project. This report is being forwarded for your use and information. SMC will maintain a copy of this report on site for review during inspection.

If you have any questions about this matter please do not hesitate to contract me at (800) 762-2020 ext. 226 or via e-mail at dsmith@shieldalloy.com.

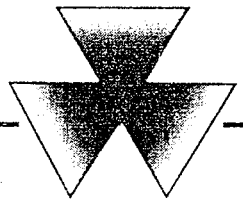
Sincerely,

David R. Smith

David R. Smith
cc:
w/o encl:

Nigel C. Morrison	Shieldalloy Metallurgical Corp.
Ellen T. Harmon, Esq.	Metallurg, Inc.
Carol Berger	Integrated Environmental Management
Jay Silberg	Shaw Pittman Potts & Trowbridge

Distribute to: Newfield Radiation Safety Committee members [HLN, SAD, JPV & FGM]



IEM

Integrated Environmental Management, Inc.

040-07102

Demolition and Final Survey of the AAF Baghouse

Shieldalloy Metallurgical Corporation

Report No. 94005/G-20187

Demolition and Final Survey of the AAF Baghouse

Submitted to:

Shieldalloy Metallurgical Corporation
West Boulevard, Post Office Box 768
Newfield, New Jersey 08344
(856) 692-4200

by:

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Report No. 94005/G-20187
January 7, 2000

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INTRODUCTION

Shieldalloy Metallurgical Corporation (SMC) operates a facility located in Newfield, New Jersey. This facility manufactures or has manufactured specialty steel and super alloy additives, primary aluminum master alloys, metal carbides, powdered metals, and optical surfacing products. Raw materials currently used at the facility include beneficiated ores which contain oxides of columbium (niobium), vanadium, aluminum metal, titanium metal, strontium metal, zirconium metal, and fluoride (titanium and boron) salts. During the manufacturing process, the facility generates a variety of by-products that have commercial application.

SMC is licensed by the U. S. Nuclear Regulatory Commission (USNRC) to ship, receive, possess, use, and store source material pursuant to License No. SMB-743. The primary forms of source material currently present at the site include ores used as feed to metallurgical operations, byproduct slag, and baghouse dust. The byproduct slag is being marketed to the steel industry as a synthetic slag fluidizer.

Purpose

Ferrocolumbium production is performed within a single building, called "D111". This building is equipped with an operator control room, mechanical booms and heavy equipment handlers, storage containers, scales, a variety of melting pots, two furnaces, other miscellaneous items, and a dust collection system comprised of two interconnected emission control units with high-efficiency baghouses.

One of the emission control units is an American Air Filter baghouse, termed the "AAF Baghouse" in our March 25th application. This unit also accepts effluent air from the D111 furnaces at pressure. The air enters the collector through the inlet air valves, and is passed up through the Dacron filter tubes where particulates are filtered out. The air leaving the tubes passes through a clean air plenum and is discharged to the atmosphere through a roof vent that runs the full length of the baghouse.

During D111 production activities, the AAF Baghouse may be operated independently or in conjunction with the second emission control unit. The second unit is termed the "Flex-Kleen Baghouse".

Because of improvements made to the air handling system in the immediate vicinity of the smelting operation, and because maintenance performed on the Flex-Kleen Baghouse in 1998 and 1999 improved its efficiency, it was no longer necessary to operate the two emission control systems in tandem in order to achieve effective air handling/cleaning. Therefore, in light of the difficulties and expense in monitoring emissions from the AAF Baghouse, and because its failure notification

methods were inferior to those associated with the Flex-Kleen Baghouse, the decision was made to bypass the AAF Baghouse during D111 smelting operations.[1]

The radioactivity contained within the AAF Baghouse is of relatively low concentration (i.e., far less than 0.05% uranium and thorium by weight).[2] However, in spite of the fact that its use was no longer necessary, small but unnecessary personnel radiation exposures would occur during routine structural maintenance and repair. Because SMC is committed to the ALARA concept in all operations performed at the Newfield, New Jersey facility, the decision was made to remove this emission control unit from D111.

During the remedial action, which took place between May 17 and June 17, 1999, the AAF Baghouse was disassembled. Waste items and materials that were generated during the disassembly were surveyed as they were disassembled to determine whether they could be released for unrestricted use (i.e., without regard for radiological constituents). Those items that did not meet the pre-determined release criteria were decontaminated and re-surveyed, or controlled as a radioactive material.

Scope

The disassembly and final survey of the AAF Baghouse and ancillary equipment was performed following the guidance contained in the SMC Radiation Safety Procedures (RSPs) and applicable Integrated Environmental Management (IEM) RSPs. This final survey report contains a summary of the project and its methods, a listing of all data acquired, and a comparison of findings to the pre-determined release criteria.

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

[2] Integrated Environmental Management Report No. 94005/G-7120, "Technical Basis for the Use of Baghouse Dust as an Additive in Cement Production", June 17, 1996.

FACILITY INFORMATION

Contaminants of Concern

SMC is licensed to possess uranium and thorium in any form suitable for transport under Department of Transportation regulations. Previous studies of the radionuclide content of the materials typically found at the site are indicative of a natural distribution of the radioactive progeny of these series radionuclides. Therefore, the contaminants of concern for the demolition of the AAF Baghouse included ^{232}Th plus progeny in equilibrium and ^{238}U plus progeny in equilibrium.

Release Criteria

Radiation Safety Procedure No. RSP-009, "Contamination Control" contains the release criteria for the equipment and material surfaces at the Newfield facility. The criteria applicable to this project are shown in Table 1.

PROJECT APPROACH AND PROCEDURES

Project Organization

Health physics activities during this project were managed, on behalf of SMC, by Mr. Alan Duff, R.R.P.T., an employee of **IEM**.[3] During performance of the dismantlement, Mr. Duff was responsible for designating the temporary restricted areas in which work was performed, directing the work of other support staff, performing the survey activities, and after disassembly was complete, preparing this report. Mr. Duff is qualified as a "Radiation Surveyors" pursuant to Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-006, "Training and Qualification of Radiation Personnel".

Radiological surveys were also performed by Mr. Ronn Merkel. In Mr. Duff's absence, Mr. Merkel provided other health physics support to the project. Mr. Merkel is also qualified pursuant to RSP-006.

Technical oversight for the project was the responsibility of Ms. Carol Berger, C.H.P., also an employee of **IEM**. Ms. Berger reviewed and approved all project plans, assisted in the review of the quality of data collected and in the preparation of the this report, and provided an interface between SMC and project personnel.

Appendix A contains a summary of the qualifications of all **IEM** project personnel. Appendix B contains the Field Activity Daily Logs maintained by **IEM** while on-site.

Representatives of SMC observed some or all of the demolition and survey activities while they were on-going. In addition, SMC was given an opportunity to review and comment on a draft before this final survey report was issued.

Survey Objectives and Protocol

Instrumentation used to acquire measurement data was appropriate for the type of radiation expected, of sufficient sensitivity and accuracy to detect the radioactive materials found at the SMC facility, and of sufficient quantity to support the activities. Each instrument was labeled with a unique identifier (e.g., serial number of detector and rate meter) to enable traceability between instrument and survey records. Table 2 contains a listing of each instrument type, its use during performance of the final status surveys, and its nominal background response, and detection efficiency. Additional details on the type, calibration and use of the instruments may be found in Appendix C.

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[3] Summit Compliance was contracted by SMC to perform the AAF Baghouse demolition operations. Mr. Robert Bennett of Summit acted as the field project manager throughout the project. A crew of up to four (4) Summit employees were utilized during the project to perform the disassembly operations.

Prior to the start of work in each day, the performance of each instrument was evaluated pursuant to RSP-008, "Instrumentation". Appendix C contains the daily instrument check forms, including the measured background values.

Measured contamination levels at the work site were compared with the release criteria shown in Table 1. One hundred percent of the surfaces of the disassembled items were scanned by moving the detector at a rate of one to two inches per second with the detector in close proximity to the surface (i.e., within a few millimeters). When the health physics technician detected elevated activity (i.e., count rates above background) in a particular location, he would pause and obtain a stationary count in that location. Any area exhibiting residual radioactivity above the applicable criterion was marked, remediated, and re-surveyed.

Radiation Safety Procedures

Health and safety provisions were established to permit the disassembly project to be conducted without adverse impacts on worker health and safety. SMC Radiation Safety Procedures (RSPs) and applicable IEM RSPs were utilized as the primary guidance documents for this project on matters of radiation safety. The topics from these procedures that were applicable to this project included, but were not limited to:

- Work area entry (access control);
- Control of radiological work;
- Radiation safety training;
- Emergency procedures;
- ALARA provisions;
- Contamination controls;
- Protective clothing;
- Personnel Monitoring
- Non-radiological hazards;
- Use of instrumentation; and
- Survey methods.

A Radiation Work Permit (RWP) was prepared and approved for implementation prior to the start of work. A copy of the RWP is contained in Appendix D. Personnel performing the demolition operations wore breathing zone air (BZA) samplers to monitor their internal exposure.

Baghouse Disassembly

The baghouse was disassembled between May 17 and June 17, 1999. The first steps in the disassembly involved the removal of the remaining baghouse dust and the filter bags from the baghouse. The bags were disconnected from the chains that supported them and lowered into a dump truck positioned adjacent to the baghouse. Residual baghouse dust was swept from ledges and horizontal surfaces inside the baghouse and vacuumed out with a vacuum truck equipped with a dust collection system and HEPA filtered exhaust. Both the bags and the baghouse dust were transported to the storage yard and placed on the existing baghouse dust pile.

The internal surfaces of the baghouse were surveyed for residual alpha activity prior to the dismantlement of the baghouse. No areas of contamination that exceeded the release criteria were noted on the internal surfaces of the baghouse with the exception of some isolated areas on support beams, hoppers, and the hatch door. These areas were all successfully decontaminated, re-surveyed, and released for conventional disposal/recycling.

A silo adjacent to the baghouse also contained baghouse dust. The bottom of the silo was removed with a cutting torch and the contents were placed into a dump truck for transport to the Storage Yard. The silo was then cut from its support beams and lowered to ground level with a crane for survey and further disassembly. No contamination in excess of the release criteria were noted with the exception of some support beams. These were successfully decontaminated, re-surveyed and released for conventional disposal/recycling.

Ventilation ducts that connected D111 to the AAF baghouse were disconnected from the roof of D111 and lowered to the ground using a crane. Once on the ground, the ducts were surveyed and found to contain no residual radioactivity above the release criteria. They were subsequently cut apart using a cutting torch and staged for conventional disposal/recycling.

The baghouse itself was disassembled using a trackhoe equipped with a grapple attachment. As pieces were removed, each was surveyed to ensure any newly-exposed surfaces met the release criteria. The concrete pad that provided support to the baghouse was left in place.

Data Conversion

Total (fixed plus removable) contamination data were converted to the units of net activity by the following methodology:

$$A_{total} = \frac{cpm - BKG_{ave}}{E} \times \frac{100}{A}$$

where A_{total} = the total surface activity (dpm/100 cm^2), cpm = the counts per minute measured by direct survey, BKG_{ave} = the average background count rate for this measurement methodology

(cpm), E = detection efficiency of the instrument used (counts per disintegration), and A = the active surface area of the detector (cm^2).

The removable surface contamination data were converted to units of net activity by the following methodology:

$$A_{removable} = \frac{cpm - BKG_{ave}}{E}$$

where $A_{removable}$ = the removable surface activity (dpm/100 cm^2).[4] For this case, the background consisted of clean (unused) smears counted in the same counter.

Ambient gamma exposure rate data were converted to units of net exposure rate by the following methodology:

$$R_{net} = R_{gross} - BKG_{ave} \times CF$$

where R_{net} = the net measured exposure rate (μR/hr), R_{gross} = the gross measured exposure rate (μR/hr or cpm), and CF = an optional conversion factor to convert count rate instrument readings into units of "μR/hr" if instrument read-outs were in "counts per minute". A similar conversion was used for measurements of total (fixed plus removable) beta/gamma surface contamination.

Personnel air monitoring was performed pursuant to RSP-008, "Instrumentation". Once the filters were counted, the results were converted into personnel exposures, in units of DAC-hours, by:

$$E\ (DAC\text{-}hours) = \frac{\frac{A_f}{V} \times t}{DAC}$$

where A_f = the alpha activity on the air filter (μCi), V = the volume of air drawn through the filter (millilters), t = the duration of monitoring, and DAC = the Derived Air Concentration (DAC) as shown in License No. SMB-743.

Detection Limits

The detection limit for surface activity measurements (counts) acquired over a pre-set time period was determined by the following methodology:

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

where MDA = the activity level (dpm/100 cm^2), BKG_{ave} = the background count rate for this measurement type (cpm), A = the detector area (cm^2), and t = the measurement count time (min).

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[4] If the area smeared is less than 100 cm^2, the result will be recorded as "dpm per smear".

The MDA for an instrument operating in the ratemeter mode (e.g., for surface activity measurements or ambient exposure rates) was determined by:

$$MDA = \frac{4.65\sqrt{\frac{BKG_{ave}}{2t_c}}}{E \times \frac{A}{100}}$$

where t_c = the meter time constant (min). Alternatively, the detection limits for scanning measurements can be approximated, based upon an audibly discernable increase in count rate by the following methodology:

$$MDA = \frac{R_a \times B_{ave}}{E \times \frac{A}{100}}$$

where R_a = the audibly discernable increase in instrument response by the individual surveyor.

Measurement Uncertainty

The rate of radioactive decay is not constant with time and is therefore described by a Poisson probability distribution. Based on such a distribution, the best estimate of the standard deviation (s) on a number of counts (c) is the square root of the counts. Likewise, the standard deviation in a count rate over the count time (t) is:

$$s_r = \frac{\sqrt{c}}{t}$$

For the measurements conducted during these surveys, the number of counts due only to background will be a significant portion of the total counts. Thus the uncertainty (s_r) associated with the background was taken into account by:

$$s_r = \sqrt{\frac{c}{t^2} + \frac{BKG_{ave} \times t_{BKG}}{(t_{BKG})^2}}$$

where BKG_{ave} = the mean background count rate, and t_{BKG} = the time period over which the background counts were acquired.

MEASUREMENT RESULTS

Background Determination

Background measurements were obtained in unaffected areas of the SMC facility in accordance with IEM Radiation Safety Procedure No. RSP-018, "Surveillance" These ranged from three (3) to eight (8) counts per minute (alpha) with the Ludlum Model 2224 ratemeter/scalers with the Model 43-89 detectors. Background values for the Bicron Microrem gamma survey instrument averaged six (6) to seven (7) microrem per hour. Appendix C contains the results of the background determinations.

Residual Contamination

Appendix E contains the results of contamination surveys of the materials and equipment removed from the AAF Baghouse, and the concrete pad that held it. Pieces that were monitored during disassembly were, for the most part, free of residual radioactivity above the release criteria. Some pieces of the support structure were found to contain up to a maximum level of 3,300 dpm/100 cm^2 (alpha). These pieces, and all others that exceeded the release criteria, were pressure washed to remove the contamination, re-surveyed, and released for conventional disposal/recycling.

With one exception, all pieces of the baghouse and its support structure were verified to meet the release criteria, and were thus released for conventional disposal/recycling. The exception was one piece of equipment, a small hopper from the top of the silo. This item was transferred to the Storage Yard, where it will be addressed at a later date.

The concrete pad that supported the baghouse and its associated ventilation equipment was surveyed and found to contain residual beta activity up to 19,800 dpm/100 cm^2 beta. Because smears of the concrete pad were negative for the presence of removable alpha activity, the residual radioactivity on the pad is fixed to the surface.

Personnel Monitoring

Appendix F contains the records of personnel (air) monitoring for those individuals who participated in the demolition of the AAF Baghouse. All analytical results were less than the nominal detection limit of the counting/measurement system. Individual exposure estimates were incorporated into the SMC dosimetry record files pursuant to RSP-004, "Radiation Protection Records".

SUMMARY AND CONCLUSIONS

Between May 17 and June 17, 1999, the AAF Baghouse was emptied of filter bags and baghouse dust, disassembled, and decontaminated, as necessary. With few exceptions, surveys of the disassembled baghouse demonstrated that it could be released for unrestricted use. The exceptions included the residual baghouse dust, filter bags, and a few disassembled pieces.

In addition, the cement pad that held the former baghouse was also found to contain fixed activity above the release criteria. This area will be surveyed on a planned and periodic basis as part of the routine surveillance activities for D111. It will be posted as a "radioactive materials area" and eventually remediated when D111 is decommissioned.

TABLES

Table 1 - Site-specific Release Criteria

TYPE	NUCLIDE[1]	REMOVABLE[2,4]	TOTAL[2,3] (FIXED PLUS REMOVABLE)
Surface	U-nat, U-235, U-238 and associated decay products	1,000 dpm α/100 cm^2 above background	5,000 dpm α/100 cm^2 above background
Surface	Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200 dpm/100 cm^2 above background	1,000 dpm α/100 cm^2 above background
Surface	Mixture of U-nat and Th-nat	--	600 dpm α/100 cm^2 by *direct frisk* above background[5]
Surface	Mixture of U-nat and Th-nat	--	3000 dpm α/100 cm^2 *fixed* above background

[1] Where surface contamination by both α and β-gamma-emitting radionuclides exists, the limits established for α and β-gamma-emitting radionuclides should apply independently.

[2] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[3] The levels may be averaged over 1 m^2, provided the maximum surface activity in any area of 100 cm^2 is less than three times the guide values. For purposes of averaging, any square meter of surface shall be considered to be above the activity guide G if: (1) from measurements of a representative number (n) of sections it is determined that $1/n \sum_n S_i \geq G$, where S_i is the dis/min-100 cm^2 determined from measurement of section I; or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 area exceeds 3G.

[4] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. (Note - The use of dry material may not be appropriate for tritium.) When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. Except for transuranics and Ra-226, Ra-228, Ac-227, Th-228, Th-230, and Pa-231 α emitters, it is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

[5] Assumes removable activity is the limiting value.

[6] Activity must be shown to be not removable activity.

Table 2 - Survey Instrumentation Data

INSTRUMENT MODEL	DETECTOR	USE	NOMINAL BACKGROUND	DETECTION EFFICIENCY
Bicron Microrem	Internal gamma scintillation detector	Walkover gamma survey	urem/hr	N/A
Ludlum Model 2224 scaler/ratemeter	Ludlum Model 43-89 dual alpha/beta contamination	Contamination surveys of items for unrestricted release	Alpha- 3 cpm or less Beta- 300 cpm or less (10 uR/hr field)	~17% alpha (Th-230)
Eberline SAC-4	Alpha scintillation	Alpha smear counting	Typically 0-5 cpm or less	~30% alpha (Th-230)

APPENDICES

Appendix A - Personnel Qualifications

R. Alan Duff - Lead Health Physics Technician

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

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; 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.

- 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.

- 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 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.

- 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, 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 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.

- 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.

- 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.

- 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.

- 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.

Ronn Merkel - Health Physics Technician

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.

Carol D. Berger - Program Manager

Professional Qualifications

Ms. Berger has over twenty years experience in nuclear and radiological activities with emphasis in strategic planning, radiation dosimetry, instrumentation, and applied health physics. As a co-founder of IEM, Inc., Ms. Berger is actively involved in performance of radiological dose assessments, regulatory interactions, site decommissioning, program evaluations, program development, pathway analyses, risk assessments, dosimetry evaluations, assessment and control of sources of non-ionizing radiations, waste management programs, environmental monitoring programs, and detection and quantification of low-levels of radioactivity.

Education

M.S., Health Physics, San Diego State University, San Diego, California; 1979
M.S., Radiation Physics, San Diego State University, San Diego, California; 1977
B.S., Physics/Chemistry, San Diego State University, San Diego, California; 1972

Certifications

Certified Health Physicist (Comprehensive): American Board of Health Physics, 1983
Re-certified: 1987, 1991, 1995, 1999

Experience and Background

1994 - Present — *Founder, Integrated Environmental Management, Inc., Rockville, Maryland.*
Provides high-quality strategic environmental management 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.

1989 - 1994 — *Senior Technical Consultant, IT Corporation/Nuclear Sciences, Washington, D.C.*
Performed health physics consulting for government and commercial facilities in Internal and External Dosimetry; Radiation Monitoring; Environmental Monitoring; Instrumentation; Emergency Response and Preparedness; Site Decommissioning; Radioactive Waste Management; Radiation Risk Assessment; Training; Licensing and Regulatory Negotiations; and Non-ionizing Radiation

1986 - 1989 *Senior Health Physicist, IT Radiological Sciences Laboratory, Knoxville, Tennessee* Performed health physics consulting for government and commercial facilities in Internal and External Dosimetry; Radiation Monitoring; Environmental Monitoring; Applied Health Physics; Instrumentation; Radioactive Waste Management; Training; and Non-ionizing Radiation.

1983 - *1986* *Radiation Dosimetry Group Leader, Oak Ridge National Laboratory, Oak Ridge, Tennessee.* Responsible for internal and external dose assessment and programs for ORNL employees, visitors and contractors. Experience included Internal and External Dose Assessment; Monitoring Program Design and Implementation; Instrumentation Development; Site Characterizations; Personnel Management; and Training.

1978 - *1983* *Internal Dose Group Leader, Oak Ridge National Laboratory, Oak Ridge, Tennessee.* Responsible for development of the ORNL Whole Body Counter Facility for detection and quantification of the actinides in-vivo. Experience included: Internal Dose Assessment; Monitoring Program Design and Implementation; Instrumentation Development; Special Studies; Personnel Management; and Training.

1978 - *1986* *Adjunct Faculty, Oak Ridge Associated Universities, Oak Ridge, Tennessee.* Professional training courses and general classes in the following health physics and radiation protection areas: Internal Dose Assessment; In-vivo Monitoring and Bioassay Methodologies; Instrumentation, and Applied Health Physics.

1979 - *1980* *Health Physics and Dosimetry Task Group Member, President's Commission on the Accident at Three Mile Island, Washington, D.C.* Tasks included: Internal Dose Assessment from Whole Body Counting Results; Estimates of Source Term from in-plant Monitoring Systems; Atmospheric Dispersion Modeling and Population Dose Assessment; and Development of Health Physics Sequence of Events.

Professional Society Membership

American Academy of Health Physics (President, 1995; Executive Committee, 1995-1997; Chair of Strategic Planning Committee, 1997)
Health Physics Society
Baltimore-Washington Chapter - Health Physics Society (Treasurer, 1993-1994, Board of Directors, 1998-1999)
Sigma Xi - Scientific Research Society
American Bar Association, Section of Natural Resources, Energy, and Environmental Law Institute

Publications

Over 30 professional publications; over 40 oral presentations; over 100 technical reports; more than 15 training courses taught.

Other Appointments/Awards

East Tennessee Chapter - Health Physics Society (President, 1986; President-Elect, 1985; Secretary, 1981-1982)

San Diego Chapter - Health Physics Society (Charter member)

American Board of Health Physics, Comprehensive Panel of Examiners, 1989-1993.

ASTM Task Group E-10.04.27 "Transuranic Wound Analysis"; 1986 to present

ANSI Standards Committee (ANSI N13.41) on Multiple Badging; 1986 to 1996 (Chairman, PlanCo-59 Working Group, 1990 to 1996)

ANSI Standards Committee (ANSI N13.39) on Internal Dosimetry Programs; 1994 to present

NCRP Scientific Committee 46-10, "Assessment of Occupational Exposures from Internal Emitters", 1989 to present.

Member of the Health Sciences Advisory Council for the School of Health Sciences, Purdue University, 1995 to 1998.

DOE/IAEA Whole Body Counter Intercalibration Committee (1980-1986)

Consultant to Knoxville Academy of Medicine, Mass Casualty Simulation (1984-1985)

Consultant to the National Cancer Institute to Evaluate Devices and Techniques to Determine Previous Radiation Exposure under Public Law 98-54 (Award for participation presented by Oak Ridge Associated Universities, April, 1988.)

Steering Committee Member, U. S. Department of Energy Task Group on the Education of Future Health Physicists - 1989 to 1991.

Technical reviewer and referee for *Health Physics*, *Nuclear Technology*, and *Radiation Protection Management*

IT Corporation *Distinguished Technical Associate* - June, 1992.

Appendix B - Field Activity Daily Logs

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 5/17/99	Time: 0700	Job/Task Number: 94005.20
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: West Blvd., Newfield, NJ.		
Description of Work: Setup for baghouse disassembly.		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0700 On Site, Merkel & Duff, Met w/ Rob Bennett of summit
0715 Signed in w/ guard @ guardhouse.
0730 Held initial tailgate meeting, discussed work plan & activities to be performed & precautions to be taken.
0830 Completed training on project, making preparations to commence work, performing instrument setups.
0845 Retrieved Pentek VacPac System & Unloaded, vacuum hose not shipped with system. Called Pentek's Chris Futrick, hose will be here by common carrier before noon today.
1045 Issued BZA samplers to workers.
10:55 Workers Cutting & Dropping Bags into Summit Dump Truck, moving them to storage yard to unload & store.
1200-1230 Lunch, 1300 - Recommenced work @ baghouse
1330 Commenced walkover & survey at eastern end of storage yard, area has had surface soil removed ~1'-3' depth. Hose (vacuum) arrived.
1530 Secured surveying in storage yard, secured work at baghouse.
1600 Performing paperwork in inst. office (Duff & Merkel), preparing air samplers for use tomorrow.
1630 Left Site, ~1/4 of bags complete.

No Further Entries

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
Significantly more materials in bags than expected, silo ~1/3 full.

Weather Conditions: Partly cloudy, mild, wind calm	Important Telephone Calls and Interactions: None
Personnel on Site: Duff, Merkel, Bennett, White, Taylor, Schnorbus, Butler, D. Smith	
Name (print): R.A. Duff	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 5/18/99	Time: 0700	Job/Task Number: 94005.20
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: West Blvd. Newfield, NJ		
Description of Work: setup For baghouse disassembly		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0700 On site, preparing instruments for days use
0730 At baghouse, issued BZA pumps to personnel, commenced baghouse bag removal into dump truck. Duff & storage yard performing walkover survey.
0815 Encountered a problem w/ BZA filter papers clogging up & stopping pumps.
1200-1245 Lunch
1300 Recommenced storage yard survey & baghouse bag removal
1530 Secured workers. Bag removal ~75% complete, storage yard survey ~1/3 complete. Duff + Merkel @ Lab, preparing instruments for use, cleaning BZA pumps & Filter holders, doing paperwork.
1600 Duff / Merkel left site

No Further Entries

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

None

Weather Conditions: Cloudy, light drizzle, wind from NE ~5 mph	Important Telephone Calls and Interactions: None
Personnel on Site: Duff, Merkel, Bennett, White, Taylor, Schnorbus, Butler.	
Name (print): R. Alan Duff	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC NewField		
Date: 5/19/99	Time: 0700	Job/Task Number: 94005.20
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: West Blvd., NewField, N.J.		
Description of Work: Baghouse bag removal, survey of storage yard		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0630 Merkel on site, preparing instruments for use.
0645 Duff on site, preparing instruments for use.
0700 Merkel at baghouse w/crew, commenced removing baghouse bags.
0715 Duff @ storage yard, commenced walkover & survey.
0900 Secured survey of storage yard (rain), Duff @ lab doing paperwork. Spoke w/D. Smith. Since slag being found in stor. yard right up to perimeter Fence, wants me to perform a walkover & survey outside of Fence.
1100 Recommenced storage yard survey.
1200-1230 Lunch
1300 Continued work on baghouse & storage yard survey.
1445 Secured work for the day, bag removal complete.
1530 Duff & Merkel left site.

No Further Entries

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

Weather Conditions: Rain, warm, wind calm.	Important Telephone Calls and Interactions: None
Personnel on Site: Duff, Merkel, D. Smith, R. Bennett, White, Taylor, Schnorbus, Butler	
Name (print): R. Alan Duff	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC New Field		
Date: 5/20/99	Time: 0700	Job/Task Number: 94005.20
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: West Blvd., Newfield, NJ		
Description of Work: Baghouse decontamination, storage yard survey		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0630 Merkel on site, preparing instruments for use.
0700 Duff on site, crew commenced sweeping upper levels of baghouse to remove gross amts. of residual dust.
0730 Duff @ storage yard, ~~Commenced~~ continued walkover & survey. Spot frisks of upper levels of baghouse show all areas should meet release criteria.
0900 Cutting vent duct between baghouse & Fans w/ oxy-acetylene torch. Pieces ~~Fan~~ removed have shown 1000-3000 dpm/100cm² of fixed ~~total~~.
1200-1230 Lunch.
1300 Recommenced work.
1400 Duff completed walkover & survey of excavated areas, commenced & walkover outside fence. Flags placed in areas of elevated measurements
1530 ~~1540~~ Completed work at the baghouse for the day.
1545 Completed walkover around fence perimeter. Some elevated locations were located & marked on survey maps & w/Flags.
1630 Duff/Merkel left site for the day.

No further Entries

Changes from Plans and Specifications, and Other Special Orders and Important Decisions: None	
Weather Conditions: Clear, mild, winds mph from SE	Important Telephone Calls and Interactions: N/A
Personnel on Site: Duff, Merkel, D. Smith, Schnorbus, White, Butler, Taylor	
Name (print): R. Alan Duff	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 5/21/99	Time: 0700	Job/Task Number: 94005.20
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: West Blvd., Newfield, N.J.		
Description of Work: Baghouse decontamination/disassembly.		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0630 Merkel on site, preparing instruments for today's use.
0700 Duff + crew on site, crew deconning upper levels of baghouse + cutting up vent ducting + parts of silo.
0830 Preparing BZA pumps for use for Dill Flex Kleen baghouse work.
0915 Issued BZA's to Bldg. Dill personnel performing Flex Kleen baghouse maintenance.
1030 Removed ~~rest~~ residual dust from silo adjacent to AAF baghouse.
1200-1230 Lunch
1300 Resumed work, Duff performing 2ND qtr. TLD badge exchange.
1450 TLD exchange complete w/exception of Jim Valenti's House TLD.
1500 Secured work at baghouse.
1545 Duff/Merkel left site.

No Further Entries

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

Weather Conditions: Sunny, warm, wind from SE ~5mph.	Important Telephone Calls and Interactions: None
Personnel on Site: Duff, Merkel, Bennett, White, Taylor, Schnarbus, Butler	
Name (print): R. Alan Duff	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 5/24/99	Time: 0700	Job/Task Number: 94005.20
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: West Blvd., Newfield, NJ.		
Description of Work: AAF Baghouse decon/disassembly.		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0630 Merkel on site, prepared instruments & air samplers for day's use
0700 Duff on site. Crew at baghouse, decontaminating inside of AAF baghouse (sweeping residual dust from upper levels to lower levels w/brooms). Duff/Merkel deconning Pentek Vac-Pac system prior to return.
1200-1230 Lunch
1300 Resumed work. Spoke w/Dave Smith, he has concerns about metal pieces requiring more agressive decontamination. I will speak to C. Berger on possible alternatives. (Release limit is 600 dpm/100cm² total, by direct frisk. Need limit ↑ to allow use of 1000 (Th) + 5000 (U) dpm/100m² fixed limits).
1530 Secured work for the day.
1600 Duff/Merkel left site

No Further Entries

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

None

Weather Conditions: Rain, warm, wind from W ~ 10 mph	Important Telephone Calls and Interactions: None
Personnel on Site: Duff, Merkel, White, Schnerbus, Butler, Dave Smith	
Name (print): R. Alan Duff	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 5/25/99	Time: 0700	Job/Task Number: 94005.20
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: West Blvd., Newfield, NJ		
Description of Work AAF baghouse decontamination.		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0600 Merkel on site, preparing instruments & air samplers for use.
0700 Duff on site, workers preparing to use vacuum truck to remove residual baghouse dust. Merkel preparing Pentek Vac-Pac system for return. Duff performing quarterly radiation/contamination surveys
0730 Vacuuming mid levels of baghouse & hoppers w/vac truck.
1200 Completed decon & survey of vac-pac system, making arrangements for unit's return to Pentek.
1200-1230 Lunch
1300 Recommenced vacuuming of baghouse, Performing test decon of metal.
1430 Merkel left site, vac-pac system turned over to SMC for shipment.
1515 Secured work at baghouse test decon of metal from vent ducts showed a reduction of 50% (Reduced from ~3000 dpm/100 cm² to ~1500 dpm/100 cm²) with minor effort using wire brush & household cleaner & paper towels. Workers emptied 2 of 6 hoppers today w/vacuum truck. 3 Truckloads of dust were moved today to the storage yard from the baghouse.
1630 Met w/ Dave Smith, discussed test decon results, storage yard survey results.
1700 Duff left site, completed surveys w/exception of D111.

No Further Entries RAD

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

None

Weather Conditions: Sunny, mild, wind from South ~5 mph	Important Telephone Calls and Interactions: None
Personnel on Site: Duff, Merkel, D. Smith, Bennett, Schnorbus, White, ~~Bttlers, Fagan~~ sick	
Name (print): R. Alan Duff	Signature: [signature]

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 5/26/99	Time: 0700	Job/Task Number: 94005.20
Client Name: Shieldalloy Metallurgical Corp.		
Address of Work Site: West Blvd., Newfield, NJ		
Description of Work: AAF Baghouse decontamination/disassembly.		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0600 Merkel on site, preparing instruments for today's use.
0700 Duff on site, crew continuing vacuuming of mid levels & hoppers of baghouse. Conducted surveys of vacuumed areas. Vacuum truck dumping removed materials on dust pile in storage yard.
1200-1245 Lunch
1300 Crew continued vacuuming of baghouse, removing bulk materials.
to 1500 Completed work, crew left site. Duff/Merkel at lab office counting smears, completing survey forms.
1600 Left site, gave quick debrief to D. Smith on status of baghouse, surveillance activities performed. Turned over lead of Project to Merkel, Duff returning to home office.

No Further Entries
RAD

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

None

Weather Conditions: Clear, warm, wind calm	Important Telephone Calls and Interactions: None
Personnel on Site: Duff, Merkel, Bennett, Schmorbus, White	
Name (print): R. Alan Duff	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC / NewField		
Date: 5-27-99	Time: 0600	Job/Task Number: 94005.20
Client Name: Sheildalloy Met. Corp		
Address of Work Site: West Blvd Newfield NJ		
Description of Work AAF Baghouse Decon.		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0600 Meekel onsite, Preparing instruments, BZA
0700 Magco Crane Co. onsite To Remove Silo, Ductwork
VAC Truck moved to E. side of Baghouse to Complete Dust removal
0730 Begin Rigging Silo For Removal by Bennett, MAGCO
0900 Silo Completed, Moving CRANE to Position For Duct work.
Jim Valinni Taking Pictures
0900 VAC Truck Driver wearing BZA
1000 Preparing to cut First Piece of duct work out; on D-111
1230 First Piece DOWN Surveyed NO Contamination, 5-6 inches of Material in Bottom of Duct work
1330 VAC truck to empty
1430 Cutting 2nd Piece of ductwork, 2 workers in U.S. side Room Cleaning out hoppers.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
left @ 2:30 (workers)

Weather Conditions: SUNNY, Mild 5-7 mph Winds	Important Telephone Calls and Interactions:
Personnel on Site: Meekel, D. Smith, Robb Bennett, Schanbs, White/Magco	
Name (print): Don Meekel	Signature: Don Meekel

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: Sheild Alloy Met Corp Newfield		
Date: 5-28-99	Time: 0600	Job/Task Number: 94005.20
Client Name: Sheildalloy Metallurgical Corp		
Address of Work Site: West Blvd, Newfield NJ.		
Description of Work AAF Baghouse Decon		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0600 Merkl In Prep instruments, Air Sampl pumps.
0700 Continue Cut out of Air Duct on Top D-111
Workers still using UAC Truck in East Side Rooms 1ST Level.
0900 2nd FT section of Duct work From D-111 Removed
Surveyed inside out, No levels above limits detected
Spotty Levels of 100-125 CPM
* Notified D. Smith via J. Valinni to hose down Piles of Dust.
1030 12-15 FT Piece of Duct on Ground Surveyed No levels Above
Limits
Workers inside UAC. bottom Floor

1130 3rd Piece Removed 8-10 Feet. Surveyed no Contamination detected

1200 Lunch

1300 Working on 4th Piece {Elbow} r
2 Workers in Bottom level UAC. Equipt, Floor.
1400 Removed on ground 4th Piece Surveyed NO Contaminants detected
Above levels.
1430 Merkel in office on Paperwork.
* Spoke directly to D. Smith to hose down Piles of dust, he said
"he WASn't going to worry About it".

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
CALL D. Smith Notify of Watering Piles of Dust From Baghouse

Weather Conditions: Sunny, Clear, Cool Lite Breeze	Important Telephone Calls and Interactions: None
Personnel on Site: Merkel, Bennett, white,	
Name (print): Ron Merkel	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC / Newfield		
Date: 6-1-99	Time: 0600	Job/Task Number: 94005.20
Client Name: Stellalloy Metallurgical Corp		
Address of Work Site: West. Blvd, Newfield, NJ		
Description of Work MAF Baghouse Decon		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0600 Merkel In Source check inst., Cal. Air/Sample pumps.
0700 2 Workers Vac. Dust From Last Hopper. Scotty on Roof Prep to cut out Final Section of Vent Duct.
1000 Final Piece of duct work Removed 45 Feet Long. Surveyed inside + Outside, Inside 60-80 cpm (1 min scaler) Outside Top 85-144 cpm (1 min scaler)
1130 Bennett, white MAKing Blanks For Roof Penetrations Lunch
1230 Bennett, white on Roof Putting Blanks in Place
1330 D. Smith Stopped By. to take Some Pictures.; Gave him An update.
1430 Crane operations w/ MASCO Complete; Surveyed Crane inside, outside wheels etc.
1800 Crane offsite
VAC Truck Emptying.
1530 Bennett and Crew off site.
No Further Entries

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

None

Weather Conditions: Sunny, Mild	Important Telephone Calls and Interactions: Alan Doff, Carol Berger
Personnel on Site: Merkel, Bennett, MASCO Crane Co.	
Name (print): Ron Merkel	Signature: Ron Merkel

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC Newfield		
Date: 6-2-98	Time: 0600	Job/Task Number: 94005.20
Client Name: Stellalloy Met Corp		
Address of Work Site: West Blvd, Newfield N.J.		
Description of Work AAF Baghouse Decon		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0600 Merkel onsite Cal. air Pumps, instruments.
0700 No Air Sample Pumps Needed Today.
0800 Cutting up Large Sections OF Ductwork.
0900 Finishing with VAC Truck
1000 VAC truck gone to empty Final Load
Preping to Decon VAC truck
11:00 Power Washing VAC TRUCK, Lg DumpTRUCK

1300 Merkel Surveying VAC truck VAC truck Clean except Baghouse Portion; Baghouse Portion on truck shows to have 140 - 180 CPM α ON Bags & Loose Dust in Bottom of Baghouse
1400 Called Carol Berger; Plan of Action try to get Bags out of truck Cost depending & Replace. Vaccum out Residual dust in Baghouse

1500 Cleaning up
1600 Source Checking instruments

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

None

Weather Conditions: Overcast, Breezy	Important Telephone Calls and Interactions: Carol Berger
Personnel on Site: Merkel Bennett, Chris Eisco	
Name (print): Ron Merkel	Signature: R. Merkel

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility:	SMC Newfield		
Date:	6-03-99	Time: 0600	Job/Task Number: 94005.20
Client Name:	Sheild Alloy Met		
Address of Work Site:	West Blvd Newfield NJ		
Description of Work	Decon D-111 AAF Baghouse		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0600 Merkel onsit Source Checking Instrumnets.
0700 Bennett + Crew setting up Water Supply + Pressure Washer For Decon of Bottom Floor AAF Baghouse.
* 2 Workers From Eisco Onsite to Remove Bags From VAC Truck Workers in Full Face Resp. Tyvek, Gloves.
0930 Scotty, John Removing Fence Around Transformer.
Eisco Workers Finish Removing Bags.
1000 Eisco to empty Residual Dust From Bags, Decon Baghouse (Truck) With Lik Water.
1130 Decon Complete Bennett + Crew to Lunch.
1200 Survey Affected Areas of Truck; After decon Truck Baghouse was less BKG. BKG = 7
1300 Bennett + Crew putting up Fence Around transformer yard.
1330 Begin Cutting Ductwork on ground; Merkel Surveying Lower Room of AAF Baghouse. AFTER Decon.
1500 Bennett + Crew cutting Duct work.
Merkel Surveying Equipment in Bottom Floor of AAF Baghouse.

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

None

Weather Conditions: 72° Sunny, Breezy	Important Telephone Calls and Interactions: N/A
Personnel on Site: Merkel Bennett, D. Smith, White	
Name (print): Ron Merkel	Signature: R Merkel

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC.		
Date: 6-7-99	Time: 0600	Job/Task Number: 94005.20
Client Name: Shieldalloy Metallurgical inc		
Address of Work Site: West Blvd Newfield NJ.		
Description of Work Decon, Demo MAF Baghouse		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0600 Source Check instruments.
0700 2 workers Cutting steel; TORCH
Bennett & White Begining to tear Bldg down.
0900 Merkel Surveying SCRAP Metal on ground. MARKing Elevated Pieces W/ Red Paint; took pictures

1100 Top half of Bldg on ground. Scotty Seperating structur steel from siding.
D. Smith Stopped By to TAKE Pictures
1200 Lunch.
1300 Called Allen left MESSAGE. 2 workers cutting up silo
1500 Top 2 Floors of Bldg were taken down seperation Complete, Seperated into Structural, GRATE, CORRUGATED
1600 Source check inst.
NO Further Entries

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

None

Weather Conditions: Sunny, Hot 85-90° Breezy	Important Telephone Calls and Interactions: None
Personnel on Site: Bennett, white, Smith, Merkel	
Name (print): Ron Merkel	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC		
Date: 6-8-99	Time: 0615	Job/Task Number: 94005.20
Client Name: Sheild alloy Metalurgical inc		
Address of Work Site: W. west Blvd New field NJ.		
Description of Work Decon Demo AAF Baghouse		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0615 Merkel onsite

0700 Scotty, John onsite; John cutting Silo Scotty is on Grapple - Seperating steel

0800 Bennett onsite preparing to level remainder of Baghouse.

1000 Called Allan Concerning Release limits

1100 hoppers From 1st floor Baghouse are on ground.

1200 lunch.

1300 Merkel surveying Hoppers

1400 D. Smith is onsite; Using Excavator

1500 Completion of cutting of Silo

1530 Scotty, John leave site

1600 Merkel sonck checking instruments -

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

None

Weather Conditions: Sunny Hot 95°	Important Telephone Calls and Interactions: Allan & Release limits
Personnel on Site: White, John, Merkel, Bennett, Smith	
Name (print): Dan Merkel	Signature: Dan Merkel

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC		
Date: 6-9-99	Time: 0630	Job/Task Number: 94005.20
Client Name: Sheild Alloy Metalurgical INC		
Address of Work Site: N. West Blvd Newfield NJ.		
Description of Work Demo D-111 AAF Baghouse		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0630: Merkel in to source check instruments
0700 White, John, Jimmy on site, setting up to cut steel + Decon Corrigated tin.
0800 Bennett onsite; Fired Jimmy Because of missing too much
Merkel Surveying Pieces of steel that used to be Silo
0900 Merkel Surveyed Large 2 Fan Blower; part of Duct work that was connected to D-111.

1000 Scotty Deconing Corrigated Siding

1100 Scotty + John Cutting overhead Pipes From D-111 → AAF Baghouse

1200 Lunch.

1300 Scotty + John Removing (2) 200hp Motors From Ventilation System
1400 Maintenance Stopped By to Check on the 2 motors they will Salvage them.
1500 Scotty + John cutting down overhead Pipe
1600 Source Check Instruments
No further Entries

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

None

Weather Conditions: Sunny, Hot 78° – 90°	Important Telephone Calls and Interactions: None
Personnel on Site: Merkel White, Bennett, John, Jimmy	
Name (print): Ron Merkel	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC		
Date: 6-10-99	Time: 0600	Job/Task Number: 94005.20
Client Name: Shield alloy metallurgical inc.		
Address of Work Site: West Blue Mansfield NJ.		
Description of Work Decon, Demo AAF Baghouse		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0600 Merkel in source check instruments.
0700 Scotty + John onsite Cutting overhead Pipe from D-111 → AAF Baghouse
0800 R. Bennett onsite Moving Palletts For D. Smith
0830 3 way call to Allan + Carol; Evacuation Drill
0900 Bennett Moving Scrap From Back to D-111 For Disposal with Rest of Scrap From D-111 Surveyed Scrap. & Drainage Tile, Misc metal.

1000 Talked to Bennett About Staging Area For Clean Pieces of Steel Awaiting Cutting; W. side of G-Warehouse in Bermed Area.

1100 Scotty + John loading Cut metal in 1st Roll off.

1200 Lunch
1300 Clearing AAF Baghouse Slab For Laydown/Decon Area.
1400 Surveying Structural Steel; Scotty Spreading Stretral Pile
1500 Scotty + John Cleaning up. Merkel still Surveying
1600 Merkel to office to Source Check Instruments.
1630 leaving site No further entries

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:
Create A Staging Area For Scrap Awaiting Cutting.
Beside G Warehouse

Weather Conditions: Overcast, Breezy 70-75°	Important Telephone Calls and Interactions: Allan, Carol 3 way. (Laydown Area)
Personnel on Site: Merkel Scotty, John Bennett, Smith	
Name (print): Ron Merkel	Signature: Ron Merkel

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC		
Date: 6-11-99	Time: 0700	Job/Task Number: 94005.20
Client Name: Sheild Alloy Metalurgical		
Address of Work Site: N. West Blvd		
Description of Work Surveying Scrap, Decon		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0600 S. White, Merkel, John onsite
0800 Surveying Structural Steel Pile
Scotty Spreading Pile 1 Scoop / Time.
0900 Survey 4 happens AFTER Decon.

1100 Continue Survey of structure pile
moved duct work to Laydown area. Ductwork was
Surveyed while in place; John Power Washed the tops
+ Sides of each one Prior to Staging
1200 Lunch
1300 Continue Survey of Structure Steel
John Cutting up Tank.
1400.

1500 Meter stopped functioning Replaced Mylar, Source Checked
1600 Source check Instalments

NO Further Entries

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

None

Weather Conditions: Clear cool 70° Breezy	Important Telephone Calls and Interactions: N/a
Personnel on Site: White, John, Merkel	
Name (print): Don Merkel	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC		
Date: 6-14-99	Time: 0630	Job/Task Number: 94005.20
Client Name: Sheild Alloy Metallurgical Inc		
Address of Work Site: 4 West Blvd Newfield NJ		
Description of Work: Demo, Decon D-111 AAF Baghouse		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0630 Merkel IN Charge MyLAR ON Inst.; Source check meters.

0700 Scotty, John ONSite; Cutting Structure Steel Merkel Fixing Signs ON STORAGE YARd. Posts.

0900 Meekl To Fedex to Send timesheets.

1100 D. Smith Stopped By to See Progress; Scotty, John Still Cutting Structural Steel.

1200 Lunch.

1300 Merkel writing Surveys.

1500 John, Scotty Cutting Structural Steel

NO further entries

Changes from Plans and Specifications, and Other Special Orders and Important Decisions: None	
Weather Conditions: RAINy, 80°, Humid.	Important Telephone Calls and Interactions: None
Personnel on Site:	
Name (print): Ron Merkel	Signature: Ron Merkel

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC		
Date: 6-15-99	Time: 0700	Job/Task Number: 94005.20
Client Name: Shield Alloy Metallurgical Inc.		
Address of Work Site: N. West Blvd Newfield NJ.		
Description of Work: Decon, Demo, Cutting, Scrap.		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0700 Merkel, Scotty, John. onsite. Scotty + John Cutting Supports in Prep. to Remove. Final piece of ductwork that went to D-111 Roof; and Fans.
0800 R. Bennett onsite Removing Fans + Duct work
0900 John + Scotty Deconning Structural Steel that was found to be close to limits.
1000 Surveyed Structural steel after Decon, All Pieces Below limits; Bennett offsite to get pressure washer.
1100 close Rated Roll off container Full of Structural Steel BKG was 10-12 cpm/hr Counted Readings were BKG or less.

1200 Lunch
1300 D. Smith Notified me to call Carol + Allen About Allan Wouldn't Be Coming in on Wed 15th
1400 Surveying 2 Fan units; Scotty + John cutting steel

1500 Complete Survey of Fan units;

NO Further Activities

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

Weather Conditions: Overcast, 75°, Breezy	Important Telephone Calls and Interactions: Allan, Carol.
Personnel on Site: Bennett, Scotty, John, Merkel	
Name (print): R. Merkel	Signature: R Merkel

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Facility: SMC		
Date: 6-16-99	Time: 0700	Job/Task Number: 94005.20
Client Name: Sheild Alloy Metalurgical inc		
Address of Work Site: H. west Blvd		
Description of Work: Demo, Decon AAF Bashouse		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0630 Meekl onsite source checking instruments
0700 meekl Surveying Misc Pipes.
Scotty Deconning Final Pieces of Duct-work; John cutting steel
0800 Meekl writing Surveys.
0930 Calling Allan. For Final Instructions.
1030 Surveying Final Pieces of Ductwork
1100 To Fedex to Ship BZA + Meter to Ohio
1200 lunch
1300.

1400 Write Survey Ron Electrical Panel.

Changes from Plans and Specifications, and Other Special Orders and Important Decisions: None	
Weather Conditions: Cloudy Cool 70°	Important Telephone Calls and Interactions: Allan Duff
Personnel on Site: Scotty, John, Ronn	
Name (print): Ron Meekl	Signature: Ron Meekl

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
FIELD ACTIVITY DAILY LOG

Page ____ of ____

Facility: SMC		
Date: 6-17-99	Time: 0700	Job/Task Number: 94005.20
Client Name: Shieldalloy Metallurgical Inc		
Address of Work Site: N. West Blvd		
Description of Work: Demo / Decon D-111 APF Baghouse.		

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

0700 Scotty, John, Bennett onsite
Merkel onsite Scotty John picking up misc debris around Pad.
0800 Decoming Crapple.; Dan Wanted me to scan it before I left.
0900 Performing quarterly survey in D-111.

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

Weather Conditions: —	Important Telephone Calls and Interactions: None
Personnel on Site: Merkel, D. Smith, Bennett, White, Schnorbus	
Name (print): Ronn Merkel	Signature: PP Jyy for Ronn Merkel per telecommunication

Appendix C - Instrument Records

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.20	Detector			Meter		
Site Location/Background Location: SMC Newfield, D202 Inst. office	Type: Ludlum 43-89	Serial No. 141648	Probe Area (cm²) 100	Type: Ludlum 2224	Serial No: 146718	Operating Voltage: N/A
Check Source No: 3785	Check Source No: ✓			Check Source No: ✓		
Radionuclide: Th-230 / Activity: 6500 dpm / 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.									
5/17/99	4	3	4	4	←	N/A	→		4	3	3	3	←	N/A	→		1238	19.0%	N/A	N/A	63.2	N/A	—	N/A	RM
5/18	3	3	4	4	—	—	—		4	4	3	4	—	—	—		1188	18.2%	N/A	N/A	66.0	N/A	—	N/A	RM
5/19	5	4	5	5	—	N/A	N/A		4	4	4	4	—	N/A	—		1167	17.9%	N/A	N/A	73.6	N/A	✓	N/A	RM
5/20	6	5	6	6	—	N/A	N/A		5	4	4	4	—	N/A	—		1255	19.2%	N/A	N/A	73.4	N/A	✓	N/A	RM
5/21	4	5	5	5	—	N/A	—		5	5	5	5	—	N/A	—		1166	17.9%	N/A	N/A	73.2	N/A	✓	N/A	RM
5/24	3	3	4	3	—	N/A	—		5	6	5	5	—	N/A	—		1148	17.6%	N/A	N/A	61.2	N/A	✓	N/A	RM
5/25	7	6	8	7	—	N/A	—		6	7	7	7	—	N/A	—		1156	17.7%	N/A	N/A	84.8	N/A	✓	N/A	RM
JUNE																									
6-9	7	8	8	8	—	N/A	—		8	7	7	7	—	N/A	—		1336	20.4%	N/A	N/A	77.8	N/A	✓	N/A	RM
6-10	6	7	7	7	—	N/A	—		6	7	6	6	—	N/A	—		1203	18.4%	N/A	N/A	81.6	N/A	✓	N/A	RM
6-11	7	7	6	7	—	N/A	—		7	6	6	6	—	N/A	—		1216	18.6%	N/A	N/A	80.7	N/A	✓	N/A	RM
6-14	8	7	8	8	—	N/A	—		7	7	7	7	—	N/A	—		1228	18.8	N/A	N/A	84.4	N/A	✓	N/A	RM
6-15	7	6	7	7	—	N/A	—		7	6	7	7	—	N/A	—		1239	18.9	N/A	N/A	79.4	N/A	✓	N/A	RM
6-16	7	7	7	7	—	N/A	—		6	7	7	7	—	N/A	—		1256	19.2	N/A	N/A	78.2	N/A	✓	N/A	RM

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

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).

6-17-99 7 7 7 ← N/A → 6 7 7 7 ← N/A → 1226 18.7% N/A NA 80.3 N/A ✓ N/A RM

SHIELDALLOY METALLURGICAL CORPORATION
CONTAMINATION SURVEY INSTRUMENT DATA SHEET
RSP-018

Project Description: AAF Beghouse / 2nd Qtr. 99 Surveillance	Detector			Meter Cal due 1/13/00		
Background Location: SMC Newfield, Lab instrument office	Type: ←	Serial No. N/A	Probe Area (cm²) →	Type: Eberline SAC-4	Serial No: 868	Operating Voltage: 750
Check Source No: 3785	Check Source No:			Check Source No:		
Radionuclide: Tl-230 / Activity: 6500dpm / Date: 9/18/91	Radionuclide:	Activity:	Date:	Radionuclide:	Activity:	Date:

Date	Start of Shift Background (cpm for a 50 minute count)								End of Shift Background (cpm for a N/A 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.							
5/25/99	2.4	←	N/A	→	←	N/A	→		←			N/A	→				2028	31.2%	N/A	N/A	31.8	N/A	BKF
5/26/99	2.2	←	N/A	→	←	N/A	→		←			N/A	→				2014	31.0%	N/A	N/A	31.0	N/A	MO
6/15/99	2.7	←	N/A	→	←	N/A	→		←			N/A	→				1936	29.8%	N/A	N/A	34.7	N/A	MO for RM
6/17/99	2.5	←	N/A	→	←	N/A	→		←			N/A	→				2021	31.1%	N/A	N/A	32.4	N/A	MO for RM

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

* Background checked periodically during shift to determine if significant bkgd. changes have occurred

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).

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

Project No. 94005.20	Detector		Meter		
Site Location/Background Location: SMC Newfield 0202 Inst. Office	Type: N/A	Serial No. N/A	Type: Bicron Microrem	Serial No: B296W	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)	Initials
		1	2	3	Avg.	1	2	3	Ave.		
5/17/99	uR/hr	7	6	7	7	7	7	6	7	750	RWO
5/18/99	uR/hr	6	7	6	6	6	6	7	6	750	RW
5/19/99	uR/hr	5	6	6	6	7	6	6	6	750	RW
5/20/99	uR/hr	6	6	5	6	7	7	6	7	800	RWO
5-21-99	uR/hr	7	6	7	7	6	7	7	7	800	RWO
5-24-99	uR/hr	5	7	7	7	7	7	6	7	800	RW
5-25-99	uR/hr	7	7	6	7	6	7	6	6	750	RW
5-26-99	uR/hr	6	6	7	6	7	6	7	7	800	RW
5-27-99	uR/hr	7	7	7	7	8	7	7	7	800	RW
5-28-99	uR/hr	6	7	7	7	7	6	8	7	800	RW
6-1-99	uR/hr	6	6	7	6	6	7	8	7	800	RW
6-2-99	uR/hr	6	6	7	6	7	8	7	7	800	RW
6-3-99	uR/hr	7	7	6	7	7	6	6	6	800	RW
6-4-99	uR/hr	7	6	6	6	7	7	7	7	800	RW
6-7-99	uR/hr	7	7	6	7	8	7	6	7	800	RW
6-8-99	uR/hr	6	7	7	7	7	6	7	7	800	
6-9-99	uR/hr	7	7	7	7	8	6	7	7	850	RW
6-10-99	uR/hr	7	6	6	6	6	6	7	6	800	RW
6-11-99	uR/hr	6	7	6	6	7	7	7	7	800	RW
6-14-99	uR/hr	7	7	6	7	6	6	7	6	800	RW
6-15-99	uR/hr	6	7	7	7	6	6	6	6	750	RW
6-16-99	uR/hr	7	6	7	7	6	7	7	7	750	RW
6-17-99	uR/hr	7	6	6	6	6	6	6	6	750	RW

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
CONTAMINATION SURVEY INSTRUMENT DATA SHEET

Project No: 94005.20 + 94005.05	Detector			Meter		
Site Location/Background Location: SMC Newfield D202 Inst. Office	Type: Ludlum	Serial No: 132118 +19791	Probe Area (cm²): 100	Type: 2224	Serial No: 119791	Operating Voltage: N/A
Check Source No:	Check Source No: ✓			Check Source No: ✓		
Radionuclide: Th-230 / Activity: 6500 DPM / 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.									
5/17/91	2	3	4	3	—	N/A	—		3	4	3	3	—	N/A	—		1169	17.9%	N/A	N/A	60.1	N/A	—	N/A	RM
5-18-91	3	4	3	3	—	—	—		4	3	4	4	—	—	—		1149	17.6%	N/A	N/A	61.2	N/A	✓	N/A	RM
5/19/91	3	4	4	4	—	N/A	—		3	4	4	4	—	N/A	—		1142	17.5%	N/A	N/A	68.6	N/A	✓	N/A	RM
5/20/91	6	6	7	6	—	N/A	—		5	5	4	5	—	N/A	—		1248	19.2%	N/A	N/A	73.4	N/A	✓	N/A	RM
5-21-91	7	8	6	7	—	N/A	—		6	5	6	6	—	N/A	—		1132	17.3%	N/A	N/A	86.8	N/A	✓	N/A	RM
5-22-91	7	6	8	7	—	N/A	—		7	7	8	7	—	N/A	—		1116	17.0%	N/A	N/A	88.3	N/A	✓	N/A	RM
5-23-91	6	6	7	6	—	N/A	—		6	7	7	7	—	N/A	—		1206	18.4%	N/A	N/A	76.6	N/A	✓	N/A	RM
5-24-91	7	8	6	7	—	N/A	—		7	5	7	7	—	N/A	—		1166	17.8%	N/A	N/A	84.3	N/A	✓	N/A	RM
5-25-91	6	6	7	6	—	N/A	—		6	7	7	7	—	N/A	—		1236	18.9%	N/A	N/A	74.6	N/A	✓	N/A	RM
6-1-91	8	7	7	7	—	N/A	—		7	6	6	6	—	N/A	—		1188	18.2%	N/A	N/A	82.5	N/A	✓	N/A	RM
6-2	7	8	7	7	—	—	—		8	8	7	8	—	N/A	—		1210	18.4%	N/A	N/A	81.6	N/A	✓	N/A	RM
6-3	7	7	7	7	—	N/A	—		6	8	7	7	—	N/A	—		1189	18.1%	N/A	N/A	82.9	N/A	✓	N/A	RM
6-4	8	7	8	8	—	N/A	—		6	7	8	7	—	N/A	—		1177	18.0%	N/A	N/A	88.1	N/A	✓	N/A	RM

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

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).

SHIELDALLOY METALLURGICAL CORPORATION
CONTAMINATION SURVEY INSTRUMENT DATA SHEET
RSP-018

Project Description: 94005.20			Detector			Meter		
Background Location: SMC New Field D202-Inst. office			Type: Ludlum 43-89	Serial No. 132118	Probe Area (cm^2) 100	Type: 2224 Ludlum	Serial No: 119791	Operating Voltage: N/A
Check Source No: 3785			Check Source No:			Check Source No:		
Radionuclide: Th-230	Activity: 6500 dpm	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)		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.							
6-7	11	7	6	8	—	N/A	—		8	7	7	7	—	N/A	—		1220	18.6%	N/A	N/A	85.3	N/A	RJ
6-8	7	8	8	8	—	N/A	—		7	7	6	7	—	N/A	—		1262	19.3%	N/A	N/A	82.2	N/A	RJ
6-9	7	7	7	7	—	N/A	—		6	5	5	5	—	N/A	—		1194	18.2%	N/A	N/A	82.5	N/A	RJ
6-14	5	6	4	6	—	N/A	—		6	5	6	6	—	N/A	—		1224	18.7	N/A	N/A	75.4	N/A	RJ

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

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).

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. 915-235-467
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER SHIELDALLOY METALLURGICAL ORDER NO. 227320/238032

Mfg. Eberline Model SAC-4 Serial No. 868

Mfg. _____ Model _____ Serial No. _____

Cal. Date 13-Jan-99 Cal Due Date 13-Jan-00 Cal. Interval 1 Year Meterface SAC-4

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 73 °F RH 20 % Alt 699.8 mm H

☐ 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 _____ = _____

☐ 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 Electronic

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Digital Readout	400 K cpm	40011 (0)	40011 (0)	Log Scale			
	40 K cpm	4007	4007				
	4 K cpm	401	401				
	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 technique. The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323-1997 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

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

☑ m 500 S/N 70648 ☐ Oscilloscope S/N _____ ☑ Multimeter S/N 61730074

Calibrated By: Lorie Martinez Date 13-Jan-99

Reviewed By: V. Lee Alvarado Date 17 Jan 99

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 #. 227320/238032

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

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

Other

High Voltage	Background	Isotope Pu239 Size 12.8K cpm	Isotope Size	Isotope Size	Isotope Size
750	1	904			
800	0	979			
850	0	1009			
900	1	1027			
950	0	999			
1000	1	1015			
1050	4	1044			

Signature Lori Martin Date 13-Jan-99

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 MGNT ORDER NO. 229961/ 239307

Mfg. Ludlum Measurements, Inc. Model 2224 Serial No. 146718

Mfg. Ludlum Measurements, Inc. Model 43-89 Serial No. PR 146748

Cal. Date 18-Mar-99 Cal Due Date 18-Mar-00 Cal. Interval 1 Year Meterface 202-783

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 72 °F RH 41 % Alt 703.8 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 6.25 V Input Sens. Comments mV Det. Oper. 6.25 V at Comments mV Threshold Dial Ratio ____ = ____ m

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

COMMENTS:

Alpha Threshold: 120mV
Beta Threshold: 3.5mV
Beta Window: 30mV
Overload check but not set
HV set with detector not connected
Firmware 390063

Instrument calibrated with 39 inch cable

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	400Kcpm	400	400
X 1000	100Kcpm	100	100
X 100	40Kcpm	400	400
X 100	10Kcpm	100	100
X 10	4Kcpm	400	400
X 10	1Kcpm	100	100
X 1	400cpm	400	400
X 1	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	399889	399889
	40 K cpm	39988	39988
	4 K cpm	3999	3999
	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 ANSI/NCSL Z540-1-1994 and ANSI N323-1997 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-3

☑ Alpha S/N Pu-239 12800cpm ☑ Beta S/N Tc-99 14200cpm, Sr-90/Y-90 25978cpm ☐ Other ____

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

Calibrated By: Conrad Salinas Date 18 Mar 99

Reviewed By: Rhonda Hanin Date 21 Mar 99

FORM C22A 09/17/98

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 146748

Customer INTEGRATED ENVIRONMENTAL MGNT

Counter 2224 Serial No. 146718

Count Time 1Minute

Other

Order #. 229961/239307

Alpha Input Sensitivity 120 mV

Beta Input Sensitivity 3.5 mV

Beta Window 30 mV

Distance Source to Detector Surface

High Voltage	Background		Isotope Pu-239 Size 12800cpm		Isotope Sr-90/Y-90 Size 25978cpm		Isotope Tc-99 Size 14800cpm	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
600	0	196	4966	407	2	10500	8	2641
625	0	263	5199	491	1	12727	7	3728
650	0	270	5227	811	2	13418	9	4902
675	1	344	5241	1717	0	14422	6	6257

☐ 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 18 Mar 99

of Scientific and Industrial Instruments

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 MGNT ORDER NO. 229961/ 239307

Mfg. Bicron Model MICRO REM Serial No. B296W

Mfg. _____ Model _____ Serial No. _____

Cal. Date 19-Mar-99 Cal Due Date 19-Mar-00 Cal. Interval 1 Year Meterface 0-200 uR/h

heck mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 72 °F RH 25 % Alt 710.8 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.

strument Volt Set _____ V Input Sens. _____ mV Det. Oper. _____ V at _____ mV Threshold Dial Ratio _____ = _____ mV

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

COMMENTS:

amma Calbration: 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	150 mR/hr	137	150
x1000	50 mR/hr	45	50
x100	15 mR/hr	140	150
x100	5 mR/hr	47	50
x10	1500 uR/hr	150	150
x10	500 uR/hr	50	50
x1	150 uR/hr	145	150
x1	100 uR/hr	100	100
x0.1	15 uR/hr	15	15
x0.1			

*Uncertainty within ± 10% C.F. within ± 20% _____ Range(s) Calibrated Electronically

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

Ludium 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 ANSI/NCSL Z540-1-1994 and ANSI N323-1997 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 Salinas Date 19 Mar 99

Reviewed By: Rhonda Hann Date 21 Mar 99

FORM C22A 09/17/98

Appendix D - Radiation Work Permit

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

RWP LOG

IEM Project No.: 94005.20 (AAF Baghouse Disassembly)

Permit No.	Preparer	Date Authorized	Date Terminated	Brief Description of Work
IEM/SNC -99-01	R. Alan Duff/	5/17/99	6/17/99	AAF Baghouse Disassembly

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIATION WORK PERMIT

Permit No: IEM/SMC-99-01	Type: ☒ Job Specific ☐ Extended ☐ Routine
Expiration Date: 6/17/99	IEM Project No.: 94005.20

Description and Location of Work: Decontamination & disassembly of AAF Baghouse ☒ See Work Plan

SURVEY INFORMATION

General Area Dose Rates ~~mR/hr~~ uRem/hr	15 uRem/hr	☒ See Map
Maximum Accessible Dose Rates ~~mR/hr~~ uRem/hr	40 uRem/hr	☒ See Map
Removable Contamination (dpm/100 cm²):	< 100 dpm/100 cm²	☐ See Map

ALARA REVIEW

Estimated Total Dose (Maximum Individual): ☐ TBD Attached	Actual Total Dose (Maximum Individual):
Pre-job Briefing by: R. Alan DuFF	Post-job Briefing by:

Dose Reduction Techniques to be Employed: Minimize time spent in baghouse, respiratory protection, HEPA vacuum system

DOSIMETRY REQUIREMENTS

☐ TLD/Film Badge	☐ Finger Ring	☐ SRPD	☒ BZA	☐ Alarming Dosimeter
☐ Stay-Time Estimate: N/A	☐ Other (Specify): N/A			

PROTECTIVE EQUIPMENT

☒ Coveralls	☐ Lab Coat	☐ Hood	☒ Rubber Gloves	☒ Booties
☐ Rubbers	☒ Respirator	☐ Taped Seams	☒ HP Coverage	☐ Stationary Air Sampler
☐ Pre-job Bioassay	☐ Post-job Bioassay	☐ Special Briefing in:		

Other Precautions and Special Instructions: Frisk upon exit from work areas

Authorized by (signature of RSO):	Date: 5/17/99
Authorized by (signature of CHP): PER TELECOM FOR A.J. Boerner	Date: 5/17/99
Terminated by (signature of RSO):	Date: 6/17/99

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number AAF - 0517 Date of Survey 5/17/99

Survey Description: Pre-work survey, survey of AAF Baghouse. γ walk survey of excavated areas of storage yard.	Survey Performed by: [signature] Signature R.A. DUFF Print Name
Drawing Attached: ☑ Yes ☐ No	

Instrument (1)	Instrument (2)	Instrument (3)
Model: Ludlum 2224/43-89	Model: Bicron Microrem	Model: Ludlum 2241/44-10
Serial No. 119791/132118	Serial No. B296W	Serial No. 114535
Calibration Due: 3/18/00	Calibration Due: 3/19/00	Calibration Due: 1/14/00
Efficiency 17.9%	Efficiency N/A	Efficiency N/A
MDA CF BKG 3cpm α	MDA N/A CF N/A BKG 7 uRem/hr	MDA N/A CF N/A BKG 7 uR/hr

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			
See Individual Maps								

Appendix E - Survey Results

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-051899 Date of Survey 5-18-99

Survey Description:	Survey Performed by:
D-111 Baghouse Bag Removal.	Ron Merkel Signature Rd Merkel Print Name Ron Merkel
Drawing Attached: ☐ Yes ☐ No	

Instrument (1)	Instrument (2	Instrument (3)
Model: Ludlum 2224/43-89	Model: Bicron Microrem	Model:
Serial No. 119791 / 132118	Serial No. BZ96W	Serial No.
Calibration Due: 3/18/00	Calibration Due: 3/19/00	Calibration Due:
Efficiency ~~17.99~~ 17.6%	Efficiency N/A	Efficiency
MDA 61.2dpm CF 5.7 BKG 3	MDA N/A CF N/A BKG 6 cpm	MDA CF BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-051999 Date of Survey 5-19-99

Survey Description: D III Baghouse; Bag Removal	Survey Performed by: Ron Morlock Signature Print Name Ron Morlock
Drawing Attached: ☐ Yes ☐ No	

Instrument (1)	Instrument (2	Instrument (3)
Model: Ludlum 2224/43-89	Model: Bicron Micro	Model:
Serial No. 119791/132118	Serial No. BZ 96W	Serial No.
Calibration Due: 3/18/00	Calibration Due: 3/19/00	Calibration Due:
Efficiency 17.5%	Efficiency N/A	Efficiency
MDA 68.6dpm CF 5.7 BKG ~1/cm²	MDA N/A CF N/A BKG 6 cpm/hr	MDA CF BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-052099 Date of Survey 5-20-99

Survey Description: D-111 Baghouse Removal of Dust From Top To Bottom. Vaccuum + Sweeping.	Survey Performed by: Ron Merkel
Drawing Attached: ☐ Yes ☐ No	Signature: Ron Merkel Print Name: Ron Merkel

Instrument (1)	Instrument (2	Instrument (3)
Model: Ludlum 2224/43-89	Model: Bicron Microrem	Model: N/A
Serial No. 119791/132118	Serial No. BZ96W	Serial No.
Calibration Due: 3-18-00	Calibration Due: 3/19/00	Calibration Due:
Efficiency 19.2%	Efficiency N/A	Efficiency
MDA 73.4 dpm CF 5.2 BKG 6 cpm α	MDA N/A CF N/A BKG 7 max	MDA CF BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm	(dpm/100 cm²)			

& map

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-052199 Date of Survey 5-21-99

Survey Description:	Survey Performed by:
Post Decon of upper level Rooms	Ronn Merkel Signature Ronmerke Print Name
Drawing Attached: ~~☐~~ Yes ☐ No	

Instrument (1)	Instrument (2)	Instrument (3)
Model: 2224 / 4389	Model: Bicron uR	Model: N/A
Serial No. 146718/146748 ~~149791 / 132118~~	Serial No. B296 U	Serial No. N/A
Calibration Due: 3-18-00	Calibration Due: 3-19-00	Calibration Due: N/A
Efficiency 17.9 % α	Efficiency N/A	Efficiency N/A
MDA 73.2 dpm CF 5.6 BKG α 6 5 cpm	MDA N/A CF N/A BKG 7 uR/h	MDA N/A CF N/A BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number _____ Page 1 of 1

Instrument/SN: 2791/132118	Calibration Due: 3-18-00	Site Name: SMC	Date: 5-21 Time: 0800
Instrument/SN B296W	Calibration Due: 3-19-00	Location: D-111 Baghouse	
Instrument/SN N/A	Calibration Due: N/A	Purpose: Post Decon Survey Upper level Rooms (6)	
Survey Performed By (Print): Ronn Merkel		Survey Performed By (Signature): Ron Merkel	
✓ 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	Upper Level Baghouse. 6 ROOMS.																									
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
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16																										
17																										
18																										
19																										
20																										
21																										
22																										
23																										
24	* Direct Frisk of ALL accessible AREAS No Elevated Levels Detected, horizontal AREAS Averaged 15-30 cpm.																									
25																										

Notes:

\\\\ = Grating

* ALL FLOORS ARE GRATINGS

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-052599A Date of Survey 5-25-99

Survey Description:	Survey Performed by:
VAC TRUCK Prejob Survey.	Ron Merkel Signature Ron Merkel Print Name
Drawing Attached: ☑ Yes ☐ No	

Instrument (1)	Instrument (2	Instrument (3)
Model: 2221/4389	Model: Bicron	Model:
Serial No. 119791/132118	Serial No. B-296W	Serial No.
Calibration Due: 3-18-00	Calibration Due: 3-19-00	Calibration Due:
Efficiency 17%	Efficiency N/A	Efficiency
MDA 88.3 dpm CF 5.9 BKG 7 cpm	MDA N/A CF N/A BKG 6 cpm	MDA CF BKG

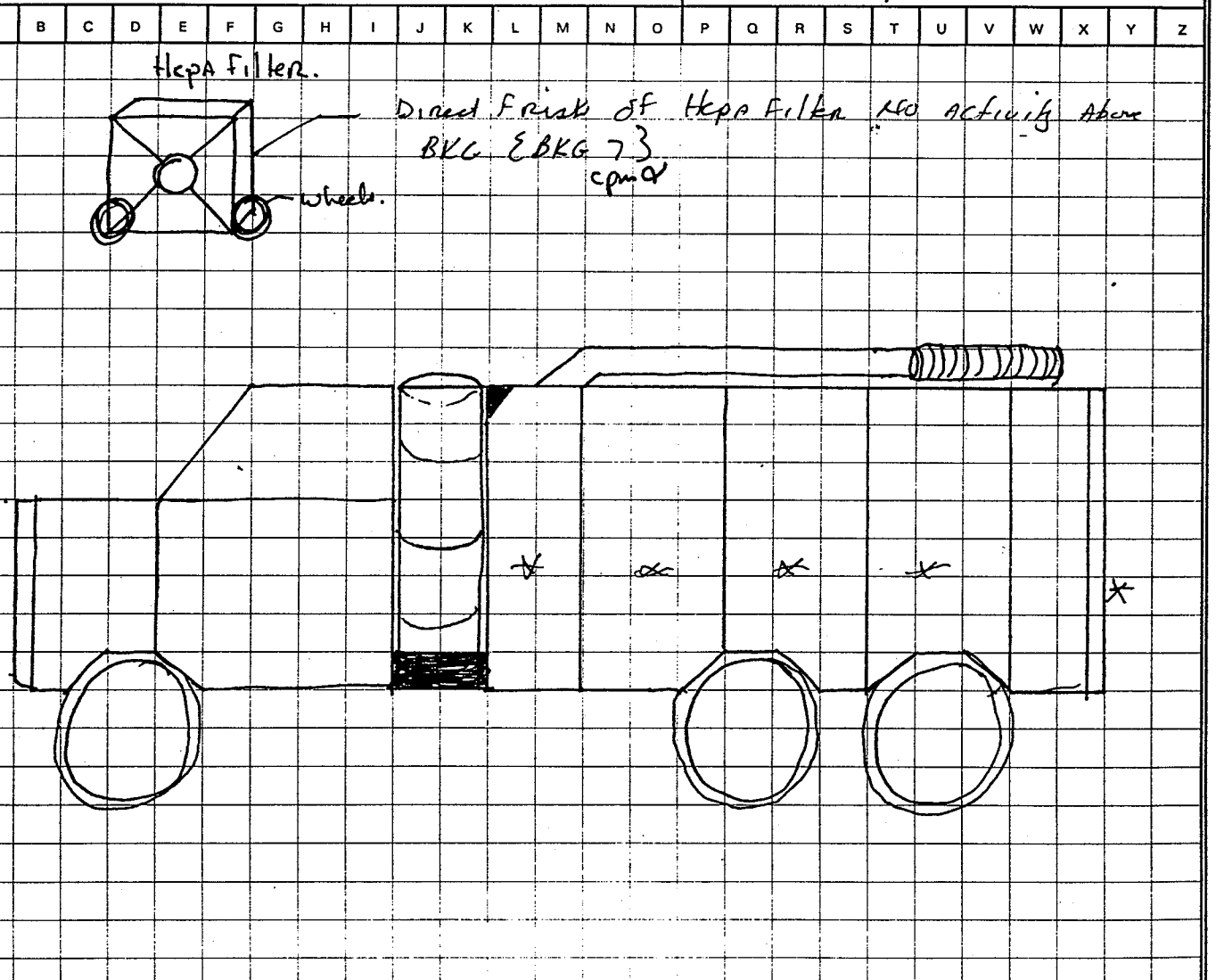
Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number SMC-052599A

Instrument/SN: 2224/4389 119791/132118	Calibration Due: 3-18-00	Site Name: SMC	Date: 5-25 Time: 0700
Instrument/SN BICRON B596W	Calibration Due: 3-19-00	Location: Newfield NT	
Instrument/SN N/A	Calibration Due: N/A	Purpose: PreJob Survey of Eisco VacTruck	
Survey Performed By (Print): Ronn Merkel		Survey Performed By (Signature): Ronn Merkel	
☒ Battery OK ☒ HV OK ☒ Source Check OK		Grid Dimensions: N/A x ____ ☐ meters ☐ feet ☐ inches ☐ centimeters	



Notes: Contact readings W/ ur meter 8-13 mr/hr.
opened left gate surveyed reachable parts with Friskem, NO Activity detected above Bkg.

* = Contact Readings

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-052599B Date of Survey 5-25-99

Survey Description: Release VAC Pac For Shipment To Vendor	Survey Performed by: Signature / Ronn Merkel Print Name
Drawing Attached: ☒ Yes ☐ No	

Instrument (1)	Instrument (2	Instrument (3)
Model: Ludlum 2224/4389	Model: Bicron	Model: N/A
Serial No. 119791 / 132118	Serial No. B296-W	Serial No. N/A
Calibration Due: 3-18-00	Calibration Due: 3-19-00	Calibration Due: N/A
Efficiency 17%	Efficiency N/A	Efficiency N/A
MDA 88.3dpm CF 5.9 BKG 60	MDA N/A CF N/A BKG Juke	MDA CF BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number SMC052599B

Instrument/SN: Ludlum 2224/4389 119791/132117	Calibration Due: 3-18-00	Site Name: SMC	Date: 5/25 Time: 1100
Instrument/SN Bicron B296W	Calibration Due: 3-19-00	Location: D-111 AAF Bldg House	
Instrument/SN N/A	Calibration Due: N/A.	Purpose: Release Survey of UAC-PAC For Shipment TO Vendor	
Survey Performed By (Print): Ronn Merkel		Survey Performed By (Signature): R Merkel	
☒ 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		*	DeCONNed UAC PAC IN ACCORDANCE with Vendors instructions																							
3			disposed of ALL Items (ie Hepa, Roughing Filters etc)																							
4																										
5		*	UAC WAS wiped down Inside/outside ALL ACCESSIBLE AREAS.																							
6																										
7		*	Direct FRISK OF ALL ACCESSIBLE AREAS; NO CONTAMINATION																							
8			Detected → none greater than bkgd. alpha (RNO)																							
9																										
10		*	Boxes OF Hose (UNOPENED) WERE direct FRISKED FOR α NO																							
11			Elevated Levels detected greater than bkgd.																							
12																										
13			Unit was rented from Pentek.																							
14																										
15																										
16																										
17																										
18																										
19																										
20																										
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Notes:

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-060199A Date of Survey 6-1-99

Survey Description:	Survey Performed by:
Direct Survey of CRANE Used TO dismantle Duct work	RONN MERKEL Signature Print Name RONN MERKEL
Drawing Attached: ☒ Yes ☐ No	

Instrument (1)	Instrument (2)	Instrument (3)
Model: Ludlum 2224/4389	Model: BICRON	Model: N/A
Serial No. 119791 / 132118	Serial No. B296W	Serial No.
Calibration Due: 3-18-00	Calibration Due: 3-19-00	Calibration Due:
Efficiency 18.2%	Efficiency N/A	Efficiency
MDA 82.5 dpm CF 5.5 BKG 7 cpm	MDA N/A CF N/A BKG Leaky	MDA CF BKG

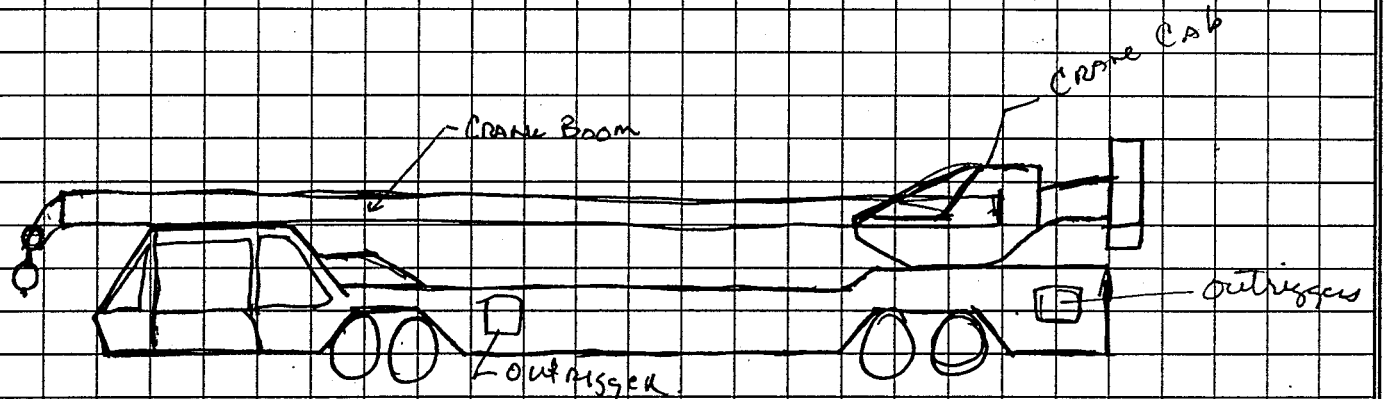
Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(micro R/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number SMC-060199A

Instrument/SN: 2224/14389 / 119791/132118	Calibration Due: 3-18-00	Site Name: SMC	Date: 6/1/99 Time: 1430
Instrument/SN BICRON B296W	Calibration Due: 3-19-00	Location: Newfield NJ.	
Instrument/SN N/A	Calibration Due: N/A	Purpose: Release CRANE	
Survey Performed By (Print): Ronn Merkel		Survey Performed By (Signature): R Merkel	
☐ Battery OK ☐ HV OK ☐ Source Check OK		Grid Dimensions: N/A x N/A ☐ meters ☐ feet ☐ inches ☐ centimeters	



Notes: Surveyed Inside CAb, Wheels, Tires, inside CRANE CAb, Headache BACC, outriggers
No Counts Above BKg. alpha.

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-052599C Date of Survey 5/25/99

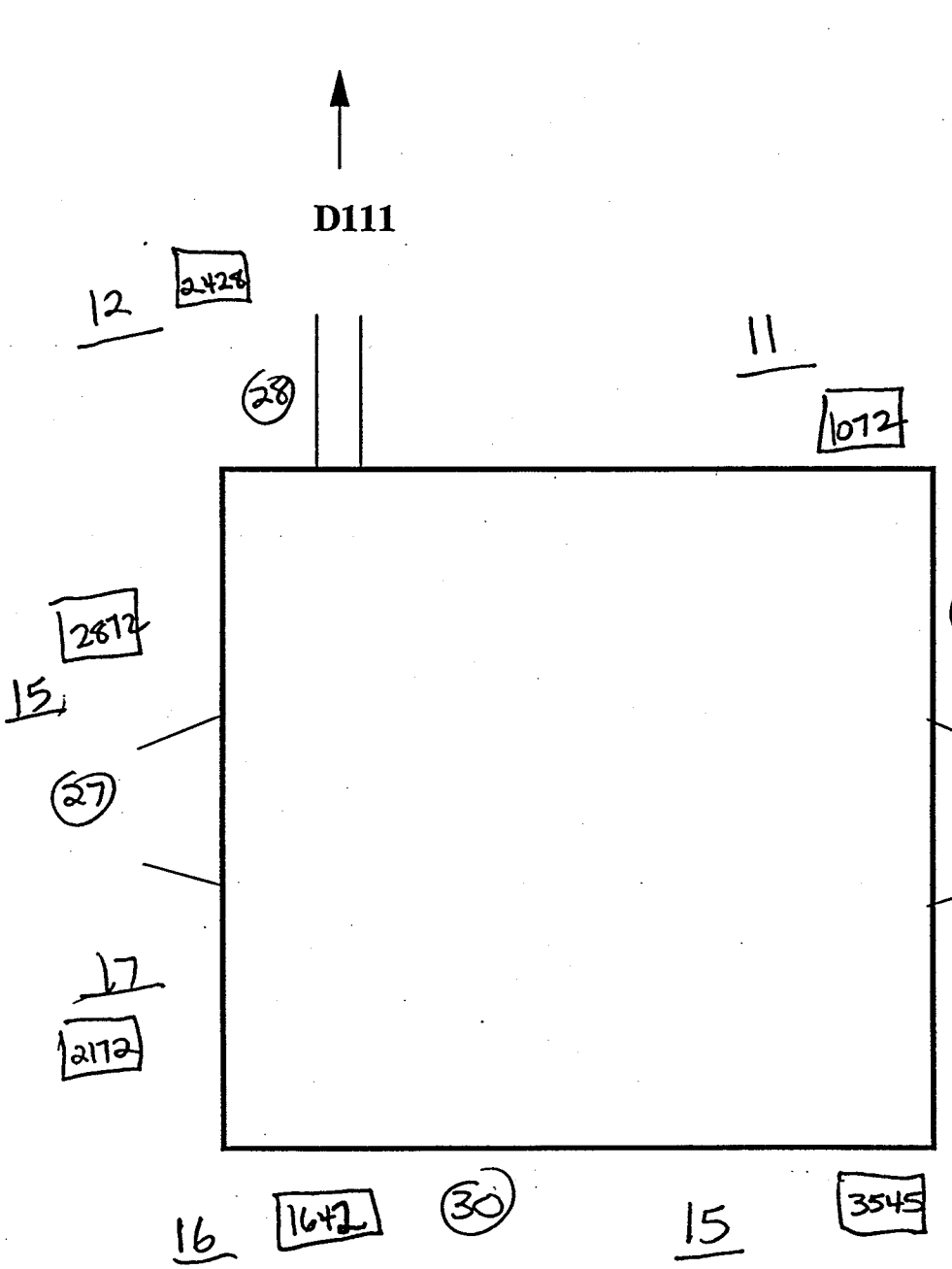
Survey Description:	Survey Performed by:
Quarter 2 1999 surveillance - radiation & contamination surveys in areas listed in RSP-008.	Signature: R. Alan DuFF Print Name
Drawing Attached: ☒ Yes ☐ No	

Instrument (1)	Instrument (2)	Instrument (3)
Model: Ludlum 2224/43-89	Model: Bicron Microrem	Model: Eberline SAC-4
Serial No. 146718/146748	Serial No. B296W	Serial No. 868
Calibration Due: 3/18/00	Calibration Due: 3/19/00	Calibration Due: 1/13/99
Efficiency 17.7% α	Efficiency N/A	Efficiency 31.2% α
MDA 85 dpm CF 5.7 BKG 7 cpm α	MDA N/A CF N/A BKG 7 uRem/hr	MDA 31.8 dpm CF N/A BKG 24 cpm α

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

SEE INDIVIDUAL MAPS

Date 5/25/99



D111 AAF Dust Collector

(Disassembly in progress)

(#) - denotes smear location

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

#_ - denotes ~~exposure~~ rate in ~~microR/hr~~ mRem/hr

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-060199B Date of Survey 6-1-99

Survey Description: QND level post Decon survey of ~~T&T Fiber~~ AAF Baghouse; 6 Bag Rooms.

Drawing Attached: ☑ Yes ☐ No

Survey Performed by: Ronn Merkel

Signature: R Merkel

Print Name: Ronn Merkel

Instrument (1)	Instrument (2)	Instrument (3)
Model: Ludlum 2224 / 4389	Model: Bicron	Model: N/A
Serial No. 119791 / 132118	Serial No. B-296W	Serial No. N/A
Calibration Due: / 3-18-00	Calibration Due: 3-19-00	Calibration Due: N/A
Efficiency 18.2%	Efficiency N/A	Efficiency N/A
MDA 82.5 dpm CF 5.5 BKG 7 cpm α	MDA N/A CF N/A BKG	MDA CF BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			
Grade						10 uR/hr.	1	surveyed all accessible, reachable components
Bag Plates							1	
Walls							1	
Beams							1	
Doors.						↓	1	↓

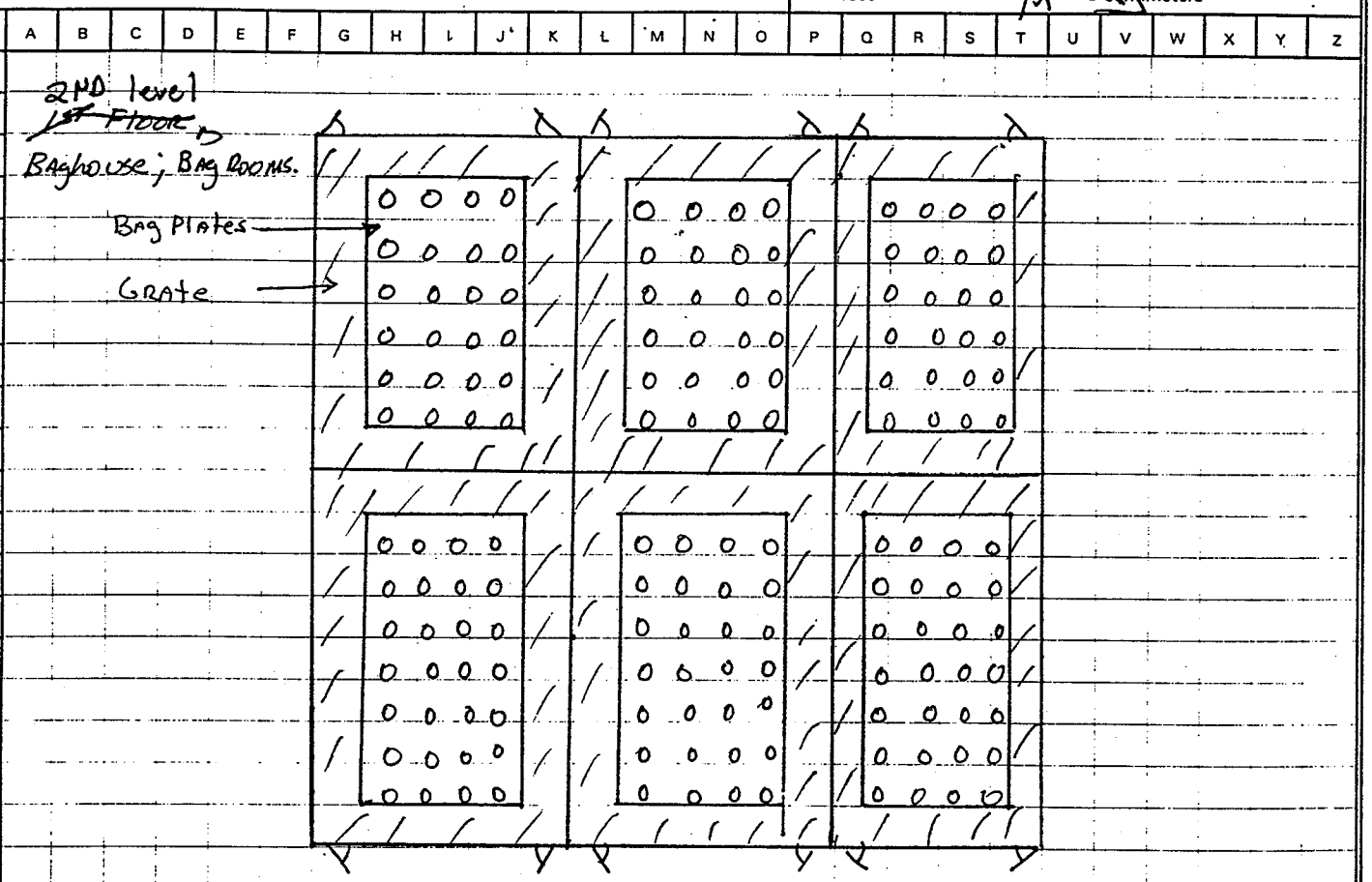
INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number SMC-060199B

Page 1 of 1

Instrument/SN: 2224 / 4389 / 119791 / 132118	Calibration Due: 3-18-00	Site Name: SMC	Date: 6-1	Time:
Instrument/SN BICRON BJ96W	Calibration Due: 3-19-00	Location: Newfield NJ		
Instrument/SN N/A	Calibration Due: N/A	Purpose: Release Survey Prior to Demo.		
Survey Performed By (Print): Ronn Merkel		Survey Performed By (Signature):		
☐ Battery OK ~~☐ HV~~ OK ~~☐ Source Check OK~~		Grid Dimensions: N/A x ☐ meters ☐ feet ☐ inches ~~☐ centimeters~~		



/// = Grating

000 = Bag Plates over hoppers.

Notes: Floor of Rooms is Grate, with the Bag Plates in center over hoppers. Walls are Structural Steel Covered With Corrigated Tin, Doors Steel ALL Accessible Areas Surveyed By direct Frisk, Levels observed were. 80 - 140 CPM on higher Levels there was no change AFTER Wiping With Simple Green, Paper Towels.

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-060299 Date of Survey 6-2-99

Survey Description: Post Decon Survey For VAC Truck Eisco	Survey Performed by: Ronn Merkel Signature Print Name Ronn Merkel
Drawing Attached: ☒ Yes ☐ No	

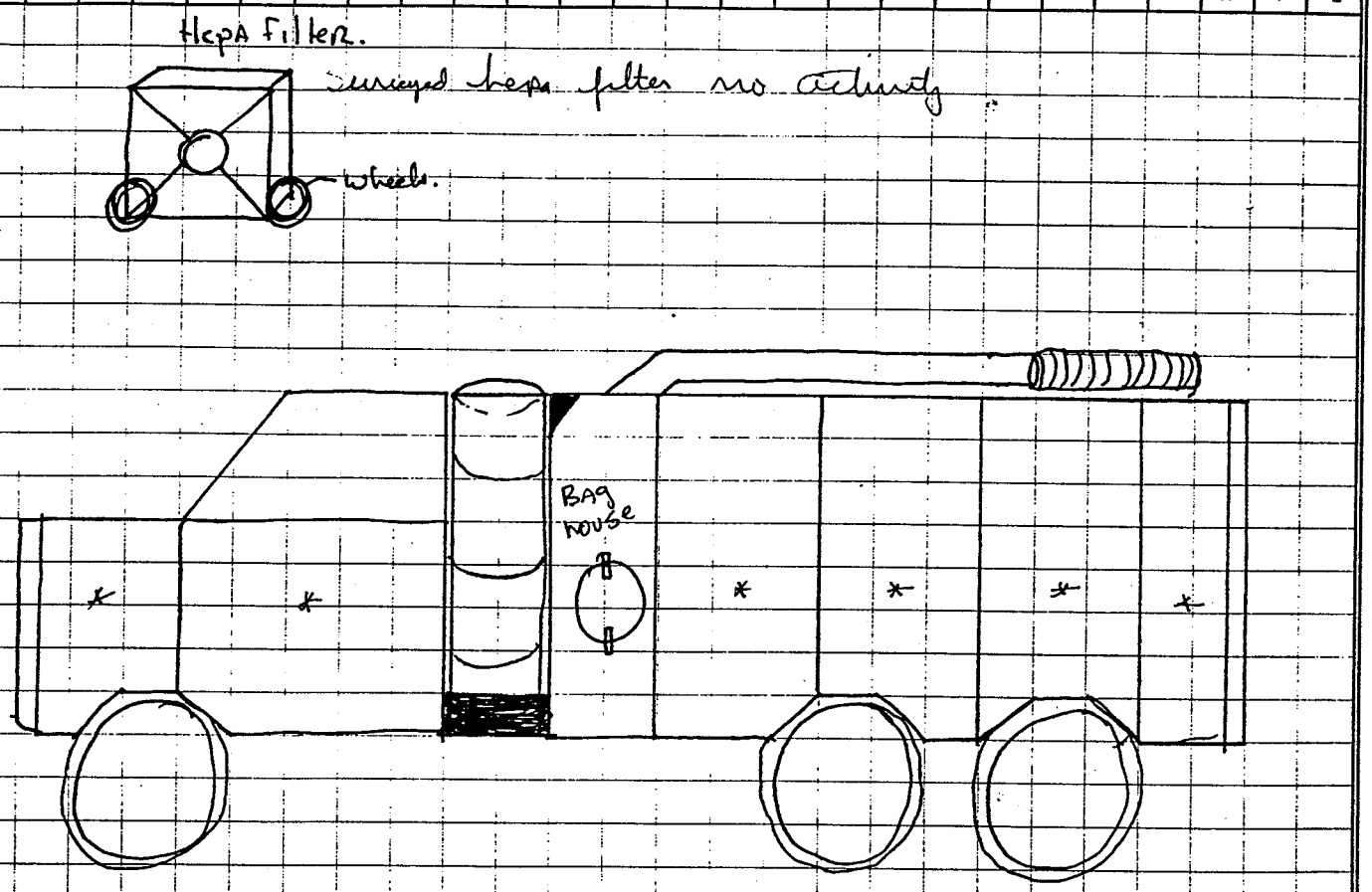
Instrument (1)	Instrument (2	Instrument (3)
Model: Ludlum 2224/4389	Model: Bicron	Model:
Serial No. 119791 / 132118	Serial No. B296W	Serial No.
Calibration Due: 3-18-00	Calibration Due: 3-19-00	Calibration Due:
Efficiency 18.4%	Efficiency N/A	Efficiency
MDA 81.6 dpm CF 5.4 BKG ~~47~~ cpm ~~2~~	MDA N/A CF N/A BKG 6 mRem/hr	MDA CF BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha				
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)	(microR/hour)		
Outside								
Bed								
Baghouse								
Cab.								

INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number _____ Page 2 of 2

Instrument/SN: 2224/4389 119791/132118	Calibration Due: 3-18-00	Site Name: SMC	Date: 6-23 Time:
Instrument/SN BICRON B396W	Calibration Due: 3-19-00	Location: Newfield NJ	
Instrument/SN N/A	Calibration Due: N/A	Purpose: Release of ~~activity~~ Vac truck	
Survey Performed By (Print): RONN MERKEL		Survey Performed By (Signature): RMerkel	
☒ Battery OK ☒ HV OK ☒ Source Check OK		Grid Dimensions: _____ x _____ ☐ meters ☐ inches ☐ feet ☐ centimeters	



Vin #

Notes: TRUCK WAS DECONNED OUTSIDE, INSIDE HOLDING TANK UPON SURVEY. TRUCK WAS CLEAN; NO ACTIVITY & ABOVE BKG EXCEPT BAG HOUSE PORTION WHICH WAS 140-180 CPM &.
BAGS WILL BE REMOVED AND DISPOSED OF PER D. SMITH, CAROL BERGER.

* DIRECT FRISK

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-060499 Date of Survey 6-4-99

Survey Description:	Survey Performed by:
Release Large Dump Truck "Yuke"	Signature: [signature]
	Print Name: Ronn Merkel
Drawing Attached: ~~Yes~~ ☐ No	

Instrument (1)	Instrument (2)	Instrument (3)
Model: Ludlum 2224/4389	Model: Bicron	Model:
Serial No. 119791	Serial No. B296W	Serial No.
Calibration Due: 3-18-00	Calibration Due: 3-19-00	Calibration Due:
Efficiency 18%	Efficiency N/A	Efficiency
MDA 88.1 dpm CF 5.6 BKG 9 cpm	MDA N/A CF N/A BKG 6 uR/hr	MDA CF BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

INTEGRAGED ENVIRONMENTAL MANAGEMENT, INC.

RADIOLOGICAL SURVEY FORM

Survey Number_____ Page _____ of _____

Instrument/SN:	Calibration Due:	Site Name:	Date:	Time:
Instrument/SN	Calibration Due:	Location:		
Instrument/SN	Calibration Due:	Purpose:		
Survey Performed By (Print):		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																										
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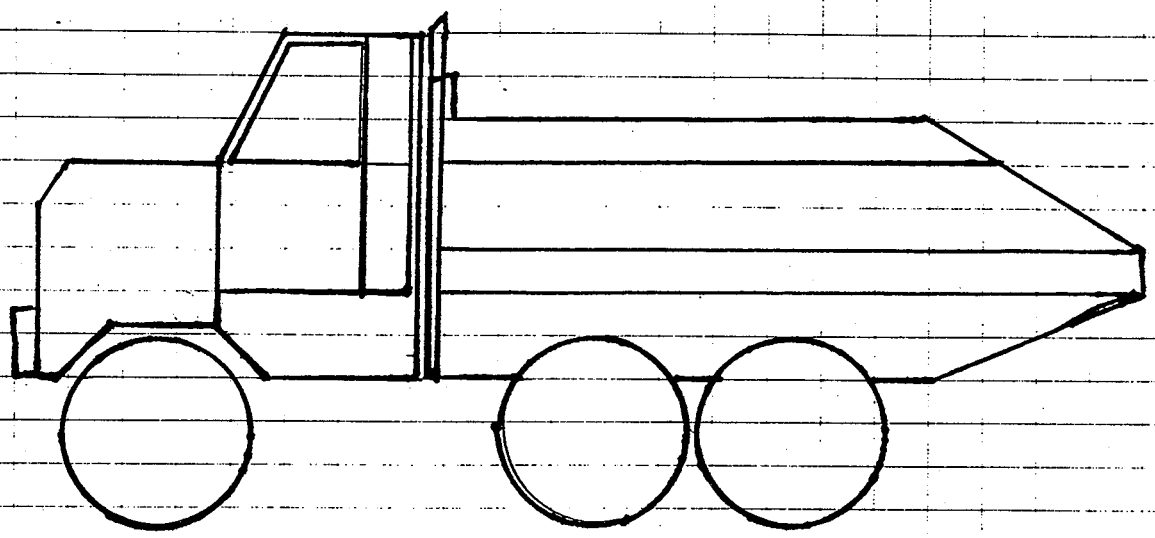


Surveyed ALL ACCESSIBLE AREAS OF TRUCK; NO Contamination detected. ALL Levels were ≤ BKG. BKG 7 cpm ±.
TRUCK WAS DECONNED By PRESSURE WASHER.

Notes:

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number AAF-061599 Date of Survey 6-15-99

Survey Description:	Survey Performed by:
4- Piece Duct work Connected the two FAN units together 100% Direct Frisk & ACC was releasable For unrestricted Use. NO levels observed Exceeded the 600 DPM/100cm² Direct & OR 3000 DPM/100cm² Fixed α	Signature: Ronn Merkel Print Name: Ronn Merkel
Drawing Attached: ☑ Yes ☐ No	

Instrument (1)	Instrument (2)	Instrument (3)
Model: Ludlum 2224/43B9	Model: Bicron	Model: N/A
Serial No. 146748/146718	Serial No. 13296 W	Serial No. N/A
Calibration Due: 3-18-00	Calibration Due: 3-19-00	Calibration Due: N/A
Efficiency 18.9	Efficiency N/A	Efficiency
MDA CF BKG 7	MDA N/A CF N/A BKG 7	MDA CF BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number 061599A | Date of Survey 6-15-99

Survey Description: Direct Frisk 100% α All level observed were within The release criteria of 3000 DPM/100cm² α Fixed And 600 DPM/100cm² Direct. Drawing Attached: ☑ Yes ☐ No	Survey Performed by: [signature] Signature Ronn Merkel Print Name

Instrument (1)	Instrument (2)	Instrument (3)
Model: Ludlum 2224/4389	Model: Bicron ur	Model: N/A
Serial No. 146748/146718	Serial No. B-296W	Serial No. N/A
Calibration Due: 3-18-00	Calibration Due: 3-19-00	Calibration Due: N/A
Efficiency 18.9%	Efficiency N/A	Efficiency
MDA CF BKG 7	MDA N/A CF N/A BKG 7	MDA CF BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

2

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM
RSP-008

Survey Number SMC-061599B Date of Survey 6-15-99

Survey Description: Direct Frisk 100% α ALL Levels observed were within Release Criteria (3000 dpm/100 cm² Fixed And 600 dpm/100cm² Direct alpha)

Drawing Attached: ☒ Yes ☐ No

Survey Performed by:

Signature

Ronn Merkel

Print Name

Instrument (1)	Instrument (2)	Instrument (3)
Model: Ludlum 2224/4389	Model: Bicron µR	Model:
Serial No. 146748/146718	Serial No. B 296-W	Serial No.
Calibration Due: 3-18-00	Calibration Due: 3-19-00	Calibration Due:
Efficiency 18.9% α	Efficiency N/A	Efficiency
MDA CF BKG 7	MDA N/A CF N/A BKG 7 ~~uR/hr~~	MDA CF BKG

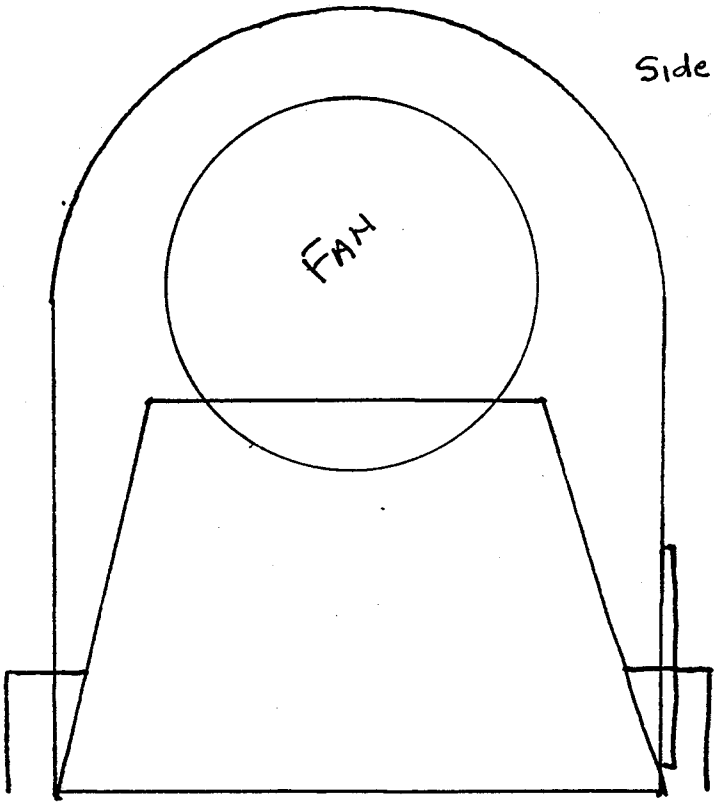
Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm²)	cpm/area	(dpm/100 cm²)			

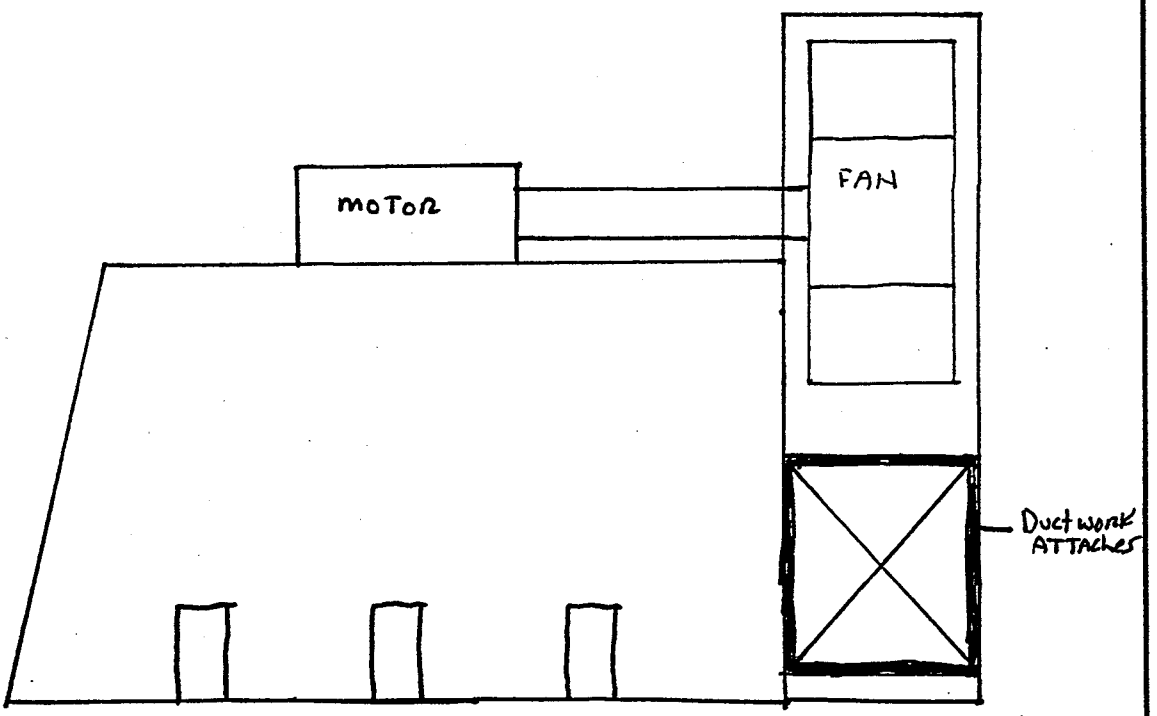
IEM
Integrated Environmental Management, Inc.

Project No:	Page ____ of____
Subject:	
Performed by:	Data:
Checked by:	Date:

#1

Side View



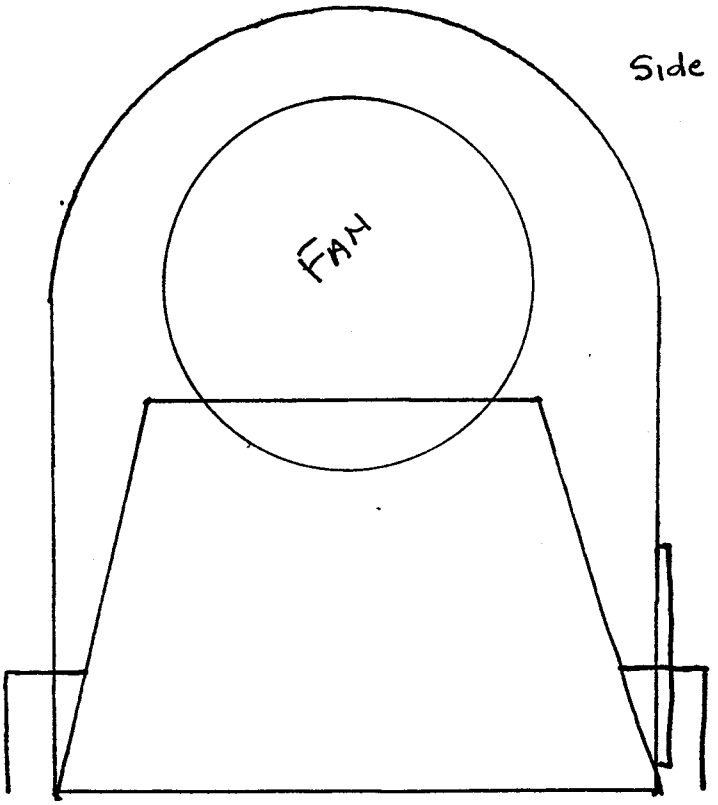


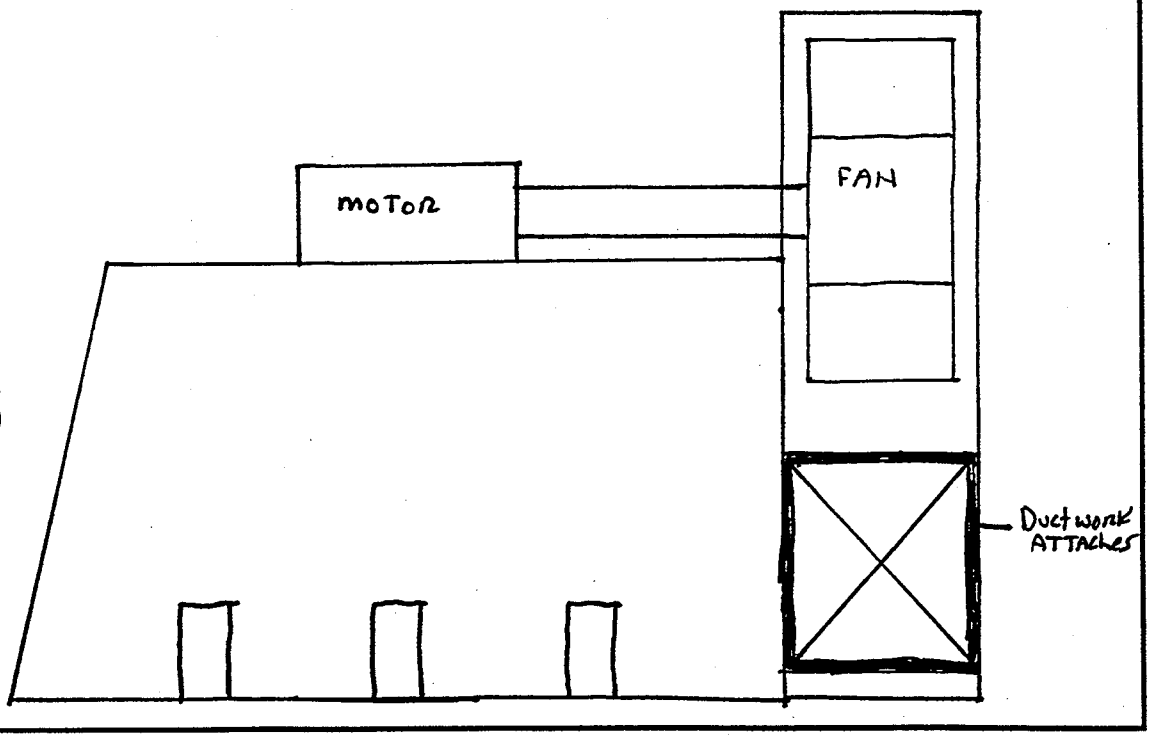
IEM
Integrated Environmental Management, Inc.

Project No:	Page ____ of____
Subject:	
Performed by:	Date:
Checked by:	Date:

#2

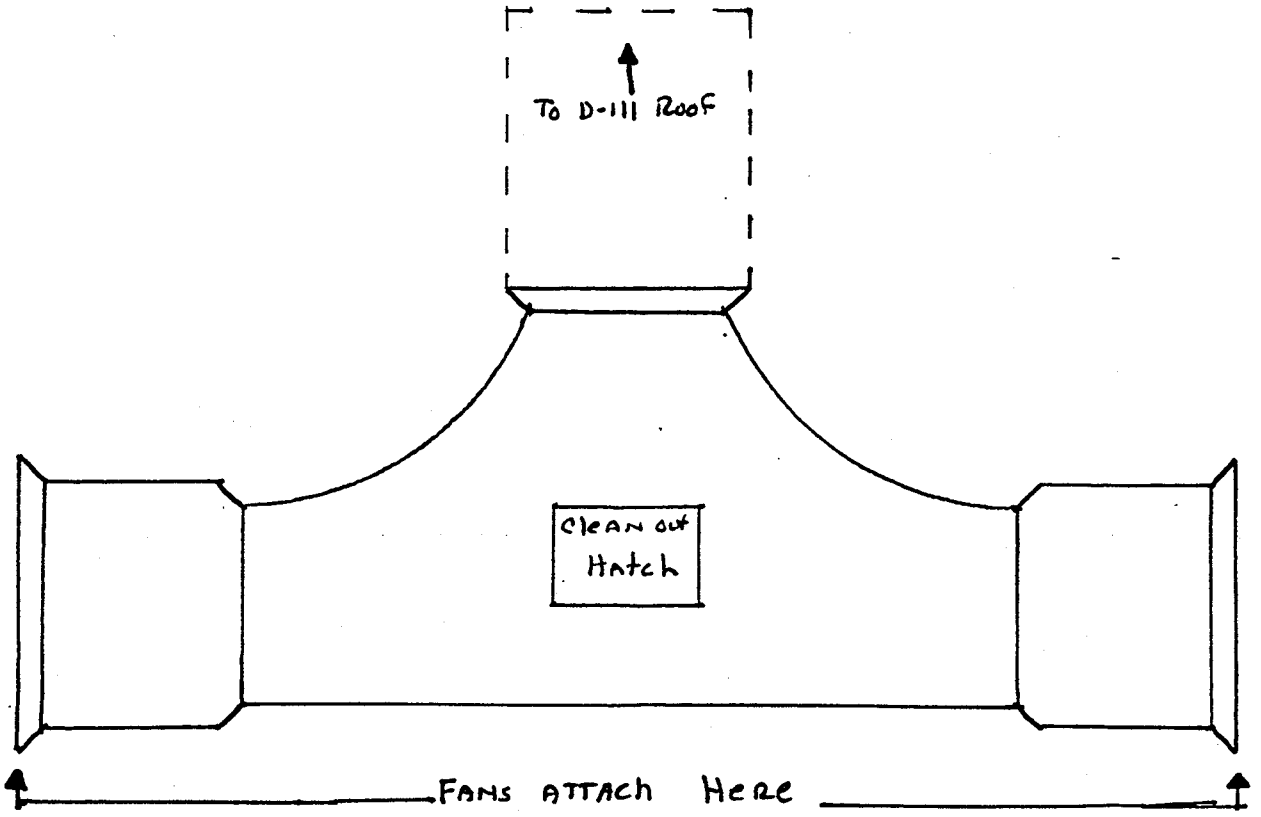
Side View





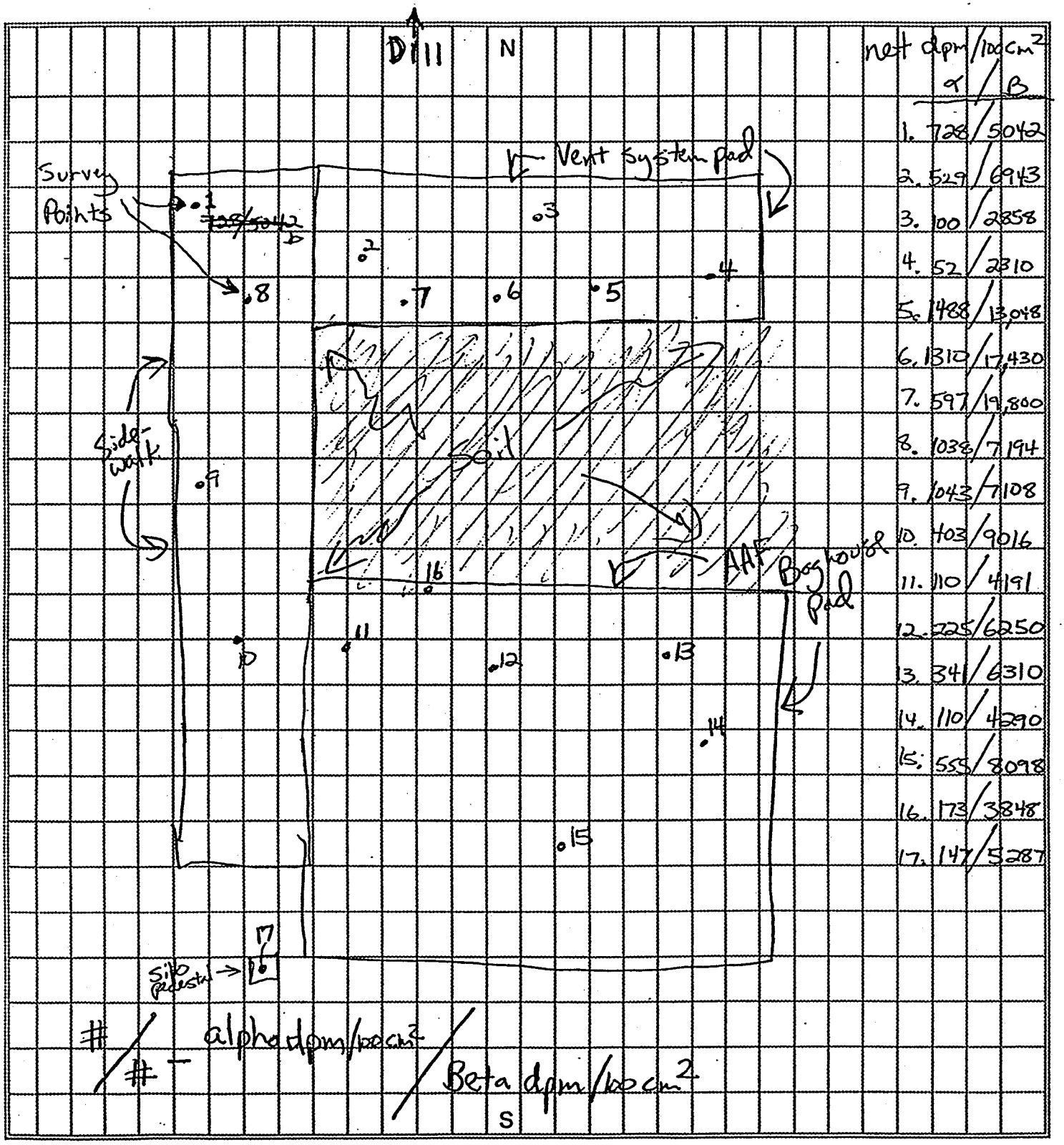
IEM
Integrated Environmental Management, Inc.

Project No:	Page ____ of ____
Subject:	
Performed by:	Date:
Checked by:	Date:



SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY MAP
RSP-008

Survey Number SMC-090999 Building/Area AAF Baghouse Concrete Pad Date of Survey 9/9/99



	net dpm/100cm² α / β
1.	728 / 5042
2.	529 / 6943
3.	100 / 2858
4.	52 / 2310
5.	1488 / 13,048
6.	1810 / 17,430
7.	597 / 19,800
8.	1038 / 7194
9.	1043 / 7108
10.	403 / 9016
11.	110 / 4191
12.	225 / 6250
13.	341 / 6310
14.	110 / 4290
15.	555 / 8098
16.	173 / 3848
17.	147 / 5287

Platform

SHIELDALLOY METALLURGICAL CORPORATION
RELEASE SURVEY DOCUMENTATION
RSP-008

Survey Number AAF-0604-99 (678 struck out; 04 written above)

Instrument/SN: 119791/132118	Calibration Due: 3-18-00	Building Number: D-111 AAF Baghouse
Instrument/SN: Bicron B296W	Calibration Due: 3-19-00	Location of Equipment/Personnel to be Released: Laydown Area
Instrument/SN: N/A	Calibration Due: N/A	Reason for Release Survey: Release as Scrap
☑ Battery Check OK	☑ Source Check OK	☑ HV Check OK / ☐ Other (specify):

Radionuclide (s): Th 232, U238	Release Criteria: ☐ Background (indistinguishable) ☑ Other (specify): 600 DPM/100cm² α Direct, 3000 DPM 100cm² α Fixed	Basis for Release Criteria: ☐ Procedure No. RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached ☐ NUREG-1500 ☑ Other (specify): C. Berger Calculation
Background Data: 7 cpm α	Efficiency Data: 18.0%	Scan Speed: ☐ Calculation Attached 1-2"/sec — Action Level (cpm, stationary): ☐ Calculation Attached 3000 DPM × 18% eff 540 cpm

Results

With the exception of items listed on the right, the following materials, equipment and personnel were surveyed and meet the criteria for release:

Silo Platform structure, Grate.
After disassembly 100% of Grating were Releasable
75% of structure (Beams) Releasable
Other 25% Listed to Right

Item/Person	Initial Level of Contamination (include units)	Action Taken	Final Level of Contamination (include units)
Beam #1 8 foot piece	3300 DPM/100cm²	Set aside Decon	1700 dpm/100cm² ✓
Beam #2 6 FT pc	3000 DPM/100cm²	" "	1500 DPM/100cm² ✓
Beam #3 10 FT pc	3100 DPM/100cm²	" "	1000 DPM/100cm²
Beam #4 Leg	3300 DPM/100cm²	" "	1400 DPM/100cm²

☐ Continuation Sheet Attached

Notes, Calculations, Drawings, etc.

I-Beams are Aprox 24" wide 12-14 Feet Long. After Decon Cut into 3-4 Foot Sections. Smears taken on deconned items showed no detectable activity

☐ Continuation Sheet Attached

Survey performed by (print): [signature]	Signature: [signature]	Date: 6-4-99
HP Supervisor (RSO struck out) Approval (print): [signature] R.A. Duff	Signature: [signature]	Date: 6/18/99

SHIELDALLOY METALLURGICAL CORPORATION
RELEASE SURVEY DOCUMENTATION
RSP-008

Survey Number AAF SMC-060999 Page 1 of 1

Instrument/SN: Ludlum 2224/43B9 119791/132118	Calibration Due: 3-18-00	Building Number: D-111 Baghouse; D-111 1200F	
Instrument/SN Bicron Microrem B296W	Calibration Due: 3-19-00	Location of Equipment/Personnel to be Released: Laydown Area D-111 AAF Baghouse	
Instrument/SN N/A	Calibration Due: N/A	Reason for Release Survey: Release Ductwork AS Clean Scrap	
☑ Battery Check OK	☑ Source Check OK	☑ HV Check OK	☐ Other (specify):

Radionuclide (s): Th 232 U 238	Release Criteria: ☐ Background (indistinguishable) ☑ Other (specify): 6000 dpm/100cm² α direct 3000 dpm/100cm² α Fixed	Basis for Release Criteria: ☐ Procedure No. RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached ☐ NUREG-1500 ☑ Other (specify): C. Berger Calculation	
Background Data: 6 CPM α	Efficiency Data: 17.8% α	Scan Speed: ☐ Calculation Attached 1-2"/sec	Action Level (cpm, stationary): ☐ Calculation Attached 3000 DPM x % EFF 534 CPM

Results

With the exception of items listed on the right, the following materials, equipment and personnel were surveyed and meet the criteria for release:

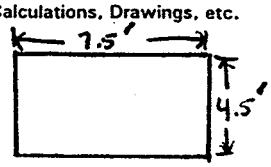
DUCTWORK
1 45 FT Piece
1 18 FT Piece
1 Elbow Approx 12 FT
1 14 FT Piece
4 Flat Pieces

* All ductwork Surveyed No Contamination Above or Close to 3000 dpm α Fixed Pieces were Sprayed off on outside as Precaution

☐ Continuation Sheet Attached

Item/Person	Initial Level of Contamination (include units)	Action Taken	Final Level of Contamination (include units)
		All Pieces were Sprayed off (Exterior) And Surveyed.	

Notes, Calculations, Drawings, etc.



Ductwork Measurements Above But were various Lengths

Ductwork was installed between ~~removed from~~ Bldg. D111 roof & the AAF baghouse.

☐ Continuation Sheet Attached

Survey performed by (print): Ron Merkel	Signature: Ron Merkel	Date: 6-9-99
~~RPSupervisor~~ RSO Approval (print): R.A. Duff	Signature: R.A. Duff	Date: 6/18/99

SHIELDALLOY METALLURGICAL CORPORATION
RELEASE SURVEY DOCUMENTATION
RSP-008

Survey Number SMC-061099 6-10-99

Instrument/SN: Ludlum 146178/146748	Calibration Due: 3-18-00	Building Number: D-111 AAF Baghouse	
Instrument/SN Bicron B296W	Calibration Due: 3-19-00	Location of Equipment/Personnel to be Released: AAF Baghouse Laydown Area	
Instrument/SN N/A	Calibration Due: N/A	Reason for Release Survey: Release structural steel	
☒ Battery Check OK	☐ Source Check OK	☒ HV Check OK	☐ Other (specify):

Radionuclide (s): Th-232 U-238	Release Criteria: ☐ Background (indistinguishable) ☐ Other (specify): 600 dpm/100 cm² Direct α 3000 dpm/100 cm² α Fixed	Basis for Release Criteria: ☐ Procedure No. RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached ☐ NUREG-1500 ☒ Other (specify): C Berger Calculation.	
Background Data: 7 cpm α	Efficiency Data: 18.4% α	Scan Speed: ☑ Calculation Attached 1-2"/sec	Action Level (cpm, stationary): ☐ Calculation Attached 3000 dpm/100 cm² α Fixed

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 Approximately 70-80 pieces of Structural steel 95% of steel surveyed was Releasable, The other 5% surveyed was Close to Limits so it was set aside For decon. They Are Listed to Right

☐ Continuation Sheet Attached

Item/Person	Initial Level of Contamination (include units)	Action Taken	Final Level of Contamination (include units)
I-Beam	1800 dpm/100 cm²	Set Aside For Decon	800 dpm/100 cm²
I-Beam	2400 dpm/100 cm²	" "	1300 dpm/100 c
Door.	1600 dpm/100 cm²	" "	1300 dpm/100 c
Angle Iron	2900 dpm/100 cm²	" "	2000 dpm/100 cm²

Notes, Calculations, Drawings, etc.

Steel was various lengths + Sizes
Deconned items were smeared and showed no detectable activity.

☐ Continuation Sheet Attached

Survey performed by (print): Ron Merkel	Signature: Ron Merkel	Date: 6-10-99
HP Supervisor RSO Approval (print): R.A. Duff	Signature: R.A. Duff	Date: 6/12/99

SHIELDALLOY METALLURGICAL CORPORATION
RELEASE SURVEY DOCUMENTATION
RSP-008

Survey Number SMC 061099

Instrument/SN: 146178 / 146248	Calibration Due: 3-18-00	Building Number: D-111 AAF Baghouse	
Instrument/SN Bicron B-296W	Calibration Due: 3-19-00	Location of Equipment/Personnel to be Released: Laydown Area.	
Instrument/SN N/A	Calibration Due: N/A	Reason for Release Survey: Release For Unrestricted Use	
~~☐ Battery Check OK~~	~~☐ Source Check OK~~	~~☐ HV Check OK~~	☐ Other (specify):

Radionuclide (s): Th 232, U-238	Release Criteria: ☐ Background (indistinguishable) ☐ Other (specify): 600 DPM/100 cm² Direct, 3000 DPM 100 cm² Fixed	Basis for Release Criteria: ☐ Procedure No. RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached ☐ NUREG-1500 ~~☐ Other (specify):~~ C. Berger Calculation	
Background Data: 7 cpm α	Efficiency Data: 18.4% α	Scan Speed: ☐ Calculation Attached 1-2"/sec	Action Level (cpm, stationary): ☐ Calculation Attached 3000 DPM x % Eff

Results

With the exception of items listed on the right, the following materials, equipment and personnel were surveyed and meet the criteria for release:

Hoppers 1+2. were surveyed by direct Frisk they were released NO elevated levels of contamination were Found. (alpha)

☐ 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. Merkel	Signature:	Date: 6-10-00
~~RP Supervisor~~ RSO Approval (print): R.A. Duff	Signature:	Date: 6/13/00

SHIELDALLOY METALLURGICAL CORPORATION
RELEASE SURVEY DOCUMENTATION
RSP-008

Survey Number SMC-061199 6-11 Page 1 of 2

Instrument/SN: Ludlum 146178/146748	Calibration Due: 3-18-00	Building Number: D-111 HAF Baghouse	
Instrument/SN B296W	Calibration Due: 3-19-00	Location of Equipment/Personnel to be Released: Laydown Area HAF Baghouse Slab	
Instrument/SN N/A	Calibration Due: N/A	Reason for Release Survey: Release For Unrestricted Use	
☑ Battery Check OK	☐ Source Check OK	☐ HV Check OK	☐ Other (specify):

Radionuclide (s): Th-232 U-238	Release Criteria: ☐ Background (indistinguishable) ☑ Other (specify): 600 DPM/100cm² Direct 3000 DPM/100cm² Fixed	Basis for Release Criteria: ☐ Procedure No. RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached C. Berger ☐ NUREG-1500 ☑ Other (specify):	
Background Data: 7 cpm ✓	Efficiency Data: 18.6% ✓	Scan Speed: ☐ Calculation Attached 1-2"/sec	Action Level (cpm, stationary): ☐ Calculation Attached 3000 DPM x 18.6% = 558 cpm

Results

With the exception of items listed on the right, the following materials, equipment and personnel were surveyed and meet the criteria for release:

4 hoppers surveyed inside + out. {3,4,5,6}.
Direct Frisk indicated hoppers were 99% Releasable
The other 1% were the hatch doors on 4-5

☐ Continuation Sheet Attached

Item/Person	Initial Level of Contamination (include units)	Action Taken	Final Level of Contamination (include units)
piece 1 hatch door	2800 dpm/100cm² Decon'ed		1400 DPM/100
piece 2 hatch door	1700 dpm/100cm² Decon'ed		1200 DPM/100

Notes, Calculations, Drawings, etc.

hoppers were about 6'x10' hoppers are numbered on side
Decon'ed items were sheared and showed no dedectable activity.

☐ Continuation Sheet Attached

Survey performed by (print): R. Merkel	Signature:		Date: 6-6-99
HP Supervisor RSO Approval (print): R.A. DUFF	Signature:		Date: 6/8/99

SHIELDALLOY METALLURGICAL CORPORATION
RELEASE SURVEY DOCUMENTATION
RSP-008

Survey Number SMC-061199 ~~6-11~~ Page 2 of 2

Instrument/SN: Ludlum 146178/146748	Calibration Due: 3-18-00	Building Number: D-111 AAF Baghouse
Instrument/SN B-296W	Calibration Due: 3-19-00	Location of Equipment/Personnel to be Released: Laydown Area 1
Instrument/SN N/A	Calibration Due: N/A	Reason for Release Survey: Release for unrestricted use
☑ Battery Check OK	☐ ~~Source~~ Check OK	☑ ~~HV~~ Check OK / ☐ Other (specify):

Radionuclide (s): Th-232, U-238	Release Criteria: ☐ Background (indistinguishable) ☐ Other (specify): 600 DPM/100cm2 Direct 3000 DPM/100cm2 Fixed	Basis for Release Criteria: ☐ Procedure No. RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached ☐ NUREG-1500 ☑ Other (specify): C. Berger	
Background Data: 7 cpm α	Efficiency Data: 18.6% α	Scan Speed: ☐ Calculation Attached 1-2"/Sec.	Action Level (cpm, stationary): ☐ Calculation Attached 3000 DPM x % eff = 558

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 aprox 150 pieces of structural steel.

90% of steel surveyed was releasable. The other 10% was set aside for further Decon.

☐ Continuation Sheet Attached

Item/Person	Initial Level of Contamination (include units)	Action Taken	Final Level of Contamination (include units)
7-8 Pieces of I-Beam	2700 DPM/100cm2	Set aside for Decon	1500 DPM/100cm2 (Highest Reading Piece)

Notes, Calculations, Drawings, etc.

All pieces that were close to the 3000 DPM limits were set aside for Decon. They all appeared to have a yellow crusty material on them. Smears taken on deconned items showed no detectable activity.

☐ Continuation Sheet Attached

Survey performed by (print): R. [signature]	Signature: [signature]	Date: 6-11-99
HP Supervisor ~~RSO~~ Approval (print): R.A. Duff	Signature: [signature]	Date: 6/18/99

SHIELDALLOY METALLURGICAL CORPORATION
RELEASE SURVEY DOCUMENTATION
RSP-008

Survey Number SMC-06/499 Page 1 of 2

Instrument/SN: Ludlum 146748 / 146718	Calibration Due: 3-18-00	Building Number: D-111 AAF Baghouse	
Instrument/SN B2960W	Calibration Due: 3-19-00	Location of Equipment/Personnel to be Released: D-111 ~~AAF~~ Baghouse / Laydown Area	
Instrument/SN N/A	Calibration Due: N/A	Reason for Release Survey: Unrestricted Use	
~~Battery~~ Check OK	~~Source~~ Check OK	~~HV~~ Check OK	☐ Other (specify):

Radionuclide (s): Th-232 U-238	Release Criteria: ☐ Background (indistinguishable) ~~Other~~ (specify): Alpha only 6000 dpm/100cm² Direct 3000 dpm/liter cm² Fixed	Basis for Release Criteria: ☐ Procedure No. RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached ☐ NUREG-1500 ~~Other~~ (specify): C. Berger Calculation	
Background Data: 8 cpm α	Efficiency Data: 18.8% α	Scan Speed: ☐ Calculation Attached 1-2"/sec	Action Level (cpm, stationary): ~~Calculation~~ Attached 3000dpm x % eff = 564 cpm

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 approximately 100 pieces of structural steel, ALL pieces surveyed were releasable. And staged for cutting. Steel was support pieces for AAF Baghouse. Most items were I-Beams or angles.

☐ 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. Merkel	Signature:		Date: 6-14-99
~~HP Supervisor~~ RSO Approval (print): R.A. Duff	Signature:		Date: 6/18/99

SHIELDALLOY METALLURGICAL CORPORATION
RELEASE SURVEY DOCUMENTATION
RSP-008

Survey Number SMC-061499 Page 2 of 2

Instrument/SN: Cudlum 1416748/146718	Calibration Due: 3-18-00	Building Number: D-111 MAF Baghouse	
Instrument/SN Bicron B-296W	Calibration Due: 3-19-00	Location of Equipment/Personnel to be Released: MAF Baghouse Slab	
Instrument/SN N/A	Calibration Due: N/A	Reason for Release Survey: Release of Corrigated Siding For Unrestricted use	
☑ Battery Check OK	☑ Source Check OK	☑ HV Check OK	☐ Other (specify):

Radionuclide (s): Th 232 U 238	Release Criteria: ☐ Background (indistinguishable) ☑ Other (specify): 600 DPM/100cm² direct 3000 DPM/100cm² Fixed Alpha only	Basis for Release Criteria: ☐ Procedure No. RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached ☐ NUREG-1500 ☑ Other (specify): C. Berger Calculation	
Background Data: 7 cpm α	Efficiency Data: 18.9% 9	Scan Speed: ☐ Calculation Attached 1-2"/sec	Action Level (cpm, stationary): ☐ Calculation Attached 3000 x 18.9 EFF = 567 Cpm

Results

With the exception of items listed on the right, the following materials, equipment and personnel were surveyed and meet the criteria for release:

Corrigated siding was surveyed prior to Demo work on inside No Contamination was found. once on ground. Siding was Checked to best of my Ability Considering the Condition of metal. As Precautionary Measure metal was Decowned using Pressure Washer Lightly. in designated Area. metal was considered to be Releasable for Unrestricted use

☐ 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): Ron Merkel	Signature: Ron Merkel		Date: 6-14-99
RSO Approval (print): R.A. Duff	Signature: R.A. Duff		Date: 6-18-99

SHIELDALLOY METALLURGICAL CORPORATION
RELEASE SURVEY DOCUMENTATION
RSP-008

Survey Number SMC-061699 Page 1 of 2

Instrument/SN: Ludlum 146748/146718	Calibration Due: 3-18-00	Building Number: D-11 AAF Baghouse	
Instrument/SN B-296-W	Calibration Due: 3-19-00	Location of Equipment/Personnel to be Released: AAF Baghouse Slab	
Instrument/SN	Calibration Due:	Reason for Release Survey: UN Restricted Use	
☑ Battery Check OK	☑ Source Check OK	☑ HV Check OK	☐ Other (specify):

Radionuclide (s): Th-232, U-238	Release Criteria: ☐ Background (indistinguishable) ☑ Other (specify): 600 DPM/100 cm² Direct, 3000 DPM/100 cm² Fixed Alpha only	Basis for Release Criteria: ☐ Procedure No. RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached ☐ NUREG-1500 ☑ Other (specify): C. Berger Calculations	
Background Data: 7 cpm α	Efficiency Data: 19.2% α	Scan Speed: ☐ Calculation Attached 1-2"/sec.	Action Level (cpm, stationary): ☐ Calculation Attached 3000 x .2 eff = 576 cpm

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 electrical Panel Box 100% releasable. No activity was found to exceed 3000 DPM/100 cm² OR 600 DPM/100 cm² alpha.

☐ Continuation Sheet Attached

Item/Person	Initial Level of Contamination (include units)	Action Taken	Final Level of Contamination (include units)

Notes, Calculations, Drawings, etc.

Electrical Box was Approx 8 x 8 x 8.

☐ Continuation Sheet Attached

Survey performed by (print): Ron Muhl	Signature: R Muhl	Date: 6-16-00
RP Supervisor RSO Approval (print): R.A. Duff	Signature:	Date: 6/16/00

SHIELDALLOY METALLURGICAL CORPORATION
RELEASE SURVEY DOCUMENTATION
RSP-008

Survey Number SMC 061699 ~~05/14/99~~

Instrument/SN: Ludlum 146748/146718	Calibration Due: 3-18-00	Building Number: D-111 AAF Baghouse	
Instrument/SN Bicron B296W	Calibration Due: 3-19-00	Location of Equipment/Personnel to be Released: AAF Baghouse Laydown	
Instrument/SN n/a	Calibration Due: n/a	Reason for Release Survey: Release For Unrestricted Use	
☑ Battery Check OK	☐ ~~Source~~ Check OK	☑ ~~HV~~ Check OK	☐ Other (specify):
Radionuclide (s): Th 232 U 238	Release Criteria: ☐ Background (indistinguishable) ☑ Other (specify): 600 DPM/100cm² Direct 3000 cpm/100cm² Fixed Alpha Only	Basis for Release Criteria: ☐ Procedure No. RSP-009 ☐ USNRC Regulatory Guide 1.86 ☐ Calculation Attached ☐ NUREG-1500 ☐ ~~Other~~ (specify): C. Berger Calculation	
Background Data: 7 cpm ∝	Efficiency Data: 19.2% ∝	Scan Speed: ☐ Calculation Attached 1-2"/sec	Action Level (cpm, stationary): ☐ Calculation Attached 576 cpm

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 15 pieces of pipe (various sizes) 100% Releasable, No Contam. Found

Pipe was going From D-111 Inside TO Electrical panel on Baghouse

☐ 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. Mercer	Signature: R Mercer	Date: 6-16-99
~~RSO~~ BSO Approval (print): R. A. Duff	Signature: R A Duff	Date: 6/16/99

Appendix F - Personnel Monitoring Records

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLE COUNT RECORD

Site/Location: SMC NewField / Instrument Office	Project No.: 94005.20 & 94005.05
Emission Type (check): ☒ α ☐ β ☐ β/γ	Instrument Model/Serial No.: Eberline SAC-4 #868

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]
1 #8244 Taylor	5/17/99 1515	5/26/99	31.0%	111	50	2.2	3	1	3	1	332,235	4.4E-12	4.2E-11
2 #8242 Schnerbus	↓ ↓	↓	↓	↓	↓	↓	3	↓	3	1	304,965	4.8E-12	4.6E-11
3 #8241 Butler							3		3	1	319,950	4.5E-12	4.4E-11
4 #8243 S.White	↓ ↓						2		2	0	338,985	0	4.1E-11
5 #8241 Butler	5/18/99 1515						3		3	1	1,202,400	1.2E-12	1.2E-11
6 #8242 Schnerbus	1515						3		3	1	1,081,440	1.3E-12	1.3E-11
7 #8243 S.White	1515						1		1	0	1,222,320	0	1.1E-11
8 #8244 Taylor	↓ 1515						3		3	1	1,195,920	1.2E-12	1.2E-11
9 #8241 Butler	5/19/99 1530						3		3	1	1,277,550	1.1E-12	1.1E-11
10 #8242 Schnerbus	↓ ↓						3		3	1	1,149,795	1.3E-12	1.2E-11
11 #8243 S.White							4		4	2	1,298,715	2.2E-12	1.1E-11
12 #8244 Taylor	↓ ↓						3		3	1	1,241,595	1.2E-12	1.1E-11
13 #8241 Schnerbus	5/21/99 1520						2		2	0	1,260,500	0	1.1E-11
14 #8244 S.White	1520						3		3	1	1,218,000	1.2E-12	1.1E-11
15 #8243 R.Hart	1445						2		2	0	856,020	0	1.6E-11
16 MSA-1 E.Jordan	↓ 1445	↓	↓	↓	↓	↓	2	↓	2	0	989,010	0	1.4E-11

[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 x 10^6 x V x Efficiency

[d] $MDA = \frac{2.71 + 4.65\sqrt{B_R t}}{t \; eff \; \frac{A}{100}}$

Health Physics Technician: Ronald Alan Duff

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLE COUNT RECORD

Site/Location: SMC New Field / Instrument office	Project No.: 94005.20 & 94005.05
Emission Type (check): ☒ α ☐ β ☐ β/γ	Instrument Model/Serial No.: Eberline SAC-4 #868

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]
17 MSA-2 C.Boyd	5/21/99 1445	5/26/99 ~~1445~~	31.0%	111	50	2.2	1	1	1	0	972,840	0	1.4E-11
18 MSA-3 G.Serrano	↓ 1445	↓ ~~1445~~	↓	↓	↓	↓	2	↓	2	0	978,780	0	1.4E-11
19 #8244 S.White	5/24/99 1530	~~1530~~					1		1	0	1,245,930	0	1.1E-11
20 #8242 S.White	5/25/99 1515	↓ ~~1515~~	↓	↓	↓	↓	2	↓	2	0	1,112,265	0	1.3E-11
21 #8242 Schwenke	5/26/99 1500	5/15/99 ~~1500~~	29.8%	137	↓	2.7	3	↓	3	~~0~~	1,077,600	0	1.5E-11
22 #8244 S.White	↓ 1500	~~1500~~	↓	↓		↓	2		2	0	1,165,920	0	1.3E-11
23 #8241 Butler	5/27/99	~~1500~~					3		3	~~0~~	1,200,000	0	1.3E-11
24 #8243 S.White	↓	~~1500~~					3		3	~~0~~	1,215,840	0	1.3E-11
25 #8244 VacTruck	↓ ↓	~~1500~~					2		2	0	1,173,120	0	1.3E-11
26 #8241 VacTruck	5/28/99 1400						4		4	1	1,032,360	1.5E-12	1.5E-11
27 #8242 S.White	↓ 1400						4		4	1	931,560	1.6E-12	1.7E-11
28 #8243 Butler	↓ 1400						3		3	0	1,036,560	0	1.5E-11
29 #8241 SpencCab	6/1/99 1500						3		3	0	1,189,920	0	1.3E-11
30 #8242 S.White	↓ ↓						2		2	0	1,072,320	0	1.5E-11
31 #8242 VacTruck	↓ ↓	↓	↓	↓	↓	↓	3	↓	3	0	1,200,000	0	1.3E-11

[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: Ronald Alan Duff

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
Filter Type: F+J CP47H	Filter Size: ~~CP47H~~ 47 mm
Filter Lot: N/A	Air Sample Number: ~~1~~ (1)

B. SAMPLING PARAMETERS

Sample Start Date:	5-17-99	Time:	1:00 pm	Flow Rate (L/min):	2.476
Sample End Date:	5-17-99	Time:	3:15 PM	Flow Rate (L/min):	2.446

Total Sample Time (T): 135 mn (Minutes)

Average Flow Rate (F): 2.461 (Liters/Minute)

Sample Volume (V) = 135 (min) x F 2.461 (L/min) x 1000 (ml/L) = 332235 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Robert Taylor	General Area and Specific Location:
Type of Work Performed: Bag house Disassembly Bag removal	Type of Work On-going:
Radiation Work Permit Number: IEM/SMG-99-01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 AAF Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Respirator (Full Face APR)	Names of Workers:
Sampling performed by (print): Ron Marko	Signature:

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
Filter Type: F+J CP47H	Filter Size: ~~CP47HD~~ 47 MM
Filter Lot: N/A	Air Sample Number: 2

B. SAMPLING PARAMETERS

Sample Start Date:	5-17-99	Time:	1:00 p.m.	Flow Rate (L/min):	2.267
Sample End Date:	5-17-99	Time:	3:15 p.m.	Flow Rate (L/min):	2.251

Total Sample Time (T): 135 min (Minutes)

Average Flow Rate (F): ~~135 min~~ 2.259 (Liters/Minute)

Sample Volume (V) = 135 (min) x F 2.259 (L/min) x 1000 (ml/L) = 304,965 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: John Schnorbus	General Area and Specific Location:
Type of Work Performed: Bag removal	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC-99-01 ~~N/A~~	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 AAF Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Respirator (Full Face APR)	Names of Workers:
Sampling performed by (print): Ron Meeks	Signature: Ron Meeks

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 # 8211	Calibration Due: Daily
Filter Type: F+J GP47H	Filter Size: ~~GP47HJ~~ 47 mm
Filter Lot: N/A	Air Sample Number: N/A 3

B. SAMPLING PARAMETERS

Sample Start Date:	5-17-99	Time:	1:00 pm	Flow Rate (L/min):	2.257
Sample End Date:	5-17-99	Time:	3:15 pm	Flow Rate (L/min):	2.484

Total Sample Time (T): 135 mn (Minutes)

Average Flow Rate (F): 2.3705 (Liters/Minute)

Sample Volume (V) = 135 (min) x F 2.370 (L/min) x 1000 (ml/L) = 319,950 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: James Butler	General Area and Specific Location:
Type of Work Performed: Bag house bag removal	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC-99-01 ~~N/A~~	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 AAF Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Respirator (Full-face APR)	Names of Workers:
Sampling performed by (print): Ron Morkel	Signature: R Morkel

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 W/ Gilibrator
Filter Type: F&J CPN-47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: 4

B. SAMPLING PARAMETERS

Sample Start Date:	5/17/99	Time:	1300	Flow Rate (L/min):	2.517
Sample End Date:	5/17/99	Time:	1515	Flow Rate (L/min):	2.504

Total Sample Time (T): 135 (Minutes)

Average Flow Rate (F): 2.511 (Liters/Minute)

Sample Volume (V) = 135 (min) x F 2.511 (L/min) x 1000 (ml/L) = 338,985 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Scott White	General Area and Specific Location:
Type of Work Performed: Baghouse bag removal	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC-99-01	Radiation Work Permit Number: N/A
General Area and Specific Work Location: D111, AAF Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: Full Face APR	Names of Workers:
Sampling performed by (print): R. Alan Duff	Signature:

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
Filter Type: FTJ CP47H	Filter Size: ~~CP47H~~ 47MM
Filter Lot: N/A	Air Sample Number: 5

B. SAMPLING PARAMETERS

Sample Start Date:	5-18-99	Time:	07:15	Flow Rate (L/min):	2.512
Sample End Date:	5-18-99	Time:	15:15	Flow Rate (L/min):	2.498

Total Sample Time (T): 480m (Minutes)

Average Flow Rate (F): 2.505 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.505 (L/min) x 1000 (ml/L) = 1,202,400 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: James Butler	General Area and Specific Location:
Type of Work Performed: Baghouse Bag Removal	Type of Work On-going:
Radiation Work Permit Number: IEM/smc-99-01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 AAF Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Full Face Respirator	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature:

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
Filter Type: F+J CA/H	Filter Size: ~~APCTH~~ 47mm
Filter Lot: N/A	Air Sample Number: ~~5~~ 6

B. SAMPLING PARAMETERS

Sample Start Date:	5-18-99	Time:	07:15	Flow Rate (L/min):	2.255
Sample End Date:	5-18-99	Time:	15:15	Flow Rate (L/min):	2.251

Total Sample Time (T): 480 min (Minutes)

Average Flow Rate (F): 2.253 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.253 (L/min) x 1000 (ml/L) = 1,081,440 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: John Schnacbus	General Area and Specific Location:
Type of Work Performed: Baghouse Bag Removal	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC-99-01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 AAF Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Full Face Respirator	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature: Ron Merkel

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
Filter Type: F+J GP47H	Filter Size: ~~GP47H~~ 47mm
Filter Lot: N/A	Air Sample Number: 7

B. SAMPLING PARAMETERS

Sample Start Date:	5-18-99	Time:	0715	Flow Rate (L/min):	2.529
Sample End Date:	5-18-99	Time:	1515	Flow Rate (L/min):	2.564

Total Sample Time (T): 480 min (Minutes)

Average Flow Rate (F): 2.5465 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.5465 (L/min) x 1000 (ml/L) = 1,222,320 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Scott White	General Area and Specific Location:
Type of Work Performed: Baghouse; Bag Removal	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC-99-01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 AAF Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Full Face Respirator	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature: Ron Merkel

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
Filter Type: F+J CP417H	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: +3 10

B. SAMPLING PARAMETERS

Sample Start Date:	5-10-99	Time:	0700	Flow Rate (L/min):	2.242
Sample End Date:	5-10-99	Time:	1530	Flow Rate (L/min):	2.267

Total Sample Time (T): 510 (Minutes)

Average Flow Rate (F): 2.2545 (Liters/Minute)

Sample Volume (V) = 510 (min) x F 2.2545 (L/min) x 1000 (ml/L) = 1,149,795 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: John Schnorbus	General Area and Specific Location:
Type of Work Performed: Bag house Bag Removal Clean up, Sweeping Dust	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC 99-01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 AAF Baghouse	Type of Operation/Equipment in Area: W A
Respiratory Protection Used: Full Face Respirator APR	Names of Workers:
Sampling performed by (print): Ronn Merkel	Signature:

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
Filter Type: FLJ CPH47	Filter Size: 47-mm
Filter Lot: N/A	Air Sample Number: 11

B. SAMPLING PARAMETERS

Sample Start Date:	5-20-99	Time:	0700	Flow Rate (L/min):	2.548
Sample End Date:	5-20-99	Time:	1530	Flow Rate (L/min):	2.552

Total Sample Time (T): 510 (Minutes)

Average Flow Rate (F): 2.5465 (Liters/Minute)

Sample Volume (V) = 510 (min) x F 2.5456 (L/min) x 1000 (ml/L) = 1298715 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Scotty White	General Area and Specific Location:
Type of Work Performed: Baghouse Bag Removal Clean up - Sweeping Dust	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC 99-01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 Baghouse HAF	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Full Face Respirator	Names of Workers:
Sampling performed by (print): Ron Merkel	Signature: Ron Merkel

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
Filter Type: F+J CN 47H	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: 12 K5

B. SAMPLING PARAMETERS

Sample Start Date: 5-20-99	Time: 0900	Flow Rate (L/min): 2.446
Sample End Date: 5-20-99	Time: 1530	Flow Rate (L/min): 2.423

Total Sample Time (T): 510 (Minutes)

Average Flow Rate (F): 2.4345 (Liters/Minute)

Sample Volume (V) = 510 (min) x F 2.4345 (L/min) x 1000 (ml/L) = 1,241,595 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Robert Taylor	General Area and Specific Location:
Type of Work Performed: Baghouse Bag Removal Clean up, sweeping Dust.	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC 99-01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 Baghouse AAF	Type of Operation/Equipment in Area: N A
Respiratory Protection Used: Full Face Respirator	Names of Workers:
Sampling performed by (print): Ronn Merkel	Signature: [signature]

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INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

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A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8247	Calibration Due: Daily w/ gilibrator
Filter Type: FAJ CP47H	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: 13

B. SAMPLING PARAMETERS

Sample Start Date: 5/21/99	Time: 0700	Flow Rate (L/min): 2.521
Sample End Date: 5/21/99	Time: 1520	Flow Rate (L/min): Failed (batt dead)

Total Sample Time (T): 500 (Minutes)

Average Flow Rate (F): 2.521 (Liters/Minute)

Sample Volume (V) = 500 (min) x F 2.521 (L/min) x 1000 (ml/L) = 1,260,500 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: John Schnorbus	General Area and Specific Location:
Type of Work Performed: Clean up dust in AAF baghouse	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC 99-01	Radiation Work Permit Number:
General Area and Specific Work Location: D111, AAF Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Full Face APR	Names of Workers:
Sampling performed by (print): R.A. DeFord	Signature:

INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(14)

A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily w/ Gilibrator
Filter Type: F+J CP47H	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: 14

B. SAMPLING PARAMETERS

Sample Start Date:	5/21/99	Time:	0700	Flow Rate (L/min):	2.436
Sample End Date:	5/21/99	Time:	1520	Flow Rate (L/min):	(Failed Battery Dead)

Total Sample Time (T): 500 (Minutes)

Average Flow Rate (F): 2.436 (Liters/Minute)

Sample Volume (V) = 500 (min) x F 2.436 (L/min) x 1000 (ml/L) = 1,218,000 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Scott White	General Area and Specific Location:
Type of Work Performed: Clean up dust in AAF Baghouse	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC 99-01	Radiation Work Permit Number:
General Area and Specific Work Location: D111, AAF Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: Full Face APR	Names of Workers:
Sampling performed by (print): R.A. Duff	Signature:

INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

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A. AIR SAMPLING EQUIPMENT

Pump Type (check): [X] Breathing Zone [ ] Low Volume General Air [ ] High Volume General Air

Serial # 8244	Calibration Due: Daily w/ Gilibrator
Filter Type: F&J CPH-47	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: 19

B. SAMPLING PARAMETERS

Sample Start Date:	5/24/99	Time:	0700	Flow Rate (L/min):	2.449
Sample End Date:	5/24/99	Time:	1530	Flow Rate (L/min):	2.437

Total Sample Time (T): 510 (Minutes)

Average Flow Rate (F): 2.443 (Liters/Minute)

Sample Volume (V) = 510 (min) x F 2.443 (L/min) x 1000 (ml/L) = 1,245,930 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Scott White	General Area and Specific Location: N/A
Type of Work Performed: Dill AAF Baghouse disassembly	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC-99-01	Radiation Work Permit Number:
General Area and Specific Work Location: Bldg. D111, AAF Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Full Face APR	Names of Workers:
Sampling performed by (print): R. Alan Diff	Signature:

INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

(20)

A. AIR SAMPLING EQUIPMENT

Pump Type (check): [X] Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8242	Calibration Due: Daily w/ calibrator
Filter Type: FSJ CPH-47	Filter Size: 47mm
Filter Lot: N/A	Air Sample Number: 20

B. SAMPLING PARAMETERS

Sample Start Date: 5/25/99	Time: 0700	Flow Rate (L/min): 2.260
Sample End Date: 5/25/99	Time: 1515	Flow Rate (L/min): 2.233

Total Sample Time (T): 495 (Minutes)

Average Flow Rate (F): 2.247 (Liters/Minute)

Sample Volume (V) = 495 (min) x F 2.247 (L/min) x 1000 (ml/L) = 1,112,265 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Scott White	General Area and Specific Location:
Type of Work Performed: D111 AAF baghouse disassembly	Type of Work On-going:
Radiation Work Permit Number: IEM/SMC 99-01	Radiation Work Permit Number:
General Area and Specific Work Location: Bldg. D111, AAF baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Full Face APR	Names of Workers:
Sampling performed by (print): R. Alan Duff	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 5-26-99

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AIR SAMPLING EQUIPMENT

Pump Type: ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial No: 83412	Calibration Due: Daily	
Filter Type: FLJ CP47H	Filter Size: 47 mm	Filter Lot No. N/A

SAMPLING PARAMETERS

Sample Start Date: 5-26-99	Time: 0700	Flow Rate (lpm): 2.245
Sample End Date: 5/26/99	Time: 1500	Flow Rate (lpm) 2.245

Total Sample Time (T) in minutes: 480

Average Flow Rate (F) in liters per minute: 2.245

Sample Volume (V) = T 480 (min) x F 2.245 (lpm) x 1000 = 1,077,606 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: John Schnorbus	General Area and Specific Location:
Type of Work Performed: D-111 AAF Baghouse Vacuum, Cutting, Cleaning	N/A
Work Permit No.: IEM/SMC 99-01	
General Area and Specific Work Location: D-111 AAF Baghouse Level 1	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☒ Full Face ☐ Half Face ☐ Other	Names of Workers in Area:

Monitoring Conducted by: Ron Merkel

Signature: [signature]

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 5-26-99

AIR SAMPLING EQUIPMENT (22)

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial No: 8244	Calibration Due: Daily		
Filter Type: FHT CP47H	Filter Size: 47 mm	Filter Lot No. N/A	

SAMPLING PARAMETERS

Sample Start Date: 5-26-99 0700	Time: 0700	Flow Rate (lpm): 2.428
Sample End Date: 5-26-99	Time: 1500	Flow Rate (lpm) 2.429

Total Sample Time (T) in minutes: 480

Average Flow Rate (F) in liters per minute: 2.429

Sample Volume (V) = T 480 (min) x F 2.429 (lpm) x 1000 = 1,165,920 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Scotty White	General Area and Specific Location:
Type of Work Performed: D-111 Baghouse Vaccuum, oxy, acetelene cutting	
Work Permit No.: IEM/smc 99-01	
General Area and Specific Work Location: D-111 Baghouse Level-1	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☑ Full Face ☐ Half Face ☐ Other	Names of Workers in Area:

N/A

Monitoring Conducted by: Ron Merkl

Signature: Ron Merkl

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 5-~~28~~-99 (27)

AIR SAMPLING EQUIPMENT (23)

Pump Type: ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial No: 8241	Calibration Due: Daily	
Filter Type: F+J CP417+1	Filter Size: 47 mm	Filter Lot No. N/A

SAMPLING PARAMETERS

Sample Start Date: 5-~~28~~-99 (27) 0700	Time: 0700	Flow Rate (lpm): 2470
Sample End Date: 5-~~28~~-99 (27) ~~1500~~	Time: 1500	Flow Rate (lpm) 2529

Total Sample Time (T) in minutes: 480

Average Flow Rate (F) in liters per minute: 2.500

Sample Volume (V) = T 480 (min) x F 2.5 (lpm) x 1000 = 1,200,000 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: ~~Butler~~ Butler	General Area and Specific Location:
Type of Work Performed: UAC. D-111 Baghouse	
Work Permit No.: IEM/SMC 99-01	
General Area and Specific Work Location: D-111 AAF Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☒ Full Face ☐ Half Face ☐ Other	Names of Workers in Area:

Monitoring Conducted by: Ron Martel

Signature: Ron Martel

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 5-~~28~~-99 (27)

AIR SAMPLING EQUIPMENT (24)

Pump Type: ☒ ~~Breathing Zone~~ ☐ Low Volume General Air ☐ High Volume General Air

Serial No: 8243		Calibration Due: Daily	
Filter Type: F+J CP47H	Filter Size: 47mm		Filter Lot No. N/A

SAMPLING PARAMETERS

Sample Start Date:	5-~~28~~-99 (27)	Time:	0700	Flow Rate (lpm):	2.500
Sample End Date:	5-~~28~~-99 (27)	Time:	1500	Flow Rate (lpm)	2.565

Total Sample Time (T) in minutes: 480

Average Flow Rate (F) in liters per minute: 2.533

Sample Volume (V) = T 480 (min) x F 2.533 (lpm) x 1000 = 1,215,840 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Scott White	General Area and Specific Location:
Type of Work Performed: Decon D-111 Baghouse.	N/A
Work Permit No.: IEM/SMC 99-01	
General Area and Specific Work Location: D-111 Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☒ ~~Full Face~~ ☐ Half Face ☐ Other	Names of Workers in Area:

Monitoring Conducted by: Ron Meche

Signature: Ron Meche

INTEGRATED ENVIIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

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A. AIR SAMPLING EQUIPMENT

Pump Type (check): ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial # 8244	Calibration Due: Daily
Filter Type: FDJ 47CPN	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: 25

B. SAMPLING PARAMETERS

Sample Start Date:	5-~~27~~ 28 -99	Time:	0700	Flow Rate (L/min):	2472
Sample End Date:	5-~~27~~ 28 -99	Time:	1500	Flow Rate (L/min):	2415

Total Sample Time (T): 480 (Minutes)

Average Flow Rate (F): 2.444 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.444 (L/min) x 1000 (ml/L) = 1,173,120 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: N/A UAC Truck General Area	General Area and Specific Location:
Type of Work Performed: Empty UAC Truck	Type of Work On-going:
Radiation Work Permit Number: IEM/SNC 99-01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 Baghouse	Type of Operation/Equipment in Area: A
Respiratory Protection Used: N/A	Names of Workers:
Sampling performed by (print): Ron Merrill	Signature:

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 5-28-99

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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 CP47H	Filter Size: 47mm	Filter Lot No. N/A

SAMPLING PARAMETERS

Sample Start Date:	5-28-99	Time:	0700	Flow Rate (lpm):	2.468
Sample End Date:	5-28-99	Time:	1400	Flow Rate (lpm)	2.448

Total Sample Time (T) in minutes: 420 min

Average Flow Rate (F) in liters per minute: 2.458

Sample Volume (V) = T 420 (min) x F 2.458 (lpm) x 1000 = 1,032,360 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: N/A VAC. TRUCK general area	General Area and Specific Location:
Type of Work Performed: Emptying dust collected from baghouse	
Work Permit No.: SMC/Item 95-01	N/A
General Area and Specific Work Location: D-111 AAF 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: Ron Markl	
Signature:	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 5-28-99

(27)

AIR SAMPLING EQUIPMENT

Pump Type: ☒ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial No: 3242		Calibration Due: Daily	
Filter Type: 1-2J CP47H	Filter Size: 47mm	Filter Lot No. N/A	

SAMPLING PARAMETERS

Sample Start Date:	5-28-99	Time:	0700	Flow Rate (lpm):	2247
Sample End Date:	5-28-99	Time:	1400	Flow Rate (lpm)	2189

Total Sample Time (T) in minutes: 420 min

Average Flow Rate (F) in liters per minute: 2.218

Sample Volume (V) = T 420 (min) x F 2.218 (lpm) x 1000 = 931,560 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Scotty White	General Area and Specific Location:
Type of Work Performed: Vacuuming Dust on 1st Floor Baghouse D-111	
Work Permit No.: SMC/IEM 95-01	
General Area and Specific Work Location: D-111 Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☒ Full Face ☐ Half Face ☐ Other	Names of Workers in Area:
Monitoring Conducted by: Ron Merkl	
Signature:	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
AIR SAMPLING DATA SHEET

Date: 5-28-99

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AIR SAMPLING EQUIPMENT

Pump Type: ☑ Breathing Zone ☐ Low Volume General Air ☐ High Volume General Air

Serial No:	8243	Calibration Due:	Daily		
Filter Type:	F+J CP47H	Filter Size:	47mm	Filter Lot No:	NA

SAMPLING PARAMETERS

Sample Start Date:	5-28-99	Time:	0700	Flow Rate (lpm):	2.516
Sample End Date:	5-28-99	Time:	1400	Flow Rate (lpm)	2.419

Total Sample Time (T) in minutes: 420 min

Average Flow Rate (F) in liters per minute: 2.468

Sample Volume (V) = T 420 (min) x F 2.468 (lpm) x 1000 = 1,036,560 milliliters

WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Jim Boller	General Area and Specific Location:
Type of Work Performed: Vacuuming Dust On 1st Floor Bag House	
Work Permit No.: SMC/IEM 95-01	N/A
General Area and Specific Work Location: D-141 AAF Baghouse	Type of Operation/Equipment in Area:
Respiratory Protection Used: ☐ None ☑ Full Face ☐ Half Face ☐ Other	Names of Workers in Area:

Monitoring Conducted by: Ryan Merkel

Signature:

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
Filter Type: F&J CP47H	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: 29

B. SAMPLING PARAMETERS

Sample Start Date:	6-1-99	Time:	0700	Flow Rate (L/min):	2.504
Sample End Date:	6-1-99	Time:	1500	Flow Rate (L/min):	2.454

Total Sample Time (T): 480 min (Minutes)

Average Flow Rate (F): 2.479 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.479 (L/min) x 1000 (ml/L) = 1,189,920 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: N/A (Crane cab) General Area	General Area and Specific Location:
Type of Work Performed: Decon AAF Baghouse	Type of Work On-going:
Radiation Work Permit Number: SMC/IE 99 95.01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 AAF Baghouse	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: None ~~Full Face Respirator~~	Names of Workers:
Sampling performed by (print): Ron Merkl	Signature:

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
Filter Type: FHJ CP47H	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: 30

B. SAMPLING PARAMETERS

Sample Start Date:	6-1-99	Time:	0700	Flow Rate (L/min):	2255
Sample End Date:	6-1-99	Time:	1500	Flow Rate (L/min):	2212

Total Sample Time (T): 480 min (Minutes)

Average Flow Rate (F): 2.234 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.234 (L/min) x 1000 (ml/L) = 1,072,320 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: Scotty white	General Area and Specific Location:
Type of Work Performed: Decon AAF Baghouse Bottom Floor	Type of Work On-going:
Radiation Work Permit Number: IEM/SME 95-01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 AAF Baghouse	Type of Operation/Equipment in Area: A
Respiratory Protection Used: Full Face Respirator	Names of Workers:
Sampling performed by (print): R. Merkl	Signature:

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
Filter Type: F+J CP47H	Filter Size: 47 mm
Filter Lot: N/A	Air Sample Number: 31

B. SAMPLING PARAMETERS

Sample Start Date:	6-1-99	Time:	0700	Flow Rate (L/min):	2.527
Sample End Date:	6-1-99	Time:	1500	Flow Rate (L/min):	2.472

Total Sample Time (T): 480 min (Minutes)

Average Flow Rate (F): 2.5 (Liters/Minute)

Sample Volume (V) = 480 (min) x F 2.5 (L/min) x 1000 (ml/L) = 1,200,000 (ml)

C: WORKER/WORKPLACE DATA

BREATHING ZONE	GENERAL AIR
Name of Worker Monitored: N/A VAC TRUCK general area	General Area and Specific Location:
Type of Work Performed: Empty VAC TRUCK	Type of Work On-going:
Radiation Work Permit Number: SMF EM 95-01	Radiation Work Permit Number:
General Area and Specific Work Location: D-111 BAGHOUSE MAF	Type of Operation/Equipment in Area: N/A
Respiratory Protection Used: Dust mask	Names of Workers:
Sampling performed by (print): R. Merkel	Signature: R Merkel

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
1	8241	5-17-99	2.257	2.484	RM
2	8242	5-17-99	2.267	2.251	RM
3	8244	5/17-99	2.476	2.446	RM < 8243/5/17/99 2.517/2.504
4	8242	5/18/99	2.255	2.251	RM
5	8243	5/18/99	2529	2.564	RM
6	8241	5/18/99	2.512	2.498	RM
7	8244	5/18/99	2.555	2.428	RM
8	8241	5/19/99	2.480	Pumps Faulted off Due To weather	RM
9	8242	5/19/99	2.230	↓	RM
10	8243	5/19/99	2.523		RM
11	8244	5/19/99	2.423		RM
12	8241	5/20/99	2.496	2.514	RM
13	8242	5/20/99	2.242	2.267	RM
14	8243	5/20/99	2.546	2.552	RM
15	8244	5/20/99	2.446	2.423	RM
16	8241	5-21-99	2.521	Pumps Faulted Due to weather	RM
17	8242	5-21-99	2.247	↓	RM
18	~~8243~~ used on Flexklean work	~~5-21-99~~	~~2.523~~		RM
19	8244	5-21-99	2.436	↓	RM
20	8242	5-26-99	2.245	2.245	RM
21	8244	5-26-99	2428	2.429	RM
22	8241	5-27-99	2.470	2.470	RM
23	8242	5-27-99	2.252	Not Used	RM
24	8243	5 27 99	2.500	2.565	RM
	8244	5-27-99	2.472	2.415	RM
	8241	5-28	2.468	2.448	RM
	8242	5-28	2.247	2.184	RM
	8243	5-28	2.516	2.419	RM

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
8241	6-1-99	2504	2454	RW
8242	6-1-99	2255	2212	RW
8243	6-1-99	2527	2472	RW

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
MSA-1	5/21/99	3009	2986	[illegible]
MSA-2	5/21/99	2955	2940	[illegible]
MSA-3	5/21/99	2969	2963	[illegible]
8243	5/21/99	2645	2543	[illegible]
8244	5/24/99	2.449	~~2.36~~ 2.437	[illegible]
8242	5/25/99	2.260	2.233	[illegible]

his report was prepared under the direction of
Shieldalloy Metallurgical Corporation

by

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