Molycorp, Inc.
Molybdenum Group
300 Caldwell Avenue
Washington, PA 15301
Telephone (724) 222-5605
Facsimile (724) 222-7336

Molycorp

April 16, 2002

US NRC Region 1
485 Allandale Rd
King of Prussia, PA 19406
Attn. Craig Gordon

RE: Molycorp, Washington PA
Final Survey Packages

Dear Mr. Gordon:

Molycorps consultant, MACTEC, has completed final status surveys for buildings 25,29,32,33,35,36 and the sample storage room in building 19 located at Molycorps Washington, PA facility. Please find enclosed the final survey packages for these buildings / areas. It is our understanding that confirmatory surveys of these buildings will be done by ORISE during their visit April 15 -20, 2002.

If you have any further questions during this submittal please call me at the above number.

Sincerely,

George W. Dawes

George W. Dawes
Facility Superintendent

Cc: Ray Cherniske (email) w/o attach
Steve Rima, MACTEC (email) w/o attach
Tom McLaughlin, NRC
Wade Adams, ORISE
Robert Maiers, PA DEP, Harrisburg
Dwight Shearer PADEP, Pittsburgh

Final Status Survey Report for Buildings 25, 29, 32, 33, 35, 36 and the Soil Sample Storage Room (Bldg 19) at the Molycorp Site

Washington, PA

MACTEC, Inc.

Revision - 0
Dated 4/15/02

Final Status Survey Report for Buildings 25, 29, 32, 33, 35, 36 and the Soil Sample Storage Room (Bldg 19) at the Molycorp Site

Washington, PA

Revision - 0
Dated 4/15/02

Reviews:

MACTEC Radiological Engineer — Date: 4-16-02

MACTEC Radiological Engineering/H&S Manager, CHP — Date: 4/16/2002

MACTEC Project Manager — Date: 4-16-02

Table of Contents

Section Page

1.0 BACKGROUND INFORMATION 1
1.1 General Information and Operating History 1
1.2 Reason for Decommissioning 2
1.3 Management Approach 3
2.0 SITE INFORMATION 4
2.1 Site Location 4
2.2 Building Status 4
2.3 Grounds 6
3.0 DECOMMISSIONING ACTIVITIES 7
3.1 Objectives 7
3.2 Results of Previous Surveys 7
3.3 Decontamination Procedures 9
4.0 FINAL SURVEY PROCEDURES 9
4.1 Sampling Parameters 10
4.2 Sampling Schedule 13
4.3 Background Levels Identified 18
4.4 Major Contaminates Identified 19
4.5 Guidelines Established 19
4.6 Equipment and Procedures Selected 19
4.7 Instrument MDA 20
4.8 Instrument Selection 20
4.9 Instrument use techniques 22
4.10 Procedures Followed 22
4.11 Surveying Organization 22
5.0 SURVEY FINDINGS 23
5.1 Techniques for Reducing/Evaluating Data 23
5.2 Statistical Evaluation and Comparison Tables 23
6.0 SUMMARY 24
7.0 REFERENCES 25

List of Tables and Figures

Tables and Figures Page

Table 2.1 - Building Classification and Radiological Information 5

Figure 4.1 - Natural Thorium Decay Chain 12

Table 4.2 - Surface Scan Schedule 13

Table 4.3 - Direct Surface Measurement Schedule 14

Table 4.4 - Loose Surface Measurement Schedule 16

Table 4.5 - Exposure Rate Measurement Schedule 17

Table 4.6 - Instrument Selection 21

Appendices

Appendix A - Building 25 Data Package A-1

Appendix B - Building 33 Data Package B-1

Appendix C - Building 35 Data Package C-1

Appendix D - Building 36 Data Package D-1

Appendix E - Soil Sample Storage Room Data Package E-1

Appendix F - Building 29 Data Package F-1

Appendix G - Building 32 Data Package G-1

Appendix H - Background Assessment Data H-1

Appendix I - Instrumentation Data I-1

1.0 BACKGROUND INFORMATION

1.1 GENERAL INFORMATION AND OPERATING HISTORY

Molycorp, Inc.'s (Molycorp) predecessor, the Molybdenum Corporation of America, was formed from the Electric Reduction Company in Washington, Pennsylvania on June 16, 1920. The facility was purchased to manufacture ferroalloys.

Molybdenum manufacturing was begun in the 1920s. Processing of this material was idled in 1991. Although primarily manufacturing molybdenum products, the plant also produced ferrocolumbium (FeCb, 1964 to 1971), as well as other ferroalloys, e.g., tungsten.

In the late 1960s new federal requirements necessitated Molycorp to obtain a Source Material License from the Atomic Energy Commission for possession and use of materials containing 0.05 percent or greater by weight uranium, thorium, or a combination of both. Most of the material that was processed by the corporation for ferrocolumbium contained thorium above the 0.05 percent limit. The slag resulting from this production was in a glass/ceramic form containing an average of 1.2 percent thorium. Almost immediately upon receiving a Source Material License in December 1968, various investigations were undertaken to address the new regulatory requirements.

Applied Health Physics, Inc. was contracted by Molycorp to conduct a series of leaching studies on ferrocolumbium slag during the late 1960s. These studies indicated that radioactive materials were fixed and would not leach into the groundwater in excess of prescribed limits. During this period, Molycorp applied unsuccessfully to the Pennsylvania Department of Health's Industrial Wastes Section and AEC for an onsite burial permit. Ferrocolumbium slag cleanup was concentrated in the early to mid-1970s time frame.

In June 1971, an AEC compliance inspection revealed that thorium-bearing slag had been inadvertently buried onsite in violation of the terms and conditions of their license and AEC regulations. The AEC issued a Notice of Violation and requested Molycorp to take remedial action to excavate these materials and dispose of them in accordance with AEC regulations and guidance documents. Applied Health Physics was contracted to perform a thorough radiological survey of the site and to provide health physics and waste disposal services necessary to comply with AEC's request. Survey measurements indicated exposure levels at 1.2 mR/hr in some areas.

In 1972, thoriated material from the site was disposed of at the West Valley, New York, burial site. The disposal was terminated when New York officials decided that the volume of waste was too large and the contamination level insignificant to use up valuable burial area. Molycorp performed cleanup operations to segregate and stabilize the remaining thoriated material in a capped pile containing about 27,700 cubic yards of slag on the south property. A 1975 Applied Health Physics, Inc. report indicated the average concentration of thorium-232 in the slag pile was 1,250 pCi/g, with exposures within the 0.2 mR/hr Nuclear Regulatory Commission maximum level allowed at the time (AEC was reorganized as the NRC in 1974). This pile was eventually removed and disposed of.

In 1978, one of two molybdenum-roasting furnaces was shut down as part of a consent decree with the Pennsylvania Department of Environmental Resources (PADER) Air Quality Agency due to exceedances of SO_2 standards. All remaining processes continued until 1991.

Oak Ridge Associated Universities, an NRC contractor, conducted a radiological survey of the site in 1985. The survey identified elevated (twice background or greater) levels of thorium in the dikes that separated the surface impoundments, and indicated the potential of subsurface thoriated slags in the western portion of the site.

RSA, Inc. conducted a subsurface survey for Molycorp in 1990 to characterize the thorium contamination across the western portion of the site (i.e., the impoundment area), and the areas immediately to the north, west, and northwest. Thirty-two holes were drilled on the site and radiation measurements were logged at every six inches of depth from the surface down to bedrock, both above and below water table. Radiation levels were also logged in monitoring wells previously drilled on the site. In addition to the subsurface survey, RSA, Inc. conducted a survey of the radiation exposure rates inside the study area. This survey consisted of approximately 400 measurements of the gamma radiation field at a height of one meter above ground level. Findings reveled that; in general, the subsurface concentrations of thorium were above those in the surface soils in almost every hole drilled. A general pattern was that the underground radiation levels decreased to background at a depth of about ten feet. While a majority of the holes exhibited concentrations of greater than 0.01 percent thorium, in only a few holes did the thorium content exceed an average of 0.05 percent at some point below the surface of the ground.

The Molycorp Source Material License (SMB 1393) was renewed in 1992 and included an amendment incorporating a schedule for decommissioning the site. In November 1992, Molycorp submitted a Site Characterization Plan (SCP) to the NRC for approval.

Molycorp submitted the "Decommissioning Plan for the Washington, PA Facility" to the NRC in July 1995. In a letter dated June 1, 1999, (John C. Daniels, Molycorp Project Manager, to John W.N. Hickey, NRC Branch Chief) Molycorp informed the NRC that the Decommissioning Plan would be revised and re-submitted in two parts.

Part 1 Revision of the current Decommissioning Plan was submitted and approved June 30, 1999, and describes the activities required to remediate the site to unrestricted use levels in accordance with the SDMP Action Plan (57 FR 13389). The soil, slag or other material exceeding the SDMP Action Plan criteria will be transported to an NRC approved location for final disposition.

Part 2 Revision of the Decommissioning Plan was to provide for the disposition of the material that exceeded the SDMP Action Plan criteria to a designated on-site impound at the Washington, PA site. The Decommissioning Plan Part 2 Revision was never approved.

1.2 REASON FOR DECOMMISSIONING

Decommissioning of the Molycorp Washington, PA Facility is being performed due to the cessation of molybdenum production at the facility. Several factors, included age of equipment and the production of molybdenum elsewhere in the United States and overseas, have led to the shutdown of the production process and closure of the facility. In December 2001, all activities were halted and a majority of the workforce was terminated.

1.3 MANAGEMENT APPROACH

This report focuses on the approach taken by management to decommission buildings located at the Molycorp Washington, PA Site. This report does not address the decommissioning activities of soils or subsurface contamination at the site.

The approach taken by management for the decommissioning of buildings includes the characterization and classification of site buildings and areas, performance of radiological surveys to identify and quantify surface radioactive material, identification of elevated dose rates, performance of remedial actions (as required), removal of materials and equipment from buildings, performance of the final surveys to release buildings from radiological controls, and the performance of any remedial action necessary to meet the release criteria of the final status survey.

Once buildings have been surveyed for final status, and the NRC has reviewed and approved the building Final Status Survey Report and completed their verification surveys, the buildings will be demolished and the rubble removed. As identified earlier, subsurface (soil) decommissioning activities are not being performed under the current work scope (decommissioning work.)

Management supported and required the use of all regulatory and approved decommissioning plans and standards for the decommissioning process at Molycorp. The final status survey was conducted in accordance with; NUREG/CR 5849, "Manual for Conducting Radiological Surveys in Support of License Termination," RSI's "Decommission Plan for the Washington, PA Facility, Part 1 Revision," and the requirements of Molycorp's "U.S. Nuclear Regulatory Commission Material License, Amendment No. 5, SMB-1393." Individual requirements of each reference were compiled in MACTEC's "Survey Plan for Determining the Final Status of Buildings at the Molycorp Site" and used as the plan for performing the final status survey.

Approved radiation protection procedures were used during the performance of radiological surveys in support of final status surveys. Qualified radiation protection staff was hired and trained to the requirements of the sampling plan. A radiological engineer (CHP) was assigned to support the project and oversee the day-to-day radiological survey operations. The MACTEC Corporate RSO was involved at all decision making levels, and communicated directly with the NRC, State of Pennsylvania, ORISE Support Personnel and MACTEC Senior Management.

Radiological survey equipment was identified and selected to provide the highest sensitivity for the existing site conditions. Radiological survey equipment selection was based partially on equipment used for earlier final status surveys performed by Radiological Services, Inc. (RSI) in 2001. Additional radiological survey equipment was selected and implemented to what RSI had used in the past. The selection and addition of a hand-held gas-filled proportional instrument and detector package provided a greater sensitivity for the detection of radioactive material, and complemented the previously used selection of instruments used by RSI. All radiological survey equipment used for final surveys was calibrated by an instrument calibration facility using radioactive sources traceable to National Institute of Science and Technology (NIST). When radiological survey instrumentation was due for calibration, or the instrument malfunctioned, the instrument was removed from service and sent off-site for calibration or repair.

Radiation protection personnel worked closely with decommissioning and construction personnel on the project. The Project Manager interacted closely with the workforce, Radiological Engineer and the HP

technicians. The Project Manager was provided weekly HP activity reports detailing the current week's activities and the coming week's goals.

2.0 SITE INFORMATION

2.1 SITE LOCATION

The Molycorp, Inc. project site (the site) is located in southwestern Pennsylvania on the outskirts of Washington County approximately 35 miles southwest of Pittsburgh. The site is separated from the populated City's urbanized are by the ramps and structures associated with Interstate 70 (I-70). The region is generally comprised of towns located close to transportation corridors surrounded by agricultural lands and open areas.

The site consists of approximately 20 acres, which represents the fenced portion of the 59-acre parcel owned by Molycorp Inc. that lies entirely within Canton Township at 300 Caldwell Avenue, Washington, Pennsylvania, 15301. The fenced area is situated between 1,010 and 1,045 feet above mean sea level with relatively flat topography.

Molycorp's property has frontage along two dedicated public streets in Canton Township – Caldwell Avenue and Weirich Avenue. The site is transversed by Chartiers Creek that flows south to north through the property. The property is served by the CSX operated railroad via two lines that were formerly owned by the Tylerdale Connecting Railroad Company and the Baltimore and Ohio Railroad.

Adjacent property owners can be classified into three major categories on the current use of the land – residential, industrial, and public. The residential property lies to the east of the site on Green Street and to the west along Weirich Avenue. The industrial property is located predominately north of the site and includes property under the ownership of the Findlay Refractories Company and Allegheny Ludlum Corporation. Darrt Development Company owns several scattered parcels located to the south and east of the site. Land under public ownership includes the Canton Township Volunteer Fire Company property, the right-of-way for I-70, and other public streets. The Washington Institute of Technology owns a 38-acre parcel with a commercial building adjacent to the southwestern property line. This building was used as a mining education and training facility. However, it has not been used for this purpose for some time and has fallen into a state of disrepair and, therefore, is considered a vacant parcel.

A ten-acre parcel of vacant land under the ownership of L. and C. Cox on Weirich Avenue between Comfort Lane and Point View Drive (behind Allegheny Lundlum) may be the site of future commercial development. The property owner has formally requested that the zoning be changed from R-2 Residential to General Commercial.

2.2 BUILDING STATUS

All buildings/areas did not have the same potential for residual contamination and therefore did not require the same level of survey coverage. For the purposes of establishing the degree of survey effort required, building surfaces were segregated into affected and unaffected buildings/areas. The definitions for the areas:

- Affected area: Accessible areas that have potential radioactive contamination (based on facility operating history) or known radioactive contamination (based on past or preliminary radiological surveillance).

- Unaffected area: All accessible areas not classified as affected. These areas are not expected to contain residual radioactivity, based on knowledge of site history and previous survey information.

All 21 buildings located on site had been characterized (as identified in NRC Material License, Amendment No. 5, SMB-1393) for radiological hazards and classified as either affected or unaffected. 15 buildings had been characterized and classified as unaffected; two (2) buildings had been surveyed for final status; and six (6) buildings had been characterized and classified as affected (or containing affected areas). Building classification and radiological information are described in Table 2.1

TABLE 2.1 - BUILDING CLASSIFICATION AND RADIOLOGICAL INFORMATION

Classification	Building	Radiological Information
A	1	Lab Area, soil samples in the lab and a small source in a lab office. Possible fixed contamination exists on the floor of one of the lab rooms.
A	19	Building contains rad material samples in an individual office. The office has been classified as an affected area.
A	26	Building 26 contains a temporary rad storage area (~20'x30') identified with a rad boundary and radiological postings. The building also contains an above ground 4 section tank (one section being potentially contaminated, internal) and a stainless steel filter (~3 ft. dia. by 4 ft.) that is contaminated.
A	29	Concrete floor with sumps, floor sumps are potentially contaminated and need to be characterized . The rest of the building is identified as unaffected.
A	31	Concrete floor with a steel liner on top. Steel walls and roof, insulated walls. Licensed material mixer was stored in building.
A	33	Concrete floor, steel walls and roof, insulated. Equipment/supplies were originally stored in building. The building was erected in 1979 and is otherwise radiologically clean. Categorized as affected due to the storage of sample containers (contaminated dirt) in the back corner of the building.
U	2	Heat exchange in front of Building 2. Several stories high, mixture of solid and grating floors. Concrete and tin construction.
U	13	Concrete floor, steel and brick walls, some insulation on walls and ceiling.

U	14	Most of the building internals have been removed, brick structure. Roof is rusted and partially disintegrated.
U	21	Concrete floor, steel and cinder block walls, steel ceiling. Maintenance shop in use until March, 2002.
U	22	Concrete floor, metal walls and roof. Equipment/supply storage is the main purpose of this building.
U	23	Concrete floor, steel walls and ceiling.
U	25	Concrete floor, steel walls and ceiling.
U	28	Concrete floor, steel walls and roof, 2 walls insulated, equipment/ supplies located previously stored on shelve located in the building.
U	32	Concrete floor, one wall insulated, steel roof, equipment/supplies previously stored on shelve located in the building, steel front door.
U	34	Concrete floor, steel walls and roof, large conveyor system inside building. Sand pits are located in building.
U	35	Concrete floor, insulated walls and ceiling. Equipment/supplies previously stored in the building. The building was erected in 1988.
U	36	Concrete floor with sumps, double walled construction ½ way up, insulated walls and ceiling.
U	37	Concrete floor, corrugated steel walls and roof. Smaller inside storage building, cinder block construction, roof area was used for storage of additional equipment/supplies.
FS Surveyed	39	Building 39 previously surveyed for final status.
FS Surveyed	42	Building 39 previously surveyed for final status.

2.3 GROUNDS

The Molycorp Washington, PA facility produced a ferrocolumbium alloy from Brazilian ore (pyrochlore) between 1946 and 1970. While the use of pyrochlore was commonplace by that time, this particular ore contained thorium as an accessory metal. The thorium was also in concentrations which required Molycorp to acquire a Source Materials License. This operation resulted in the production of a thorium-bearing slag. A portion of this slag was ball-milled (turned into a granular powder) and used as fill over portions of the site.

While significant amounts of this slag have been removed from the site, remaining slag in soil continued to play a significant role in the survey and release of buildings on site. Building steel walls and concrete floors

showed significant readings above "normal" background levels when surveyed by hand-held or portable detectors.

In two instances during the final status survey of buildings 39 and 42, performed by RSI, survey results indicated elevated levels of radioactivity on building walls (even though smears in the same locations indicated that no removable radioactivity existed.) To identify the source of elevated radioactivity, two sections (approximately 2' by 2') of the building's wall were removed from the building by RSI. These wall pieces were resurveyed in areas where background radiation levels were considered "normal" and found to be free of radioactivity (no readings greater than background).

Because this elevated background condition exists at the Molycorp site, MACTEC devised instrument detector windows for some of their instruments and used them in areas where thorium slag in soil created a background nuisance during survey activities.

3.0 DECOMMISSIONING ACTIVITIES

Decommissioning activities of the buildings on site were performed as a "first step" to release the site for unrestricted future use. The scope of work conducted at the site during this phase of work included D and D of all above surface structures and buildings.

All existing structures (buildings, tanks, dryers, bag houses, utilities, etc.) will be removed from the site. Wastes created during the D and D activities will be identified, segregated, and processed for shipment to the appropriate waste facility. Waste will be removed from site in accordance with all applicable federal, state and local regulations and authorities.

3.1 OBJECTIVES

The objectives for this phase of D and D activities included:

- Removal of equipment and surplus supplies from buildings
- Characterization of hazards associated with the buildings (performance of effective radiological surveys)
- Remediation or disposal of hazards identified in the characterization process
- Completion of Final Status Survey
- Unrestricted release of buildings
- Demolition of buildings

3.2 RESULTS OF PREVIOUS SURVEYS

Numerous radiological studies and surveys have been conducted at the Molycorp Washington, PA site. Since the late 1960, regulatory requirements and pressure from local agencies have driven surveys and studies of the hazards associated with the production of various ferroalloys. Recently, RSI has completed

and submitted for review the Final Status Survey for buildings 39 and 42. Listed below is a brief history of the previous surveys performed on the Molycorp site:

Applied Health Physics, Inc. was contracted by Molycorp to conduct a series of leaching studies on ferrocolumbium slag during the late 1960s. These studies indicated that radioactive materials were fixed and would not leach into the groundwater in excess of prescribed limits. During this period, Molycorp applied unsuccessfully to the Pennsylvania Department of Health's Industrial Wastes Section and AEC for an onsite burial permit. Ferrocolumbium slag cleanup was concentrated in the early to mid-1970s time frame.

In June 1971, an AEC compliance inspection revealed that thorium-bearing slag had been inadvertently buried onsite in violation of the terms and conditions of their license and AEC regulations. The AEC issued a Notice of Violation and requested Molycorp to take remedial action to excavate these materials and dispose of them in accordance with AEC regulations and guidance documents. Applied Health Physics was contracted to perform a thorough radiological survey of the site and to provide health physics and waste disposal services necessary to comply with AEC's request. Survey measurements indicated exposure levels at 1.2 mR/hr in some areas.

In 1972, thoriated material from the site was disposed of at the West Valley, New York, burial site. The disposal was terminated when New York officials decided that the volume of waste was too large and the contamination level insignificant to use up valuable burial area. Molycorp performed cleanup operations to segregate and stabilize the remaining thoriated material in a capped pile containing about 27,700 cubic yards of slag on the south property. A 1975 Applied Health Physics, Inc. report indicated the average concentration of thorium-232 in the slag pile was 1,250 pCi/g, with exposures within the 0.2 mR/hr Nuclear Regulatory Commission maximum level allowed at the time (AEC was reorganized as the NRC in 1974). This pile was eventually removed and disposed of.

In 1978, one of two molybdenum-roasting furnaces was shut down as part of a consent decree with the Pennsylvania Department of Environmental Resources (PADER) Air Quality Agency due to exceedances of SO_2 standards. All remaining processes continued until 1991.

Oak Ridge Associated Universities, an NRC contractor, conducted a radiological survey of the site in 1985. The survey identified elevated (twice background or greater) levels of thorium in the dikes that separated the surface impoundments, and indicated the potential of subsurface thoriated slags in the western portion of the site.

RSA, Inc. conducted a subsurface survey for Molycorp in 1990 to characterize the thorium contamination across the western portion of the site (i.e., the impoundment area), and the areas immediately to the north, west, and northwest. Thirty-two holes were drilled on the site and radiation measurements were logged at every six inches of depth from the surface down to bedrock, both above and below water table. Radiation levels were also logged in monitoring wells previously drilled on the site. In addition to the subsurface survey, RSA, Inc. conducted a survey of the radiation exposure rates inside the study area. This survey consisted of approximately 400 measurements of the gamma radiation field at a height of one meter above ground level. Findings reveled that; in general, the subsurface concentrations of thorium were above those in the surface soils in almost every hole drilled. A general pattern was that the underground radiation levels decreased to background at a depth of about ten feet. While a majority of the holes exhibited concentrations

of greater than 0.01 percent thorium, in only a few holes did the thorium content exceed an average of 0.05 percent at some point below the surface of the ground.

Foster Wheeler Environmental Corporation conducted a site characterization of the Molycorp Washington, PA site in 1994 and published its report titles "Site Characterization Report for License Termination of the Washington, PA Facility, 1995." This three volume report was conducted to meet the Site Characterization Plan's objectives:

- To determine the extent of the distribution of thoriated residues on the site, in the structures and in the environmental media.
- To determine the rate(s) of migration, if any, of thorium or its daughters through various pathways to man.
- To assess associated non-radiological constituents and determine their affects on the radiological constituents and potential impacts on decommissioning.
- To quantify parameters that affect potential human exposure to existing site radiological materials.
- To support evaluation of alternative decommissioning actions wan detailed planning of a preferred approach for decommissioning, decontamination, and waste disposal.

3.3 DECONTAMINATION PROCEDURES

Most of the above surface buildings have been previously decontaminated and identified as unaffected buildings or areas. These classifications are noted in Molycorp's NRC License, SMB-1393 and identified in Section 2.2. Buildings classified as affected will be surveyed, and where remediation is necessary, decontamination will be performed. It has been estimated that very little radioactive waste will be generated during the entire project scope. Items found to be contaminated above the limits have and will be controlled as radioactive material, temporarily stored on site, and ultimately disposed of as radioactive waste.

MACTEC's "Survey Plan for Determining the Final Status of Buildings at the Molycorp Site" contains the procedures and requirements for the survey of the buildings on site. RSI's Radiation Protection Procedures (currently the approved procedures used on site) contain the procedural requirements for operational radiation activities on the site.

4.0 FINAL SURVEY PROCEDURES

The basis of the Molycorp radiological survey design conformed to NUREG/CR 5849, "Manual for Conducting Radiological Surveys in Support of License Termination," RSI's "Decommission Plan for the Washington, PA Facility, Part 1 Revision," and the requirements of Molycorp's "U.S. Nuclear Regulatory Commission Material License, Amendment No. 5, SMB-1393." These references provide adequate information and sampling requirements to ensure a proper survey had been planned and performed. The requirements listed in these references were compiled into a sampling plan (MACTEC's "Survey Plan for

Determining the Final Status of Buildings at the Molycorp Site") and used as the guidance document for sampling instructions.

4.1 SAMPLING PARAMETERS

Sampling parameters were identified from NUREG/CR 5849, "Manual for Conducting Radiological Surveys in Support of License Termination," RSI's "Decommission Plan for the Washington, PA Facility, Part 1 Revision," and the requirements of Molycorp's "U.S. Nuclear Regulatory Commission Material License, Amendment No. 5, SMB-1393." QC samples were included in the sampling requirements.

Site buildings or areas were classified by contamination potential and grouped into survey units having a common history, contamination potential, or that were naturally distinguishable from other site areas, to assure that the number of survey data points from each survey unit adequately represented the radiological environment of that survey unit. Survey units are subdivisions of the whole area of interest within the sampling plan.

Unaffected survey units identified by direct measurement that exceed 25% of the guideline levels were reclassified as affected areas, gridded as necessary, and resurveyed accordingly.

Representative surveying was accomplished for buildings by using a systematic grid approach to ensure spatial representation of the survey unit of interest. The grid system provided reference locations to aid in proper sample identification and distribution, and ensured that minimum sample surface areas were sampled.

Direct and loose surface measurement locations were identified on the actual surface being surveyed. The physical probe location was traced on the surface being surveyed. When necessary, survey readings were recorded on the physical surface at the location of the survey.

Survey results were obtained and used for comparison against the limits for unrestricted release, as defined in the site's NRC License. These limits are included in MACTEC's "Survey Plan for Determining the Final Status of Buildings at the Molycorp Site" as Appendix A.

Table 4.1 identifies the release limits of the license.

Table 4.1 - Acceptable Surface Contamination Levels (dpm/100cm^2)

Radionuclide [1]	Average	Maximum	Removable
U-nat, U-235, U-238, and associated decay products	5,000 α	15,000α	1,000α
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100	300	20
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000	3,000	200
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above	5,000	15,000	1,000

(1) Where surface contamination by both alpha and beta-gamma emitting nuclides exist, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

Even though limited quantities of natural uranium have been identified at the Washington, PA site, and is included as a part of the site's NRC License, the more restrictive limits for release (for surface activity) are for the natural thorium radionuclide, which is the significant radionuclide of concern.. Therefore, the limits for release are due to the natural thorium radionuclide, and the limits are 1,000 dpm/100cm^2 average, 3,000 dpm/100cm^2 maximum and 200 dpm/100cm^2 removable.

Because both alpha and beta radiations are a product of the decay of natural thorium (in equilibrium), the limits listed above apply independently to both alpha radiation and beta radiation.

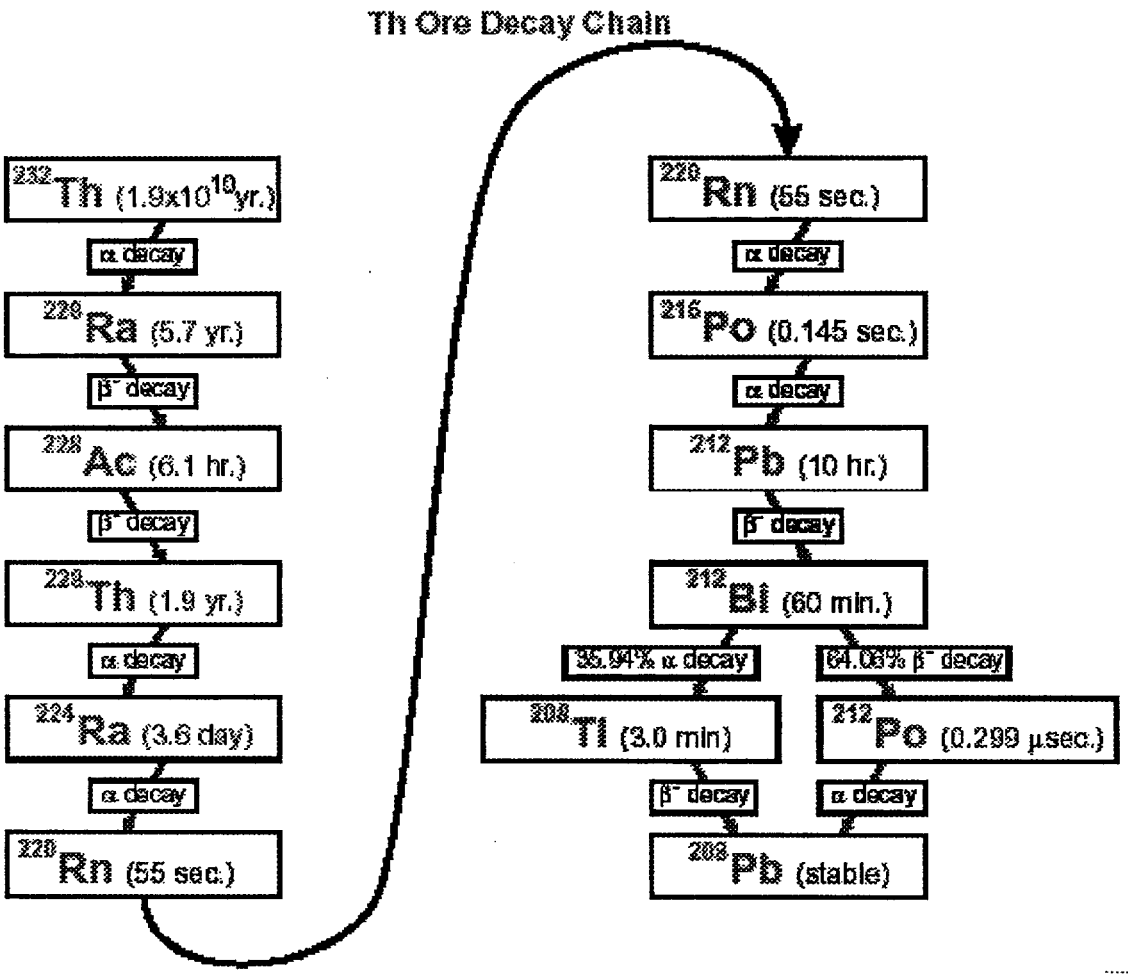
Due to the inherent difficulty of properly quantifying the alpha radiation component during the decay of natural thorium when using a hand-held instrument, a ratio of alpha decays to beta decays was identified and beta radiation was used as a surrogate to quantify the alpha activity. This was not the case for determining removable contamination. The Ludlum 2929 was calibrated and set up for the measurement of both alpha and beta radioactivity.

The detectable ratio of alpha to beta is a 2:1 for natural thorium decay. In actuality, the decay of natural thorium produces 6 alphas and 4 betas to reach stable lead. However, one of the betas emitted during the decay process (from Ra-228) is not detectable (39 keV E-max). The other three betas emitted are detectable and are suitable as a surrogate.

The alpha readings recorded on the various data forms and record sheets were actual instrument readings, obtained from the instrument during the survey, and do not represent this ratio factoring. The use of alpha to beta ratio factoring is incorporated in the data set just prior to statistical analysis and comparison to limit values.

Figure 4.1 is a graphical representation of the decay of natural thorium.

FIGURE 4.1 - NATURAL THORIUM DECAY CHAIN



4.2 SAMPLING SCHEDULE

Scanning of surfaces to identify locations of residual surface activity were performed according to Table 4.2.

TABLE 4.2 - SURFACE SCAN SCHEDULE

Building/ Structure Status	Survey Location	Surface Scan (4.6)
Affected Areas	Building floor and lower walls (<2 m from floor)	100% - Floor and lower walls (<2 m from floor) and other surfaces found to have residual activity in excess of guideline values during characterization surveys.
Affected Areas	Upper surfaces (>2 m from floor) of affected areas found to be non contaminated during the characterization	Limited - Areas found to be non contaminated during the characterization survey, scans in the immediate vicinity of direct measurement.
Affected Areas (4.10.1)	Exterior of piping, ventilation ducting, electrical boxes, conduit, or other interior surfaces that may contain residual contamination	B-G scans, biased, to determine locations that exceed 2x background. *At these locations, and available access points to pipe and duct interiors, direct alpha measurements and smear sample will be obtained.*
All Buildings (4.10.2)	Exterior surface of the roof	Gamma scan only - 1 measurement per 4 m^2 (see Exposure Rates Table)
All Buildings (4.10.2)	Exterior walls	B-G scan, 10% of lower wall surfaces (<2 m from floor).
Unaffected Areas	Building floor and lower wall surfaces (<2 m from floor)	B-G scan, 10% of floor and lower wall surfaces (<2 m from floor)
Equipment/ Structures Located in Affected Areas/Buildings	Equipment/Structure	Free Release Survey - If equipment/structure is identified as being used for processing licensed material. Biased - If equipment/structure was never used for processing licensed material.
Equipment/ Structures Located in Unaffected Areas/Buildings	Equipment/Structure	Biased - If equipment/structure is suspected of being used for processing licensed material. Not Required - If equipment/structure was never used for processing licensed material.

Result Requirements		Locations of surface activity exceeding twice background will be marked for further evaluation.

Building interior surface scans were conducted for alpha and beta-gamma radiations. Scans of exterior building surfaces were for beta and gamma radiations to identify the presence of elevated areas that might indicate residual gross activity.

For hand-held instrumentation, the detector was kept as close as possible to the surface and moved across the surface at a slow speed. Scan surveys were performed by moving the detector over the surface area at a maximum speed of 1-2 inches per second and a distance of approximately 1/2 inch for beta and 1/4 inch for alpha. When the count rate increased, the rate of movement of the detector was decreased or stopped. If the increase in count rate was real (not a random variation in the background count rate), a static 60-second measurement was performed over the area of increased count rate to quantify the activity. Audible indicators (headphones or instrument speaker) were used to identify locations having elevated activity levels. All scanning results were noted on standard survey forms as well as task-specific generated forms.

When elevated levels of surface activity were identified with the Ludlum Model 239-1F floor monitor, the surface was marked and scanned with a hand held unit with a detector size of ~ 100 cm^2 and an appropriate detector efficiency.

Gamma exposure rate measurements (gamma scan) were conducted with the instrument at 1 m above the floor at systematically and randomly selected locations.

Direct measurements were performed according to Table 4.3.

TABLE 4.3 - DIRECT SURFACE MEASUREMENT SCHEDULE

Building/ Structure Status	Survey Location	Direct Measurement (4.7)
Affected Areas	Building floor and lower walls (<2 m from floor)	Floor and lower walls (<2 m from floor) and other surfaces found to have residual activity in excess of guideline values during characterization surveys. (1)
Affected Areas	Upper surfaces (>2 m from floor) of affected areas found to be non contaminated during the characterization	Measurements will be performed at a minimum of 30 locations on both vertical and horizontal surfaces and sufficient additional locations to provide coverage at a minimum of one location per 20 m^2 of surface area. (1)

Affected Areas (4.10.1)	Exterior of piping, ventilation ducting, electrical boxes, conduit, or other interior surfaces that may contain residual contamination	Where B-G scans exceed 2x background - obtain direct alpha measurements. At available access points to pipe and duct interiors - obtain direct alpha measurements.
All Buildings (4.10.2)	Exterior and interior surfaces of air exhaust equipment and at roof drains	Biased
All Buildings (4.10.2)	Exterior walls	A minimum of 30 random direct measurements or an average of at least 1 measurement location per 50 m^2 surface area, whichever is greater, of the survey unit. (4.10.2)
All Buildings (4.10.2)	Exterior surface of the roof	Biased in areas of plausible contamination. (based on gamma scan results)
Unaffected Areas	Building floor and lower walls (<2 m from floor)	A minimum of 30 random direct measurements or an average of at least 1 measurement location per 50 m^2 surface area, whichever is greater. (5849)
Equipment/ Structures Located in Affected Areas/Buildings	Equipment/Structure	Free Release - If equipment/structure is identified as being used for processing licensed material. Biased - If equipment/structure was never used for processing licensed material.
Equipment/ Structures Located in Unaffected Areas/Buildings	Equipment/Structure	Biased - If equipment/structure is identified as being used for processing licensed material. Not Required - If equipment/structure was never used for processing licensed material.
Results Requirements		If direct measurements indicate residual activity exceeds 25% of the guideline, the area is surveyed per affected area requirements.

[1] If scanning methods are capable of detecting residual Th activity of less than 1,000 dpm/100 cm^2, direct surface activity measurements will be systematically performed at two meter intervals on floors and lower walls and at the same intervals on upper surfaces. If scanning methods produce an MDA that exceeds 1,000 dpm/100 cm^2, measurements will be performed at one meter intervals. On upper surfaces of affected areas that are not scanned for the presence of residual activity, measurements will be performed at a minimum of 30 locations on both vertical and horizontal surfaces. These locations will include surfaces where radioactive material would likely settle and sufficient additional locations to provide coverage at a minimum of one location per 20 m^2 of surface area.

Direct surface measurements were conducted by integrating counts over a 1-minute period.

When scans or measurement exceeds guideline levels, the location was noted for further remediation or resolution. Localized scanning and measurements were repeated after any remediation activities were performed.

Smear surveys were preformed according to Table 4.4.

TABLE 4.4 - LOOSE SURFACE MEASUREMENT SCHEDULE

Building/ Structure Status	Survey Location	Removable Surface Activity
Affected Areas	Building floor and lower walls (<2 m from floor)	Collected from each location where a direct surface activity measurement is made (alpha and beta analysis).
Affected Areas	Upper surfaces (>2 m from floor) of affected areas found to be non contaminated during the characterization.	Collected from each location where a direct surface activity measurement is made (alpha and beta analysis).
Affected Areas (4.10.1)	Exterior of piping, ventilation ducting, electrical boxes, conduit, or other interior surfaces that may contain residual contamination.	Where B-G scans exceed 2x background - obtain alpha smear sample. At available access points to pipe and duct interiors - obtain alpha smear sample.
All Buildings (4.10.2)	Exterior and interior surfaces of air exhaust equipment and at roof drains.	Biased to locations where contamination is most likely.
All Buildings (4.10.2)	Exterior walls	Collected from each location where a direct surface activity measurement is made (alpha and beta analysis).
All Buildings (4.10.2)	Exterior surface of the roof	Samples of roofing material (volumetric) will be obtained where direct measurements indicate contamination is present.
Unaffected Areas	Building and Structure Surfaces	Collected from each location where a direct surface activity measurement is made (alpha and beta analysis).

Equipment/ Structures Located in Affected Areas/Buildings	Equipment/Structure	Collected from each location where a direct surface activity measurement is made (alpha and beta analysis).
Equipment/ Structures Located in Unaffected Areas/Buildings	Equipment/Structure	Collected from each location where a direct surface activity measurement is made (alpha and beta analysis).

A smear for removable contamination was obtained at each location where a direct surface activity measurement was taken, unless otherwise stated in Table 4.3.

Smears were counted for gross alpha and beta with the appropriate instrument.

As a precaution against accidental contamination of the instrumentation used to analyze the smear samples, screening of samples that had a high potential of containing elevated levels of radioactivity was performed.

Exposure rate measurements were performed according to Table 4.5.

TABLE 4.5 - EXPOSURE RATE MEASUREMENT SCHEDULE

Building/ Structure Status	Survey Location	Exposure Rate Measurement (4.8)
Affected Areas	Building Surfaces	Gamma exposure rates measured 1 meter perpendicular to building surfaces at 1 measurement per 4 m^2.
All Buildings	Exterior Roof Surface (gamma scan)	Gamma exposure rates measured 1 meter perpendicular to building surfaces at 1 measurement per 4 m^2. (4.10.2)
Unaffected Areas	Building Surfaces	Gamma exposure rates measured 1 meter perpendicular to building surfaces at 1 measurement per 50 m^2 (calibrated for natural thorium).

Gamma exposure rates were measured at 1 m above ground or floor surfaces using a gamma scintillation instrument.

Where necessary, samples of paint were obtained from 100 cm^2 areas of painted surfaces where direct and removable activity measurements suggest contamination (> surface contamination levels) may have been

painted over. These samples were analyzed for beta activity. Direct measurements and smear surveys were made of the underlying surface, after removal of the paint.

Samples of roofing materials (non-metal roofs) were obtained where direct measurements indicate contamination was present in the roofing material. Roof material samples were controlled as volumetric samples and analyzed as such.

Cotton swabs were used for sampling in hard-to-reach areas such as inside wall and floor penetrations, anchor-bolt holes, and floor cracks or expansion joints.

Each piece of equipment that required monitoring was its own entity and was described by name and serial number on survey forms and/or logs. Special attention (increased sample density) was given to areas where there was a high potential for contamination. Equipment previously identified as not affected (not contaminated) was not surveyed unless there was indication that it had become contaminated.

4.3 BACKGROUND LEVELS IDENTIFIED

Material-specific background levels were established by RSI in late 2001 for each type of instrument used for total surface contamination measurements during their final status surveys of buildings 39 and 42. Similar instrumentation was selected for use by MACTEC to take advantage of this previously available information.

Background measurements were collected on surfaces of similar construction as the buildings at the site and having no possibility of being impacted by site operations. Measurements to establish background for a specific material were collected from multiple locations to provide an estimate of the variability or uncertainty. Background determination was performed using the same instrumentation that was used for final status survey data collection. An average background value was determined for each material surveyed and this value was subtracted from each measurement to determine a net count or count rate. Background determinations were required and performed for concrete and a class of material designated a generic material.

The required number of background measurements per material type is as follows:

- Concrete - minimum of 20 measurements
- Cinderblock - minimum of 20 measurements
- Generic Material - minimum of 10 measurements for each type of material surveyed (i.e., wood, insulation, corrugated steel, etc.)

It was previously identified in the final status survey report for buildings 39 and 42, submitted by RSI, that significant background radiation levels existed at the Molycorp site, primarily due to gamma radiation from the thorium slag in the soil. RSI had reported levels as high as 30 micro-R per hour.

During survey activities performed by MACTEC at the site, a significant component of the measured activity was indeed identified to be from the elevated gamma background coming from the slag in the soil. A method was devised to minimize the interference of this background radiation when using the hand-held detectors, and produce more accurate results of beta activity, the primary indicator used for the detection and quantification of natural thorium. A shield, or "beta window" was used to eliminate the beta

component of a measurement made in areas where background levels proved to be a nuisance. A second measurement was taken without the shield in place. This measurement process produced two readings, one containing a beta-gamma interaction with the detector, and one containing only a gamma interaction with the detector. The difference between the two readings provided a beta-only component of the measurement, with the gamma background removed. This reading was then compared against the materials background that was determined at the off-site location and a net beta reading was obtained.

The material used to shield the beta radiation was a thin piece of aluminum (approximately 3/16 inch think). A test was performed to validate the aluminum's ability to shield the beta radiation. A beta source was counted without the shield, and then the shield was put in place. The source was again counted. Results of the tests indicated that in all cases, when the shield was in place , the instrument indicated background values and completely shielded out any beta radiation.

4.4 MAJOR CONTAMINATES IDENTIFIED

The major contaminate (significant radionuclide of concern) at the Molycorp Washington, PA site was identified to be natural thorium. Trace amounts of natural uranium were also identified as a contaminate. Both of these materials are identified in the site's NRC License.

No other licensed material has been brought on site, based on the site Facility Superintendent's knowledge of process and site operations.

Results of preliminary assessment and characterization survey support the conclusion and identify the significant radiological contaminant to be thorium-232, from the processing of certain types of ore concentrates in the production of ferrocolumbium. Most of the material Molycorp processed for ferrocolumbium was a pyrochlore, which contained thorium above the 0.05 percent limit. It is possible that buildings and structures involved with the processing of pyrochlore and production of ferrocolumbium may have been contaminated with thorium-232. The average activity ratio of Th-228 and Th-230 to Th-232 found in slag/soil samples are:

Th-228:Th-232	1.03%
Th-230:Th-232	0.16 %

4.5 GUIDELINES ESTABLISHED

All final status survey measurements were compared to the values listed in the Site's NRC License. The criteria specified in the guideline for natural thorium are more conservative than natural uranium, and were applied at the site for final status survey.

4.6 EQUIPMENT AND PROCEDURES SELECTED

Instrument and procedure selection was based on several criteria. The first criteria that was considered was the use of instruments and procedures that had been previously used on site for final status surveys. Since RSI had just completed the final status survey of two buildings at the site, prior to MACTEC's arrival, using similar procedures and instruments made sense. Because MACTEC's radiation protection operating procedures had not yet been approved for use at the site, RSI's radiation protection procedures were used. RSI's radiation protection procedures had previously been approved for use on site by the NRC. Verbal

approval was given by the NRC to allow MACTEC to continue work using RSI's radiation protection procedures until their procedures were approved.

4.7 INSTRUMENT MDA

The detection sensitivity of a measurement system refers to the statistically determined quantity of radioactive material or radiation that can be measured or detected at a preselected confidence level. This sensitivity is a factor of both the instrumentation and the technique or procedure being used. Typically, detection sensitivity has been defined (EPA 1980) as the level above which there is less than a 5% probability that radioactivity will be reported present when it is really absent (Type I error) or reported absent when it is really present (Type II error).

Minimum detectable activity (MDA) is an *a priori* estimate of the minimum activity level which is practically measurable with a specific instrument, and sampling and/or measurement technique. The basic equation for determining field instrument MDA (NUREG/CR-5849) is:

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

Where:

B_R = background count rate
t = sample count time (min)
E = efficiency
A = area of probe

FIGURE 4.2

Instrument MDAs were calculated on a daily basis and recorded on the applicable survey forms. Where instrument MDAs did not meet criteria (25% of the release limit value,) instrument background count times and sample count times were increased until MDA values became acceptable.

4.8 INSTRUMENT SELECTION

Instrument and equipment selection was made based on previous use and the criteria of NUREG/CR-5849, for MDA sensitivity. In addition to the previous use criteria, instruments were selected based on the ability to detect the desired radiation and at a desired level, ease of use, availability and cost.

- For dose rate measurements, the Ludlum Micro-R meter was selected and used. It was selected due to it's relatively flat energy response curve and because it had been used on site previously for final status surveys.

- For surface scans of large areas (floor and walls), the Ludlum Floor Monitor (239-1F/2350-1) with the 582 cm^2 detector (43-37) was selected. The MDA for the instrument was considered acceptable until an area of elevated activity was detected by the instrument. During surveys with the floor monitor, when an area of elevated activity was detected, the probe size was theoretically reduced from 582 cm^2 to a size of 100 cm^2 (a postulated physical size of elevated activity). The MDA of the instrument with it's newly reduced probe size (100 cm^2 probe size) became unacceptable for scanning. For areas where the floor monitor detected elevated activity, the area was identified and resurveyed with a 100 cm^2 hand-held gas proportional detector. Instrument MDA was calculated and recorded at the start of the job, at the job site. If the instrument was relocated to a different

location during the same day of work, the MDA was again calculated and recorded for the new location. The floor monitor was set up and calibrated to detect both alpha and beta radiations.

- For surface scans of areas with elevated readings, the Ludlum 2350-1 with the 43-68 or 43-106 was selected. Due to the detector's relative size (compared to the 43-37) the MDA for the detector was acceptable. However, using a hand-held instrument to survey large surface areas is not efficient in either cost or time. The primary duty of the large area hand-held gas-flow proportional detector was scanning areas where elevated levels of activity had been identified by the floor monitor. When required to be used, the instrument's MDA was calculated and recorded at the start of the job, at the job site. If the instrument was relocated to a different location during the same day of work, the MDA was again calculated and recorded for the new location. This instrument was not used for static measurements due to the added effort of the surveyor (moving the gas bottle around with the instrument) and the added cost to use the instrument. The instrument's lower MDA allowed for the sample population density of other sample mediums (for affected area surveys units) to be less dense. When the MDA of the scanning instrument could not reach 25% of the release limit, the sample population density increased for the other sample mediums (direct and loose surface measurements) and a greater number of samples were required to be obtained. The instrument was set up and calibrated to detect both alpha and beta radiations.

- For static (direct) surface measurements, the Ludlum 2360 with the 43-89 detector was selected. The MDA was acceptable. Instrument MDA was calculated and recorded at the start of the job, at the job site. If the instrument was relocated to a different location during the same day of work, the MDA was again calculated and recorded for the new location. When background radiation created an unacceptable MDA for this instrument, the instrument was reconfigured to count with a longer count time. Background count times were also increased to lower instrument MDA to acceptable levels. Durability, ease of use and cost were a consideration in the selection of this instrument. The instrument was set up and calibrated to detect both alpha and beta radiations.

- For counting samples (smears and air samples), the Ludlum 2929 with 43-10-1 detector was selected. Instrument MDA was calculated and recorded daily, and found to be acceptable. Durability, ease of use, familiarity and cost were a consideration in the selection of this instrument. The instrument was set up and calibrated to detect both alpha and beta radiations.

Table 4.6 provides information on the instruments selected to be used for final status surveys at the Molycorp Washington, PA site. Information on MDA calculations can be found in "Survey Plan for Determining the Final Status of Buildings at the Molycorp Site," Appendix B.

TABLE 4.6 - INSTRUMENT SELECTION

Instruments	Probe	Radiation	MDA (dpm/100 cm^2)	Use
Ludlum, Model 2360	43-89	Alpha	67	Static Surveys
Ludlum, Model 2360	43-89	Beta	520	Static Surveys
Ludlum, Model 2929	43-10-1	Alpha	29	Counter Scaler

Ludlum, Model 2929	43-10-1	Beta	182	Counter Scaler
Ludlum, Model 2350-1	43-68/43-106	Alpha	105	Scan Surveys
Ludlum, Model 2350-1	43-68/43-106	Beta	625	Scan Surveys
Ludlum, Model 239-1F	43-37	Alpha	64	Floor Monitor
Ludlum, Model 239-1F	43-37	Beta	1186	Floor Monitor
Ludlum, Model 19	Internal	Gamma		Exposure Rates

4.9 INSTRUMENT USE TECHNIQUES

Instruments selected for performing final status surveys were provided by GTS Duratek, Field Engineering and Field Services group, Kingston, TN. Prior to delivery, instrument calibrations and operations were verified by the vendor, and shipped to Washington, PA. Upon arrival, the instruments were inspected and verified operational. Instrument backgrounds were preformed. QC check control limits were established and Chi-squared tests were performed.

Prior to daily use, instruments were response checked and compared against their two and three sigma warning and control limit values. For scaler instruments, daily backgrounds were determined and MDCs were calculated in addition to their response checks. After daily use, hand-held instruments were once again source response checked to ensure that the instrument did not fail during the day's work. All instrument "daily checks" data was logged in the appropriate data log record.

Qualified HP technicians were trained on the use of the instruments, and provided access to the instrument's User Manuals. Surveys were performed in accordance with approved radiological survey procedures on site. Survey results were reviewed by the Radiological Engineer for accuracy and completeness.

4.10 PROCEDURES FOLLOWED

The requirements of NUREG/CR 5849, "Manual for Conducting Radiological Surveys in Support of License Termination" were followed for most statistical methodologies used during the performance of surveys and testing of data for the final status survey. In one instance, the methodology found in "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM) was used for determining the scanning MDA of those instruments used for scanning. This methodology provided a more accurate MDA result than would have been calculated from the guidance found in NUREG/CR-5849.

4.11 SURVEYING ORGANIZATION

Characterization and final status surveys were performed by a team composed of qualified personnel currently employed or subcontracted by MACTEC.

The team was operated under the supervision of the Project Manager, Mr. Vern Taylor, of MACTEC, Inc who has overall authority of the project.

The day to day operations of the site were the responsibility of the Site Superintendent, Mr. John Peek of MACTEC, Inc.

Radiological field measurements and sample collection were the responsibility of Mr. Michael McDonald of MACTEC, Inc. Mike is a Board Certified Health Physicist (CHP) in comprehensive practice and a Registered Radiation Protection Technologist (RRPT).

Radiological surveys were performed by a team of HP technicians. One Senior HP Technician was assigned as the Lead Technician and was given the responsibility of the team.

5.0 SURVEY FINDINGS

Detailed data reports (Survey Findings Report) for each survey unit sampled are provided as an appendix to this report. Field data collection forms, survey report forms, instrumentation information (background, QC, MDA, and source response data forms), statistical test results, and comparisons to release limits are all provided as a single package. Each package also contains a summary of the final status survey for that survey unit and includes information on anomalies discovered during the survey process. Where significant differences existed between final status survey results and results of previous surveys for the survey unit, explanations are provided.

Raw survey data was compiled into survey data tables, where appropriate, and presented with calculational results and comparisons, and are presented in the Survey Findings Report.

5.1 TECHNIQUES FOR REDUCING/EVALUATING DATA

Survey information was obtained from the instrument's meter face used at the time of the survey. This data was recorded on a Radiological Survey Location Indicator data sheet, in the instrument's units. For scans and static measurements, the units were in counts per minute (cpm). Smear data was recorded after counting, subtracting background, and conversion to units of disintegrations per minute per 100 square centimeters (dpm/100cm^2). Dose rate measurements were recorded in units of micro-Roentgen per hour (uR/hr) and taken directly from the instruments meter face. Information used in the conversion from cpm to dpm (instrument efficiencies) was recorded on both the Radiological Survey Location Indicator data sheet and the Radiation Protection Survey Report form. For scans, the highest reading for the given immediate scan area was recorded in cpm.

Where "hot spots" needed to be evaluated, additional readings were taken and the average hot spot activity was calculated in accordance with NUREG/CR-5849, Section 8.5.2 - Elevated Areas of Activity.

5.2 STATISTICAL EVALUATION AND COMPARISON TABLES

The statistical methodology used to provide the true representation of the data in relationship to the applicable limits is found in Sections 2.0 and 8.0 of NUREG/CR-5849. Comparison tables and tests used in the analysis are presented as part of each survey unit's Survey Findings Report package, as an appendix to this report.

6.0 SUMMARY

Final status survey of the buildings located at the Molycorp Washington, PA site were performed in accordance with the requirements listed in NUREG/CR 5849, "Manual for Conducting Radiological Surveys in Support of License Termination," RSI's "Decommission Plan for the Washington, PA Facility, Part 1 Revision," Molycorp's "U.S. Nuclear Regulatory Commission Material License, Amendment No. 5, SMB-1393," and MACTEC's "Survey Plan for Determining the Final Status of Buildings at the Molycorp Site."

According to the findings of the final status surveys performed at the Molycorp Washington, PA site, all release criteria have been met. Results of the final status survey demonstrate that the residual radioactivity in Buildings XXX is below the unrestricted use criteria and confirm that the buildings are suitable for unrestricted use.

7.0 REFERENCES

1) *Manual for Conducting Radiological Surveys in Support of License Termination*, NUREG/CR-5849, Draft, December 1993.

2) *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) Revision 1*, NUREG-1575, Rev. 1, US Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, Washington, DC, August 2000.

3) *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs*, American National Standard, ANSI/ASQC E4-1994.

4) *Quality Assurance for Radiological Monitoring Program - Effluent Streams and the Environment*, NRC Regulatory Guide 4.15, 1979.

5) *Termination of Operating Licenses for Nuclear Reactors*, Nuclear Regulatory Commission, Regulatory Guide 1.86, 1974.

6) *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*, NUREG/CR-1507, Final, 1997.

7) *Statistical Methods for Evaluating the Attainment of Cleanup Standards*, Pacific Northwest Laboratory, Richland, WA, December 1992.

8) *Radiation Detection and Measurement*, Knoll, 1979.

9) *Washing, PA Facility, Decommissioning Plan, Part 1 Revision*, June 30, 1999, Radiological Services Inc.

10) *Radiation Protection Program, Health Physics Procedures*, June 1999, Radiological Services Inc.

11) *Site Characterization Report for License Termination of the Washington, PA Facility*, January 1995, Radiological Services Inc.

12) *U.S. Nuclear Regulatory Commission Materials License*, Molycorp, Inc, SMB-1393, Docket No. 040-08778, Amendment 5.

Appendix A

Building 25 Data Package

Molycorp Washington, PA

Building 25 Data Package

This data package contains final status survey information for Building 25, Molycorp, Washington, PA site.

Field data collection forms, survey report forms, statistical test results, and comparisons to release limits are provided.

Summary

No anomalies were reported during the survey of Building 25. Elevated levels of background radiation, from soil radioactivity, continued to be a presence during survey activities.

Results from the final status survey of Building 25 provides evidence that release criteria have been met, demonstrates that residual radioactivity is below the unrestricted use criteria, and confirms that Building 25 is suitable for unrestricted use.

Results of Surface Scans
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Floor and Mezzanine

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
F1	1550	78	14	7
F2	1600	128	12	5
F3				
F4				
F5	1400	-72	14	7
F6	1530	58	12	5
F7				
F8	1390	-82	10	3
F9				
F10	1550	78	12	5
F11	1500	28	10	3
F12				
F13	1450	-22	10	3
F14				
M1	1150	-322	18	11
M2	1500	28	12	5
M3	1350	-122	12	5
M4	1200	-272	10	3
M5				

All floor and mezzanine scans performed with Ludlum 239-1F (2350-1 No.95359 with 43-37 No. 92503)

Floor Monitor Info:
Scan MDA Beta - 188 dpm/detector area
Scan MDA Alpha - 16.9 dpm/detector area
Scan background Beta - 1472 cpm
Scan background Alpha - 7 cpm
Detector Eff. Beta - .27
Detector Eff. Alpha - .207

Results of Surface Scans

Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Walls (Interior)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
W1	270	13	0	-2
W2	260	3	1.6	-0.4
W3	280	23	1.4	-0.6
W4	265	8	1	-1
W5	225	-32	1	-1
W6	280	23	2	0

All interior wall scans performed with Ludlum Model 2350-1 No.117014 with 43-106 No. 133866

Monitor Info:
Scan MDA Beta - 610 dpm/100cm^2
Scan MDA Alpha - 63 dpm/100cm^2
Scan background Beta - 257 cpm
Scan background Alpha - 2 cpm
Detector Eff. Beta - .248
Detector Eff. Alpha - .211

Results of Surface Scans

Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Exterior (Walls)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
W1	280	23	1	-1
W2	270	13	1	-1
W3	275	18	2	0
W4	250	-7	1	-1
W5	260	3	2	0
W6	240	-17	3	1

All exterior wall scans performed with Ludlum Model 2350-1 No.117014 with 43-106 No. 133866

Monitor Info:
Scan MDA Beta - 610 dpm/100cm^2
Scan MDA Alpha - 63 dpm/100cm^2
Scan background Beta - 257 cpm
Scan background Alpha - 2 cpm
Detector Eff. Beta - .248
Detector Eff. Alpha - .211

Elevated Scan Readings
Molycorp - Building 25 Survey Unit (Unaffected Area)

No elevated scan measurements were reported.

Direct Measurements (Total Activity)
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Floor and Mezzanine

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
F1	329	275	54	78	-24	-212	199	387	-425
F2	319	257	62	78	-16	-142	205	387	-283
F3	323	220	103	78	25	221	233	387	442
F4	310	246	64	78	-14	-124	207	387	-248
F5	302	253	49	78	-29	-257	195	387	-513
F6	313	263	50	78	-28	-248	196	387	-496
F7	279	227	52	78	-26	-230	198	387	-460
F8	320	248	72	78	-6	-53	212	387	-106
F9	319	253	66	78	-12	-106	208	387	-212
F10	318	256	62	78	-16	-142	205	387	-283
F11	294	224	70	78	-8	-71	211	387	-142
F12	295	260	35	78	-43	-381	184	387	-761
F13	315	274	41	78	-37	-327	189	387	-655
F14	290	227	63	78	-15	-133	206	387	-265
M1	223	205	18	8	10	88	88	387	177
M2	198	210	-12	8	-20	-177	35	387	-354
M3	220	220	0	8	-8	-71	49	387	-142
M4	229	221	8	8	0	0	69	387	0
M5	300	252	48	8	40	354	130	387	708

All building interior floor and mezzanine direct measurements were performed with 2360 No. 164680 and 43-89 No. 118544

	Beta	Alpha		Beta	Alpha
Floor Efficiency	0.113	0.164	Mezzanine Efficiency	0.113	0.164
Floor Background (cpm)	78	2.4	Mezzanine Background (cpm)	8	3.7
Floor MDA (dpm/100 cm^2)	387	60	Mezzanine MDA (dpm/100 cm^2)	140	71

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Direct Measurements (Total Activity)
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Walls (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [(1)] (dpm/100cm^2)
W1	226	224	2	8	-6	-53	55	140	-106
W2	207	213	-6	8	-14	-124	25	140	-248
W3	154	183	-29	8	-37	-327	79	140	-655
W4	181	179	2	8	-6	-53	55	140	-106
W5	166	182	-16	8	-24	-212	49	140	-425
W6	173	165	8	8	0	0	69	140	0

All building interior wall direct measurements were performed with 2360 No. 164680 and 43-89 No. 118544

	Beta	Alpha
Wall Efficiency	0.113	0.164
Wall Background (cpm)	8	3.7
Wall MDA (dpm/100 cm^2)	140	71

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Direct Measurements (Total Activity)
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Exterior (Walls)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [(1)] (dpm/100cm^2)
W1	202	212	-10	8	-18	-159	25	140	-319
W2	225	219	6	8	-2	-18	65	140	-35
W3	206	195	11	8	3	27	76	140	53
W4	199	197	2	8	-6	-53	55	140	-106
W5	179	187	-8	8	-16	-142	0	140	-283
W6	225	180	45	8	37	327	126	140	655

All building exterior direct measurements were performed with 2360
No. 164680 and 43-89 No. 118544

	Beta	Alpha
Efficiency	0.113	0.164
Background (cpm)	8	3.7
MDA (dpm/100 cm^2)	140	71

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Elevated Direct Measurements (Total Activity) and Averaging Results
Molycorp - Building 25 Survey Unit (Unaffected Area)

No elevated direct measurements were reported.

Removable Surface Activity Measurements
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Floor and Mezzanine

Location (see map)	Removable Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm^2)	Uncertainty 95% CL	MDA	Instrument #
F1	-18	23.0	152	2.6	5.4	11.6	1
F2	84	45.4	152	-0.3	1.8	11.6	1
F3	6	15.7	152	2.6	5.4	11.6	1
F4	48	35.0	152	-0.3	1.8	11.6	1
F5	-18	23.0	152	-0.3	1.8	11.6	1
F6	36	30.8	152	-0.3	1.8	11.6	1
F7	-66	40.6	152	2.6	5.4	11.6	1
F8	6	15.7	152	-0.3	1.8	11.6	1
F9	-54	37.0	152	-0.3	1.8	11.6	1
F10	-42	33.0	152	-0.3	1.8	11.6	1
F11	-48	35.0	152	-0.3	1.8	11.6	1
F12	0	10.4	152	-0.3	1.8	11.6	1
F13	-54	37.0	152	-0.3	1.8	11.6	1
F14	18	23.0	152	-0.3	1.8	11.6	1
M1	6	15.7	152	-0.3	1.8	11.6	1
M2	-24	25.8	152	-0.3	1.8	11.6	1
M3	24	25.8	152	5.5	7.8	11.6	1
M4	-36	30.8	152	-0.3	1.8	11.6	1
M5	-30	28.4	152	-0.3	1.8	11.6	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info:

	Beta	Alpha
Background (cpm)	46	0.12
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	152	11.6

Removable Surface Activity Measurements
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Walls (Interior)

Location (see map)	Removable Beta ($dpm/100cm^2$)	Uncertainty 95% CL	MDA	Removable Alpha ($dpm/100cm^2$)	Uncertainty 95% CL	MDA	Instrument #
W1	12	19.7	152	-0.3	1.8	11.6	1
W2	0	10.4	152	-0.3	1.8	11.6	1
W3	-6.1	15.8	152	2.6	5.4	11.6	1
W4	-6.1	15.8	152	-0.3	1.8	11.6	1
W5	54	37.0	152	2.6	5.4	11.6	1
W6	18	23.0	152	2.6	5.4	11.6	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info:

	Beta	Alpha
Background (cpm)	46	0.12
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	152	11.6

Removable Surface Activity Measurements
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Exterior (Walls)

Location (see map)	Removable Beta ($dpm/100cm^2$)	Uncertainty 95% CL	MDA	Removable Alpha ($dpm/100cm^2$)	Uncertainty 95% CL	MDA	Instrument #
W1	-12	19.7	152	-0.3	1.8	11.6	1
W2	-6	15.7	152	-0.3	1.8	11.6	1
W3	36	30.8	152	2.6	5.4	11.6	1
W4	-48	35.0	152	-0.3	1.8	11.6	1
W5	-48	35.0	152	2.6	5.4	11.6	1
W6	12	19.7	152	-0.3	1.8	11.6	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info:

	Beta	Alpha
Background (cpm)	46	0.12
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	152	11.6

Elevated Removable Surface Activity Measure
Molycorp - Building 25 Survey Unit (Unaffected Area)

No elevated removable surface activity was reported above

Exposure Rate Measurements
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Floor and Mezzanine

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
F1	10	2
F2	10	2
F3	9	1
F4	9	1
F5	8	0
F6	9	1
F7	8	0
F8	8	0
F9	8	0
F10	9	1
F11	9	1
F12	8	0
F13	8	0
F14	8	0
M1	7	1
M2	7	1
M3	6	0
M4	6	0
M5	6	0

Floor background dose rate: 8 uR/hr with Model 19, No.115870

Mezzanine background dose rate: 6 uR/hr with Model 19, No.115870

Exposure Rate Measurements
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Walls (Interior)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
W1	8	0
W2	8	0
W3	8	0
W4	8	0
W5	8	0
W6	8	0

Background dose rate: 8 uR/hr with Model 19, No.115870

Exposure Rate Measurements
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Exterior (Walls)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
W1	9	1
W2	9	1
W3	8	0
W4	8	0
W5	8	0
W6	8	0

Background dose rate: 8 uR/hr with Model 19, No.115870

Exposure Rate Measurements
Molycorp - Building 25 Survey Unit (Unaffected Area)

Building Exterior (Roof)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
see map	10	2	see map	6	-2
see map	10	2	see map	6	-2
see map	10	2	see map	7	-1
see map	8	0	see map	7	-1
see map	9	1	see map	6	-2
see map	8	0	see map	6	-2
see map	7	-1	see map	7	-1
see map	7	-1	see map	7	-1
see map	8	0	see map	6	-2
see map	7	-1	see map	6	-2
see map	7	-1	see map	7	-1
see map	7	-1	see map	7	-1
see map	8	0	see map	6	-2
see map	7	-1	see map	6	-2
see map	7	-1	see map	6	-2
see map	6	-2	see map	7	-1
see map	7	-1	see map	6	-2
see map	7	-1	see map	6	-2
see map	6	-2	see map	6	-2
see map	6	-2	see map	6	-2
see map	7	-1	see map	6	-2
see map	7	-1	see map	6	-2

Background dose rate: 6-10 uR/hr with Model 19, No.115870

Summary of Building Surface Direct Reading (Total Activity) Results
Molycorp - Building 25 Survey Unit (Unaffected Area)

Including all building interior and exterior measurements

Beta				Alpha			
n	$\bar{x}$	s	μ_α	n	$\bar{x}$	s	μ_α
31	-90	169.8	-38.5	31	-180	339.7	-76.9

$t_{1-\alpha}$ 1.696

Guidelines/Conditions Satisfied?

Beta	Alpha
Yes	Yes

Summary of Exposure Rate Measurements
Molycorp - Building 25 Survey Unit (Unaffected Area)

Including all building interior and exterior measurements (uR/hr)

n	$\bar{x}$	s	μ_α
75	-0.5	1.2	-0.2

$t_{1-\alpha}$	1.668

Guidelines/Conditions Satisfied?
Yes

	DDO-138 Radiation Protection Survey Report	Site: Molycorp / Washington, PA

Section 1: Survey Information UNAFFECTED Bldg

Date:	Time:	Location:	Survey Issue Log Number:
4-4-02	1300	Bldg 25	02-0103

RWP Number:	Purpose of Survey:	Page
NA	☐ RWP ☐ Routine Survey ☐ Unconditional Release ☑ Other:	1 of 6

Survey Title: UNAFFECTED

Model 19 # 115870 Due 8-6-02

2360 used for 1 minute STATIC Readings
Shielded / unshielded

Walls

	BKG	MDA
β⁻	8	~~97~~ 140
α	3.7	71

Floor

	BKg	MDA
β⁻	78	387
α	2.4	60

Bkgd Readings: Floor 0/S 8 micro Rem/hr Mezz 6 micro Rem/hr

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17	NA	
18		
19		
20		
21		
22		
23		
24		
25		
26		

Legend:
00 = mRem/h gamma; 00 C = mRem/h gamma contact; ① = Smear Location; ▽ = Air Sample Location; -X-X-X- = Rope, Boundary, or Barrier
00 β = mRem/h beta; 00 βC = mRem/h beta contact; —①— = Large Area Wipe; = Bulk Material Sample

Section 2: Instrument Used

Instrument Model/SN:	Cal Due Date:	Probe Model/SN:	Cal Due Date:	Detector Eff.: (cpm/dpm) β⁻	α	MDA: β⁻	α	Other β⁻	BKg	α
2350-1/117014	8-13-02	43-106/133866	8-6-02	.248	.211	610	63	257		2
2350-1/95359	8-6-02	43-37/092503	8-6-02	.27	.207	188	16.9	1472		7
2929/152202	2-6-03	43-10/156519	2-6-03	.165	.344	152	11.6	46		.12
2360/164680	7-9-02	43-89/118544	8-6-02	.113	.164	See Above				

Section 3: Review and Approval

Survey Performed By (Sign):	Area Posted and/or Barricaded:	Date and Time:
Mark Blaucock	☐ Yes ☐ No ☑ Not Required	4-4-02 / 1300
Radiation Safety Officer (Print Name & Sign):		**Date and Time:**
Mike McDonald		4-16-02 10:12

Radiological Survey Results - Survey Location Indicator

Survey # 02-0103

Survey Area Information: Bldg # 25 INTERIOR FLOOR + MEZZ.

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4-4-02
	Steve Filo	Steve Filo	4-4-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-1	1550	14	329	275	12	10	2.6	-18
F-2	1600	12	319	257	6	10	-.3	84
F-3	NA	NA	323	220	7	9	2.6	6
F-4	NA	NA	310	246	3	9	2.6	48
F-5	1400	14	302	253	4	8	-.3	-18
F-6	1530	12	313	263	3	9	-.3	36
F-6QC	NA	NA	356	249	3	9	-.3	-6
F-7	NA	NA	279	227	4	8	2.6	-66
F-8	1390	10	320	248	9	8	-.3	6
F-9	NA	NA	319	253	7	8	-.3	-54
F-10	1550	12	318	256	6	9	-.3	-42
F-11	1500	10	294	224	2	9	-.3	-48
F-12	NA	NA	295	260	7	8	-.3	0
F-13	1450	10	315	274	8	8	-.3	-54
F-14	NA	NA	290	227	10	8	-.3	18
M-1	1150	18	223	205	9	7	-.3	6
M-1QC	NA	NA	226	218	11	7	-.3	-12
M-2	1500	12	198	210	10	7	-.3	-24
M-3	1350	12	220	220	10	6	5.5	24
M-4	1200	10	229	221	10	6	-.3	-36
M-5	NA	NA	300	252	12	6	-.3	-30

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 25 Interior / Exterior walls Survey #02-0103

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

N/A

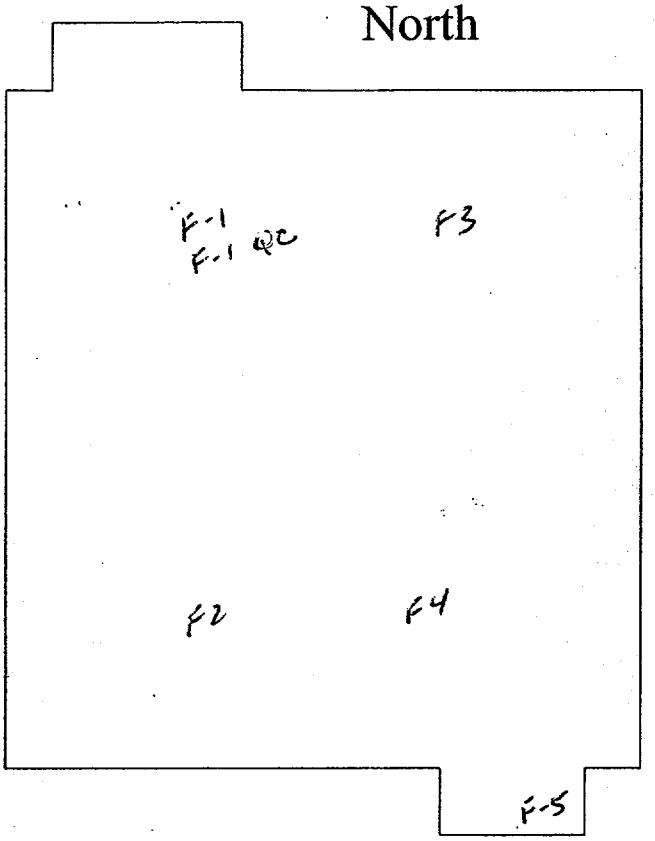
Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4-4-02
	Rose Marie A. Ridge	Rose Marie A. Ridge	4-4-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-1	270	0	226	224	2	8	-.3	12
W-2	260	1.6	207	213	1	8	-.3	0
W-3	280	1.4	154	183	4	8	2.6	-6.1
W-3 QC			175	148	5	8	5.5	-30
W-4	265	1	181	179	3	8	-.3	-6.1
W-5	225	1	166	182	5	8	2.6	54
W-6	280	2	173	165	4	8	2.6	18
W-1	280	1	202	212	2	9	-.3	-12
W-2	270	1	225	219	4	9	-.3	-6
W-3	275	2	206	195	2	8	2.6	36
W-4	250	1	199	197	2	8	-.3	-48
W-5	260	2	179	187	6	8	2.6	-48
W-5 QC			181	204	2	8	-.3	12
W-6	240	3	225	180	11	8	-.3	12

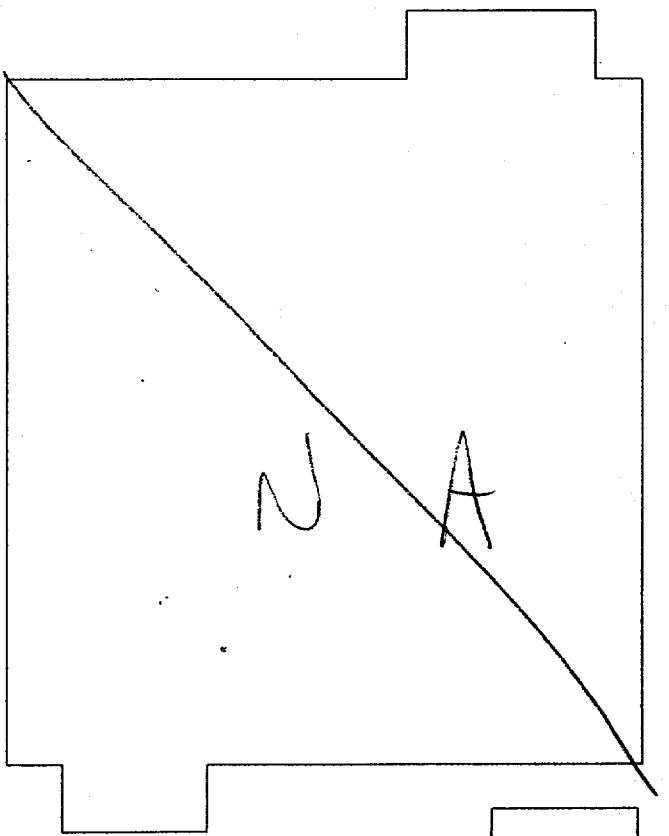
5

Building 25
North

Survey # 02-0103



Upper Floor
Interior



Upper Floor Underside
Interior

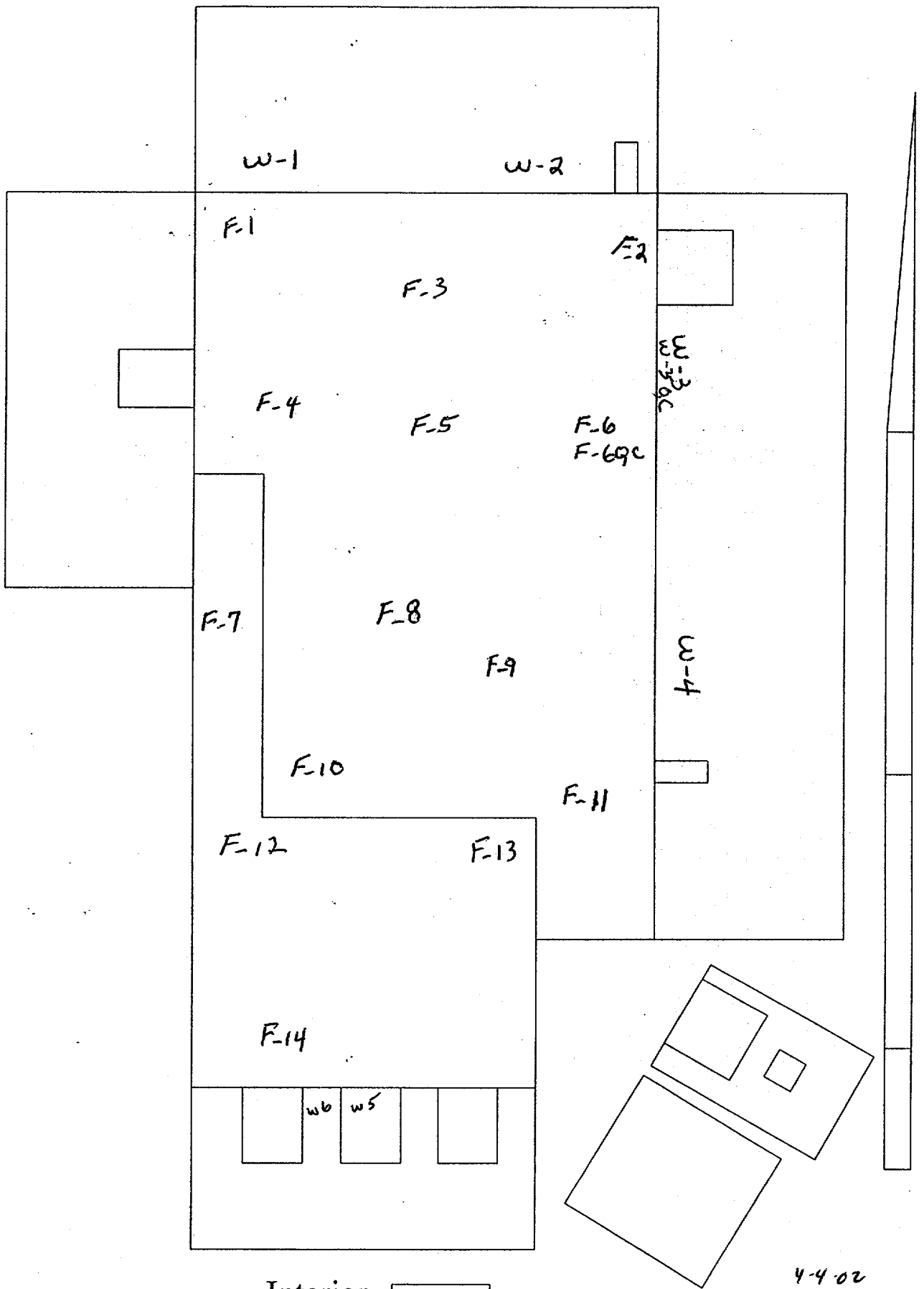
Scale:
4m x 4m

mark Blaucoak
4-4-02

4 of 6

Building 25
North

Survey #02-0103



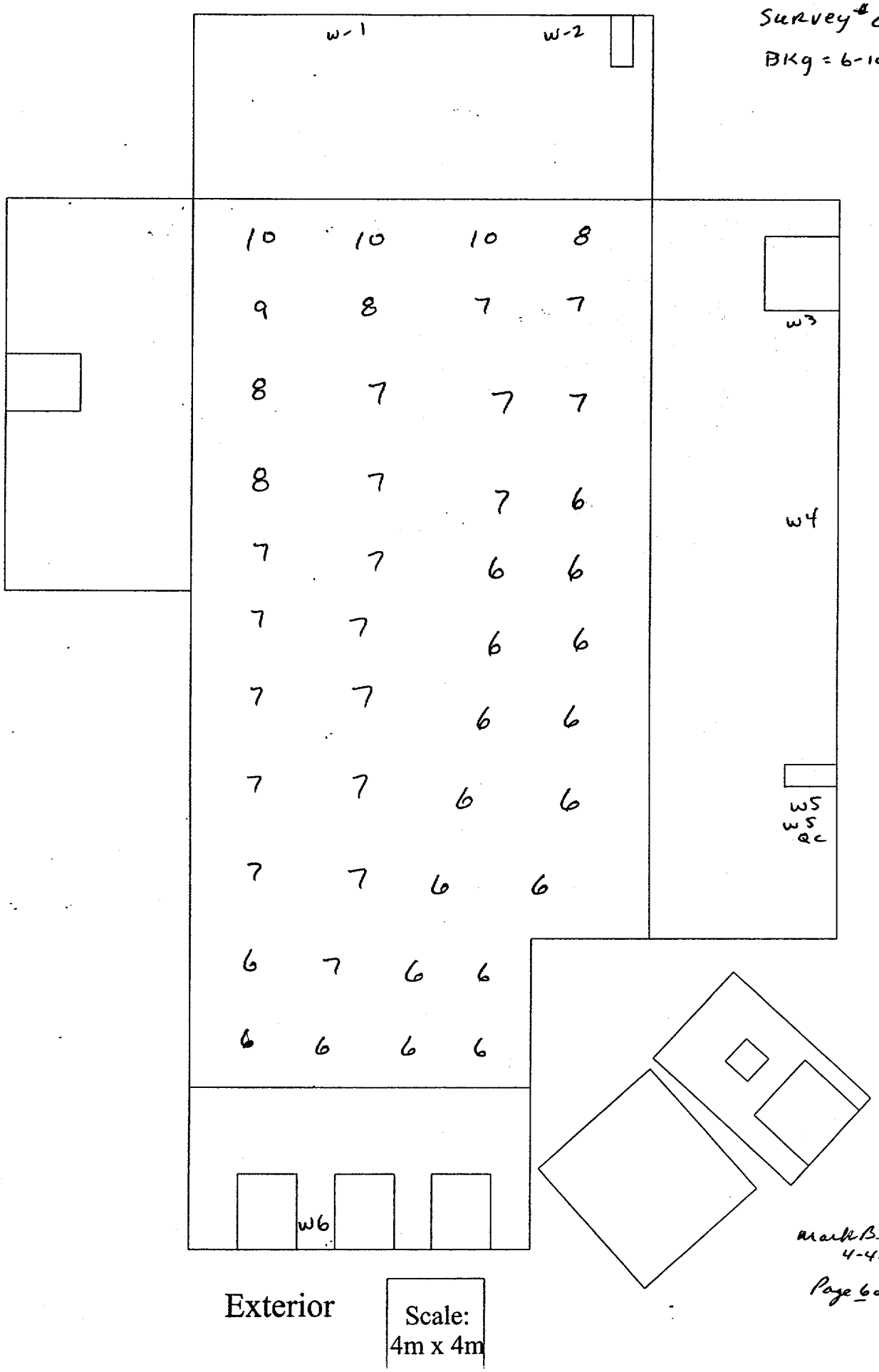
Interior

Scale:
4m x 4m

4-4-02
Mark Blencoe

Building 25
North

Survey # 02-0103
BKg = 6-10 microRem/hr



Exterior

Scale:
4m x 4m

Mark Blanchard
4-4-02

Page 6 of 6

Appendix B

Building 33 Data Package

Molycorp Washington, PA

Building 33 Data Package

This data package contains final status survey information for Building 33, Molycorp, Washington, PA site.

Field data collection forms, survey report forms, statistical test results, and comparisons to release limits are provided.

Summary

No anomalies were reported during the survey of Building 33. Elevated levels of background radiation, from soil radioactivity, continued to be a presence during survey activities. The Northeast corner of the building exhibits the highest elevated soil-contributing dose rates.

Results from the final status survey of Building 33 provides evidence that release criteria have been met, demonstrates that residual radioactivity is below the unrestricted use criteria, and confirms that Building 33 is suitable for unrestricted use.

Results of Surface Scans
Molycorp - Building 33 Survey Unit (Affected Area)

Building Floor

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm	Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
F1	1440	102	8	-8.0	F81	1550	212	14	-2.0
F2	1590	252	7	-9.0	F82	1600	262	14	-2.0
F3	1640	302	12	-4.0	F83	1560	222	10	-6.0
F4	1470	132	10	-6.0	F84	1570	232	10	-6.0
F5	1530	192	13	-3.0	F85	1660	322	11	-5.0
F6	1510	172	9	-7.0	F86	1570	232	7	-9.0
F7	1500	162	11	-5.0	F87	1420	82	10	-6.0
F8	1470	132	14	-2.0	F88	1510	172	12	-4.0
F9	1360	22	6	-10.0	F89	1490	152	7	-9.0
F10	1660	322	12	-4.0	F90	1530	192	12	-4.0
F11	1490	152	13	-3.0	F91	1540	202	10	-6.0
F12	1540	202	11	-5.0	F92	1480	142	8	-8.0
F13	1510	172	13	-3.0	F93	1590	252	8	-8.0
F14	1610	272	8	-8.0	F94	1490	152	10	-6.0
F15	1630	292	11	-5.0	F95	1460	122	12	-4.0
F16	1430	92	8	-8.0	F96	1520	182	12	-4.0
F17	1450	112	10	-6.0	F97	1420	82	8	-8.0
F18	1510	172	12	-4.0	F98	1380	42	16	0.0
F19	1340	2	11	-5.0	F99	1600	262	13	-3.0
F20	1580	242	10	-6.0	F100	1470	132	13	-3.0
F21	1390	52	10	-6.0	F101	1360	22	10	-6.0
F22	1570	232	8	-8.0	F102	1470	132	11	-5.0
F23	1540	202	11	-5.0	F103	1510	172	10	-6.0
F24	1340	2	6	-10.0	F104	1590	252	10	-6.0
F25	1440	102	8	-8.0	F105	1520	182	8	-8.0
F26	1330	-8	12	-4.0	F106	1380	42	6	-10.0
F27	1340	2	10	-6.0	F107	1400	62	10	-6.0
F28	1600	262	10	-6.0	F108	1420	82	11	-5.0
F29	1370	32	13	-3.0	F109	1540	202	8	-8.0
F30	1470	132	9	-7.0	F110	1510	172	10	-6.0
F31	1400	62	12	-4.0	F111	1550	212	11	-5.0
F32	1420	82	8	-8.0	F112	1450	112	8	-8.0
F33	1340	2	11	-5.0	F113	1430	92	7	-9.0
F34	1490	152	7	-9.0	F114	1460	122	10	-6.0
F35	1430	92	10	-6.0	F115	1640	302	10	-6.0
F36	1670	332	6	-10.0	F116	1480	142	12	-4.0
F37	1390	52	12	-4.0	F117	1430	92	6	-10.0
F38	1460	122	10	-6.0	F118	1490	152	8	-8.0
F39	1330	-8	8	-8.0	F119	1370	32	11	-5.0
F40	1520	182	9	-7.0	F120	1540	202	12	-4.0
F41	1400	62	13	-3.0	F121	1420	82	13	-3.0
F42	1330	-8	12	-4.0	F122	1580	242	11	-5.0
F43	1340	2	11	-5.0	F123	1460	122	12	-4.0
F44	1460	122	14	-2.0	F124	1580	242	10	-6.0
F45	1570	232	12	-4.0	F125	1670	332	11	-5.0
F46	1380	42	7	-9.0	F126	1590	252	13	-3.0
F47	1340	2	6	-10.0	F127	1350	12	7	-9.0
F48	1330	-8	4	-12.0	F128	1570	232	10	-6.0
F49	1330	-8	10	-6.0	F129	1480	142	11	-5.0
F50	1350	12	12	-4.0	F130	1500	162	13	-3.0
F51	1340	2	14	-2.0	F131	1600	262	12	-4.0
F52	1220	-118	13	-3.0	F132	1460	122	8	-8.0
F53	1330	-8	8	-8.0	F133	1560	222	10	-6.0
F54	1340	2	14	-2.0	F134	1570	232	9	-7.0

F55	1440	102	10	-6.0	F135	1570	232	10	-6.0
F56	1330	-8	10	-6.0	F136	1520	182	8	-8.0
F57	1330	-8	11	-5.0	F137	1390	52	11	-5.0
F58	1310	-28	12	-4.0	F138	1530	192	12	-4.0
F59	1350	12	6	-10.0	F139	1410	72	9	-7.0
F60	1420	82	14	-2.0	F140	1420	82	10	-6.0
F61	1300	-38	10	-6.0	F141	1430	92	12	-4.0
F62	1500	162	11	-5.0	F142	1560	222	12	-4.0
F63	1590	252	13	-3.0	F143	1900	562	11	-5.0
F64	1450	112	12	-4.0	F144	1670	332	12	-4.0
F65	1300	-38	8	-8.0	F145	1300	-38	8	-8.0
F66	1380	42	10	-6.0	F146	1330	-8	8	-8.0
F67	1300	-38	12	-4.0	F147	1400	62	10	-6.0
F68	1390	52	8	-8.0	F148	1350	12	8	-8.0
F69	1390	52	10	-6.0	F149	1480	142	7	-9.0
F70	1400	62	13	-3.0	F150	1420	82	10	-6.0
F71	1410	72	13	-3.0	F151	1400	62	13	-3.0
F72	1640	302	14	-2.0	F152	1350	12	8	-8.0
F73	1320	-18	12	-4.0	F153	1380	42	10	-6.0
F74	1330	-8	8	-8.0	F154	1400	62	12	-4.0
F75	1340	2	10	-6.0	F155	1410	72	11	-5.0
F76	1340	2	10	-6.0	F156	1510	172	9	-7.0
F77	1300	-38	6	-10.0	F157	1340	2	8	-8.0
F78	1460	122	8	-8.0	F158	1350	12	7	-9.0
F79	1400	62	12	-4.0	F159	1390	52	10	-6.0
F80	1430	92	12	-4.0					

All floor scans performed with Ludlum 239-1F (2350-1 No.95359)
with 43-37 No. 92503

Floor Monitor Info:
Scan MDA Beta - 180 dpm/detector area
Scan MDA Alpha - 31 dpm/detector area
Scan background Beta - 1338 cpm
Scan background Alpha - 16 cpm
Detector Eff. Beta - .27
Detector Eff. Alpha - .207

Results of Surface Scans

Molycorp - Building 33 Survey Unit (Affected Area)

Building Walls (Interior)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm	Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
W1	500	233	1.2	0.4	W39	290	23	1.2	0.4
W2	480	213	0.8	0	W40	300	33	1.2	0.4
W3	420	153	0.6	-0.2	W41	290	23	1.4	0.6
W4	490	223	2	1.2	W42	280	13	1	0.2
W5	460	193	1	0.2	W43	280	13	1	0.2
W6	440	173	1	0.2	W44	280	13	0.6	-0.2
W7	360	93	1	0.2	W45	270	3	1	0.2
W8	280	13	2	1.2	W46	320	53	1	0.2
W9	280	13	1	0.2	W47	360	93	1.4	0.6
W10	280	13	2.4	1.6	W48	390	123	1.2	0.4
W11	290	23	2	1.2	W49	480	213	1	0.2
W12	280	13	1	0.2	W50	500	233	1.2	0.4
W13	300	33	1	0.2	W51	420	153	2	1.2
W14	280	13	2	1.2	W52	420	153	1	0.2
W15	260	-7	1	0.2	W53				
W16	260	-7	0.8	0	W54	420	153	2	1.2
W17	240	-27	1	0.2	W55				
W18	250	-17	2	1.2	W56	240	-27	1	0.2
W19	240	-27	2	1.2	W57	220	-47	1	0.2
W20	240	-27	0.6	-0.2	W58				
W21	270	3	1.2	0.4	W59	200	-67	1	0.2
W22	220	-47	1	0.2	W60	230	-37	0	-0.8
W23	240	-27	1	0.2	W61	200	-67	1	0.2
W24	200	-67	1	0.2	W62	210	-57	1	0.2
W25	220	-47	0.6	-0.2	W63				
W26	240	-27	0.6	-0.2	W64	260	-7	2	1.2
W27	240	-27	1	0.2	W65				
W28	260	-7	1.2	0.4	W66	265	-2	1	0.2
W29	240	-27	1	0.2	W67				
W30	300	33	0.6	-0.2	W68	210	-57	0	-0.8
W31	300	33	1	0.2	W69	250	-17	1	0.2
W32	320	53	2	1.2	W70	280	13	1	0.2
W33	280	13	1	0.2	W71				
W34	260	-7	1.4	0.6	W72				
W35	300	33	2.4	1.6	W73				
W36	280	13	0.6	-0.2	W74				
W37	290	23	1.2	0.4	W75	460	193	2	1.2
W38	280	13	1	0.2					

All interior wall scans performed with Ludlum 2350-1 No.117014
with 43-106 No. 133866:

Scan MDA Beta - 508 dpm/detector area
Scan MDA Alpha - 40 dpm/detector area
Scan background Beta - 267 cpm
Scan background Alpha - .8 cpm
Detector Eff. Beta - .248
Detector Eff. Alpha - .211

Results of Surface Scans

Molycorp - Building 33 Survey Unit (Affected Area)

Building Ceiling (Interior)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
C1	440	173	1	0.2
C2				
C3				
C4	340	73	2	1.2
C5				
C6	260	-7	1	0.2
C7				
C8	280	13	2	1.2
C9				
C10				
C11	280	13	1	0.2
C12				
C13	270	3	2	1.2
C14				
C15				
C16	240	-27	1	0.2
C17				
C18	250	-17	1	0.2

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
C19				
C20				
C21	280	13	1.2	0.4
C22				
C23				
C24				
C25				
C26	300	33	1	0.2
C27				
C28	260	-7	1	0.2
C29				
C30	250	-17	0	-0.8
C31	270	3	1	0.2
C32				
C33	275	8	1	0.2
C34				
C35	260	-7	2	1.2
C36				

Ceiling scans performed with Ludlum 2350-1 No.117014 with 43-106 No. 133866:

Scan MDA Beta - 508 dpm/detector area
Scan MDA Alpha - 40 dpm/detector area
Scan background Beta - 267 cpm
Scan background Alpha - .8 cpm
Detector Eff. Beta - .248
Detector Eff. Alpha - .211

Results of Surface Scans

Molycorp - Building 33 Survey Unit (Affected Area)

Building Exterior (Walls)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
W1	435	168	7	6.2
W2	400	133	6	5.2
W3				
W4				
W5				
W6	400	133	6	5.2
W7				
W8				
W9	400	133	10	9.2

All exterior scans performed with Ludlum 2350-1 No.117014 with 43-106 No. 133866:

Scan MDA Beta - 508 dpm/detector area
Scan MDA Alpha - 40 dpm/detector area
Scan background Beta - 267 cpm
Scan background Alpha - .8 cpm
Detector Eff. Beta - .248
Detector Eff. Alpha - .211

Elevated Scan Readings
Molycorp - Building 33 Survey Unit (Affected Area)

Location	Alpha Scan (net cpm)
W1(E)	6.2
W2 (E)	5.2
W6 (E)	5.2
W9 (E)	9.2

E = Exterior

Direct Measurements (Total Activity)
Molycorp - Building 33 Survey Unit (Affected Area)

Building Floor (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
F1	354	272	82	78	4	35	219	566	71
F2	337	253	84	78	6	53	221	566	106
F3	331	248	83	78	5	44	220	566	88
F4	359	256	103	78	25	221	233	566	442
F5	347	246	101	78	23	204	232	566	407
F6	315	237	78	78	0	0	217	566	0
F7	314	239	75	78	-3	-27	215	566	-53
F8	268	248	20	78	-58	-513	172	566	-1027
F9	271	235	36	78	-42	-372	185	566	-743
F10	339	305	34	78	-44	-389	184	566	-779
F11	303	222	81	78	3	27	219	566	53
F12	311	226	85	78	7	62	221	566	124
F13	346	224	122	78	44	389	245	566	779
F14	318	233	85	78	7	62	221	566	124
F15	314	232	82	78	4	35	219	566	71
F16	304	255	49	78	-29	-257	195	566	-513
F17	279	225	54	78	-24	-212	199	566	-425
F18	286	229	57	78	-21	-186	202	566	-372
F19	322	235	87	78	9	80	223	566	159
F20	297	202	95	78	17	150	228	566	301
F21	295	235	60	78	-18	-159	204	566	-319
F22	287	243	44	78	-34	-301	192	566	-602
F23	314	251	63	78	-15	-133	206	566	-265
F24	330	256	74	78	-4	-35	214	566	-71
F25	294	218	76	78	-2	-18	215	566	-35
F26	318	230	88	78	10	88	223	566	177
F27	283	212	71	78	-7	-62	212	566	-124
F28	343	245	98	78	20	177	230	566	354
F29	319	250	69	78	-9	-80	210	566	-159
F30	277	230	47	78	-31	-274	194	566	-549
F31	303	228	75	78	-3	-27	215	566	-53
F32	309	240	69	78	-9	-80	210	566	-159
F33	341	266	75	78	-3	-27	215	566	-53
F34	292	213	79	78	1	9	217	566	18
F35	313	242	71	78	-7	-62	212	566	-124
F36	283	239	44	78	-34	-301	192	566	-602
F37	315	223	92	78	14	124	226	566	248
F38	322	239	83	78	5	44	220	566	88
F39	270	249	21	78	-57	-504	173	566	-1009
F40	277	251	26	78	-52	-460	177	566	-920
F41	259	235	24	78	-54	-478	175	566	-956
F42	287	237	50	78	-28	-248	196	566	-496
F43	323	225	98	78	20	177	230	566	354
F44	277	258	19	78	-59	-522	171	566	-1044
F45	307	235	72	78	-6	-53	212	566	-106
F46	304	248	56	78	-22	-195	201	566	-389
F47	274	252	22	78	-56	-496	173	566	-991
F48	259	243	16	78	-62	-549	168	566	-1097
F49	270	210	60	78	-18	-159	204	566	-319
F50	254	222	32	78	-46	-407	182	566	-814
F51	280	219	61	78	-17	-150	204	566	-301
F52	257	224	33	78	-45	-398	183	566	-796

F53	280	210	70	78	-8	-71	211	566	-142
F54	289	218	71	78	-7	-62	212	566	-124
F55	259	229	30	78	-48	-425	180	566	-850
F56	284	212	72	78	-6	-53	212	566	-106
F57	276	246	30	78	-48	-425	180	566	-850
F58	262	219	43	78	-35	-310	191	566	-619
F59	293	225	68	78	-10	-88	210	566	-177
F60	283	235	48	78	-30	-265	195	566	-531
F61	289	218	71	78	-7	-62	212	566	-124
F62	286	236	50	78	-28	-248	196	566	-496
F63	257	252	5	78	-73	-646	158	566	-1292
F64	277	203	74	78	-4	-35	214	566	-71
F65	279	222	57	78	-21	-186	202	566	-372
F66	275	236	39	78	-39	-345	188	566	-690
F67	288	226	62	78	-16	-142	205	566	-283
F68	246	239	7	78	-71	-628	160	566	-1257
F69	265	192	73	78	-5	-44	213	566	-88
F70	301	238	63	78	-15	-133	206	566	-265
F71	346	234	112	78	34	301	239	566	602
F72	307	246	61	78	-17	-150	204	566	-301
F73	327	227	100	78	22	195	231	566	389
F74	291	240	51	78	-27	-239	197	566	-478
F75	286	209	77	78	-1	-9	216	566	-18
F76	305	215	90	78	12	106	225	566	212
F77	284	217	67	78	-11	-97	209	566	-195
F78	268	224	44	78	-34	-301	192	566	-602
F79	299	254	45	78	-33	-292	192	566	-584
F80	302	248	54	78	-24	-212	199	566	-425
F81	327	252	75	78	-3	-27	215	566	-53
F82	314	214	100	78	22	195	231	566	389
F83	300	208	92	78	14	124	226	566	248
F84	321	230	91	78	13	115	225	566	230
F85	304	231	73	78	-5	-44	213	566	-88
F86	283	237	46	78	-32	-283	193	566	-566
F87	314	225	89	78	11	97	224	566	195
F88	312	196	116	78	38	336	242	566	673
F89	311	226	85	78	7	62	221	566	124
F90	308	240	68	78	-10	-88	210	566	-177
F91	317	223	94	78	16	142	227	566	283
F92	312	226	86	78	8	71	222	566	142
F93	331	235	96	78	18	159	229	566	319
F94	322	236	86	78	8	71	222	566	142
F95	327	248	79	78	1	9	217	566	18
F96	311	220	91	78	13	115	225	566	230
F97	284	195	89	78	11	97	224	566	195
F98	288	214	74	78	-4	-35	214	566	-71
F99	322	237	85	78	7	62	221	566	124
F100	323	234	89	78	11	97	224	566	195
F101	310	215	95	78	17	150	228	566	301
F102	316	249	67	78	-11	-97	209	566	-195
F103	312	238	74	78	-4	-35	214	566	-71
F104	304	225	79	78	1	9	217	566	18
F105	274	214	60	78	-18	-159	204	566	-319
F106	303	238	65	78	-13	-115	207	566	-230
F107	319	215	104	78	26	230	234	566	460
F108	304	213	91	78	13	115	225	566	230
F109	325	221	104	78	26	230	234	566	460
F110	318	211	107	78	29	257	236	566	513
F111	309	226	83	78	5	44	220	566	88
F112	307	219	88	78	10	88	223	566	177
F113	307	234	73	78	-5	-44	213	566	-88

F114	302	245	57	78	-21	-186	202	566	-372
F115	328	265	63	78	-15	-133	206	566	-265
F116	310	241	69	78	-9	-80	210	566	-159
F117	259	201	58	78	-20	-177	202	566	-354
F118	294	208	86	78	8	71	222	566	142
F119	323	226	97	78	19	168	229	566	336
F120	292	241	51	78	-27	-239	197	566	-478
F121	337	251	86	78	8	71	222	566	142
F122	295	277	18	78	-60	-531	170	566	-1062
F123	336	257	79	78	1	9	217	566	18
F124	324	290	34	78	-44	-389	184	566	-779
F125	330	220	110	78	32	283	238	566	566
F126	290	222	68	78	-10	-88	210	566	-177
F127	316	258	58	78	-20	-177	202	566	-354
F128	319	249	70	78	-8	-71	211	566	-142
F129	337	284	53	78	-25	-221	199	566	-442
F130	328	231	97	78	19	168	229	566	336
F131	317	234	83	78	5	44	220	566	88
F132	328	264	64	78	-14	-124	207	566	-248
F133	337	265	72	78	-6	-53	212	566	-106
F134	316	246	70	78	-8	-71	211	566	-142
F135	328	276	52	78	-26	-230	198	566	-460
F136	319	224	95	78	17	150	228	566	301
F137	292	230	62	78	-16	-142	205	566	-283
F138	276	243	33	78	-45	-398	183	566	-796
F139	299	242	57	78	-21	-186	202	566	-372
F140	306	240	66	78	-12	-106	208	566	-212
F141	328	255	73	78	-5	-44	213	566	-88
F142	323	234	89	78	11	97	224	566	195
F143	199	210	-11	78	-89	-788	142	566	-1575
F144	336	247	89	78	11	97	224	566	195
F145	212	280	-68	78	-146	-1292	55	566	-2584
F146	176	199	-23	78	-101	-894	129	566	-1788
F147	199	184	15	78	-63	-558	167	566	-1115
F148	313	226	87	78	9	80	223	566	159
F149	318	230	88	78	10	88	223	566	177
F150	317	280	37	78	-41	-363	186	566	-726
F151	222	188	34	78	-44	-389	184	566	-779
F152	338	251	87	78	9	80	223	566	159
F153	279	226	53	78	-25	-221	199	566	-442
F154	268	234	34	78	-44	-389	184	566	-779
F155	332	216	116	78	38	336	242	566	673
F156	238	200	38	78	-40	-354	187	566	-708
F157	321	253	68	78	-10	-88	210	566	-177
F158	359	251	108	78	30	265	237	566	531
F159	302	243	59	78	-19	-168	203	566	-336

All building interior floor direct measurements were performed with 2360 No. 164680 and 43-89 No. 118544

	Beta	Alpha
Floor Efficiency	0.113	0.164
Floor Background (cpm)	78	2.4
Floor MDA (dpm/100 cm^2)	566	60

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Direct Measurements (Total Activity)
Molycorp - Building 33 Survey Unit (Affected Area)

Building Walls (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
W1	417	457	-40	8	-48	-545	126	180	-1091
W2	354	399	-45	8	-53	-602	135	180	-1205
W3	380	406	-26	8	-34	-386	94	180	-773
W4	410	405	5	8	-3	-34	80	180	-68
W5	365	405	-40	8	-48	-545	126	180	-1091
W6	348	373	-25	8	-33	-375	92	180	-750
W7	309	301	8	8	0	0	89	180	0
W8	233	213	20	8	12	136	118	180	273
W9	220	245	-25	8	-33	-375	92	180	-750
W10	232	236	-4	8	-12	-136	45	180	-273
W11	192	212	-20	8	-28	-318	77	180	-636
W12	172	219	-47	8	-55	-625	139	180	-1250
W13	273	254	19	8	11	125	116	180	250
W14	192	205	-13	8	-21	-239	50	180	-477
W15	199	236	-37	8	-45	-511	120	180	-1023
W16	215	229	-14	8	-22	-250	55	180	-500
W17	229	270	-41	8	-49	-557	128	180	-1114
W18	234	214	20	8	12	136	118	180	273
W19	179	181	-2	8	-10	-114	55	180	-227
W20	207	216	-9	8	-17	-193	22	180	-386
W21	203	230	-27	8	-35	-398	97	180	-795
W22	220	208	12	8	4	45	100	180	91
W23	176	199	-23	8	-31	-352	86	180	-705
W24	202	224	-22	8	-30	-341	83	180	-682
W25	217	198	19	8	11	125	116	180	250
W26	213	188	25	8	17	193	128	180	386
W27	217	237	-20	8	-28	-318	77	180	-636
W28	281	256	25	8	17	193	128	180	386
W29	246	253	-7	8	-15	-170	22	180	-341
W30	243	245	-2	8	-10	-114	55	180	-227
W31	288	248	40	8	32	364	154	180	727
W32	283	252	31	8	23	261	139	180	523
W33	258	278	-20	8	-28	-318	77	180	-636
W34	280	242	38	8	30	341	151	180	682
W35	282	253	29	8	21	239	135	180	477
W36	224	232	-8	8	-16	-182	0	180	-364
W37	241	214	27	8	19	216	132	180	432
W38	235	222	13	8	5	57	102	180	114
W39	238	255	-17	8	-25	-284	67	180	-568
W40	306	260	46	8	38	432	164	180	864
W41	264	291	-27	8	-35	-398	97	180	-795
W42	314	278	36	8	28	318	148	180	636
W43	275	236	39	8	31	352	153	180	705
W44	253	244	9	8	1	11	92	180	23
W45	283	282	1	8	-7	-80	67	180	-159
W46	274	251	23	8	15	170	124	180	341
W47	338	322	16	8	8	91	109	180	182
W48	368	333	35	8	27	307	146	180	614
W49	406	430	-24	8	-32	-364	89	180	-727
W50	493	502	-9	8	-17	-193	22	180	-386
W51	463	423	40	8	32	364	154	180	727
W52	403	396	7	8	-1	-11	86	180	-23

W53	402	400	2	8	-6	-68	70	180	-136
W54	463	423	40	8	32	364	154	180	727
W55	282	244	38	8	30	341	151	180	682
W56	236	266	-30	8	-38	-432	104	180	-864
W57	212	251	-39	8	-47	-534	124	180	-1068
W58	214	224	-10	8	-18	-205	31	180	-409
W59	192	225	-33	8	-41	-466	111	180	-932
W60	213	229	-16	8	-24	-273	63	180	-545
W61	193	197	-4	8	-12	-136	45	180	-273
W62	204	223	-19	8	-27	-307	74	180	-614
W63	231	218	13	8	5	57	102	180	114
W64	241	227	14	8	6	68	104	180	136
W65	260	235	25	8	17	193	128	180	386
W66	273	281	-8	8	-16	-182	0	180	-364
W67	266	268	-2	8	-10	-114	55	180	-227
W68	222	252	-30	8	-38	-432	104	180	-864
W69	247	258	-11	8	-19	-216	39	180	-432
W70	264	250	14	8	6	68	104	180	136
W71	307	277	30	8	22	250	137	180	500
W72	264	250	14	8	6	68	104	180	136
W73	275	292	-17	8	-25	-284	67	180	-568
W74	330	314	16	8	8	91	109	180	182
W75	499	470	29	8	21	239	135	180	477

All building interior wall direct measurements were performed with 2360 No. 156371 and 43-89 No. 164832

	Beta	Alpha
Wall Efficiency	0.088	0.153
Wall Background (cpm)	8	3.7
Wall MDA (dpm/100 cm^2)	180	76

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Direct Measurements (Total Activity)
Molycorp - Building 33 Survey Unit (Affected Area)

Building Ceiling (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha (1) (dpm/100cm^2)
C1	467	465	2	8	-6	-68	70	180	-136
C2	412	390	22	8	14	159	122	180	318
C3	334	348	-14	8	-22	-250	55	180	-500
C4	313	298	15	8	7	80	107	180	159
C5	358	314	44	8	36	409	161	180	818
C6	267	242	25	8	17	193	128	180	386
C7	280	298	-18	8	-26	-295	70	180	-591
C8	272	245	27	8	19	216	132	180	432
C9	270	241	29	8	21	239	135	180	477
C10	252	234	18	8	10	114	114	180	227
C11	225	232	-7	8	-15	-170	22	180	-341
C12	251	242	9	8	1	11	92	180	23
C13	278	260	18	8	10	114	114	180	227
C14	234	242	-8	8	-16	-182	0	180	-364
C15	251	225	26	8	18	205	130	180	409
C16	258	237	21	8	13	148	120	180	295
C17	283	245	38	8	30	341	151	180	682
C18	240	220	20	8	12	136	118	180	273
C19	233	256	-23	8	-31	-352	86	180	-705
C20	247	222	25	8	17	193	128	180	386
C21	274	258	16	8	8	91	109	180	182
C22	236	270	-34	8	-42	-477	114	180	-955
C23	238	246	-8	8	-16	-182	0	180	-364
C24	252	226	26	8	18	205	130	180	409
C25	249	248	1	8	-7	-80	67	180	-159
C26	266	248	18	8	10	114	114	180	227
C27	284	272	12	8	4	45	100	180	91
C28	258	251	7	8	-1	-11	86	180	-23
C29	274	283	-9	8	-17	-193	22	180	-386
C30	267	244	23	8	15	170	124	180	341
C31	298	257	41	8	33	375	156	180	750
C32	276	241	35	8	27	307	146	180	614
C33	298	310	-12	8	-20	-227	45	180	-455
C34	274	286	-12	8	-20	-227	45	180	-455
C35	269	277	-8	8	-16	-182	0	180	-364
C36	273	258	15	8	7	80	107	180	159

All ceiling direct measurements were performed with 2360 No. 156371 and 43-89 No. 164832

	Beta	Alpha
Ceiling Efficiency	0.088	0.153
Ceiling Background (cpm)	8	3.7
Ceiling MDA (dpm/100 cm^2)	180	76

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Direct Measurements (Total Activity)
Molycorp - Building 33 Survey Unit (Affected Area)

Building Exterior (Walls)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
W1	354	310	44	8	36	409	161	180	818
W2	428	349	79	78	1	11	279	180	23
W3	466	435	31	8	23	261	139	180	523
W4	365	280	85	78	7	80	284	180	159
W5	348	284	64	78	-14	-159	265	180	-318
W6	383	311	72	78	-6	-68	273	180	-136
W7	279	248	31	8	23	261	139	180	523
W8	335	283	52	78	-26	-295	254	180	-591
W9	368	293	75	78	-3	-34	275	180	-68
W10	359	250	109	78	31	352	305	180	705
W11	338	276	62	78	-16	-182	264	180	-364
W12	325	248	77	78	-1	-11	277	180	-23
W13	288	223	65	78	-13	-148	266	180	-295
W14	316	228	88	78	10	114	287	180	227
W15	229	217	12	8	4	45	100	180	91
W16	229	227	2	8	-6	-68	70	180	-136
W17	268	228	40	8	32	364	154	180	727
W18	393	363	30	8	22	250	137	180	500
W19	350	302	48	8	40	455	167	180	909
W20	302	286	16	8	8	91	109	180	182
W21	298	263	35	8	27	307	146	180	614
W22	299	281	18	8	10	114	114	180	227
W23	309	262	47	8	39	443	165	180	886
W24	250	263	-13	8	-21	-239	50	180	-477
W25	312	270	42	8	34	386	157	180	773
W26	358	258	100	78	22	250	297	180	500
W27	279	262	17	8	9	102	111	180	205
W28	265	238	27	8	19	216	132	180	432
W29	296	256	40	8	32	364	154	180	727
W30	242	238	4	8	-4	-45	77	180	-91

All building exterior direct measurements were performed with 2360 No. 156371 and 43-89 No. 164832

	Beta	Alpha
Efficiency	0.088	0.153
Background (cpm) (other than concrete)	8	3.7
Background (cpm) (concrete)	78	2.4
MDA (dpm/100 cm^2)	180	76

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Elevated Direct Measurements (Total Activity) and Averaging Results
Molycorp - Building 33 Survey Unit (Affected Area)

No elevated direct measurements were reported.

Removable Surface Activity Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Building Floor

Location (see map)	Removable Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm^2)	Uncertainty 95% CL	MDA	Instrument #
F1	-30	28.4	155	-0.4	2.1	12	1
F2	-36	30.8	155	-0.4	2.1	12	1
F3	-30	28.4	155	-0.4	2.1	12	1
F4	-6	15.7	155	-0.4	2.1	12	1
F5	-12	19.7	155	-0.4	2.1	12	1
F6	12	19.7	155	-0.4	2.1	12	1
F7	6	15.7	155	-0.4	2.1	12	1
F8	18	23.0	155	-0.4	2.1	12	1
F9	-18	23.0	155	-0.4	2.1	12	1
F10	60	38.8	155	2.4	5.2	12	1
F11	24	25.8	155	-0.4	2.1	12	1
F12	-24	25.8	155	-0.4	2.1	12	1
F13	-36	30.8	155	-0.4	2.1	12	1
F14	-6	15.7	155	2.4	5.2	12	1
F15	0	10.4	155	-0.4	2.1	12	1
F16	-48	35.0	155	-0.4	2.1	12	1
F17	42	33.0	155	-0.4	2.1	12	1
F18	6	15.7	155	-0.4	2.1	12	1
F19	-12	19.7	155	-0.4	2.1	12	1
F20	24	25.8	155	-0.4	2.1	12	1
F21	-30	28.4	155	-0.4	2.1	12	1
F22	-36	30.8	155	-0.4	2.1	12	1
F23	18	23.0	155	-0.4	2.1	12	1
F24	-18	23.0	155	-0.4	2.1	12	1
F25	-6	15.7	155	2.4	5.2	12	1
F26	-42	33.0	155	-0.4	2.1	12	1
F27	-6	15.7	155	-0.4	2.1	12	1
F28	-12	19.7	155	-0.4	2.1	12	1
F29	0	10.4	155	-0.4	2.1	12	1
F30	30	28.4	155	-0.4	2.1	12	1
F31	-60	38.8	155	-0.4	2.1	12	1
F32	-36	30.8	155	-0.4	2.1	12	1
F33	-30	28.4	155	-0.4	2.1	12	1
F34	24	25.8	155	-0.4	2.1	12	1
F35	-6	15.7	155	2.4	5.2	12	1
F36	42	33.0	155	-0.4	2.1	12	1
F37	18	23.0	155	-0.4	2.1	12	1
F38	-12	19.7	155	-0.4	2.1	12	1
F39	12	19.7	155	-0.4	2.1	12	1
F40	54	37.0	155	-0.4	2.1	12	1
F41	6	15.7	155	-0.4	2.1	12	1
F42	-24	25.8	155	-0.4	2.1	12	1
F43	18	23.0	155	2.4	5.2	12	1
F44	-18	23.0	155	-0.4	2.1	12	1
F45	-6	15.7	155	-0.4	2.1	12	1
F46	12	19.7	155	-0.4	2.1	12	1
F47	-36	30.8	155	-0.4	2.1	12	1
F48	60	38.8	155	-0.4	2.1	12	1
F49	-36	30.8	155	-0.4	2.1	12	1
F50	-6	15.7	155	-0.4	2.1	12	1
F51	-42	33.0	155	-0.4	2.1	12	1
F52	12	19.7	155	-0.4	2.1	12	1

F53	-18	23.0	155	-0.4	2.1	12	1
F54	-24	25.8	155	-0.4	2.1	12	1
F55	60	38.8	155	-0.4	2.1	12	1
F56	-30	28.4	155	-0.4	2.1	12	1
F57	6	15.7	155	2.4	5.2	12	1
F58	-6	15.7	155	-0.4	2.1	12	1
F59	-18	23.0	155	-0.4	2.1	12	1
F60	24	25.8	155	-0.4	2.1	12	1
F61	12	19.7	155	-0.4	2.1	12	1
F62	-6	15.7	155	2.4	5.2	12	1
F63	-24	25.8	155	-0.4	2.1	12	1
F64	-60	38.8	155	-0.4	2.1	12	1
F65	0	10.4	155	-0.4	2.1	12	1
F66	-48	35.0	155	-0.4	2.1	12	1
F67	42	33.0	155	-0.4	2.1	12	1
F68	-12	19.7	155	-0.4	2.1	12	1
F69	-36	30.8	155	-0.4	2.1	12	1
F70	-30	28.4	155	-0.4	2.1	12	1
F71	18	23.0	155	-0.4	2.1	12	1
F72	54	37.0	155	-0.4	2.1	12	1
F73	-42	33.0	155	-0.4	2.1	12	1
F74	-6	15.7	155	-0.4	2.1	12	1
F75	18	23.0	155	-0.4	2.1	12	1
F76	-18	23.0	155	-0.4	2.1	12	1
F77	24	25.8	155	-0.4	2.1	12	1
F78	-60	38.8	155	-0.4	2.1	12	1
F79	-6	15.7	155	-0.4	2.1	12	1
F80	-30	28.4	155	-0.4	2.1	12	1
F81	6	15.7	155	-0.4	2.1	12	1
F82	0	10.4	155	-0.4	2.1	12	1
F83	12	19.7	155	-0.4	2.1	12	1
F84	-12	19.7	155	-0.4	2.1	12	1
F85	-30	28.4	155	-0.4	2.1	12	1
F86	-36	30.8	155	-0.4	2.1	12	1
F87	-6	15.7	155	2.4	5.2	12	1
F88	6	15.7	155	-0.4	2.1	12	1
F89	12	19.7	155	-0.4	2.1	12	1
F90	-18	23.0	155	-0.4	2.1	12	1
F91	18	23.0	155	-0.4	2.1	12	1
F92	12	19.7	155	-0.4	2.1	12	1
F93	-30	28.4	155	-0.4	2.1	12	1
F94	60	38.8	155	2.4	5.2	12	1
F95	54	37.0	155	-0.4	2.1	12	1
F96	-6	15.7	155	-0.4	2.1	12	1
F97	6	15.7	155	-0.4	2.1	12	1
F98	18	23.0	155	-0.4	2.1	12	1
F99	-18	23.0	155	-0.4	2.1	12	1
F100	24	25.8	155	-0.4	2.1	12	1
F101	-6	15.7	155	-0.4	2.1	12	1
F102	-48	35.0	155	-0.4	2.1	12	1
F103	30	28.4	155	-0.4	2.1	12	1
F104	-36	30.8	155	-0.4	2.1	12	1
F105	6	15.7	155	2.4	5.2	12	1
F106	12	19.7	155	-0.4	2.1	12	1
F107	-18	23.0	155	-0.4	2.1	12	1
F108	18	23.0	155	-0.4	2.1	12	1
F109	-18	23.0	155	-0.4	2.1	12	1
F110	-36	30.8	155	-0.4	2.1	12	1
F111	6	15.7	155	-0.4	2.1	12	1
F112	-42	33.0	155	-0.4	2.1	12	1

F113	-30	28.4	155	-0.4	2.1	12	1
F114	-6	15.7	155	-0.4	2.1	12	1
F115	-48	35.0	155	-0.4	2.1	12	1
F116	-12	19.7	155	-0.4	2.1	12	1
F117	6	15.7	155	-0.4	2.1	12	1
F118	-6	15.7	155	-0.4	2.1	12	1
F119	-36	30.8	155	-0.4	2.1	12	1
F120	-12	19.7	155	-0.4	2.1	12	1
F121	12	19.7	155	-0.4	2.1	12	1
F122	18	23.0	155	-0.4	2.1	12	1
F123	-42	33.0	155	-0.4	2.1	12	1
F124	-36	30.8	155	2.4	5.2	12	1
F125	60	38.8	155	-0.4	2.1	12	1
F126	-36	30.8	155	-0.4	2.1	12	1
F127	-18	23.0	155	-0.4	2.1	12	1
F128	-60	38.8	155	-0.4	2.1	12	1
F129	54	37.0	155	-0.4	2.1	12	1
F130	-6	15.7	155	-0.4	2.1	12	1
F131	-24	25.8	155	2.4	5.2	12	1
F132	-36	30.8	155	-0.4	2.1	12	1
F133	6	15.7	155	-0.4	2.1	12	1
F134	12	19.7	155	-0.4	2.1	12	1
F135	18	23.0	155	-0.4	2.1	12	1
F136	0	10.4	155	-0.4	2.1	12	1
F137	42	33.0	155	-0.4	2.1	12	1
F138	24	25.8	155	-0.4	2.1	12	1
F139	-6	15.7	155	-0.4	2.1	12	1
F140	6	15.7	155	2.4	5.2	12	1
F141	-18	23.0	155	-0.4	2.1	12	1
F142	-30	28.4	155	-0.4	2.1	12	1
F143	-36	30.8	155	-0.4	2.1	12	1
F144	-12	19.7	155	-0.4	2.1	12	1
F145	12	19.7	155	-0.4	2.1	12	1
F146	-6	15.7	155	-0.4	2.1	12	1
F147	-18	23.0	155	-0.4	2.1	12	1
F148	-30	28.4	155	-0.4	2.1	12	1
F149	-60	38.8	155	-0.4	2.1	12	1
F150	-6	15.7	155	-0.4	2.1	12	1
F151	12	19.7	155	-0.4	2.1	12	1
F152	-42	33.0	155	-0.4	2.1	12	1
F153	54	37.0	155	2.4	5.2	12	1
F154	-30	28.4	155	-0.4	2.1	12	1
F155	6	15.7	155	-0.4	2.1	12	1
F156	12	19.7	155	-0.4	2.1	12	1
F157	-18	23.0	155	-0.4	2.1	12	1
F158	-36	30.8	155	-0.4	2.1	12	1
F159	-30	28.4	155	-0.4	2.1	12	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info (4-1):

	Beta	Alpha
Background (cp	46	0.15
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	155	12.0

Removable Surface Activity Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Building Walls (Interior)

Location (see map)	Removable Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm^2)	Uncertainty 95% CL	MDA	Instrument #
W1	-6	15.7	155	-0.4	2.1	12	1
W2	-30	28.4	155	-0.4	2.1	12	1
W3	-12	19.7	155	-0.4	2.1	12	1
W4	12	19.7	155	-0.4	2.1	12	1
W5	6	15.7	155	-0.4	2.1	12	1
W6	-12	19.7	155	-0.4	2.1	12	1
W7	6	15.7	155	2.4	5.2	12	1
W8	-18	23.0	155	-0.4	2.1	12	1
W9	-6	15.7	155	-0.4	2.1	12	1
W10	-12	19.7	155	2.4	5.2	12	1
W11	12	19.7	155	-0.4	2.1	12	1
W12	6	15.7	155	-0.4	2.1	12	1
W13	18	23.0	155	-0.4	2.1	12	1
W14	-18	23.0	155	2.4	5.2	12	1
W15	24	25.8	155	-0.4	2.1	12	1
W16	36	30.8	155	-0.4	2.1	12	1
W17	6	15.7	155	-0.4	2.1	12	1
W18	-48	35.0	155	-0.4	2.1	12	1
W19	42	33.0	155	2.4	5.2	12	1
W20	0	10.4	155	-0.4	2.1	12	1
W21	-12	19.7	155	-0.4	2.1	12	1
W22	24	25.8	155	-0.4	2.1	12	1
W23	-30	28.4	155	-0.4	2.1	12	1
W24	-18	23.0	155	2.4	5.2	12	1
W25	18	23.0	155	-0.4	2.1	12	1
W26	-42	33.0	155	-0.4	2.1	12	1
W27	-6	15.7	155	-0.4	2.1	12	1
W28	6	15.7	155	-0.4	2.1	12	1
W29	18	23.0	155	-0.4	2.1	12	1
W30	-30	28.4	155	2.4	5.2	12	1
W31	6	15.7	155	-0.4	2.1	12	1
W32	18	23.0	155	-0.4	2.1	12	1
W33	-24	25.8	155	-0.4	2.1	12	1
W34	-30	28.4	155	-0.4	2.1	12	1
W35	18	23.0	155	-0.4	2.1	12	1
W36	-18	23.0	155	-0.4	2.1	12	1
W37	24	25.8	155	-0.4	2.1	12	1
W38	-18	23.0	155	-0.4	2.1	12	1
W39	-6	15.7	155	-0.4	2.1	12	1
W40	24	25.8	155	-0.4	2.1	12	1
W41	36	30.8	155	2.4	5.2	12	1
W42	-24	25.8	155	-0.4	2.1	12	1
W43	-24	25.8	155	2.4	5.2	12	1
W44	0	10.4	155	-0.4	2.1	12	1
W45	-12	19.7	155	-0.4	2.1	12	1
W46	-30	28.4	155	-0.4	2.1	12	1
W47	6	15.7	155	-0.4	2.1	12	1
W48	-6	15.7	155	2.4	5.2	12	1
W49	-18	23.0	155	-0.4	2.1	12	1
W50	-42	33.0	155	-0.4	2.1	12	1
W51	-30	28.4	155	-0.4	2.1	12	1
W52	6	15.7	155	2.4	5.2	12	1

W53	12	19.7	155	-0.4	2.1	12	1
W54	-6	15.7	155	-0.4	2.1	12	1
W55	-12	19.7	155	-0.4	2.1	12	1
W56	6	15.7	155	-0.4	2.1	12	1
W57	-18	23.0	155	-0.4	2.1	12	1
W58	12	19.7	155	2.4	5.2	12	1
W59	24	25.8	155	2.4	5.2	12	1
W60	36	30.8	155	-0.4	2.1	12	1
W61	6	15.7	155	-0.4	2.1	12	1
W62	-42	33.0	155	-0.4	2.1	12	1
W63	0	10.4	155	-0.4	2.1	12	1
W64	-6	15.7	155	-0.4	2.1	12	1
W65	-12	19.7	155	-0.4	2.1	12	1
W66	-30	28.4	155	-0.4	2.1	12	1
W67	-18	23.0	155	-0.4	2.1	12	1
W68	0	10.4	155	-0.4	2.1	12	1
W69	-6	15.7	155	-0.4	2.1	12	1
W70	-12	19.7	155	2.4	5.2	12	1
W71	12	19.7	155	2.4	5.2	12	1
W72	-12	19.7	155	-0.4	2.1	12	1
W73	-18	23.0	155	-0.4	2.1	12	1
W74	24	25.8	155	-0.4	2.1	12	1
W75	-6	15.7	155	-0.4	2.1	12	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info (4-1):

	Beta	Alpha
Background (cpm)	46	0.15
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	155	12.0

Removable Surface Activity Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Building Floor

Location (see map)	Removable Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm^2)	Uncertainty 95% CL	MDA	Instrument #
F1	-30	28.4	155	-0.4	2.1	12	1
F2	-36	30.8	155	-0.4	2.1	12	1
F3	-30	28.4	155	-0.4	2.1	12	1
F4	-6	15.7	155	-0.4	2.1	12	1
F5	-12	19.7	155	-0.4	2.1	12	1
F6	12	19.7	155	-0.4	2.1	12	1
F7	6	15.7	155	-0.4	2.1	12	1
F8	18	23.0	155	-0.4	2.1	12	1
F9	-18	23.0	155	-0.4	2.1	12	1
F10	60	38.8	155	2.4	5.2	12	1
F11	24	25.8	155	-0.4	2.1	12	1
F12	-24	25.8	155	-0.4	2.1	12	1
F13	-36	30.8	155	-0.4	2.1	12	1
F14	-6	15.7	155	2.4	5.2	12	1
F15	0	10.4	155	-0.4	2.1	12	1
F16	-48	35.0	155	-0.4	2.1	12	1
F17	42	33.0	155	-0.4	2.1	12	1
F18	6	15.7	155	-0.4	2.1	12	1
F19	-12	19.7	155	-0.4	2.1	12	1
F20	24	25.8	155	-0.4	2.1	12	1
F21	-30	28.4	155	-0.4	2.1	12	1
F22	-36	30.8	155	-0.4	2.1	12	1
F23	18	23.0	155	-0.4	2.1	12	1
F24	-18	23.0	155	-0.4	2.1	12	1
F25	-6	15.7	155	2.4	5.2	12	1
F26	-42	33.0	155	-0.4	2.1	12	1
F27	-6	15.7	155	-0.4	2.1	12	1
F28	-12	19.7	155	-0.4	2.1	12	1
F29	0	10.4	155	-0.4	2.1	12	1
F30	30	28.4	155	-0.4	2.1	12	1
F31	-60	38.8	155	-0.4	2.1	12	1
F32	-36	30.8	155	-0.4	2.1	12	1
F33	-30	28.4	155	-0.4	2.1	12	1
F34	24	25.8	155	-0.4	2.1	12	1
F35	-6	15.7	155	2.4	5.2	12	1
F36	42	33.0	155	-0.4	2.1	12	1
F37	18	23.0	155	-0.4	2.1	12	1
F38	-12	19.7	155	-0.4	2.1	12	1
F39	12	19.7	155	-0.4	2.1	12	1
F40	54	37.0	155	-0.4	2.1	12	1
F41	6	15.7	155	-0.4	2.1	12	1
F42	-24	25.8	155	-0.4	2.1	12	1
F43	18	23.0	155	2.4	5.2	12	1
F44	-18	23.0	155	-0.4	2.1	12	1
F45	-6	15.7	155	-0.4	2.1	12	1
F46	12	19.7	155	-0.4	2.1	12	1
F47	-36	30.8	155	-0.4	2.1	12	1
F48	60	38.8	155	-0.4	2.1	12	1
F49	-36	30.8	155	-0.4	2.1	12	1
F50	-6	15.7	155	-0.4	2.1	12	1
F51	-42	33.0	155	-0.4	2.1	12	1
F52	12	19.7	155	-0.4	2.1	12	1

F53	-18	23.0	155	-0.4	2.1	12	1
F54	-24	25.8	155	-0.4	2.1	12	1
F55	60	38.8	155	-0.4	2.1	12	1
F56	-30	28.4	155	-0.4	2.1	12	1
F57	6	15.7	155	2.4	5.2	12	1
F58	-6	15.7	155	-0.4	2.1	12	1
F59	-18	23.0	155	-0.4	2.1	12	1
F60	24	25.8	155	-0.4	2.1	12	1
F61	12	19.7	155	-0.4	2.1	12	1
F62	-6	15.7	155	2.4	5.2	12	1
F63	-24	25.8	155	-0.4	2.1	12	1
F64	-60	38.8	155	-0.4	2.1	12	1
F65	0	10.4	155	-0.4	2.1	12	1
F66	-48	35.0	155	-0.4	2.1	12	1
F67	42	33.0	155	-0.4	2.1	12	1
F68	-12	19.7	155	-0.4	2.1	12	1
F69	-36	30.8	155	-0.4	2.1	12	1
F70	-30	28.4	155	-0.4	2.1	12	1
F71	18	23.0	155	-0.4	2.1	12	1
F72	54	37.0	155	-0.4	2.1	12	1
F73	-42	33.0	155	-0.4	2.1	12	1
F74	-6	15.7	155	-0.4	2.1	12	1
F75	18	23.0	155	-0.4	2.1	12	1
F76	-18	23.0	155	-0.4	2.1	12	1
F77	24	25.8	155	-0.4	2.1	12	1
F78	-60	38.8	155	-0.4	2.1	12	1
F79	-6	15.7	155	-0.4	2.1	12	1
F80	-30	28.4	155	-0.4	2.1	12	1
F81	6	15.7	155	-0.4	2.1	12	1
F82	0	10.4	155	-0.4	2.1	12	1
F83	12	19.7	155	-0.4	2.1	12	1
F84	-12	19.7	155	-0.4	2.1	12	1
F85	-30	28.4	155	-0.4	2.1	12	1
F86	-36	30.8	155	-0.4	2.1	12	1
F87	-6	15.7	155	2.4	5.2	12	1
F88	6	15.7	155	-0.4	2.1	12	1
F89	12	19.7	155	-0.4	2.1	12	1
F90	-18	23.0	155	-0.4	2.1	12	1
F91	18	23.0	155	-0.4	2.1	12	1
F92	12	19.7	155	-0.4	2.1	12	1
F93	-30	28.4	155	-0.4	2.1	12	1
F94	60	38.8	155	2.4	5.2	12	1
F95	54	37.0	155	-0.4	2.1	12	1
F96	-6	15.7	155	-0.4	2.1	12	1
F97	6	15.7	155	-0.4	2.1	12	1
F98	18	23.0	155	-0.4	2.1	12	1
F99	-18	23.0	155	-0.4	2.1	12	1
F100	24	25.8	155	-0.4	2.1	12	1
F101	-6	15.7	155	-0.4	2.1	12	1
F102	-48	35.0	155	-0.4	2.1	12	1
F103	30	28.4	155	-0.4	2.1	12	1
F104	-36	30.8	155	-0.4	2.1	12	1
F105	6	15.7	155	2.4	5.2	12	1
F106	12	19.7	155	-0.4	2.1	12	1
F107	-18	23.0	155	-0.4	2.1	12	1
F108	18	23.0	155	-0.4	2.1	12	1
F109	-18	23.0	155	-0.4	2.1	12	1
F110	-36	30.8	155	-0.4	2.1	12	1
F111	6	15.7	155	-0.4	2.1	12	1
F112	-42	33.0	155	-0.4	2.1	12	1

F113	-30	28.4	155	-0.4	2.1	12	1
F114	-6	15.7	155	-0.4	2.1	12	1
F115	-48	35.0	155	-0.4	2.1	12	1
F116	-12	19.7	155	-0.4	2.1	12	1
F117	6	15.7	155	-0.4	2.1	12	1
F118	-6	15.7	155	-0.4	2.1	12	1
F119	-36	30.8	155	-0.4	2.1	12	1
F120	-12	19.7	155	-0.4	2.1	12	1
F121	12	19.7	155	-0.4	2.1	12	1
F122	18	23.0	155	-0.4	2.1	12	1
F123	-42	33.0	155	2.4	5.2	12	1
F124	-36	30.8	155	-0.4	2.1	12	1
F125	60	38.8	155	-0.4	2.1	12	1
F126	-36	30.8	155	-0.4	2.1	12	1
F127	-18	23.0	155	-0.4	2.1	12	1
F128	-60	38.8	155	-0.4	2.1	12	1
F129	54	37.0	155	-0.4	2.1	12	1
F130	-6	15.7	155	2.4	5.2	12	1
F131	-24	25.8	155	-0.4	2.1	12	1
F132	-36	30.8	155	-0.4	2.1	12	1
F133	6	15.7	155	-0.4	2.1	12	1
F134	12	19.7	155	-0.4	2.1	12	1
F135	18	23.0	155	-0.4	2.1	12	1
F136	0	10.4	155	-0.4	2.1	12	1
F137	42	33.0	155	-0.4	2.1	12	1
F138	24	25.8	155	-0.4	2.1	12	1
F139	-6	15.7	155	2.4	5.2	12	1
F140	6	15.7	155	-0.4	2.1	12	1
F141	-18	23.0	155	-0.4	2.1	12	1
F142	-30	28.4	155	-0.4	2.1	12	1
F143	-36	30.8	155	-0.4	2.1	12	1
F144	-12	19.7	155	-0.4	2.1	12	1
F145	12	19.7	155	-0.4	2.1	12	1
F146	-6	15.7	155	-0.4	2.1	12	1
F147	-18	23.0	155	-0.4	2.1	12	1
F148	-30	28.4	155	-0.4	2.1	12	1
F149	-60	38.8	155	-0.4	2.1	12	1
F150	-6	15.7	155	-0.4	2.1	12	1
F151	12	19.7	155	-0.4	2.1	12	1
F152	-42	33.0	155	2.4	5.2	12	1
F153	54	37.0	155	-0.4	2.1	12	1
F154	-30	28.4	155	-0.4	2.1	12	1
F155	6	15.7	155	-0.4	2.1	12	1
F156	12	19.7	155	-0.4	2.1	12	1
F157	-18	23.0	155	-0.4	2.1	12	1
F158	-36	30.8	155	-0.4	2.1	12	1
F159	-30	28.4	155	-0.4	2.1	12	1

#1 - Ludlum 2929 No. 152202 with 43-10
No. 156519 Info (4-1):

	Beta	Alpha
Background (cpm)	46	0.15
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	155	12.0

Removable Surface Activity Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Building Ceiling (Interior)

Location (see map)	Removable Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm^2)	Uncertainty 95% CL	MDA	Instrument #
C1	-30	28.4	155	-0.4	2.1	12	1
C2	-6	15.7	155	-0.4	2.1	12	1
C3	-12	19.7	155	-0.4	2.1	12	1
C4	-6	15.7	155	2.4	5.2	12	1
C5	-6	15.7	155	-0.4	2.1	12	1
C6	6	15.7	155	-0.4	2.1	12	1
C7	18	23.0	155	2.4	5.2	12	1
C8	-6	15.7	155	-0.4	2.1	12	1
C9	18	23.0	155	-0.4	2.1	12	1
C10	24	25.8	155	2.4	5.2	12	1
C11	-6	15.7	155	-0.4	2.1	12	1
C12	24	25.8	155	-0.4	2.1	12	1
C13	-6	15.7	155	-0.4	2.1	12	1
C14	18	23.0	155	-0.4	2.1	12	1
C15	-6	15.7	155	2.4	5.2	12	1
C16	-6	15.7	155	-0.4	2.1	12	1
C17	42	33.0	155	-0.4	2.1	12	1
C18	24	25.8	155	-0.4	2.1	12	1
C19	-6	15.7	155	2.4	5.2	12	1
C20	0	10.4	155	-0.4	2.1	12	1
C21	24	25.8	155	-0.4	2.1	12	1
C22	6	15.7	155	-0.4	2.1	12	1
C23	-6	15.7	155	-0.4	2.1	12	1
C24	-18	23.0	155	2.4	5.2	12	1
C25	0	10.4	155	-0.4	2.1	12	1
C26	18	23.0	155	2.4	5.2	12	1
C27	-6	15.7	155	-0.4	2.1	12	1
C28	-6	15.7	155	-0.4	2.1	12	1
C29	12	19.7	155	-0.4	2.1	12	1
C30	-6	15.7	155	-0.4	2.1	12	1
C31	-18	23.0	155	-0.4	2.1	12	1
C32	24	25.8	155	-0.4	2.1	12	1
C33	-6	15.7	155	2.4	5.2	12	1
C34	12	19.7	155	-0.4	2.1	12	1
C35	-12	19.7	155	-0.4	2.1	12	1
C36	-6	15.7	155	-0.4	2.1	12	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info (4-1):

	Beta	Alpha
Background (cpm)	46	0.15
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	155	12.0

Removable Surface Activity Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Building Exterior (Walls)

Location (see map)	Removable Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm^2)	Uncertainty 95% CL	MDA	Instrument #
W1	-6	15.7	155	-0.4	2.1	12	1
W2	12	19.7	155	-0.4	2.1	12	1
W3	-18	23.0	155	-0.4	2.1	12	1
W4	-6	15.7	155	-0.4	2.1	12	1
W5	24	25.8	155	-0.4	2.1	12	1
W6	-18	23.0	155	-0.4	2.1	12	1
W7	12	19.7	155	2.4	5.2	12	1
W8	0	10.4	155	2.4	5.2	12	1
W9	-30	28.4	155	2.4	5.2	12	1
W10	-12	19.7	155	2.4	5.2	12	1
W11	6	15.7	155	2.4	5.2	12	1
W12	-6	15.7	155	2.4	5.2	12	1
W13	12	19.7	155	2.4	5.2	12	1
W14	12	19.7	155	-0.4	2.1	12	1
W15	-18	23.0	155	-0.4	2.1	12	1
W16	6	15.7	155	-0.4	2.1	12	1
W17	-6	15.7	155	-0.4	2.1	12	1
W18	6	15.7	155	-0.4	2.1	12	1
W19	24	25.8	155	-0.4	2.1	12	1
W20	-12	19.7	155	2.4	5.2	12	1
W21	-6	15.7	155	2.4	5.2	12	1
W22	6	15.7	155	-0.4	2.1	12	1
W23	-18	23.0	155	-0.4	2.1	12	1
W24	0	10.4	155	-0.4	2.1	12	1
W25	12	19.7	155	-0.4	2.1	12	1
W26	-6	15.7	155	-0.4	2.1	12	1
W27	6	15.7	155	-0.4	2.1	12	1
W28	-6	15.7	155	-0.4	2.1	12	1
W29	24	25.8	155	2.4	5.2	12	1
W30	-6	15.7	155	-0.4	2.1	12	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info (4-1):

	Beta	Alpha
Background (cpm)	46	0.15
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	155	12.0

Elevated Removable Surface Activity Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

No elevated removable surface activity was reported above limits.

Exposure Rate Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Building Floor

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
F1	10	0	F81	10	0
F2	10	0	F82	9	-1
F3	11	1	F83	10	0
F4	11	1	F84	10	0
F5	10	0	F85	9	-1
F6	10	0	F86	9	-1
F7	10	0	F87	11	1
F8	10	0	F88	9	-1
F9	9	-1	F89	10	0
F10	10	0	F90	9	-1
F11	9	-1	F91	9	-1
F12	11	1	F92	10	0
F13	11	1	F93	9	-1
F14	10	0	F94	9	-1
F15	10	0	F95	11	1
F16	10	0	F96	9	-1
F17	9	-1	F97	10	0
F18	9	-1	F98	10	0
F19	10	0	F99	9	-1
F20	11	1	F100	9	-1
F21	10	0	F101	9	-1
F22	10	0	F102	10	0
F23	11	1	F103	10	0
F24	10	0	F104	9	-1
F25	10	0	F105	9	-1
F26	9	-1	F106	9	-1
F27	9	-1	F107	10	0
F28	10	0	F108	9	-1
F29	9	-1	F109	9	-1
F30	9	-1	F110	9	-1
F31	10	0	F111	10	0
F32	11	1	F112	11	1
F33	10	0	F113	10	0
F34	9	-1	F114	9	-1
F35	10	0	F115	9	-1
F36	10	0	F116	9	-1
F37	9	-1	F117	9	-1
F38	11	1	F118	10	0
F39	10	0	F119	9	-1
F40	9	-1	F120	10	0
F41	9	-1	F121	9	-1
F42	10	0	F122	9	-1
F43	10	0	F123	10	0

F44	11	1	F124	10	0
F45	10	0	F125	11	1
F46	9	-1	F126	10	0
F47	9	-1	F127	9	-1
F48	9	-1	F128	9	-1
F49	9	-1	F129	9	-1
F50	9	-1	F130	9	-1
F51	9	-1	F131	9	-1
F52	9	-1	F132	10	0
F53	10	0	F133	9	-1
F54	10	0	F134	9	-1
F55	11	1	F135	9	-1
F56	10	0	F136	9	-1
F57	9	-1	F137	9	-1
F58	9	-1	F138	8	-2
F59	9	-1	F139	9	-1
F60	9	-1	F140	10	0
F61	9	-1	F141	10	0
F62	9	-1	F142	9	-1
F63	10	0	F143	10	0
F64	9	-1	F144	12	2
F65	9	-1	F145	12	2
F66	10	0	F146	12	2
F67	10	0	F147	9	-1
F68	10	0	F148	9	-1
F69	10	0	F149	9	-1
F70	9	-1	F150	9	-1
F71	11	1	F151	10	0
F72	9	-1	F152	10	0
F73	9	-1	F153	10	0
F74	9	-1	F154	10	0
F75	10	0	F155	12	2
F76	10	0	F156	10	0
F77	11	1	F157	9	-1
F78	9	-1	F158	9	-1
F79	9	-1	F159	9	-1
F80	10	0			

Background dose rate: 9 - 11 uR/hr with Model 19, No.22526

Exposure Rate Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Building Walls (Interior)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
W1	16	5*	W39	10	-1
W2	13	2	W40	11	0
W3	13	2	W41	11	0
W4	12	1	W42	12	1
W5	12	1	W43	12	1
W6	12	1	W44	12	1
W7	10	-1	W45	12	1
W8	10	-1	W46	12	1
W9	10	-1	W47	17	6 *
W10	9	-2	W48	17	6 *
W11	9	-2	W49	17	6 *
W12	9	-2	W50	17	6 *
W13	9	-2	W51	13	2
W14	9	-2	W52	10	-1
W15	9	-2	W53	9	-2
W16	9	-2	W54	11	0
W17	8	-3	W55	7	-4
W18	8	-3	W56	6	-5
W19	8	-3	W57	7	-4
W20	8	-3	W58	6	-5
W21	8	-3	W59	7	-4
W22	8	-3	W60	7	-4
W23	8	-3	W61	7	-4
W24	8	-3	W62	6	-5
W25	8	-3	W63	6	-5
W26	8	-3	W64	6	-5
W27	8	-3	W65	8	-3
W28	9	-2	W66	8	-3
W29	9	-2	W67	8	-3
W30	9	-2	W68	8	-3
W31	9	-2	W69	8	-3
W32	10	-1	W70	10	-1
W33	10	-1	W71	10	-1
W34	10	-1	W72	10	-1
W35	10	-1	W73	10	-1
W36	10	-1	W74	14	3
W37	10	-1	W75	14	3
W38	10	-1			

Background dose rate: 8 - 11 uR/hr with Model 19, No.22526

* Elevated dose rates, predominant to the north side of the building, due to higher soil activity in the area.

Exposure Rate Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Building Ceiling (Interior)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
C1	18	9*	C19	7	-2
C2	17	8*	C20	7	-2
C3	15	6*	C21	7	-2
C4	13	4	C22	7	-2
C5	9	0	C23	7	-2
C6	7	-2	C24	6	-3
C7	7	-2	C25	8	-1
C8	8	-1	C26	7	-2
C9	8	-1	C27	7	-2
C10	7	-2	C28	6	-3
C11	7	-2	C29	9	0
C12	7	-2	C30	8	-1
C13	7	-2	C31	6	-3
C14	5	-4	C32	8	-1
C15	5	-4	C33	9	0
C16	5	-4	C34	8	-1
C17	5	-4	C35	8	-1
C18	7	-2	C36	8	-1

Background dose rate: 6 - 9 uR/hr with Model 19, No.22526

* Elevated dose rates, predominant to the north side of the building, due to higher soil activity in the area.

Exposure Rate Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Building Exterior (Walls)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
W1	15	2	W16	10	-3
W2	18	5*	W17	10	-3
W3	20	7*	W18	24	11*
W4	14	1	W19	12	-1
W5	14	1	W20	11	-2
W6	14	1	W21	12	-1
W7	13	0	W22	10	-3
W8	10	-3	W23	11	-2
W9	10	-3	W24	9	-4
W10	12	-1	W25	9	-4
W11	12	-1	W26	12	-1
W12	11	-2	W27	10	-3
W13	12	-1	W28	12	-1
W14	10	-3	W29	12	-1
W15	12	-1	W30	10	-3

Background dose rate: 10-13 uR/hr with Model 19, No.22526

* Elevated dose rates, predominant to the north side of the building, due to higher soil activity in the area.

Exposure Rate Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Building Exterior (Roof)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
see map	18	5	see map	10	-3
see map	17	4	see map	10	-3
see map	15	2	see map	12	-1
see map	13	0	see map	13	0
see map	15	2	see map	10	-3
see map	15	2	see map	10	-3
see map	12	-1	see map	12	-1
see map	10	-3	see map	13	0
see map	15	2	see map	11	-2
see map	15	2	see map	10	-3
see map	12	-1	see map	13	0
see map	10	-3	see map	13	0
see map	15	2	see map	10	-3
see map	15	2	see map	10	-3
see map	12	-1	see map	13	0
see map	10	-3	see map	10	-3
see map	12	-1	see map	10	-3
see map	13	0	see map	10	-3

Background dose rate: 10-13 uR/hr with Model 19, No.22526

Summary of Building Surface Direct Reading (Total Activity) Results
Molycorp - Building 33 Survey Unit (Affected Area)

Including all building interior and exterior measurements

Beta				Alpha			
n	$\bar{x}$	s	μ_α	n	$\bar{x}$	s	μ_α
300	-61	262.5	-36.0	300	-122	525.0	-71.9

$t_{1-\alpha}$ 1.652

Guidelines/Conditions Satisfied?

Beta	Alpha
Yes	Yes

Summary of Exposure Rate Measurements
Molycorp - Building 33 Survey Unit (Affected Area)

Including all building interior and exterior measurements (uR/hr)

n	$\bar{x}$	s	μ_α
336	-0.6	2.1	-0.5

$t_{1-\alpha}$ 1.651

Guidelines/Conditions Satisfied?
Yes

DDO-138 Radiation Protection Survey Report

Site: Molycorp / Washington, PA

Section 1: Survey Information AFFECTED BLdg

Date:	Time:	Location:	Survey Issue Log Number:
4/2/02	1700	Bldg 33	02-0102

RWP Number: N/A

Purpose of Survey: ☐ RWP ☐ Routine Survey ☐ Unconditional Release ☑ Other:

Page 1 of 18

Survey Title: AFFECTED BLdg

DIRECT READINGS ON THE EXTERIOR WALL (W2, 4 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, & 26) WERE TAKEN ON A POURED CONCRETE WALL Bkgd β 78 α 2.4

2360 #156371 - walls + ceiling

2360 #164680 - floor

All smears counted on 4-1-02 2929

model 19 #22526 DUE 8-6-02

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		

N/A

Bkgd Readings:

Legend:

00 = mRem/h gamma | 00 C = mRem/h gamma contact | ① = Smear Location | ▽ = Air Sample Location | -X-X-X- = Rope, Boundary, or Barrier

00 β = mRem/h beta | 00 βC = mRem/h beta contact | —D— = Large Area Wipe | = Bulk Material Sample

Section 2: Instrument Used

Instrument Model/SN:	Cal Due Date:	Probe Model/SN:	Cal Due Date:	Detector Eff.: (cpm/dpm)	MDA:	Other BKG
2350-1/95359	8-6-02	43-37/092503	8-6-02	β .27 / α .267	β 180 / α 31	β 1338 / α 16
2350-1/117014	8-13-02	43-106/133866	8-6-02	β .248 / α .211	508 / 40	367 / .8
(4-1-02) 2929 / 152202	2-6-03	43-10/156519	2-6-03	β .165 / α .344	β 151 / α 12	β 46 / α .15
2360/156371	8-15-02	43-89/164832	8-5-02	β .088 / α .153	β 180 / α 76	β 8 / α 3.7
2360/164680	7-9-02	43-89/118544	8-6-02	β .113 / α .164	β ~~566~~ 387 / α 60	β 78 / α 2.4

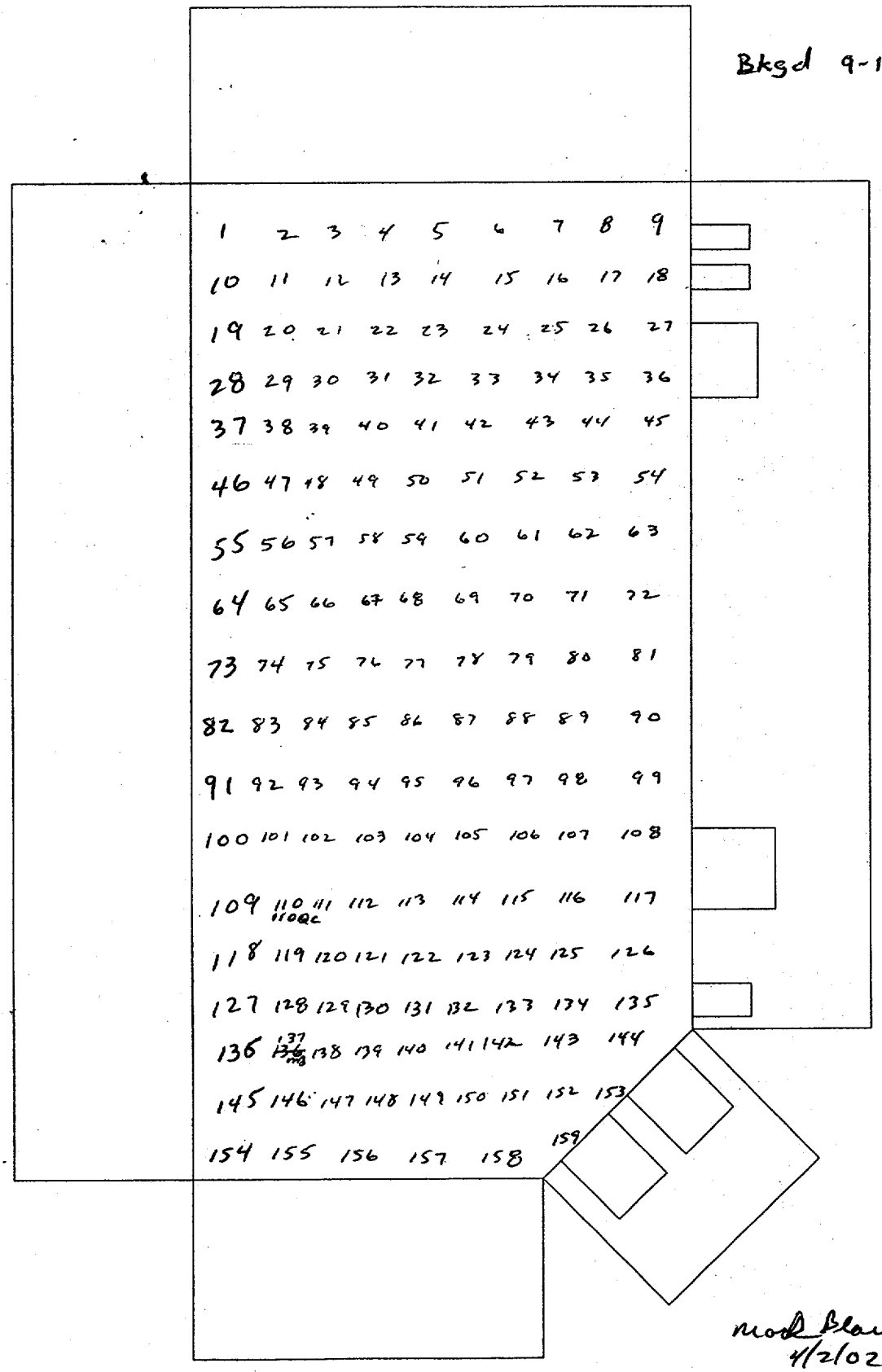
Section 3: Review and Approval

Survey Performed By (Sign):	Area Posted and/or Barricaded:	Date and Time:
Mark Blowcroft	☐ Yes ☐ No ☑ Not Required	4-2-02 / 1700
Radiation Safety Officer (Print Name & Sign): Mike McDonald		Date and Time: 4-16-02 10:12

Building 33
North

Survey # 02-0102

Bkgd 9-11 mr/hr



Mark Blanchard
4/2/02

Page 2 of 18

Interior
FLOOR

Scale:
4m x 4m

Radiological Survey Results - Survey Location Indicator

02-0102

Survey Area Information: BLdg 33 INTerior FLoor

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
					N/A			

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4-2-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-1	1440	8	354	272	4	10	-.4	-30
F-2	1590	7	337	253	3	10	-.4	-36
F-3	1640	12	331	248	5	11	-.4	-30
F-4	1470	10	359	256	8	11	-.4	-6
F-5	1530	13	347	246	14	10	-.4	-12
F-6	1510	9	315	237	17	10	-.4	12
F-7	1500	11	314	239	10	10	-.4	6
F-8	1470	14	268	248	3	10	-.4	18
F-9	1360	6	271	235	11	9	-.4	-18
F-10	1660	12	339	305	4	10	2.4	60
F-11	1490	13	303	222	3	9	-.4	24
F-12	1540	11	311	226	8	11	-.4	-24
F-13	1510	13	346	224	1	11	-.4	-36
F-14	1610	8	318	233	8	10	2.4	-6
F-15	1630	11	314	232	4	10	-.4	0
F-16	1430	8	304	255	3	10	-.4	-48
F-17	1450	10	279	225	7	9	-.4	42
F-18	1510	12	286	229	6	9	-.4	6
F-19	1340	11	322	235	5	10	-.4	-12
F-20	1580	10	297	202	6	11	-.4	24
F-21	1390	10	295	235	5	10	-.4	-30
F-22	1570	8	287	243	5	10	-.4	-36
F-23	1540	11	314	251	6	11	-.4	18
F-24	1340	6	330	256	3	10	-.4	-18
F-25	1440	8	294	218	2	10	2.4	-6
F-26	1330	12	318	230	5	9	-.4	-42
F-27	1340	10	283	212	9	9	-.4	-6

Radiological Survey Results - Survey Location Indicator

02-0102

Survey Area Information: Bldg 33 Interior Floor

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
					N/A			

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-28	1600	10	343	245	4	10	-.4	-12
F-29	1370	13	319	250	5	9	-.4	0
F-30	1470	9	277	230	3	9	-.4	30
F-31	1400	12	303	228	1	10	-.4	-60
-32	1420	8	309	240	3	11	-.4	-36
-33	1340	11	341	266	4	10	-.4	-30
F-34	1490	7	292	213	2	9	-.4	24
F-35	1430	10	313	242	2	10	2.4	-6
F-36	1670	6	283	239	18	10	-.4	42
F-37	1390	12	315	223	4	9	-.4	18
F-38	1460	10	322	239	6	11	-.4	-12
F-39	1330	8	270	249	4	10	-.4	12
F-40	1520	9	277	251	0	9	-.4	54
F-41	1400	13	259	235	3	9	-.4	6
F-42	1330	12	287	237	5	10	-.4	-24
F-43	1340	11	323	225	2	10	2.4	18
F-44	1460	14	277	258	8	11	-.4	-18
F-45	1570	12	307	235	10	10	-.4	-6
F-46	1380	7	304	248	10	9	-.4	12
F-47	1340	6	274	252	3	9	-.4	-36
F-48	1330	4	259	243	5	9	-.4	60
F-49	1330	10	270	210	1	9	-.4	-36
F-50	1350	12	254	222	5	9	-.4	-6
F-51	1340	14	280	219	1	9	-.4	-42
F-52	1220	13	257	224	5	9	-.4	12
F-53	1330	8	280	210	4	10	-.4	-18
54	1340	14	289	218	9	10	-.4	-24

Radiological Survey Results - Survey Location Indicator

02-010R

Survey Area Information: Bldg 33 Interior Floor

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLAWCIAK	Mark Blawciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-55	1440	10	359	229	5	11	-.4	60
F-56	1330	10	284	212	2	10	-.4	-30
F-57	1330	11	276	246	4	9	2.4	6
F-58	1310	12	262	219	3	9	-.4	-6
F-59	1350	6	293	225	7	9	-.4	-18
F-60	1420	14	283	235	2	9	-.4	24
F-61	1300	10	289	218	3	9	-.4	12
F-62	1500	11	286	236	4	9	2.4	-6
F-63	1590	13	257	252	6	10	-.4	-24
F-64	1450	12	277	203	5	9	-.4	-60
F-~~72~~ 65	1300	8	279	222	3	9	-.4	0
F-66	1380	10 ~~16~~	275	236	3	10	-.4	-48
F-67	1300	12	288	226	3	10	-.4	42
F-68	1390	8	246	239	11	10	-.4	-12
F-69	1390	10	265	192	6	10	-.4	-36
F-70	1400	13	301	238	1	9	-.4	-30
F-71	1410	13	346	234	0	11	-.4	18
F-72	1640	14	307	246	9	9	-.4	54
F-73	1320	12	327	227	9	9	-.4	-42
F-74	1330	8	291	240	2	9	-.4	-6
F-75	1340	10	286	209	3	10	-.4	18
F-76	1340	10	305	215	8	10	-.4	-18
F-77	1300	6	284	217	4	11	-.4	24
F-78	1460	8	268	224	2	9	-.4	-60
F-79	1400	12	299	254	4	9	-.4	-6
F-80	1430	12	302	248	13	10	-.4	-30
F-81	1550	14	327	252	9	10	-.4	6

Radiological Survey Results - Survey Location Indicator

02-0102

Survey Area Information:	BLdg 33 Interior Floor

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-82	1600	14	314	214	4	9	-.4	0
F-83	1560	10	300	208	4	10	-.4	12
F-84	1570	16	321	230	5	10	-.4	-12
F-85	1660	11	304	231	2	9	-.4	-30
F-86	1570	7	283	237	7	9	-.4	-36
F-87	1420	10	314	225	12	11	2.4	-6
F-88	1510	12	312	196	4	9	-.4	6
F-89	1490	7	311	226	6	10	-.4	12
F-90	1530	12	308	240	6	9	-.4	-18
F-91	1540	10	317	223	3	9	-.4	18
F-92	1480	8	312	226	5	10	-.4	12
F-93	1590	8	331	235	6	9	-.4	-30
F-94	1490	10	322	236	2	9	2.4	60
F-95	1460	12	327	248	7	11	-.4	54
F-96	1520	12	311	220	6	9	-.4	-6
F-97	1420	8	284	195	3	10	-.4	6
F-98	1380	16	288	214	10	10	-.4	18
F-99	1600	13	322	237	10	9	-.4	-18
F-100	1470	13	323	234	7	9	-.4	24
F-101	1360	10	310	215	3	9	-.4	-6
F-102	1470	11	316	249	0	10	-.4	-48
F-103	1510	10	312	238	0	10	-.4	30
F-104	1590	10	304	225	9	9	-.4	-36
F-105	1520	8	274	214	5	9	2.4	6
F-106	1380	6	303	238	5	9	-.4	12
F-107	1400	10	319	215	6	10	-.4	-18
F-108	1420	11	304	213	3	9	-.4	18

Radiological Survey Results - Survey Location Indicator

02-0102

Survey Area Information: Bldg 33 Interior Floor

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
				N/A				

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-109	1540	8	325	221	4	9	-.4	-18
F-110	1510	10	318	211	8	9	-.4	-36
F-110ac	1510	10	299	236	7	10	-.4	-30
F-111	1550	11	309	226	4	10	-.4	6
F-112	1450	8	307	219	4	11	-.4	-42
F-113	1430	7	307	234	9	10	-.4	-30
F-114	1460	10	302	275	6	9	-.4	-6
F-115	1640	10	328	265	3	9	-.4	-48
F-116	1480	12	310	241	5	9	-.4	12
F-117	1430	6	259	201	3	9	-.4	6
F-118	1490	8	294	208	6	10	-.4	-6
F-119	1370	11	323	226	8	9	-.4	-36
F-120	1540	12	292	241	2	10	-.4	-12
F-121	1420	13	337	251	7	9	-.4	12
F-122	1580	11	295	277	6	9	-.4	18
F-123	1460	12	336	257	3	10	2.4	-42
F-124	1580	10	324	290	4	10	-.4	-36
F-125	1670	11	330	220	5	11	-.4	60
F-126	1590	13	290	222	6	10	-.4	-36
F-127	1350	7	316	258	7	9	-.4	-18
F-128	1570	10	319	249	6	9	-.4	-60
F-129	1480	11	337	284	6	9	-.4	54
F-130	1500	13	328	231	10	9	2.4	-6
F-131	1608	12	317	234	4	9	-.4	-24
F-132	1460	8	328	264	6	10	-.4	-36
F-133	1560	10	337	265	9	9	-.4	6
F-134	1570	9	316	246	5	9	-.4	12

Radiological Survey Results - Survey Location Indicator

02-0102

Survey Area Information: Bldg 33 Interior Floor

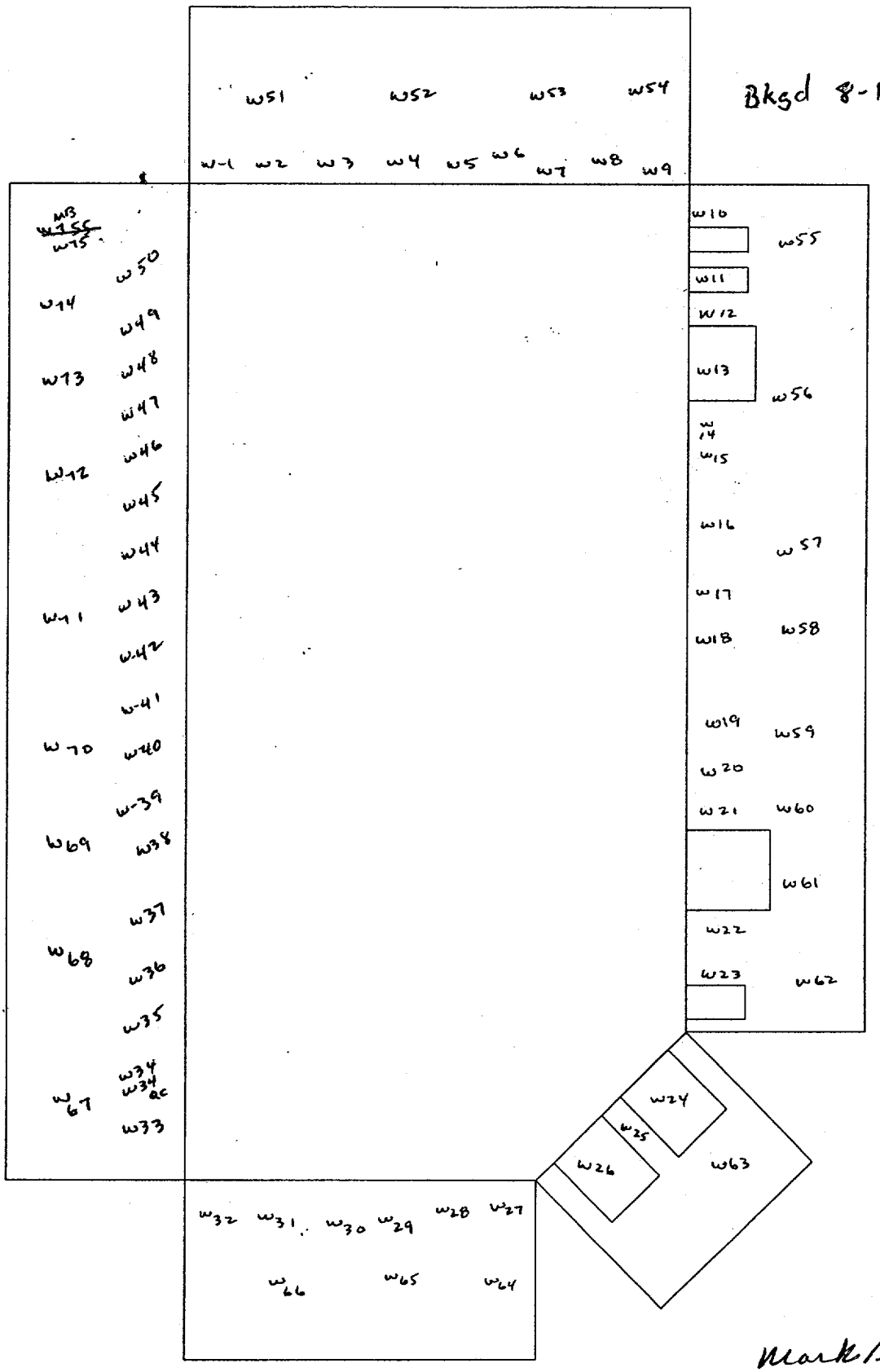
Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F- 135	1570	10	328	276	9	9	-.4	18
F- 136	1520	8	319	224	12	9	-.4	0
F- 137	1390	11	292	230	11	9	-.4	42
F- 138	1530	12	276	243	11	8	-.4	24
F- 139	1410	9	299	242	4	9	2.4	-6
F- 140	1420	10	306	240	6	10	-.4	6
F- 141	1430	12	328	255	5	10	-.4	-18
F- 142	1560	12	323	234	4	9	-.4	-30
F- 143	1900	11	199	210	9	10	-.4	-36
F- 144	1670	12	336	247	6	12	-.4	-12
F- 145	1300	8	212	280	7	12	-.4	12
F- 146	1330	8	176	199	11	12	-.4	-6
F- 147	1400	10	199	184	3	9	-.4	-18
F- 148	1350	8	313	226	5	9	-.4	-30
F- 149	1480	7	318	230	7	9	-.4	60
F- 150	1420	10	317	280	8	9	-.4	-6
F- 151	1400	13	222	188	10	10	-.4	12
F- 152	1350	8	338	251	6	10	2.4	-42
F- 153	1380	10	279	226	8	10	-.4	54
F- 154	1400	12	268	234	13	10	-.4	-30
F- 155	1410	11	332	216	4	12	-.4	6
F- 156	1510	9	238	200	7	10	-.4	12
F- 157	1340	8	321	253	9	9	-.4	-18
F- 158	1350	7	359	251	5	9	-.4	-36
F- 159	1390	10	302	243	8	9	-.4	-30

Building 33
North

02-0102



Bkgd 8-11 mr/hr

High Reading on North wall due to high Bkgd outside

Interior WALLS

Scale: 4m x 4m

Mark Blaucink
4/2/02

Radiological Survey Results - Survey Location Indicator

82-0102

Survey Area Information: Bldg 33 Interior Walls

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
				N/A				

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-1	500	1.2	417	457	4	16	-.4	-6
W-2	480	.8	354	399	1	13	-.4	-30
W-3	420	.6	380	406	1	13	-.4	-12
W-4	490	2	410	405	4	12	-.4	12
W-5	460	1	365	405	1	12	-.4	6
W-6	440	1	348	373	1	12	-.4	-12
W-7	360	1	309	301	2	10	2.4	6
W-8	280	2	233	213	4	10	-.4	-18
W-9	280	1	220	245	1	10	-.4	-6
W-10	280	2.4	232	236	1	9	2.4	-12
W-11	290	2	192	212	3	9	-.4	12
W-12	280	1	172	219	1	9	-.4	6
W-13	300	1	273	254	12	9	-.4	18
W-14	280	2	192	205	1	9	2.4	-18
W-15	260	1	199	236	3	9	-.4	24
W-16	260	.8	215	229	0	9	-.4	36
W-17	240	1	229	270	1	8	-.4	6
W-18	250	2	234	214	0	8	-.4	-48
W-19	240	1	179	181	3	8	2.4	42
W-20	240	.6	207	216	0	8	-.4	0
W-21	270	1.2	203	230	1	8	-.4	-12
W-22	220 ~~224~~	1	220	208	0	8	-.4	24
W-23	240	1	176	199	1	8	-.4	-30
W-24	200	1	202	224	1	8	2.4	-18
W-25	220	.6	217	198	2	8	-.4	18
W-26	240	.6	213	188	1	8	-.4	-42
W-27	240	1	217	237	1	8	-.4	-6

Radiological Survey Results - Survey Location Indicator

02-0102

Survey Area Information:	Bldg #33 Interior Walls

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-28	260	1.2	281	256	4	9	-.4	6
W-29	240	1	246	253	3	9	-.4	18
W-30	300	.6	243	245	1	9	2.4	-30
W-31	300	1	288	248	3	9	-.4	6
W-32	320	2	283	252	0	10	-.4	18
W-33	280	1	258	278	1	10	-.4	-24
W-34	260	1.4	280	242	1	10	-.4	-30
W-34QC	280	1.2	292	252	0	10	-.4	24
W-35	300	2.4	282	253	1	10	-.4	18
W-36	280	.6	224	232	2	10	-.4	-18
W-37	290	1.2	241	214	2	10	-.4	24
W-38	280	1	235	222	2	10	-.4	-18
W-39	290	1.2	238	255	1	10	-.4	-6
W-40	300	1.2	306	260	2	11	-.4	24
W-41	290	1.4	264	291	4	11	2.4	36
W-42	280	1	314	278	1	12	-.4	-24
W-43	280	1	275	236	1	12	2.4	-24
W-44	280	.6	253	244	3	12	-.4	0
W-45	270	1	283	282	2	12	-.4	-12
W-46	320	1	274	251	3	12	-.4	-30
W-47	360	1.4	338	322	0	17	-.4	6
W-48	390	1.2	368	333	0	17	2.4	-6
W-49	480	1	406	430	0	17	-.4	-18
W-50	500	1.2	493	502	2	17	-.4	-42
W-51	420	2	463	423	2	13	-.4	-30
W-52	420	1	403	396	1	10	2.4	6
W-53			402	400	2	9	-.4	12

Radiological Survey Results - Survey Location Indicator

02-0102

Survey Area Information: Bldg 33 Interior Walls

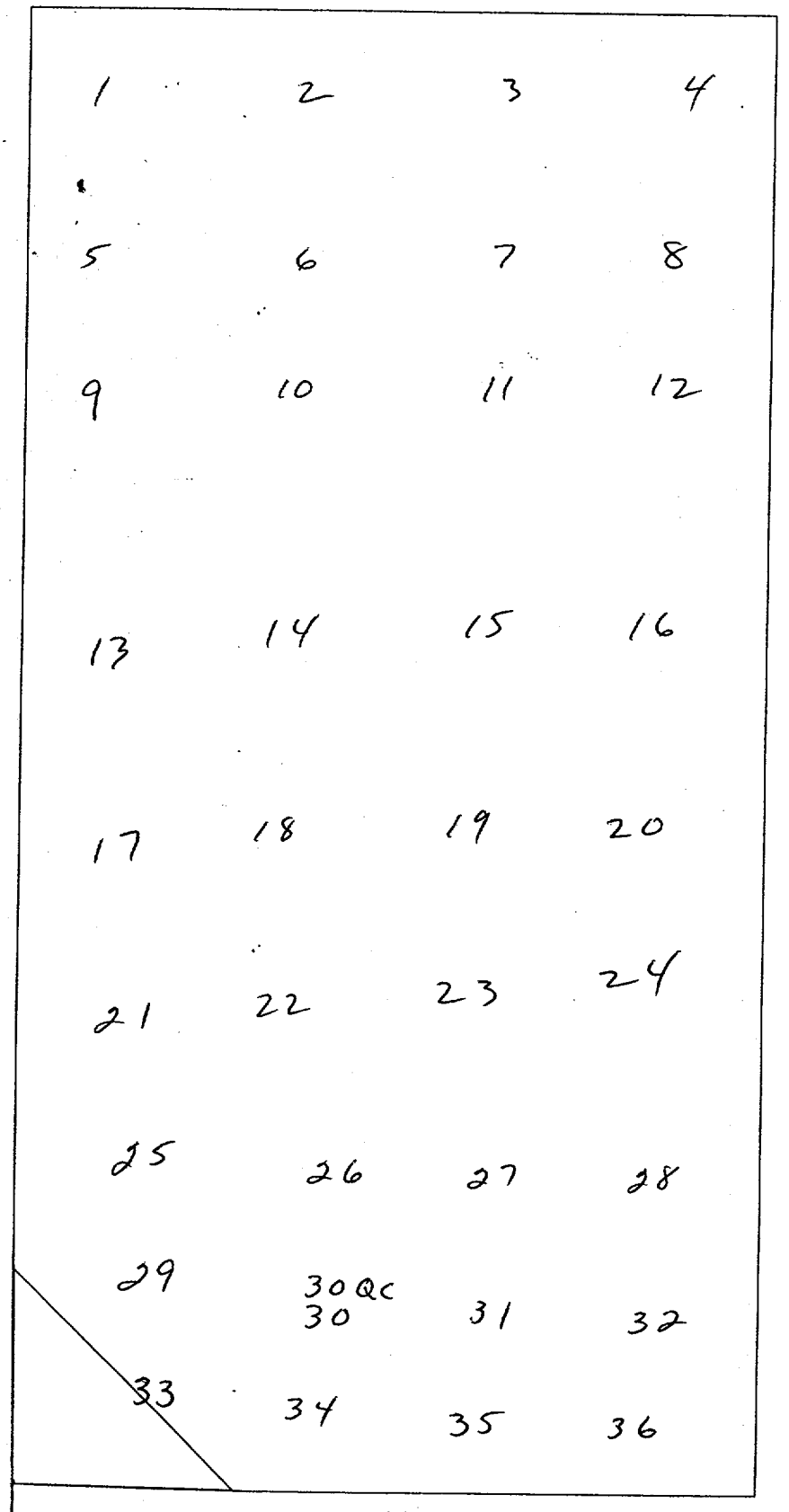
Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-54	420	2	463	423	2	11	-.4	-6
W-55	NA	NA	282	244	0	7	-.4	-12
W-56	240	1	236	266	1	6	-.4	6
W-57	220	1	212	251	0	7	-.4	-18
W-58	NA	NA	214	224	2	6	2.4	12
W-59	200	1	192	225	1	7	2.4	24
W-60	230	0	213	229	1	7	-.4	36
W-61	200	1	193	197	1	7	-.4	6
W-62	210	1	204	223	1	6	-.4	-42
W-63	NA	NA	231	218	2	6	-.4	0
W-64	260	2	241	227	2	6	-.4	-6
W-65	NA	NA	260	235	1	8	-.4	-12
W-66	265	1	273	231	2	8	-.4	-30
W-67	NA	NA	266	268	3	8	-.4	-18
W-68	210	0	222	252	1	8	-.4	0
W-69	250	1	247	258	1	8	-.4	-6
W-70	280	1	264	250	1	10	2.4	-12
W-71	NA	NA	307	277	4	10	2.4	12
W-72	↓	↓	264	250	1	10	-.4	-12
W-73	↓	↓	275	292	1	10	-.4	-18
W-74	NA	NA	330	314	1	14	-.4	24
W-75	460	2	499	470	4	14	-.4	-6

Building 33
North

02-0102



Bkgd
6-9 mr/HR

High Readings on North side due to High Bkgd outside of Bldg

Ceiling

Scale:
4m x 4m

Mark Blanchard
4/2/02

Radiological Survey Results - Survey Location Indicator

02-0102

Survey Area Information: Bldg 33 Interior Ceiling

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
C-1	440	1	467	465	1	18	-.4	-30
C-2	NA	NA	412	390	0	17	-.4	-6
C-3	NA	NA	334	348	1	15	-.4	-12
C-4	340	2	313	298	1	13	2.4	-6
5	NA	NA	358	314	1	9	-.4	-6
6	260	1	267	242	1	7	-.4	6
C-7	NA	NA	250	298	1	7	2.4	18
C-8	280	2	272	245	1	8	-.4	-6
C-9	NA	NA	270	241	1	8	-.4	18
C-10	NA	NA	252	234	3	7	2.4	24
C-11	280	1	225	232	2	7	-.4	-6
C-12	NA	NA	251	242	1	7	-.4	24
C-13	270	2	278	260	1	7	-.4	-6
C-14	NA	NA	234	242	1	5	-.4	18
C-15	NA	NA	251	225	2	5	2.4	-6
C-16	240	1	258	237	1	5	-.4	-6
C-17	NA	NA	283	245	3	5	-.4	42
C-18	250	1	240	220	0	7	-.4	24
C-19	NA	NA	233	256	3	7	2.4	-6
C-20	NA	NA	247	222	0	7	-.4	0
C-21	280	1.2	274	258	3	7	-.4	24
C-22	NA	NA	236	270	3	7	-.4	6
C-23	↓	↓	238	246	1	7	-.4	-6
C-24	↓	↓	252	226	1	6	2.4	-18
C-25	NA	NA	249	248	2	8	-.4	0
C-26	300	1	266	248	5	7	2.4	18
7	NA	NA	284	272	3	7	-.4	-6

Radiological Survey Results - Survey Location Indicator

02-0102

Survey Area Information: Bldg 33 Interior Ceiling

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

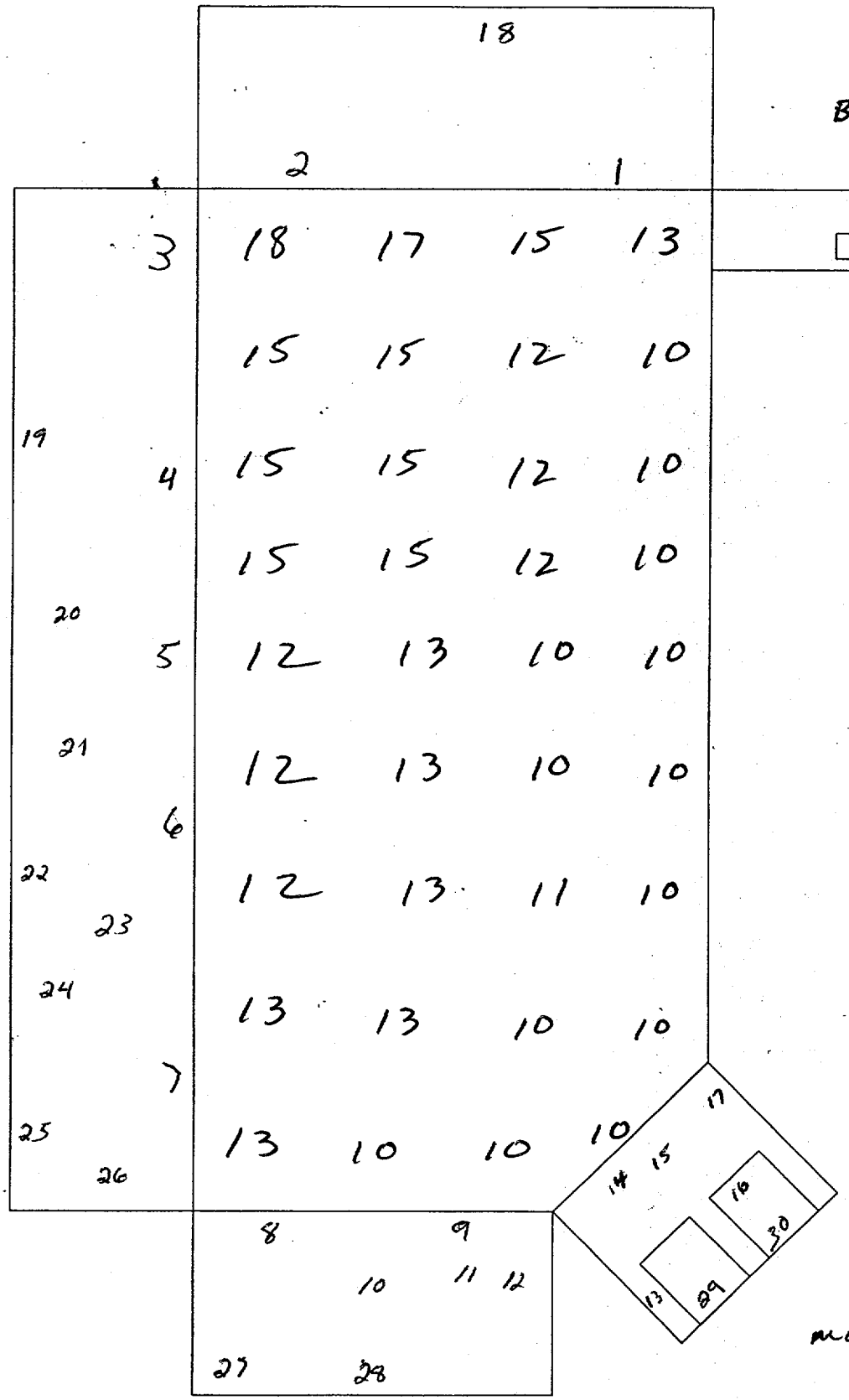
Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
C-28	260	1	258	251	2	6	-.4	-6
C-29	NA	NA	274	283	5	9	-.4	12
C-30	250	0	267	244	0	8	-.4	-6
C-30 QC	NA	NA	265	250	0	8	2.4	-6
-31	270	1	298	257	3	6	-.4	-18
-32	NA	NA	276	241	2	8	-.4	24
C-33	275	1	298	310	3	9	2.4	-6
C-34	NA	NA	274	286	2	8	-.4	12
C-35	260	2	269	277	1	9	-.4	-12
C-36	NA	NA	273	258	1	8	-.4	-6

Building 33
North

survey # 02-0102

Bkgd 10-13 μR/HR



High Readings on North wall due to High Bkgd from the ground

Mark Blomenil 4/2/02

wall # are 1 minute static Readings shielded + unshielded

Roof #'s are dose Rates in MicroR/hr

Exterior
walls
Roof

Scale:
4m x 4m

Radiological Survey Results - Survey Location Indicator

02-0102
Survey #

Survey Area Information: Bldg 33 Outside Walls

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
					N			
					A			

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-1	435	7	354	310	4	15	-.4	-6
W-2	400	6	428	349	6	18	-.4	12
W-3	NA	NA	466	435	9	20	-.4	-18
W-4	NA	NA	365	280	10	14	-.4	-6
W-5	NA	NA	348	284	6	14	-.4	24
W-6	400	6	383	311	3	14	-.4	-18
W-7	NA	NA	279	248	7	13	2.4	12
W-8	NA	NA	335	283	5	10	2.4	0
W-9	400	10	368	293	2	10	2.4	-30
W-10	NA	NA	359	250	11	12	2.4	-12
W-11			338	276	5	12	2.4	6
W-12			325	248	6	11	2.4	-6
W-13			288	223	6	12	2.4	12
W-14			316	228	5	10	-.4	12
W-15			~~356~~	~~264~~	4	12	-.4	-18
W-16			229	227	3	10	-.4	6
W-17			268	228	2	10	-.4	-6
W-18			393	363	5	24	-.4	6
W-19			350	302	4	12	-.4	24
W-20			302	286	5	11	2.4	-12
W-21			298	263	8	12	2.4	-6
W-22			299	281	8	10	-.4	6
W-23			309	262	8	11	-.4	-18
W-24			250	263	9	9	-.4	0
W-25			312	270	6	9	-.4	12
W-26			358	258	2	12	-.4	-6
W-27	NA	NA	279	262	14	10	-.4	6

Radiological Survey Results - Survey Location Indicator

02-0102
survey #

Survey Area Information: Bldg 33 Outside Walls

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4/2/02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-28	NA	NA	265	238	13	12	-.4	-6
W-28QC	↓	↓	267	234	11	12	-.4	-12
W-29	↓	↓	296	256	10	12	2.4	24
W-30	NA	NA	242	238	10	10	-.4	-6

Appendix C

Building 35 Data Package

Molycorp Washington, PA

Building 35 Data Package

This data package contains final status survey information for Building 35, Molycorp, Washington, PA site.

Field data collection forms, survey report forms, statistical test results, and comparisons to release limits are provided.

Summary

During the final status survey of Building 35, elevated levels of activity were detected. The elevated activity was localized to a four foot by four foot area on the concrete floor. This area corresponds to location F7 on the survey map for the building.

It was determined that the activity identified was fixed into the concrete, and required total removal of the concrete in that area. The building's classification was changed from unaffected to affected, and an affected final status survey was performed.

Remediation of the identified area was performed. All post-remedial surveys indicated that remediation activities were successful, and that all the affected concrete was removed.

Elevated levels of background radiation, from soil radioactivity, continued to be a presence during survey activities of Building 35.

Results from the final status survey of Building 35 provides evidence that release criteria have been met, demonstrates that residual radioactivity is below the unrestricted use criteria, and confirms that Building 35 is suitable for unrestricted use.

Results of Surface Scans
Molycorp - Building 35 Survey Unit (Affected Area)

Building Floor

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm	Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
F1	1600	180	8	-1.6	F83	1400	-20	8	-1.6
F2	1500	80	7	-2.6	F84	1400	-20	8	-1.6
F3	1700	280	7	-2.6	F85	1500	80	12	2.4
F4	1400	-20	7	-2.6	F86	1500	80	10	0.4
F5	1400	-20	7	-2.6	F87	1400	-20	10	0.4
F6	2600	1180	9	-0.6	F88	1500	80	12	2.4
F7	10000	8580	9	-0.6	F89	1400	-20	10	0.4
F8	1800	380	9	-0.6	F90	1600	180	4	-5.6
F9	1800	380	12	2.4	F91	1400	-20	10	0.4
F10	1500	80	8	-1.6	F92	1400	-20	12	2.4
F11	1400	-20	4	-5.6	F93	1500	80	6	-3.6
F12	1500	80	11	1.4	F94	1600	180	14	4.4
F13	1600	180	10	0.4	F95	1400	-20	6	-3.6
F14	1600	180	6	-3.6	F96	1500	80	12	2.4
F15	2400	980	9	-0.6	F97	1500	80	8	-1.6
F16	2700	1280	12	2.4	F98	1600	180	12	2.4
F17	1900	480	12	2.4	F99	1500	80	8	-1.6
F18	1800	380	10	0.4	F100	1400	-20	8	-1.6
F19	1600	180	10	0.4	F101	1600	180	10	0.4
F20	1400	-20	9	-0.6	F102	1600	180	12	2.4
F21	1500	80	12	2.4	F103	1600	180	12	2.4
F22	1600	180	12	2.4	F104	1500	80	6	-3.6
F23	1500	80	10	0.4	F105	1400	-20	6	-3.6
F24	1500	80	6	-3.6	F106	1400	-20	12	2.4
F25	1800	380	11	1.4	F107	1400	-20	10	0.4
F26	1700	280	12	2.4	F108	1400	-20	6	-3.6
F27	1900	480	11	1.4	F109	1400	-20	8	-1.6
F28	1500	80	9	-0.6	F110	1400	-20	6	-3.6
F29	1500	80	11	1.4	F111	1500	80	6	-3.6
F30	1400	-20	9	-0.6	F112	1200	-220	10	0.4
F31	1500	80	9	-0.6	F113	1400	-20	12	2.4
F32	1600	180	12	2.4	F114	1500	80	8	-1.6
F33	1600	180	10	0.4	F115	1400	-20	8	-1.6
F34	1500	80	11	1.4	F116	1500	80	6	-3.6
F35	1600	180	11	1.4	F117	1400	-20	14	4.4
F36	1700	280	12	2.4	F118	1500	80	6	-3.6
F37	1500	80	12	2.4	F119	1400	-20	8	-1.6
F38	1500	80	12	2.4	F120	1600	180	8	-1.6
F39	1500	80	11	1.4	F121	1500	80	12	2.4
F40	1500	80	14	4.4	F122	1500	80	10	0.4
F41	1500	80	11	1.4	F123	1400	-20	10	0.4
F42	1600	180	10	0.4	F124	1400	-20	8	-1.6
F43	1500	80	12	2.4	F125	1400	-20	6	-3.6
F44	1400	-20	11	1.4	F126	1500	80	12	2.4
F45	1500	80	9	-0.6	F127	1500	80	12	2.4
F46	1400	-20	11	1.4	F128	1500	80	10	0.4
F47	1400	-20	8	-1.6	F129	1500	80	8	-1.6
F48	1500	80	10	0.4	F130	1500	80	8	-1.6
F49	1500	80	12	2.4	F131	1600	180	6	-3.6
F50	1500	80	8	-1.6	F132	1500	80	12	2.4
F51	1600	180	6	-3.6	F133	1400	-20	10	0.4
F52	1600	180	6	-3.6	F134	1400	-20	10	0.4
F53	1500	80	8	-1.6	F135	1400	-20	12	2.4

F54	1500	80	8	-1.6	F136	1400	-20	8	-1.6
F55	1400	-20	10	0.4	F137	1400	-20	9	-0.6
F56	1500	80	10	0.4	F138	1500	80	9	-0.6
F57	1600	180	10	0.4	F139	1300	-120	12	2.4
F58	1500	80	12	2.4	F140	1400	-20	12	2.4
F59	1400	-20	10	0.4	F141	1600	180	10	0.4
F60	1500	80	8	-1.6	F142	1500	80	9	-0.6
F61	1600	180	6	-3.6	F143	1500	80	14	4.4
F62	1500	80	6	-3.6	F144	1500	80	11	1.4
F63	1600	180	6	-3.6	F145	1400	-20	12	2.4
F64	1600	180	12	2.4	F146	1400	-20	12	2.4
F65	1400	-20	7	-2.6	F147	1600	180	8	-1.6
F66	1400	-20	8	-1.6	F148	1500	80	10	0.4
F67	1500	80	10	0.4	F149	1400	-20	9	-0.6
F68	1600	180	12	2.4	F150	1400	-20	9	-0.6
F69	1500	80	12	2.4	F151	1400	-20	10	0.4
F70	1400	-20	10	0.4	F152	1500	80	12	2.4
F71	1400	-20	8	-1.6	F153	1500	80	14	4.4
F72	1500	80	6	-3.6	F154	1600	180	9	-0.6
F73	1600	180	12	2.4	F155	1500	80	10	0.4
F74	1600	180	10	0.4	F156	1500	80	10	0.4
F75	1500	80	8	-1.6	F157	1400	-20	9	-0.6
F76	1500	80	12	2.4	F158	1400	-20	12	2.4
F77	1400	-20	8	-1.6	F159	1400	-20	9	-0.6
F78	1400	-20	6	-3.6	F160	1500	80	8	-1.6
F79	1600	180	8	-1.6	F161	1400	-20	10	0.4
F80	1600	180	10	0.4	F162	1500	80	10	0.4
F81	1400	-20	8	-1.6	F163	1400	-20	11	1.4
F82	1500	80	10	0.4					

All floor scans performed with Ludlum 239-1F (2350-1 No.95359)
with 43-37 No. 92503

Floor Monitor Info:
Scan MDA Beta - 185 dpm/detector area
Scan MDA Alpha - 19.8 dpm/detector area
Scan background Beta - 1420 cpm
Scan background Alpha - 9.6 cpm
Detector Eff. Beta - .27
Detector Eff. Alpha - .207

Results of Surface Scans
Molycorp - Building 35 Survey Unit (Affected Area)

Building Walls (Interior)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm	Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
W1	295	36	6	3.8	W67	270	-5	1	0
W2	255	-4	5	2.8	W68	290	15	1	0
W3	260	1	3	0.8	W69	300	25	0.8	-0.2
W4	330	71	4	1.8	W70	270	-5	1	0
W5	315	56	7	4.8	W71	270	-5	1	0
W6	360	101	3	0.8	W72	290	15	2	1
W7	360	101	2	-0.2	W73	270	-5	1	0
W8	290	31	2	-0.2	W74	290	15	1	0
W9	280	21	1	-1.2	W75	300	25	1	0
W10	260	1	2	-0.2	W76	270	-5	1	0
W11	250	-9	4	1.8	W77	280	5	1	0
W12	210	-49	6	3.8	W78	275	0	1	0
W13	230	-29	2	-0.2	W79	290	15	0.8	-0.2
W14	220	-39	1	-1.2	W80	300	25	1	0
W15	260	1	2	-0.2	W81	300	25	1	0
W16	180	-79	3	0.8	W82	290	15	1	0
W17	240	-19	1	-1.2	W83	300	25	0.8	-0.2
W18	240	-19	1	-1.2	W84	270	-5	1	0
W19	280	21	1	-1.2	W85	300	25	1	0
W20	260	1	1	-1.2	W86	290	15	1	0
W21	270	11	2	-0.2	W87	270	-5	0.8	-0.2
W22	250	-9	2	-0.2	W88	290	15	1.2	0.2
W23	260	1	2	-0.2	W89	300	25	1	0
W24	220	-39	1	-1.2	W90	300	25	1	0
W25	200	-59	1	-1.2	W91	280	5	1.4	0.4
W26	270	11	2	-0.2	W92	300	25	1	0
W27	220	-39	2	-0.2	W93	290	15	1	0
W28	300	41	0.6	-1.6	W94	280	5	1.4	0.4
W29	260	1	0.8	-1.4	W95	270	-5	1	0
W30	280	21	0.6	-1.6	W96	290	15	0.8	-0.2
W31	240	-19	0.8	-1.4	W97	280	5	2	1
W32	320	61	0.8	-1.4	W98	280	5	1.4	0.4
W33	240	-19	0.8	-1.4	W99	290	15	1	0
W34	240	-19	1.2	-1	W100	280	5	2	1
W35	250	-9	1.6	-0.6	W101	300	25	1.5	0.5
W36	240	-19	1.2	-1	W102	300	25	1	0
W37	260	1	1.2	-1	W103	265	-10	1.6	0.6
W38	300	41	1	-1.2	W104	290	15	1	0
W39	240	-19	0.4	-1.8	W105	300	25	1	0
W40	240	-19	0.4	-1.8	W106	320	45	1	0
W41	250	-9	1	-1.2	W107	290	15	1.4	0.4
W42	250	-9	1.2	-1	W108	300	25	1	0
W43	270	11	0.6	-1.6	W109	360	85	1	0
W44	280	21	0.8	-1.4	W110	360	85	0	-1
W45	220	-39	0.8	-1.4	W111	400	125	1	0
W46	240	-19	0.8	-1.4	W112	330	55	0	-1
W47	250	-9	0.2	-2	W113	450	175	1	0
W48	240	-19	0.6	-1.6	W114	368	93	2	1
W49	220	-39	0.6	-1.6	W115	413	138	1	0
W50	240	-19	0.4	-1.8	W116	453	178	0	-1
W51	270	11	0.4	-1.8	W117	360	85	0	-1
W52	240	-19	0	-2.2	W118	340	65	0	-1
W53	220	-39	0.2	-2	W119	380	105	0	-1

W54	240	-19	1	-1.2	W120	270	-5	0	-1
W55	320	45	1	0	W121	272	-3	1	0
W56	320	45	1	0	W122	318	43	0	-1
W57	300	25	0.8	-0.2	W123	260	-15	0.6	-0.4
W58	320	45	2	1	W124	270	-5	0	-1
W59	300	25	1	0	W125	282	7	0	-1
W60	320	45	1	0	W126	220	-55	2	1
W61	350	75	2	1	W127	270	-5	0.5	-0.5
W62	340	65	1	0	W128	300	25	1	0
W63	290	15	1	0	W129	360	85	1	0
W64	300	25	0.8	-0.2	W130	280	5	1	0
W65	270	-5	1	0	W131	250	-25	0	-1
W66	290	15	1	0	W132	274	-1	1	0

All interior wall scans performed with either:

Ludlum 2350-1 No.117014 with 43-106 No. 133866
(W1 thru W54)
Scan MDA Beta - 613 dpm/detector area
Scan MDA Alpha - 66 dpm/detector area
Scan background Beta - 259 cpm
Scan background Alpha - 2.2 cpm
Detector Eff. Beta - .248
Detector Eff. Alpha - .211

Ludlum 2350-1 No.117566 with 43-106 No. 128912
(W55 thru W132)
Scan MDA Beta - 624 dpm/detector area
Scan MDA Alpha - 44 dpm/detector area
Scan background Beta - 275 cpm
Scan background Alpha - 1 cpm
Detector Eff. Beta - .251
Detector Eff. Alpha - .212

Results of Surface Scans
Molycorp - Building 35 Survey Unit (Affected Area)

Building Ceiling (Interior)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm	Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
C1	280	5	1	0	C19	260	-15	1	0
C2	290	15	2	1	C20	260	-15	0.8	-0.2
C3	280	5	2	1	C21	280	5	0.6	-0.4
C4	260	-15	3	2	C22	260	-15	1.2	0.2
C5	280	5	2	1	C23	260	-15	1	0
C6	260	-15	1	0	C24	280	5	2	1
C7	260	-15	4	3	C25	260	-15	1	0
C8	280	5	1.2	0.2	C26	280	5	1.4	0.4
C9	280	5	1.6	0.6	C27	260	-15	2	1
C10	260	-15	1.4	0.4	C28	280	5	1	0
C11	260	-15	1	0	C29	260	-15	1.2	0.2
C12	280	5	2	1	C30	260	-15	2	1
C13	260	-15	2	1	C31	270	-5	1	0
C14	280	5	2	1	C32	280	5	0.8	-0.2
C15	290	15	1.6	0.6	C33	280	5	1	0
C16	280	5	2	1	C34	260	-15	2	1
C17	280	5	2	1	C35	270	-5	2	1
C18	280	5	1	0	C36	270	-5	1.6	0.6

Ceiling scans performed with Ludlum 2350-1 No.117566 with 43-106 No. 128912

43-106 Info:
Scan MDA Beta - 624 dpm/detector area
Scan MDA Alpha - 44 dpm/detector area
Scan background Beta - 275 cpm
Scan background Alpha - 1 cpm
Detector Eff. Beta - .251
Detector Eff. Alpha - .212

Results of Surface Scans
Molycorp - Building 35 Survey Unit (Affected Area)

Building Exterior (Walls)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
W1	320	40	2	1
W2				
W3	260	-20	1.2	0.2
W4	260	-20	1	0
W5	250	-30	1	0
W6				
W7	240	-40	2	1

All exterior scans performed with Ludlum 2350-1 No.117566 with 43-106 No. 128912

43-106 Info:
Scan MDA Beta - 630 dpm/detector area
Scan MDA Alpha - 45 dpm/detector area
Scan background Beta - 280 cpm
Scan background Alpha - 1 cpm
Detector Eff. Beta - .251
Detector Eff. Alpha - .212

Elevated Scan Readings
Molycorp - Building 35 Survey Unit (Affected Area)

Location	Beta Scan (net cpm)
F7	8580

A 4' x 4' section of concrete removed at location F7 on 3-27-02.

Direct Measurements (Total Activity)
Molycorp - Building 35 Survey Unit (Affected Area)

Building Floor (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
F1	320	246	74	78	-4	-45	275	497	-91
F2	324	272	52	78	-26	-295	254	497	-591
F3	396	367	29	78	-49	-557	230	497	-1114
F4	325	301	24	78	-54	-614	225	497	-1227
F5	296	286	10	78	-68	-773	209	497	-1545
F6	584	498	86	78	8	91	285	497	182
F7	1181	1086	95	78	17	193	293	497	386
F8	352	305	47	78	-31	-352	249	497	-705
F9	485	369	116	78	38	432	310	497	864
F10	334	309	25	78	-53	-602	226	497	-1205
F11	336	267	69	78	-9	-102	270	497	-205
F12	321	229	92	78	14	159	290	497	318
F13	340	284	56	78	-22	-250	258	497	-500
F14	379	377	2	78	-76	-864	199	497	-1727
F15	468	393	75	78	-3	-34	275	497	-68
F16	516	427	89	78	11	125	288	497	250
F17	377	319	58	78	-20	-227	260	497	-455
F18	460	390	70	78	-8	-91	271	497	-182
F19	352	264	88	78	10	114	287	497	227
F20	358	270	88	78	10	114	287	497	227
F21	322	283	39	78	-39	-443	241	497	-886
F22	361	270	91	78	13	148	290	497	295
F23	341	281	60	78	-18	-205	262	497	-409
F24	338	266	72	78	-6	-68	273	497	-136
F25	381	296	85	78	7	80	284	497	159
F26	388	285	103	78	25	284	300	497	568
F27	368	331	37	78	-41	-466	239	497	-932
F28	298	244	54	78	-24	-273	256	497	-545
F29	355	253	102	78	24	273	299	497	545
F30	310	255	55	78	-23	-261	257	497	-523
F31	288	263	25	78	-53	-602	226	497	-1205
F32	324	219	105	78	27	307	301	497	614
F33	321	272	49	78	-29	-330	251	497	-659
F34	324	288	36	78	-42	-477	238	497	-955
F35	316	268	48	78	-30	-341	250	497	-682
F36	315	258	57	78	-21	-239	259	497	-477
F37	315	237	78	78	0	0	278	497	0
F38	288	254	34	78	-44	-500	236	497	-1000
F39	328	283	45	78	-33	-375	247	497	-750
F40	322	260	62	78	-16	-182	264	497	-364
F41	339	243	96	78	18	205	294	497	409
F42	334	263	71	78	-7	-80	272	497	-159
F43	326	250	76	78	-2	-23	276	497	-45
F44	291	277	14	78	-64	-727	214	497	-1455
F45	342	290	52	78	-26	-295	254	497	-591
F46	281	267	14	78	-64	-727	214	497	-1455
F47	338	251	87	78	9	102	286	497	205
F48	297	285	12	78	-66	-750	211	497	-1500
F49	308	267	41	78	-37	-420	243	497	-841
F50	321	283	38	78	-40	-455	240	497	-909
F51	335	262	73	78	-5	-57	274	497	-114
F52	299	288	11	78	-67	-761	210	497	-1523

F53	327	270	57	78	-21	-239	259	497	-477
F54	309	280	29	78	-49	-557	230	497	-1114
F55	343	260	83	78	5	57	283	497	114
F56	339	268	71	78	-7	-80	272	497	-159
F57	305	279	26	78	-52	-591	227	497	-1182
F58	332	267	65	78	-13	-148	266	497	-295
F59	308	285	23	78	-55	-625	224	497	-1250
F60	325	274	51	78	-27	-307	253	497	-614
F61	287	269	18	78	-60	-682	218	497	-1364
F62	355	258	97	78	19	216	295	497	432
F63	334	259	75	78	-3	-34	275	497	-68
F64	350	267	83	78	5	57	283	497	114
F65	339	261	78	78	0	0	278	497	0
F66	359	279	80	78	2	23	280	497	45
F67	325	250	75	78	-3	-34	275	497	-68
F68	354	281	73	78	-5	-57	274	497	-114
F69	323	261	62	78	-16	-182	264	497	-364
F70	304	283	21	78	-57	-648	222	497	-1295
F71	313	270	43	78	-35	-398	245	497	-795
F72	348	277	71	78	-7	-80	272	497	-159
F73	357	231	126	78	48	545	318	497	1091
F74	335	256	79	78	1	11	279	497	23
F75	329	221	108	78	30	341	304	497	682
F76	350	261	89	78	11	125	288	497	250
F77	330	269	61	78	-17	-193	263	497	-386
F78	309	256	53	78	-25	-284	255	497	-568
F79	362	269	93	78	15	170	291	497	341
F80	319	250	69	78	-9	-102	270	497	-205
F81	327	278	49	78	-29	-330	251	497	-659
F82	306	263	43	78	-35	-398	245	497	-795
F83	311	266	45	78	-33	-375	247	497	-750
F84	385	278	107	78	29	330	303	497	659
F85	329	271	58	78	-20	-227	260	497	-455
F86	338	246	92	78	14	159	290	497	318
F87	328	245	83	78	5	57	283	497	114
F88	324	281	43	78	-35	-398	245	497	-795
F89	319	283	36	78	-42	-477	238	497	-955
F90	335	251	84	78	6	68	283	497	136
F91	342	285	57	78	-21	-239	259	497	-477
F92	347	266	81	78	3	34	281	497	68
F93	385	264	121	78	43	489	314	497	977
F94	321	261	60	78	-18	-205	262	497	-409
F95	303	234	69	78	-9	-102	270	497	-205
F96	330	295	35	78	-43	-489	237	497	-977
F97	323	271	52	78	-26	-295	254	497	-591
F98	343	297	46	78	-32	-364	248	497	-727
F99	371	280	91	78	13	148	290	497	295
F100	312	272	40	78	-38	-432	242	497	-864
F101	347	288	59	78	-19	-216	261	497	-432
F102	345	282	63	78	-15	-170	264	497	-341
F103	321	282	39	78	-39	-443	241	497	-886
F104	311	243	68	78	-10	-114	269	497	-227
F105	322	259	63	78	-15	-170	264	497	-341
F106	353	300	53	78	-25	-284	255	497	-568
F107	347	254	93	78	15	170	291	497	341
F108	334	288	46	78	-32	-364	248	497	-727
F109	383	339	44	78	-34	-386	246	497	-773
F110	340	281	59	78	-19	-216	261	497	-432
F111	358	304	54	78	-24	-273	256	497	-545
F112	300	272	28	78	-50	-568	229	497	-1136
F113	291	283	8	78	-70	-795	207	497	-1591

F114	328	258	70	78	-8	-91	271	497	-182
F115	311	274	37	78	-41	-466	239	497	-932
F116	307	272	35	78	-43	-489	237	497	-977
F117	325	274	51	78	-27	-307	253	497	-614
F118	383	278	105	78	27	307	301	497	614
F119	315	254	61	78	-17	-193	263	497	-386
F120	306	254	52	78	-26	-295	254	497	-591
F121	326	261	65	78	-13	-148	266	497	-295
F122	312	276	36	78	-42	-477	238	497	-955
F123	282	272	10	78	-68	-773	209	497	-1545
F124	349	314	35	78	-43	-489	237	497	-977
F125	357	307	50	78	-28	-318	252	497	-636
F126	303	285	18	78	-60	-682	218	497	-1364
F127	331	247	84	78	6	68	283	497	136
F128	351	270	81	78	3	34	281	497	68
F129	310	282	28	78	-50	-568	229	497	-1136
F130	286	280	6	78	-72	-818	204	497	-1636
F131	353	296	57	78	-21	-239	259	497	-477
F132	321	249	72	78	-6	-68	273	497	-136
F133	355	275	80	78	2	23	280	497	45
F134	339	337	2	78	-76	-864	199	497	-1727
F135	303	260	43	78	-35	-398	245	497	-795
F136	318	256	62	78	-16	-182	264	497	-364
F137	356	270	86	78	8	91	285	497	182
F138	317	261	56	78	-22	-250	258	497	-500
F139	311	252	59	78	-19	-216	261	497	-432
F140	320	213	107	78	29	330	303	497	659
F141	310	242	68	78	-10	-114	269	497	-227
F142	325	239	86	78	8	91	285	497	182
F143	313	273	40	78	-38	-432	242	497	-864
F144	337	270	67	78	-11	-125	268	497	-250
F145	318	255	63	78	-15	-170	264	497	-341
F146	290	257	33	78	-45	-511	235	497	-1023
F147	319	254	65	78	-13	-148	266	497	-295
F148	352	271	81	78	3	34	281	497	68
F149	301	277	24	78	-54	-614	225	497	-1227
F150	331	247	84	78	6	68	283	497	136
F151	332	268	64	78	-14	-159	265	497	-318
F152	332	273	59	78	-19	-216	261	497	-432
F153	293	274	19	78	-59	-670	219	497	-1341
F154	353	277	76	78	-2	-23	276	497	-45
F155	315	252	63	78	-15	-170	264	497	-341
F156	337	290	47	78	-31	-352	249	497	-705
F157	337	271	66	78	-12	-136	267	497	-273
F158	349	280	69	78	-9	-102	270	497	-205
F159	317	272	45	78	-33	-375	247	497	-750
F160	326	277	49	78	-29	-330	251	497	-659
F161	333	289	44	78	-34	-386	246	497	-773
F162	338	288	50	78	-28	-318	252	497	-636

All building interior floor direct measurements were performed with 2360 No. 156371 and 43-89 No. 164832	Beta	Alpha
Floor Efficiency	0.088	0.153
Floor Background (cpm)	78	2.4
Floor MDA (dpm/100 cm^2)	497	65

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Direct Measurements (Total Activity)
Molycorp - Building 35 Survey Unit (Affected Area)

Building Walls (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
W1	205	197	8	8	0	0	69	140	0
W2	231	210	21	8	13	115	93	140	230
W3	242	252	-10	8	-18	-159	25	140	-319
W4	258	282	-24	8	-32	-283	69	140	-566
W5	316	288	28	8	20	177	104	140	354
W6	312	299	13	8	5	44	79	140	88
W7	305	276	29	8	21	186	106	140	372
W8	287	248	39	8	31	274	119	140	549
W9	238	207	31	8	23	204	108	140	407
W10	240	226	14	8	6	53	81	140	106
W11	203	225	-22	8	-30	-265	65	140	-531
W12	221	200	21	8	13	115	93	140	230
W13	209	196	13	8	5	44	79	140	88
W14	199	206	-7	8	-15	-133	17	140	-265
W15	206	194	12	8	4	35	78	140	71
W16	178	176	2	8	-6	-53	55	140	-106
W17	185	185	0	8	-8	-71	49	140	-142
W18	185	191	-6	8	-14	-124	25	140	-248
W19	195	174	21	8	13	115	93	140	230
W20	228	192	36	8	28	248	115	140	496
W21	201	183	18	8	10	88	88	140	177
W22	208	216	-8	8	-16	-142	0	140	-283
W23	245	182	63	8	55	487	146	140	973
W24	208	188	20	8	12	106	92	140	212
W25	186	214	-28	8	-36	-319	78	140	-637
W26	212	201	11	8	3	27	76	140	53
W27	209	170	39	8	31	274	119	140	549
W28	195	193	2	8	-6	-53	55	140	-106
W29	205	216	-11	8	-19	-168	30	140	-336
W30	223	213	10	8	2	18	74	140	35
W31	183	193	-10	8	-18	-159	25	140	-319
W32	242	194	48	8	40	354	130	140	708
W33	204	187	17	8	9	80	87	140	159
W34	182	188	-6	8	-14	-124	25	140	-248
W35	189	188	1	8	-7	-62	52	140	-124
W36	250	210	40	8	32	283	120	140	566
W37	187	161	26	8	18	159	101	140	319
W38	260	208	52	8	44	389	134	140	779
W39	198	166	32	8	24	212	110	140	425
W40	177	204	-27	8	-35	-310	76	140	-619
W41	191	210	-19	8	-27	-239	58	140	-478
W42	233	188	45	8	37	327	126	140	655
W43	198	169	29	8	21	186	106	140	372
W44	158	203	-45	8	-53	-469	106	140	-938
W45	169	173	-4	8	-12	-106	35	140	-212
W46	163	190	-27	8	-35	-310	76	140	-619
W47	182	183	-1	8	-9	-80	46	140	-159
W48	197	189	8	8	0	0	69	140	0
W49	249	198	51	8	43	381	133	140	761
W50	184	168	16	8	8	71	85	140	142
W51	248	209	39	8	31	274	119	140	549
W52	203	175	28	8	20	177	104	140	354

W53	202	203	-1	8	-9	-80	46	140	-159
W54	236	208	28	8	20	177	104	140	354
W55	238	227	11	8	3	27	76	140	53
W56	309	273	36	8	28	248	115	140	496
W57	288	308	-20	8	-28	-248	60	140	-496
W58	242	276	-34	8	-42	-372	88	140	-743
W59	300	266	34	8	26	230	112	140	460
W60	289	320	-31	8	-39	-345	83	140	-690
W61	281	308	-27	8	-35	-310	76	140	-619
W62	284	281	3	8	-5	-44	58	140	-88
W63	215	230	-15	8	-23	-204	46	140	-407
W64	241	231	10	8	2	18	74	140	35
W65	234	203	31	8	23	204	108	140	407
W66	203	177	26	8	18	159	101	140	319
W67	241	189	52	8	44	389	134	140	779
W68	211	208	3	8	-5	-44	58	140	-88
W69	194	209	-15	8	-23	-204	46	140	-407
W70	223	188	35	8	27	239	114	140	478
W71	205	224	-19	8	-27	-239	58	140	-478
W72	206	195	11	8	3	27	76	140	53
W73	195	203	-8	8	-16	-142	0	140	-283
W74	202	203	-1	8	-9	-80	46	140	-159
W75	206	195	11	8	3	27	76	140	53
W76	183	193	-10	8	-18	-159	25	140	-319
W77	214	196	18	8	10	88	88	140	177
W78	200	193	7	8	-1	-9	67	140	-18
W79	193	197	-4	8	-12	-106	35	140	-212
W80	230	202	28	8	20	177	104	140	354
W81	219	224	-5	8	-13	-115	30	140	-230
W82	213	180	33	8	25	221	111	140	442
W83	184	207	-23	8	-31	-274	67	140	-549
W84	203	206	-3	8	-11	-97	39	140	-195
W85	201	208	-7	8	-15	-133	17	140	-265
W86	238	186	52	8	44	389	134	140	779
W87	180	173	7	8	-1	-9	67	140	-18
W88	184	210	-26	8	-34	-301	74	140	-602
W89	189	161	28	8	20	177	104	140	354
W90	196	194	2	8	-6	-53	55	140	-106
W91	172	184	-12	8	-20	-177	35	140	-354
W92	209	192	17	8	9	80	87	140	159
W93	189	216	-27	8	-35	-310	76	140	-619
W94	214	182	32	8	24	212	110	140	425
W95	203	203	0	8	-8	-71	49	140	-142
W96	215	196	19	8	11	97	90	140	195
W97	197	167	30	8	22	195	107	140	389
W98	199	172	27	8	19	168	103	140	336
W99	169	188	-19	8	-27	-239	58	140	-478
W100	189	178	11	8	3	27	76	140	53
W101	175	168	7	8	-1	-9	67	140	-18
W102	175	196	-21	8	-29	-257	63	140	-513
W103	183	184	-1	8	-9	-80	46	140	-159
W104	204	194	10	8	2	18	74	140	35
W105	199	176	23	8	15	133	97	140	265
W106	212	191	21	8	13	115	93	140	230
W107	201	197	4	8	-4	-35	60	140	-71
W108	213	212	1	8	-7	-62	52	140	-124
W109	290	253	37	8	29	257	116	140	513
W110	297	272	25	8	17	150	100	140	301
W111	360	344	16	8	8	71	85	140	142
W112	318	280	38	8	30	265	118	140	531
W113	347	288	59	8	51	451	142	140	903

W114	304	246	58	8	50	442	141	140	885
W115	292	238	54	8	46	407	137	140	814
W116	297	239	58	8	50	442	141	140	885
W117	344	287	57	8	49	434	140	140	867
W118	367	352	15	8	7	62	83	140	124
W119	354	300	54	8	46	407	137	140	814
W120	184	156	28	8	20	177	104	140	354
W121	182	164	18	8	10	88	88	140	177
W122	187	196	-9	8	-17	-150	17	140	-301
W123	181	186	-5	8	-13	-115	30	140	-230
W124	203	189	14	8	6	53	81	140	106
W125	182	181	1	8	-7	-62	52	140	-124
W126	203	185	18	8	10	88	88	140	177
W127	214	184	30	8	22	195	107	140	389
W128	208	209	-1	8	-9	-80	46	140	-159
W129	195	197	-2	8	-10	-88	42	140	-177
W130	188	187	1	8	-7	-62	52	140	-124
W131	207	195	12	8	4	35	78	140	71
W132	262	220	42	8	34	301	123	140	602

All building interior wall direct measurements were performed with 2360 No. 164680 and 43-89 No. 118544

	Beta	Alpha
Wall Efficiency	0.113	0.164
Wall Background (cpm)	8	3.7
Wall MDA (dpm/100 cm^2)	140	71

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Direct Measurements (Total Activity)
Molycorp - Building 35 Survey Unit (Affected Area)

Building Ceiling (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
C1	295	250	45	8	37	327	126	140	655
C2	290	304	-14	8	-22	-195	42	140	-389
C3	330	280	50	8	42	372	132	140	743
C4	301	294	7	8	-1	-9	67	140	-18
C5	285	255	30	8	22	195	107	140	389
C6	275	266	9	8	1	9	72	140	18
C7	273	245	28	8	20	177	104	140	354
C8	267	247	20	8	12	106	92	140	212
C9	241	269	-28	8	-36	-319	78	140	-637
C10	260	245	15	8	7	62	83	140	124
C11	254	238	16	8	8	71	85	140	142
C12	271	232	39	8	31	274	119	140	549
C13	243	222	21	8	13	115	93	140	230
C14	232	239	-7	8	-15	-133	17	140	-265
C15	234	214	20	8	12	106	92	140	212
C16	255	200	55	8	47	416	138	140	832
C17	251	207	44	8	36	319	125	140	637
C18	204	210	-6	8	-14	-124	25	140	-248
C19	223	230	-7	8	-15	-133	17	140	-265
C20	248	230	18	8	10	88	88	140	177
C21	233	200	33	8	25	221	111	140	442
C22	248	215	33	8	25	221	111	140	442
C23	223	189	34	8	26	230	112	140	460
C24	221	201	20	8	12	106	92	140	212
C25	226	220	6	8	-2	-18	65	140	-35
C26	252	206	46	8	38	336	127	140	673
C27	248	228	20	8	12	106	92	140	212
C28	225	223	2	8	-6	-53	55	140	-106
C29	234	220	14	8	6	53	81	140	106
C30	216	195	21	8	13	115	93	140	230
C31	207	192	15	8	7	62	83	140	124
C32	182	198	-16	8	-24	-212	49	140	-425
C33	222	223	-1	8	-9	-80	46	140	-159
C34	202	199	3	8	-5	-44	58	140	-88
C35	204	205	-1	8	-9	-80	46	140	-159
C36	244	200	44	8	36	319	125	140	637

All ceiling direct measurements were performed with 2360 No. 164680 and 43-89 No. 118544

	Beta	Alpha
Ceiling Efficiency	0.113	0.164
Ceiling Background (cpm)	8	3.7
Ceiling MDA (dpm/100 cm^2)	140	71

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Direct Measurements (Total Activity)
Molycorp - Building 35 Survey Unit (Affected Area)

Building Exterior (Walls and Roof)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha (1) (dpm/100cm^2)
W1	219	191	28	8	20	177	104	140	354
W2	269	253	16	8	8	71	85	140	142
W3	214	204	10	8	2	18	74	140	35
W4	193	180	13	8	5	44	79	140	88
W5	207	209	-2	8	-10	-88	42	140	-177
W6	188	179	9	8	1	9	72	140	18
W7	184	216	-32	8	-40	-354	85	140	-708
W8	204	189	15	8	7	62	83	140	124
W9	156	143	13	8	5	44	79	140	88
W10	215	195	20	8	12	106	92	140	212
W11	300	281	19	8	11	97	90	140	195
W12	199	191	8	8	0	0	69	140	0
W13	201	165	36	8	28	248	115	140	496
W14	159	180	-21	8	-29	-257	63	140	-513
W15	182	170	12	8	4	35	78	140	71
W16	162	158	4	8	-4	-35	60	140	-71
W17	216	180	36	8	28	248	115	140	496
W18	185	170	15	8	7	62	83	140	124
W19	156	191	-35	8	-43	-381	90	140	-761
W20	166	182	-16	8	-24	-212	49	140	-425
W21	176	149	27	8	19	168	103	140	336
W22	194	157	37	8	29	257	116	140	513
W23	187	159	28	8	20	177	104	140	354
W24	170	146	24	8	16	142	98	140	283
W25	218	194	24	8	16	142	98	140	283
W26	204	203	1	8	-7	-62	52	140	-124
R1	217	177	40	8	32	283	120	140	566
R2	238	209	29	8	21	186	106	140	372
R3	257	225	32	8	24	212	110	140	425
R4	237	225	12	8	4	35	78	140	71

All building exterior direct measurements were performed with

2360 No. 164680 and 43-89 No. 118544	Beta	Alpha
Efficiency	0.113	0.164
Background (cpm)	8	3.7
MDA (dpm/100 cm^2)	140	71

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Elevated Direct Measurements (Total Activity) and Averaging Results
Molycorp - Building 35 Survey Unit (Affected Area)

Building Floor (Interior)

Location	Direct Alpha (dpm/100cm^2)	Over Area (cm^2)	Exceeds Limits Maximum	Exceeds Limits Average	Averaged Value (over 1 m^2)	Within Limits? Yes/No
F73	1091	100	No	Yes	49	Yes

Removable Surface Activity Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

Building Floor

Location (see map)	Removable Beta (dpm/100cm2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm2)	Uncertainty 95% CL	MDA	Instrument #
F1	-63	33.3	129	-1.0	3.3	14	1
F2	-13	17.4	129	-1.0	3.3	14	1
F3	0	9.7	129	2.0	4.7	14	1
F4	33	25.0	129	-1.0	3.3	14	1
F5	4	12.6	129	-1.0	3.3	14	1
F6	-25	22.3	129	-1.0	3.3	14	1
F7	-29	23.7	129	-1.0	3.3	14	1
F8	-46	28.9	129	2.0	4.7	14	1
F9	0	9.7	129	-1.0	3.3	14	1
F10	-20	20.4	129	-1.0	3.3	14	1
F11	-8	14.9	129	-1.0	3.3	14	1
F12	4	12.6	129	-1.0	3.3	14	1
F13	-5	13.2	129	1.8	4.5	14	1
F14	-17	19.2	129	5.0	7.4	14	1
F15	-42	27.7	129	-1.0	3.3	14	1
F16	-4	12.6	129	-1.0	3.3	14	1
F17	29	23.7	129	-1.0	3.3	14	1
F18	4	12.6	129	-1.0	3.3	14	1
F19	-16	18.7	129	-1.0	3.3	14	1
F20	-218	60.0	129	-1.0	3.3	14	1
F21	-25	22.3	129	-1.0	3.3	14	1
F22	-54	31.0	129	-1.0	3.3	14	1
F23	-25	22.3	129	2.0	4.7	14	1
F24	-16	18.7	129	-1.0	3.3	14	1
F25	-21	20.8	129	-1.0	3.3	14	1
F26	-42	27.7	129	-1.0	3.3	14	1
F27	63	33.3	129	-1.0	3.3	14	1
F28	-13	17.4	129	-1.0	3.3	14	1
F29	-293	69.3	129	-1.0	3.3	14	1
F30	13	17.4	129	-1.0	3.3	14	1
F31	-46	28.9	129	-1.0	3.3	14	1
F32	-25	22.3	129	-1.0	3.3	14	1
F33	-54	31.0	129	-1.0	3.3	14	1
F34	8	14.9	129	-1.0	3.3	14	1
F35	-8	14.9	129	-1.0	3.3	14	1

#1 - Ludlum 2929 No. 115563 with 43-10 No. 127216 Info:

	Beta	Alpha
Background (cpm)	70	0.35
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficiency	0.239	0.35
MDA	129	14.0

#2 - Ludlum 2929 No. 115563 with 43-10 No. 127216 Info (3-20):

	Beta	Alpha
Background (cpm)	72	0.16
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficiency	0.239	0.35
MDA	130	12.0

#3 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info (3-20):

	Beta	Alpha
Background (cpm)	46	0.12
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	155	12.0

F36	8	14.9	129	2.0	4.7	14	1
F37	-13	17.4	129	2.0	4.7	14	1
F38	-38	26.6	129	-1.0	3.3	14	1
F39	-17	19.2	129	-1.0	3.3	14	1
F40	-59	32.3	129	4.0	6.6	14	1
F41	25	22.3	129	-1.0	3.3	14	1
F42	-54	31.0	129	2.0	4.7	14	1
F43	50	30.0	129	2.0	4.7	14	1
F44	4	12.6	129	-1.0	3.3	14	1
F45	42	27.7	129	-1.0	3.3	14	1
F46	-13	17.4	129	-1.0	3.3	14	1
F47	0	9.7	129	-1.0	3.3	14	1
F48	-8	14.9	129	2.0	4.7	14	1
F49	-67	34.2	129	-1.0	3.3	14	1
F50	8	14.9	129	2.0	4.7	14	1
F51	50	30.0	129	4.0	6.6	14	1
F52	-30	24.0	129	4.0	6.6	14	1
F53	4	12.6	129	-1.0	3.3	14	1
F54	46	28.9	129	-1.0	3.3	14	1
F55	-25	22.3	129	-1.0	3.3	14	1
F56	-8	14.9	129	-1.0	3.3	14	1
F57	46	28.9	129	-1.0	3.3	14	1
F58	21	20.8	129	-1.0	3.3	14	1
F59	-8	14.9	129	2.0	4.7	14	1
F60	54	31.0	129	4.0	6.6	14	1
F61	33	25.0	129	-1.0	3.3	14	1
F62	71	35.1	129	-1.0	3.3	14	1
F63	-25	22.3	129	4.0	6.6	14	1
F64	-38	26.6	129	-1.0	3.3	14	1
F65	-46	28.9	129	-1.0	3.3	14	1
F66	88	38.8	129	-1.0	3.3	14	1
F67	59	32.3	129	2.0	4.7	14	1
F68	-21	20.8	129	2.0	4.7	14	1
F69	-38	26.6	129	-1.0	3.3	14	1
F70	54	31.0	129	-1.0	3.3	14	1
F71	30	24.0	129	-1.0	3.3	14	1
F72	8	14.9	129	2.0	4.7	14	1
F73	25	22.3	129	-1.0	3.3	14	1
F74	0	9.8	130	-0.5	2.4	12	2
F75	29	23.7	130	-0.5	2.4	12	2
F76	75	36.1	130	-0.5	2.4	12	2
F77	13	17.5	130	-0.5	2.4	12	2
F78	-38	26.6	130	-0.5	2.4	12	2
F79	-33	25.0	130	-0.5	2.4	12	2

F80	-88	38.9	130	-0.5	2.4	12	2
F81	-21	20.8	130	-0.5	2.4	12	2
F82	-13	17.5	130	-0.5	2.4	12	2
F83	-30	24.1	130	-0.5	2.4	12	2
F84	25	22.3	130	-0.5	2.4	12	2
F85	50	30.0	130	-0.5	2.4	12	2
F86	-50	30.0	130	-0.5	2.4	12	2
F87	-46	28.9	130	-0.5	2.4	12	2
F88	-30	24.1	130	-0.5	2.4	12	2
F89	84	38.0	130	-0.5	2.4	12	2
F90	50	30.0	130	-0.5	2.4	12	2
F91	80	37.2	130	-0.5	2.4	12	2
F92	-33	25.0	130	-0.5	2.4	12	2
F93	21	20.8	130	-0.5	2.4	12	2
F94	-33	25.0	130	-0.5	2.4	12	2
F95	-55	31.3	130	-0.5	2.4	12	2
F96	0	9.8	130	2.4	5.1	12	2
F97	33	25.0	130	-0.5	2.4	12	2
F98	42	27.8	130	2.4	5.1	12	2
F99	-33	25.0	130	-0.5	2.4	12	2
F100	13	17.5	130	-0.5	2.4	12	2
F101	0	9.8	130	-0.5	2.4	12	2
F102	-25	22.3	130	-0.5	2.4	12	2
F103	-8	15.0	130	-0.5	2.4	12	2
F104	25	22.3	130	-0.5	2.4	12	2
F105	-8	15.0	130	-0.5	2.4	12	2
F106	25	22.3	130	-0.5	2.4	12	2
F107	-13	17.5	130	-0.5	2.4	12	2
F108	-14	17.9	130	-0.5	2.4	12	2
F109	-17	19.2	130	2.4	5.1	12	2
F110	-13	17.5	130	-0.5	2.4	12	2
F111	-88	38.9	130	2.4	5.1	12	2
F112	25	22.3	130	2.4	5.1	12	2
F113	0	9.8	130	-0.5	2.4	12	2
F114	29	23.7	130	-0.5	2.4	12	2
F115	29	23.7	130	-0.5	2.4	12	2
F116	-54	31.1	130	-0.5	2.4	12	2
F117	17	19.2	130	-0.5	2.4	12	2
F118	-17	19.2	130	2.4	5.1	12	2
F119	-46	28.9	130	-0.5	2.4	12	2
F120	-4	12.7	130	-0.5	2.4	12	2
F121	-46	28.9	130	-0.5	2.4	12	2
F122	-21	20.8	130	-0.5	2.4	12	2
F123	-71	35.2	130	-0.5	2.4	12	2

F124	-8	15.0	130	-0.5	2.4	12	2
F125	29	23.7	130	-0.5	2.4	12	2
F126	4	12.7	130	-0.5	2.4	12	2
F127	-84	38.0	130	-0.5	2.4	12	2
F128	-42	27.8	130	-0.5	2.4	12	2
F129	-21	20.8	130	-0.5	2.4	12	2
F130	-42	27.8	130	-0.5	2.4	12	2
F131	-21	20.8	130	2.4	5.1	12	2
F132	-17	19.2	130	-0.5	2.4	12	2
F133	-4	12.7	130	-0.5	2.4	12	2
F134	-25	22.3	130	-0.5	2.4	12	2
F135	4	12.7	130	2.4	5.1	12	2
F136	-21	20.8	130	-0.5	2.4	12	2
F137	-29	23.7	130	2.4	5.1	12	2
F138	-8	15.0	130	-0.5	2.4	12	2
F139	-297	69.8	130	-0.5	2.4	12	2
F140	-25	22.3	130	-0.5	2.4	12	2
F141	4	12.7	130	2.4	5.1	12	2
F142	-17	19.2	130	-0.5	2.4	12	2
F143	-4	12.7	130	2.4	5.1	12	2
F144	-17	19.2	130	-0.5	2.4	12	2
F145	46	28.9	130	-0.5	2.4	12	2
F146	54	31.1	130	-0.5	2.4	12	2
F147	0	9.8	130	-0.5	2.4	12	2
F148	-8	15.0	130	-0.5	2.4	12	2
F149	54	31.1	130	2.4	5.1	12	2
F150	-13	17.5	130	-0.5	2.4	12	2
F151	-25	22.3	130	-0.5	2.4	12	2
F152	46	28.9	130	2.4	5.1	12	2
F153	-21	20.8	130	-0.5	2.4	12	2
F154	0	9.8	130	-0.5	2.4	12	2
F155	8	15.0	130	-0.5	2.4	12	2
F156	67	34.3	130	-0.5	2.4	12	2
F157	0	9.8	130	-0.5	2.4	12	2
F158	-25	22.3	130	-0.5	2.4	12	2
F159	-21	20.8	130	-0.5	2.4	12	2
F160	-63	33.3	130	-0.5	2.4	12	2
F161	-46	28.9	130	-0.5	2.4	12	2
F162	-4	12.7	130	-0.5	2.4	12	2
F163	33	25.0	130	2.4	5.1	12	2

Removable Surface Activity Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

Building Walls (Interior)

Location (see map)	Removable Beta (dpm/100cm2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm2)	Uncertainty 95% CL	MDA	Instrument #
W1	-48	29.4	129	-1.0	3.3	14	1
W2	60	32.5	129	-1.0	3.3	14	1
W3	-96	40.5	129	-1.0	3.3	14	1
W4	-30	24.0	129	-1.0	3.3	14	1
W5	24	21.9	129	-1.0	3.3	14	1
W6	-6	13.8	129	-1.0	3.3	14	1
W7	-12	16.9	129	-1.0	3.3	14	1
W8	18	19.6	129	-1.0	3.3	14	1
W9	-18	19.6	129	-1.0	3.3	14	1
W10	-24	21.9	129	-1.0	3.3	14	1
W11	-6	13.8	129	-1.0	3.3	14	1
W12	84	38.0	129	-1.0	3.3	14	1
W13	109	43.0	129	-1.0	3.3	14	1
W14	68	34.5	129	-1.0	3.3	14	1
W15	-24	21.9	129	-1.0	3.3	14	1
W16	-48	29.4	129	-1.0	3.3	14	1
W17	-6	13.8	129	-1.0	3.3	14	1
W18	6	13.8	129	-1.0	3.3	14	1
W19	6	13.8	129	-1.0	3.3	14	1
W20	24	21.9	129	-1.0	3.3	14	1
W21	0	9.7	129	-1.0	3.3	14	1
W22	-6	13.8	129	1.8	4.5	14	1
W23	-36	25.9	129	-1.0	3.3	14	1
W24	-48	29.4	129	-1.0	3.3	14	1
W25	24	21.9	129	-1.0	3.3	14	1
W26	30	24.0	129	-1.0	3.3	14	1
W27	48	29.4	129	-1.0	3.3	14	1
W28	-42	27.7	129	-1.0	3.3	14	1
W29	-6	13.8	129	-1.0	3.3	14	1
W30	-30	24.0	129	-1.0	3.3	14	1
W31	18	19.6	129	-1.0	3.3	14	1
W32	6	13.8	129	-1.0	3.3	14	1
W33	-18	19.6	129	-1.0	3.3	14	1
W34	-36	25.9	129	-1.0	3.3	14	1
W35	12	16.9	129	-1.0	3.3	14	1
W36	-30	24.0	129	-1.0	3.3	14	1

#1 - Ludlum 2929 No. 115563 with 43-10 No. 127216 Info:

	Beta	Alpha
Background (cpm)	70	0.35
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficiency	0.239	0.35
MDA	129	14.0

#2 - Ludlum 2929 No. 115563 with 43-10 No. 127216 Info (3-20):

	Beta	Alpha
Background (cpm)	72	0.16
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficiency	0.239	0.35
MDA	130	12.0

#3 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info (3-20):

	Beta	Alpha
Background (cpm)	46	0.12
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	155	12.0

W37	-30	24.0	129	-1.0	3.3	14	1
W38	-42	27.7	129	-1.0	3.3	14	1
W39	-6	13.8	129	-1.0	3.3	14	1
W40	42	27.7	129	-1.0	3.3	14	1
W41	-6	13.8	129	-1.0	3.3	14	1
W42	-6	13.8	129	1.8	4.5	14	1
W43	-36	25.9	129	1.8	4.5	14	1
W44	-24	21.9	129	-1.0	3.3	14	1
W45	-6	13.8	129	-1.0	3.3	14	1
W46	-96	40.5	129	-1.0	3.3	14	1
W47	-24	21.9	129	-1.0	3.3	14	1
W48	-66	34.0	129	-1.0	3.3	14	1
W49	12	16.9	129	-1.0	3.3	14	1
W50	6	13.8	129	-1.0	3.3	14	1
W51	42	27.7	129	-1.0	3.3	14	1
W52	-78	36.7	129	-1.0	3.3	14	1
W53	-18	19.6	129	-1.0	3.3	14	1
W54	-36	25.9	129	-1.0	3.3	14	1
W55	-33	30.0	155	2.4	5.2	12	3
W56	8.3	18.0	155	-0.4	2.1	12	3
W57	-12	20.2	155	-0.3	1.9	12	3
W58	30	28.8	155	-0.3	1.9	12	3
W59	-30	28.8	155	-0.3	1.9	12	3
W60	0	11.4	155	2.5	5.3	12	3
W61	-54	37.2	155	-0.3	1.9	12	3
W62	-30	28.8	155	-0.3	1.9	12	3
W63	24	26.2	155	2.5	5.3	12	3
W64	48	35.3	155	2.5	5.3	12	3
W65	-24	26.2	155	2.5	5.3	12	3
W66	30	28.8	155	-0.3	1.9	12	3
W67	12	20.2	155	-0.3	1.9	12	3
W68	-18	23.4	155	-0.3	1.9	12	3
W69	-72	42.5	155	2.5	5.3	12	3
W70	18	23.4	155	-0.3	1.9	12	3
W71	18	23.4	155	-0.3	1.9	12	3
W72	24	26.2	155	-0.3	1.9	12	3
W73	12	20.2	155	-0.3	1.9	12	3
W74	0	11.4	155	-0.3	1.9	12	3
W75	0	11.4	155	-0.3	1.9	12	3
W76	6	16.4	155	-0.3	1.9	12	3
W77	-48	35.3	155	-0.3	1.9	12	3
W78	-24	26.2	155	-0.3	1.9	12	3
W79	60	39.1	155	-0.3	1.9	12	3
W80	-42	33.3	155	-0.3	1.9	12	3

W81	-12	20.2	155	-0.3	1.9	12	3
W82	-36	31.1	155	-0.3	1.9	12	3
W83	0	11.4	155	-0.3	1.9	12	3
W84	-6	16.4	155	-0.3	1.9	12	3
W85	-6	16.4	155	-0.3	1.9	12	3
W86	-30	28.8	155	-0.3	1.9	12	3
W87	-66	40.8	155	-0.3	1.9	12	3
W88	60	39.1	155	-0.3	1.9	12	3
W89	42	33.3	155	-0.3	1.9	12	3
W90	-30	28.8	155	-0.3	1.9	12	3
W91	-30	28.8	155	-0.3	1.9	12	3
W92	24	26.2	155	-0.3	1.9	12	3
W93	-24	26.2	155	-0.3	1.9	12	3
W94	-6	16.4	155	-0.3	1.9	12	3
W95	18	23.4	155	-0.3	1.9	12	3
W96	0	11.4	155	2.5	5.3	12	3
W97	-36	31.1	155	-0.3	1.9	12	3
W98	-12	20.2	155	-0.3	1.9	12	3
W99	-36	31.1	155	-0.3	1.9	12	3
W100	-36	31.1	155	-0.3	1.9	12	3
W101	-42	33.3	155	-0.3	1.9	12	3
W102	-18	23.4	155	-0.3	1.9	12	3
W103	-24	26.2	155	2.5	5.3	12	3
W104	-42	33.3	155	-0.3	1.9	12	3
W105	12	20.2	155	-0.3	1.9	12	3
W106	-36	31.1	155	-0.3	1.9	12	3
W107	-66	40.8	155	-0.3	1.9	12	3
W108	6	16.4	155	-0.3	1.9	12	3
W109	-21	20.8	130	2.4	5.1	12	2
W110	-21	20.8	130	-0.5	2.4	12	2
W111	-13	17.5	130	-0.5	2.4	12	2
W112	33	25.0	130	-0.5	2.4	12	2
W113	13	17.5	130	-0.5	2.4	12	2
W114	50	30.0	130	-0.5	2.4	12	2
W115	33	25.0	130	-0.5	2.4	12	2
W116	30	24.1	130	-0.5	2.4	12	2
W117	8	15.0	130	2.4	5.1	12	2
W118	79	37.0	130	-0.5	2.4	12	2
W119	13	17.5	130	2.4	5.1	12	2
W120	0	9.8	130	-0.5	2.4	12	2
W121	-21	20.8	130	2.4	5.1	12	2
W122	50	30.0	130	-0.5	2.4	12	2
W123	59	32.3	130	-0.5	2.4	12	2
W124	-8	15.0	130	-0.5	2.4	12	2

W125	21	20.8	130	-0.5	2.4	12	2
W126	-17	19.2	130	-0.5	2.4	12	2
W127	-21	20.8	130	-0.5	2.4	12	2
W128	29	23.7	130	2.4	5.1	12	2
W129	4	12.7	130	-0.5	2.4	12	2
W130	29	23.7	130	-0.5	2.4	12	2
W131	-17	19.2	130	-0.5	2.4	12	2
W132	63	33.3	130	-0.5	2.4	12	2

Removable Surface Activity Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

Building Ceiling (Interior)

Location (see map)	Removable Beta (dpm/100cm2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm2)	Uncertainty 95% CL	MDA	Instrument #
C1	-65	40.5	155	-0.3	1.9	12	1
C2	30	28.8	155	-0.3	1.9	12	1
C3	18	23.4	155	-0.3	1.9	12	1
C4	-12	20.2	155	2.5	5.3	12	1
C5	24	26.2	155	2.5	5.3	12	1
C6	-30	28.8	155	-0.3	1.9	12	1
C7	0	11.4	155	-0.3	1.9	12	1
C8	12	20.2	155	-0.3	1.9	12	1
C9	-24	26.2	155	-0.3	1.9	12	1
C10	60	39.1	155	-0.3	1.9	12	1
C11	6	16.4	155	-0.3	1.9	12	1
C12	6	16.4	155	2.5	5.3	12	1
C13	-42	33.3	155	-0.3	1.9	12	1
C14	42	33.3	155	-0.3	1.9	12	1
C15	48	35.3	155	-0.3	1.9	12	1
C16	36	31.1	155	-0.3	1.9	12	1
C17	6	16.4	155	-0.3	1.9	12	1
C18	6	16.4	155	-0.3	1.9	12	1
C19	-6	16.4	155	2.5	5.3	12	1
C20	-18	23.4	155	-0.3	1.9	12	1
C21	12	20.2	155	-0.3	1.9	12	1
C22	12	20.2	155	2.5	5.3	12	1
C23	42	33.3	155	-0.3	1.9	12	1
C24	18	23.4	155	-0.3	1.9	12	1
C25	6	16.4	155	-0.3	1.9	12	1
C26	6	16.4	155	-0.3	1.9	12	1
C27	-60	39.1	155	-0.3	1.9	12	1
C28	6	16.4	155	2.5	5.3	12	1
C29	6	16.4	155	-0.3	1.9	12	1
C30	-42	33.3	155	-0.3	1.9	12	1
C31	-18	23.4	155	-0.3	1.9	12	1
C32	54	37.2	155	-0.3	1.9	12	1
C33	-96	48.6	155	-0.3	1.9	12	1
C34	24	26.2	155	-0.3	1.9	12	1
C35	-6	16.4	155	-0.3	1.9	12	1
C36	-18	23.4	155	-0.3	1.9	12	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info (3-20):

	Beta	Alpha
Background (cpm)	46	0.12
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	155	12.0

Removable Surface Activity Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

Building Exterior (Walls and Roof)

Location (see map)	Removable Beta (dpm/100cm2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm2)	Uncertainty 95% CL	MDA	Instrument #
W1	6	13.8	129	-1	3.3	12.1	1
W2	73	35.6	129	-1	3.3	12.1	1
W3	30	24.0	129	-1	3.3	12.1	1
W4	55	31.3	129	-1	3.3	12.1	1
W5	-36	25.9	129	-1	3.3	12.1	1
W6	0	9.7	129	1.8	4.5	12.1	1
W7	61	32.8	129	-1.0	3.3	12.1	1
W8	-12	16.9	129	-1.0	3.3	12.1	1
W9	-6	13.8	129	-1.0	3.3	12.1	1
W10	79	36.9	129	-1	3.3	12.1	1
W11	12	16.9	129	-1	3.3	12.1	1
W12	36	25.9	129	-1.0	3.3	12.1	1
W13	36	25.9	129	-1	3.3	12.1	1
W14	-78	36.7	129	-1	3.3	12.1	1
W15	36	25.9	129	-1	3.3	12.1	1
W16	12	16.9	129	-1	3.3	12.1	1
W17	24	21.9	129	-1	3.3	12.1	1
W18	-24	21.9	129	-1	3.3	12.1	1
W19	30	24.0	129	1.8	4.5	12.1	1
W20	-30	24.0	129	1.8	4.5	12.1	1
W21	24	21.9	129	-1	3.3	12.1	1
W22	-36	25.9	129	-1	3.3	12.1	1
W23	36	25.9	129	-1	3.3	12.1	1
W24	12	16.9	129	-1	3.3	12.1	1
W25	0	9.7	129	-1	3.3	12.1	1
W26	-42	27.7	129	-1	3.3	12.1	1
R1	0	9.7	129	-1	3.3	12.1	1
R2	-36	25.9	129	-1	3.3	12.1	1
R3	60	32.5	129	-1	3.3	12.1	1
R4	-24	21.9	129	-1	3.3	12.1	1

#1 - Ludlum 2929 No. 115563 with 43-10 No. 127216 Info:

	Beta	Alpha
Background (cpm)	70	0.14
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficiency	0.239	0.35
MDA	129	12.1

Elevated Removable Surface Activity Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

No elevated removable surface activity was reported above limits.

Exposure Rate Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

Building Floor

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
F1	10	1	F83	9	0
F2	10	1	F84	8	-1
F3	10	1	F85	8	-1
F4	10	1	F86	9	0
F5	10	1	F87	9	0
F6	15	6	F88	9	0
F7	23	14	F89	9	0
F8	15	6	F90	9	0
F9	15	6	F91	9	0
F10	10	1	F92	9	0
F11	9	0	F93	9	0
F12	11	2	F94	10	1
F13	10	1	F95	9	0
F14	10	1	F96	9	0
F15	15	6	F97	9	0
F16	15	6	F98	10	1
F17	15	6	F99	10	1
F18	16	7	F100	9	0
F19	10	1	F101	9	0
F20	10	1	F102	9	0
F21	10	1	F103	9	0
F22	10	1	F104	9	0
F23	10	1	F105	9	0
F24	10	1	F106	9	0
F25	10	1	F107	10	1
F26	9	0	F108	10	1
F27	10	1	F109	9	0
F28	9	0	F110	9	0
F29	9	0	F111	10	1
F30	9	0	F112	9	0
F31	9	0	F113	9	0
F32	9	0	F114	9	0
F33	9	0	F115	9	0
F34	9	0	F116	9	0
F35	9	0	F117	9	0
F36	9	0	F118	9	0
F37	10	1	F119	9	0
F38	10	1	F120	9	0
F39	9	0	F121	9	0
F40	9	0	F122	8	-1
F41	9	0	F123	8	-1
F42	9	0	F124	8	-1
F43	9	0	F125	9	0

F44	9	0	F126	9	0
F45	9	0	F127	9	0
F46	8	-1	F128	9	0
F47	8	-1	F129	9	0
F48	8	-1	F130	9	0
F49	8	-1	F131	9	0
F50	8	-1	F132	9	0
F51	8	-1	F133	8	-1
F52	8	-1	F134	9	0
F53	8	-1	F135	9	0
F54	8	-1	F136	9	0
F55	8	-1	F137	8	-1
F56	8	-1	F138	9	0
F57	9	0	F139	9	0
F58	9	0	F140	9	0
F59	9	0	F141	9	0
F60	8	-1	F142	9	0
F61	10	1	F143	9	0
F62	9	0	F144	10	1
F63	9	0	F145	9	0
F64	8	-1	F146	9	0
F65	8	-1	F147	9	0
F66	8	-1	F148	8	-1
F67	8	-1	F149	8	-1
F68	8	-1	F150	8	-1
F69	8	-1	F151	8	-1
F70	8	-1	F152	9	0
F71	8	-1	F153	8	-1
F72	8	-1	F154	8	-1
F73	9	0	F155	8	-1
F74	9	0	F156	9	0
F75	9	0	F157	8	-1
F76	9	0	F158	9	0
F77	9	0	F159	8	-1
F78	9	0	F160	8	-1
F79	9	0	F161	8	-1
F80	9	0	F162	8	-1
F81	9	0	F163	8	-1
F82	8	-1			

Background dose rate: 8-10 uR/hr with Model 19, No.115870

Exposure Rate Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

Building Walls (Interior)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
W1	9	2	W67	6	-1
W2	10	3	W68	6	-1
W3	10	3	W69	6	-1
W4	11	4	W70	5	-2
W5	10	3	W71	5	-2
W6	10	3	W72	6	-1
W7	9	2	W73	6	-1
W8	13	5	W74	6	-1
W9	12	5	W75	5	-2
W10	9	2	W76	6	-1
W11	9	2	W77	6	-1
W12	8	1	W78	7	0
W13	8	1	W79	6	-1
W14	8	1	W80	6	-1
W15	8	1	W81	6	-1
W16	8	1	W82	7	0
W17	9	2	W83	6	-1
W18	8	1	W84	6	-1
W19	8	1	W85	6	-1
W20	9	2	W86	6	-1
W21	9	2	W87	6	-1
W22	9	2	W88	7	0
W23	9	2	W89	6	-1
W24	9	2	W90	6	-1
W25	9	2	W91	6	-1
W26	9	2	W92	6	-1
W27	9	2	W93	7	0
W28	9	2	W94	5	-2
W29	8	1	W95	5	-2
W30	9	2	W96	6	-1
W31	9	2	W97	5	-2
W32	8	1	W98	5	-2
W33	8	1	W99	6	-1
W34	8	1	W100	5	-2
W35	8	1	W101	5	-2
W36	7	0	W102	6	-1
W37	9	2	W103	6	-1
W38	8	1	W104	5	-2
W39	8	1	W105	6	-1
W40	8	1	W106	6	-1
W41	9	2	W107	5	-2
W42	9	2	W108	6	-1
W43	8	1	W109	10	3

W44	8	1	W110	10	3
W45	9	2	W111	9	2
W46	9	2	W112	10	3
W47	9	2	W113	10	3
W48	9	2	W114	10	3
W49	9	2	W115	10	3
W50	9	2	W116	8	1
W51	9	2	W117	9	2
W52	8	1	W118	10	3
W53	9	2	W119	10	3
W54	9	2	W120	8	1
W55	8	1	W121	8	1
W56	9	2	W122	9	2
W57	9	2	W123	8	1
W58	9	2	W124	9	2
W59	9	2	W125	9	2
W60	10	3	W126	8	1
W61	9	2	W127	8	1
W62	10	3	W128	10	3
W63	18	10	W129	9	2
W64	8	1	W130	8	1
W65	7	0	W131	9	2
W66	5	-2	W132	8	1

Background dose rate: 6-8 uR/hr with Model 19, No.22526

Exposure Rate Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

Building Ceiling (Interior)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
C1	9	2	C19	7	0
C2	8	1	C20	7	0
C3	8	1	C21	6	-1
C4	7	0	C22	6	-1
C5	7	0	C23	6	-1
C6	6	-1	C24	7	0
C7	6	-1	C25	6	-1
C8	6	-1	C26	6	-1
C9	6	-1	C27	6	-1
C10	5	-2	C28	6	-1
C11	6	-1	C29	7	0
C12	6	-1	C30	6	-1
C13	6	-1	C31	6	-1
C14	6	-1	C32	6	-1
C15	7	0	C33	7	0
C16	6	-1	C34	6	-1
C17	6	-1	C35	7	0
C18	7	0	C36	6	-1

Background dose rate: 6-8 uR/hr with Model 19, No.22526

Exposure Rate Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

Building Exterior (Walls)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
W1	10	0	W14	7	-3
W2	12	2	W15	7	-3
W3	12	2	W16	7	-3
W4	10	0	W17	6	-4
W5	9	-1	W18	7	-3
W6	10	0	W19	7	-3
W7	9	-1	W20	8	-2
W8	9	-1	W21	6	-4
W9	8	-2	W22	6	-4
W10	9	-1	W23	7	-3
W11	13	3	W24	7	-3
W12	9	-1	W25	7	-3
W13	7	-3	W26	8	-2

Background dose rate: 8-12 uR/hr with Model 19, No.22526

Exposure Rate Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

Building Exterior (Roof)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
R1	11	2	see map	10	1
R2	14	5	see map	10	1
R3	10	1	see map	9	0
R4	10	1	see map	9	0
see map	10	1	see map	9	0
see map	10	1	see map	9	0
see map	9	0	see map	9	0
see map	10	1	see map	10	1
see map	10	1	see map	9	0
see map	9	0	see map	10	1
see map	9	0	see map	9	0
see map	10	1	see map	9	0
see map	9	0	see map	9	0
see map	10	1	see map	9	0
see map	9	0	see map	8	-1
see map	10	1	see map	9	0
see map	9	0	see map	9	0
see map	9	0	see map	9	0
see map	8	-1	see map	8	-1
see map	8	-1	see map	9	0

Background dose rate: 8-10 uR/hr with Model 19, No.22526

Summary of Exposure Rate Measurements
Molycorp - Building 35 Survey Unit (Affected Area)

Including all building interior and exterior measurements (uR/hr)

n	$\bar{x}$	s	μ_α
396	0.3	1.7	0.4

$t_{1-\alpha}$ 1.649

Guidelines/Conditions Satisfied?
Yes

Summary of Building Surface Direct Reading (Total Activity) Results
Molycorp - Building 35 Survey Unit (Affected Area)

Including all building interior and exterior measurements

Beta				Alpha			
n	$\bar{x}$	s	μ_α	n	$\bar{x}$	s	μ_α
360	-72	276.5	-47.7	360	-144	552.9	-95.5

$t_{1-\alpha}$ 1.650

Guidelines/Conditions Satisfied?

Beta	Alpha
Yes	Yes

	DDO-138 Radiation Protection Survey Report	Site: Molycorp / Washington, PA

Section 1: Survey Information

Date: 3-21-02	Time: 1600	Location: Bldg 35	Survey Issue Log Number: 02-0085
RWP Number: N/A	Purpose of Survey: ☐ RWP ☐ Routine Survey ☐ Unconditional Release ☐ Other:		Page 1 of 22

Survey Title: AFFECTED BLdg

WALLS CEILING 2360 #164680 7-9-02
43-89 #118544 8-6-02

BKG: B⁻ = 8, α = 3.7
EFF: B⁻ = .113, α = .164
MDA: B⁻ = ~~110~~ 140 mB, α = ~~22~~ 71 mB

FLOOR 2360 #156371 8-15-02
43-89 #164832 8-15-02

		EFF.	MDA
BKG	B⁻ = 78	.088	497
	α = 2.4	.153	65

Model 19 # 115870 Due 8-6-02

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17	N	A
18		
19		
20		
21		
22		
23		
24		
25		
26		

Bkgd Readings:

Legend:
00 = mRem/h gamma; 00 C = mRem/h gamma contact; ① = Smear Location; ▽ = Air Sample Location; -X-X-X- = Rope, Boundary, or Barrier
00 β = mRem/h beta; 00 βC = mRem/h beta contact; —Ⓓ— = Large Area Wipe; = Bulk Material Sample

Section 2: Instrument Used

Instrument Model/SN:	Cal Due Date:	Probe Model/SN:	Cal Due Date:	Detector Eff.: (cpm/dpm)	MDA:	Other BKG
2350-1/95359	8-6-02	43-37/092503	8-6-02	B⁻ .27 α .207	B⁻ 185 α 19.8	B⁻ 1420 α 9.6
2350-1/117014	8-13-02	43-106/133866	8-6-02	B⁻ .248 α .211	B⁻ 613 α 66	B⁻ 259 α 2.2
2350-1/117566	8-6-02	43-106/128912	8-6-02	B⁻ .251 α .212	B⁻ 624 α 44	B⁻ 225 α 1
2929/152202	2-6-03	43-10/156519	2-6-03	B⁻ .165 α .344	B⁻ 206 α 17	B⁻ 45 α .36
2929/115563	6-19-02	43-10/127216	6-19-02	B⁻ .239 α .35	B⁻ 176 α 17	B⁻ 70 α .35

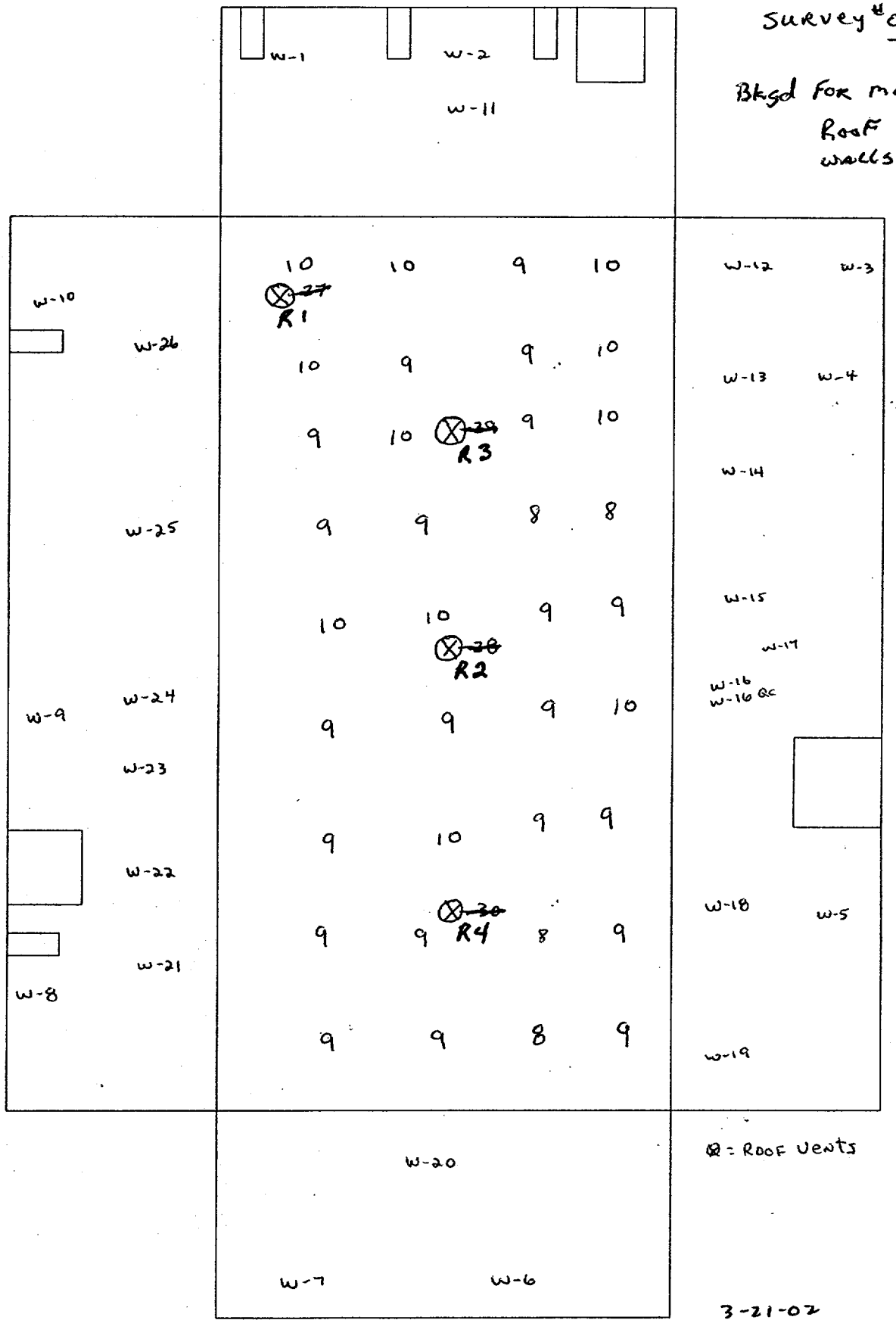
Section 3: Review and Approval

Survey Performed By (Sign):	Area Posted and/or Barricaded:	Date and Time:
Mark Blouciok	☐ Yes ☐ No ☒ Not Required	3-21-02 / 1600
Radiation Safety Officer (Print Name & Sign): Mike McDonald		Date and Time: 4-16-02 9:48

Building 35
North

Survey # 02-0085

Bkgd for model 19
Roof 8-10 cm/H
walls 8-12 cm/H



3-21-02
Mark Blouncik

Exterior

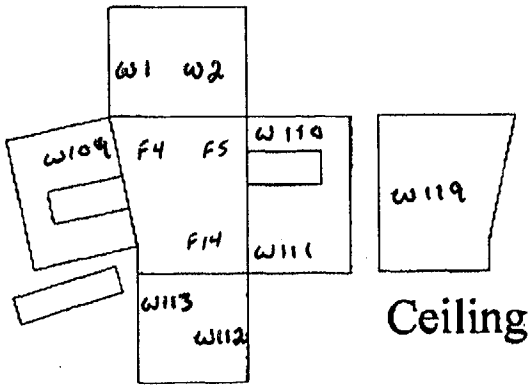
Scale:
4m x 4m

Survey #02-0085

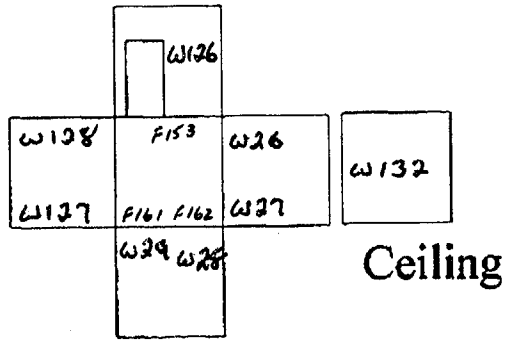
Page 3 of 22

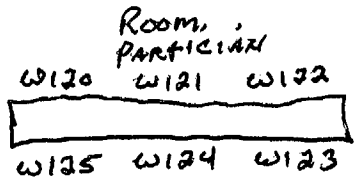
Building 35
North

Interior of North Room

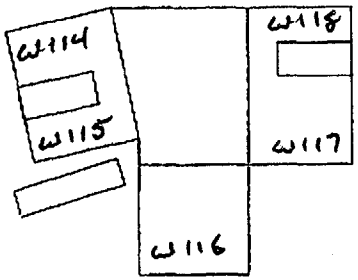


Interior of South Room



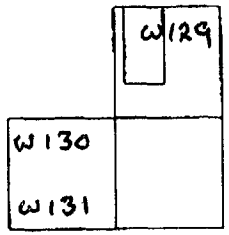


Exterior of North Room



Scale:
4m x 4m

Exterior of South Room



Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg # 35 outside Survey #02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	Steve Filo	Steve Filo	3-21-02
	Justin Trenidad	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-1	320	2	219	191	2	10	-1	6
W-2	NA	NA	269	253	6	12	-1	73
W-3	260	1.2	214	204	5	12	-1	30
W-4	260	1	193	180	3	10	-1	55
W-5	250	1	207	209	4	9	-1	-36
W-6	NA	NA	188	179	2	10	~~[illegible]~~ 1.8	0
W-7	240	2	184	216	5	9	-1	61
W-8	NA	NA	204	189	2	9	-1	-12
W-9			156	143	3	8	-1	-6
W-10			215	195	6	9	-1	79
W-11			300	281	3	13	-1	12
W-12			199	191	4	9	-1	36
W-13			201	165	2	7	-1	36
W-14			159	180	2	7	-1	-78
W-15			182	170	2	7	-1	36
W-16			162	158	3	7	-1	12
W-16BC			166	174	4	7	-1	48
W-17			216	180	3	6	-1	24
W-18			185	170	5	7	-1	-24
W-19			156	191	8	7	1.8	30
W-20			166	182	4	8	1.8	-30
W-21			176	149	6	6	-1	24
W-22			194	157	8	6	-1	-36
W-23			187	159	5	7	-1	36
W-24			170	146	2	7	-1	12
W-25			218	194	6	7	-1	0
W-26	NA	NA	204	203	3	8	-1	-42

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg #35 outside Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	STEVE FILO	Steve Filo	3-21-02
	JUSTIN TRENIDAD	Justin Trenidad	3-21-02

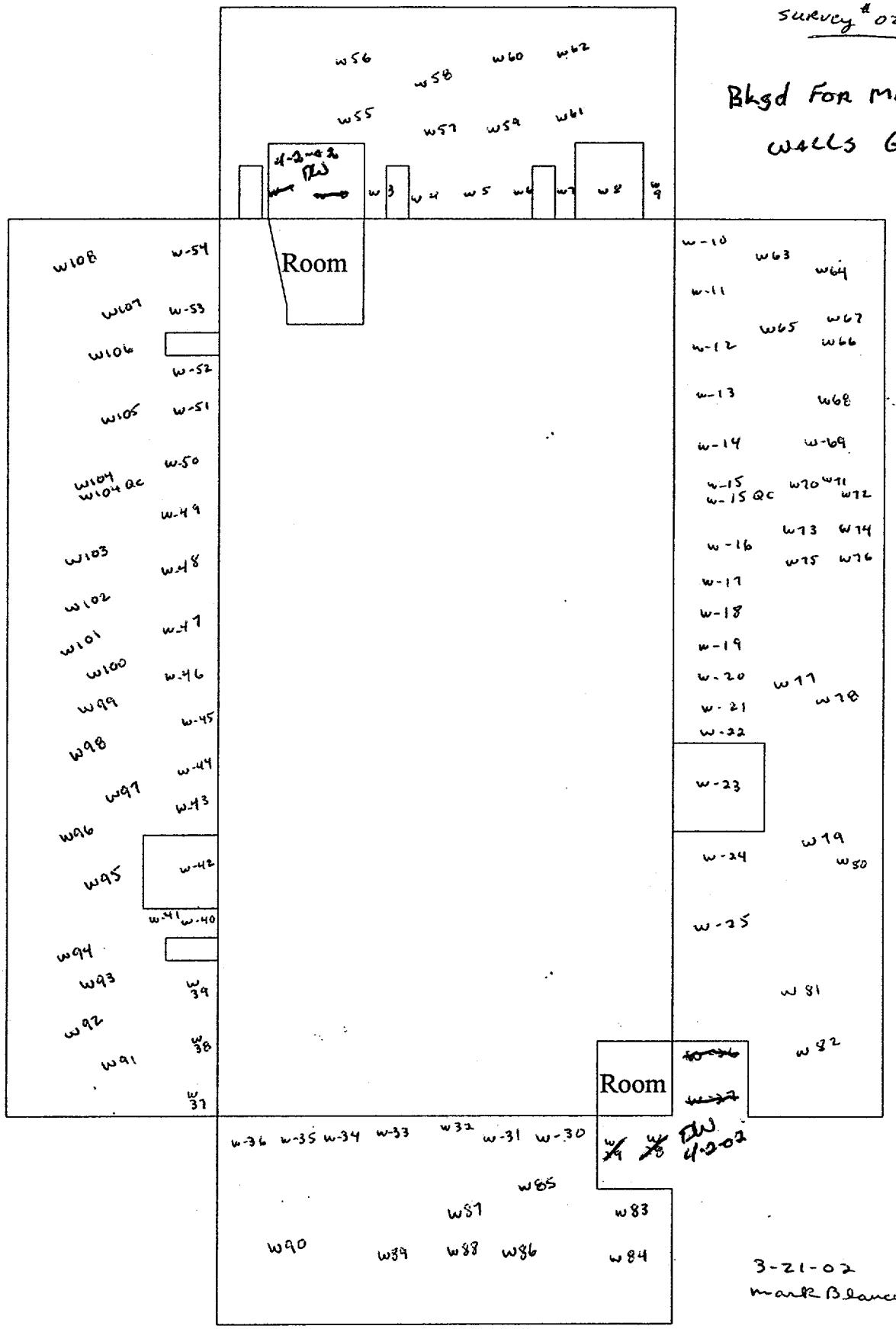
Location 4-2-02 PW	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
* W ~~27~~ R 1	NA	NA	217	177	1	10	-1	0
* W ~~28~~ R 2	↓	↓	238	209	1	9	-1	-36
* W ~~29~~ R 3	↓	↓	257	225	2	9	-1	60
* W ~~30~~ R 4	NA	NA	237	225	5	9	-1	-24

PW ~~W-27~~ ~~W-30~~ Roof vents R1 ~ R4
4-2-02

Building 35
North

Survey # 02-0085

Bldg for model 19
walls 6-8 ur/HL



3-21-02
Mark Blanciak

Interior
Walls

Scale:
4m x 4m

Radiological Survey Results - Survey Location Indicator

Survey Area Information:	Bldg 35 walls Interior	Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	STEVE FILO	Steve Filo	3-21-02
	Justin Trenidad	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-1	295	6	205	197	1	9	-1	-48
W-2	255	5	231	210	2	10	-1	60
W-3	260	3	242	252	0	10	-1	-96
W-4	330	4	258	282	1	11	-1	-30
W-5	315	7	316	288	2	10	-1	24
W-6	360	3	312	299	2	10	-1	-6
W-7	360	2	305	276	1	9	-1	-12
W-8	290	2	287	248	1	13	-1	18
W-9	280	1	238	207	2	12	-1	-18
W-10	260	2	240	226	2	9	-1	-24
W-11	250	4	203	225	0	9	-1	-6
W-12	210	6	221	200	3	8	-1	84
W-13	220	2	209	196	2	8	-1	109
W-14	220	1	199	206	3	8	-1	68
W-15	260	2	206	194	2	8	-1	-24
W-15QC	240	3	219	218	1	8	-1	-60
W-16	180	3	178	176	0	8	-1	-48
W-17	240	1	185	185	2	9	-1	-6
W-18	240	1	185	191	1	8	-1	6
W-19	280	1	195	174	1	8	-1	6
W-20	260	1	228	192	3	9	-1	24
W-21	270	2	201	183	1	9	-1	0
W-22	250	2	208	216	3	9	1.8	-6
W-23	260	2	245	182	2	9	-1	-36
W-24	220	1	208	188	1	9	-1	-48
W-25	200	1	186	214	0	9	-1	24
W-26	270	2	212	201	1	9	-1	30

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 35 walls Interior

Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	STEVE FILO	Steve Filo	3-21-02
	Justin Trenidad	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-27	220	2	209	170	2	9	-1	48
W-28	300	.6	195	193	0	9	-1	-42
W-29	260	.8	205	216	2	8	-1	-6
W-30	280	.6	223	213	2	9	-1	-30
W-31	240	.8	183	193	5	9	-1	18
W-32	320	.8	242	194	7	8	-1	6
W-33	240	.8	204	187	2	8	-1	-18
W-34	240	1.2	182	188	1	8	-1	-36
W-35	250	1.6	189	188	2	8	-1	12
W-36	240	1.2	250	210	5	7	-1	-30
W-37	260	1.2	187	161	2	9	-1	-30
W-38	300	1	260	208	7	8	-1	-42
W-39	240	.4	198	166	5	8	-1	-6
W-40	240	.4	177	204	4	8	-1	42
W-41	250	1	191	210	4	9	-1	-6
W-42	250	1.2	233	188	2	9	1.8	-6
W-43	270	.6	198	169	3	8	1.8	-36
W-44	280	.8	158	203	0	8	-1	-24
W-45	220	.8	169	173	0	9	-1	-6
W-46	240	.8	163	190	1	9	-1	-96
W-47	250	.2	182	183	1	9	-1	-24
W-48	240	.6	197	189	2	9	-1	-66
W-49	220	.6	249	198	3	9	-1	12
W-50	240	.4	184	168	3	9	-1	6
W-51	270	.4	248	209	3	9	-1	42
W-52	240	0	203	175	3	8	-1	-78
W-53	220	.2	202	203	1	9	-1	-18
W-54	240	1	236	208	6	9	-1	-36

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 35 Interior Walls

Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	Steve Filo	Steve Filo	3-21-02
	Justin Trenidad	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-55	320	1	238	227	1	8	2.4	-33
W-56	320	1	309	273	0	9	-.3	8.3
W-57	300	.8	288	308	1	9	-.3	-12
W-58	320	2	242	276	0	9	-.3	30
W-59	300	1	300	266	2	9	-.3	-30
W-60	320	1	289	320	3	10	2.5	0
W-61	350	2	281	308	0	9	-.3	-54
W-62	340	1	284	281	3	10	-.3	-30
W-63	290	1	215	230	2	18	2.5	24
W-64	300	.8	241	231	2	8	2.5	48
W-65	270	1	234	203	4	7	2.5	-24
W-66	290	1	203	177	4	5	-.3	30
W-67	270	1	241	189	1	6	-.3	12
W-68	290	1	211	208	0	6	-.3	-18
W-69	300	.8	194	209	4	6	2.5	-72
W-70	270	1	223	188	0	5	-.3	18
W-71	270	1	205	224	2	5	-.3	18
W-72	290	2	206	195	0	6	-.3	24
W-73	270	1	195	203	2	6	-.3	12
W-74	290	1	202	203	2	6	-.3	0
W-75	300	1	206	195	4	5	-.3	0
W-76	270	1	183	193	0	6	-.3	6
W-77	280	1	214	196	1	6	-.3	-48
W-78	275	1	200	193	0	7	-.3	-24
W-79	290	.8	193	197	1	6	-.3	60
W-80	300	1	230	202	2	6	-.3	-42
W-81	300	1	219	224	1	6	-.3	-12

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 35 Interior walls

Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	Steve Filo	Steve Filo	3-21-02
	Justin Trenidad	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-82	290	1	213	180	2	7	-0.3	-36
W-83	300	.8	184	207	3	6	-0.3	0
W-84	270	1	203	206	2	6	-0.3	-6
W-85	300	1	201	208	1	6	-0.3	-6
W-86	290	1	238	186	2	6	-0.3	-30
W-87	270	.8	180	173	2	6	-0.3	-66
W-88	290	1.2	184	210	2	7	-0.3	60
W-89	300	1	189	161	1	6	-0.3	42
W-90	300	1	196	194	1	6	-0.3	-30
W-91	280	1.4	172	184	1	6	-0.3	-30
W-92	300	1	209	192	3	6	-0.3	24
W-93	290	1	189	216	2	7	-0.3	-24
W-94	280	1.4	214	182	2	5	-0.3	-6
W-95	270	1	203	203	3	5	-0.3	18
W-96	290	.8	215	196	0	6	2.5	0
W-97	280	2.0	197	167	0	5	-0.3	-36
W-98	280	1.4	199	172	2	5	-0.3	-12
W-99	290	1	169	188	3	6	-0.3	-36
W-100	280	2	189	178	4	5	-0.3	-36
W-101	300	1.5	175	168	4	5	-0.3	-42
W-102	300	1	175	196	1	6	-0.3	-18
W-103	265	1.6	183	184	4	6	2.5	-24
W-104	290	1	204	194	1	5	-0.3	-42
W-104 QC	280	2	183	182	2	5	-0.3	36
W-105	300	1	199	176	3	6	-0.3	12
W-106	320	1	212	191	1	6	-0.3	-36
W-107	290	1.4	201	197	2	5	-0.3	-66
W-108	300	1	213	212	1	6	-0.3	6

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Building 35/survey of rooms inside building 35 Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
						~~71~~	~~140~~	

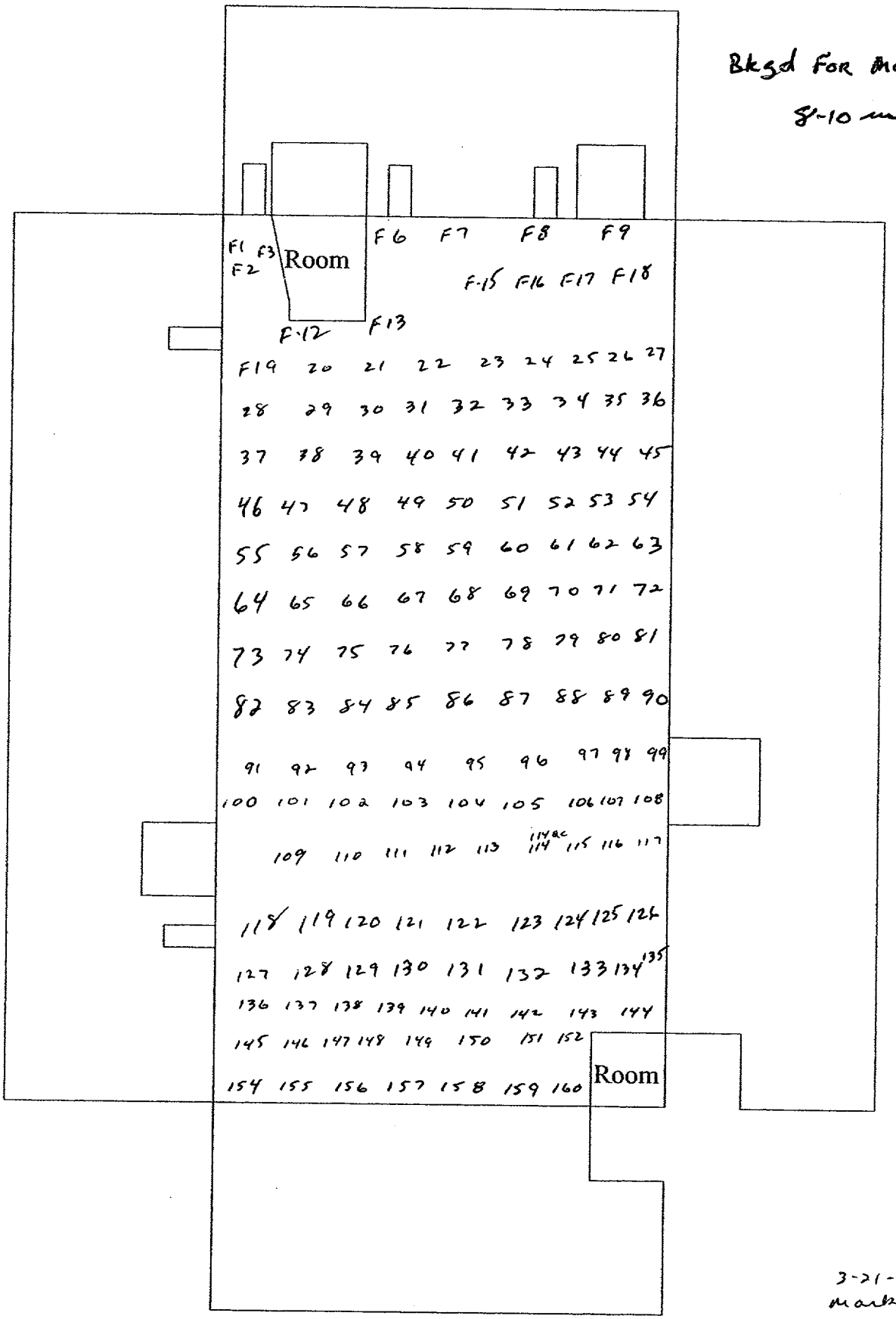
Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	TAMMIE S. DARBY	Tammie S. Darby	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W 109	360	1	290	253	0	10	2.4	-21
W 110	360	0	297	272	2	10	-.5	-21
W 111	400	1	360	344	1	9	-.5	-13
W 112	330	0	318	280	2	10	-.5	33
W 113	450	1	347	288	2	10	-.5	13
W 114	368	2	304	246	0	10	-.5	50
W 115	413	1	292	238	1	10	-.5	33
W 116	453	0	297	239	0	8	-.5	30
W 117	360	0	344	287	0	9	2.4	8
W 118	340	0	367	352	2	10	-.5	79
W 119	380	0	354	300	2	10	2.4	13
W 120	270	0	184	156	1	8	-.5	0
W 121	272	1	182	164	0	8	2.4	-21
W 122	318	0	187	196	0	9	-.5	50
W 123	260	.6	181	186	2	8	-.5	59
W 124	270	0	203	189	0	9	-.5	-8
W 125	282	0	182	181	1	9	-.5	21
W 126	220	2	203	185	2	8	-.5	-17
W 127	270	.5	214	184	2	8	-.5	~~29~~ -21
W 128	300	1	208	209	3	10	2.4	29
W 129	360	1	195	197	0	9	-.5	4
W 130	280	1	188	187	2	8	-.5	29
W 131	250	0	207	195	0	9	-.5	-17
W 132	274	1	262	220	0	8	-.5	63
				N				
					A			

Survey # 02-0085

Bkgd for Model 19
8-10 m/HL

North



3-21-02
Mark Blaurock

FLOOR
Interior

Scale:
4m x 4m

Page 12 of 22

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 35 Interior Floor — Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	Steve Filo	Steve Filo	3-21-02
	Justin Trenidad	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-1	1600	8	320	246	2	10	-1	-63
F-2	1500	7	324	272	2	10	-1	-13
F-3	1700	7	396	367	1	10	DW ~~1.8~~ 2	0
F-4	1400	7	325	301	1	10	-1	33
F-5	1400	7	296	286	1	10	-1	4
F-6	2600	9	584	498	3	15	-1	-25
F-7	10,000	9	1181	1086	5	23	-1	-29
F-8	1800	9	352	305	5	15	DW ~~1.8~~ 2	-46
F-9	1800	12	485	369	2	15	-1	0
F-10	1500	8	334	309	3	10	-1	-20
F-11	1400	4	336	267	2	9	-1	-8
F-12	1500	11	321	229	2	11	-1	4
F-13	1600	10	340	284	3	10	2	-5
F-14	1600	6	379	377	0	10	5	-17
F-15	2400	9	468	393	3	15	-1	-42
F-16	2700	12	516	427	3	15	-1	-4
F-17	1900	12	377	319	3	15	-1	29
F-18	1800	10	460	390	3	16	-1	4
F-19	1600	10	352	264	5	10	-1	-16
F-20	1400	9	358	270	4	10	-1	-218
F-21	1500	12	322	283	2	10	-1	-25
F-22	1600	12	361	270	4	10	-1	-54
F-23	1500	10	341	281	6	10	2	-25
F-24	1500	6	338	266	1	10	-1	-16
F-25	1800	11	381	296	4	10	-1	-21
F-26	1700	12	388	285	4	9	-1	-42
F-27	1900	11	368	331	2	10	-1	63

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 35 Interior Floor Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	STEVE FILO	Steve Filo	3-21-02
	Justin Trenidad	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-28	1500	9	298	244	2	9	-1	-13
F-29	1500	11	355	253	2	9	-1	-293
F-30	1400	9	310	255	2	9	-1	13
F-31	1500	9	288	263	6	9	-1	-46
F-32	1600	12	324	219	1	9	-1	-25
F-33	1600	10	321	272	2	9	-1	-54
F-34	1500	11	324	288	2	9	-1	8
F-35	1600	11	316	268	3	9	-1	-8
F-36	1700	12	315	258	4	9	2	8
F-37	1500	12	315	237	2	10	2	-13
F-38	1500	12	288	254	3	10	-1	-38
F-39	1500	11	328	283	3	9	-1	-17
F-40	1500	14	322	260	4	9	4	-59
F-41	1500	11	339	245	1	9	-1	25
F-42	1600	10	334	263	2	9	2	-54
F-43	1500	12	326	250	4	9	2	50
F-44	1400	11	291	277	3	9	-1	4
F-45	1500	9	342	290	5	9	-1	42
F-46	1400	11	281	267	2	8	-1	-13
F-47	1400	8	338	257	5	8	-1	0
F-48	1500	10	297	285	4	8	2	-8
F-49	1500	12	308	267	0	8	-1	-67
F-50	1500	8	321	283	3	8	2	8
F-~~SR~~ MS 51	1600	6	335	262	0	8	4	50
F-52	1600	6	299	288	1	8	4	-30
F-53	1500	8	327	270	3	8	-1	4
F-54	1500	8	309	280	4	8	-1	46

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 35 Interior Floor Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	STEVE FILO	Steve Filo	3-21-02
	Justin TRENIDAD	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (µrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-55	1400	10	343	260	1	8	-1	-25
F-56	1500	10	339	268	5	8	-1	-8
F-57	1600	10	305	279	2	9	-1	46
F-58	1500	12	332	267	4	9	-1	21
F-59	1400	10	308	285	1	9	2	-8
F-60	1500	8	325	274	2	8	4	~~46~~ 54 T.S.D. 3-20-02
F-61	1600	6	287	269	0	10	-1	33
F-62	1500	6	355	258	4	9	-1	71
F-63	1600	6	334	259	3	9	4	-25
F-64	1600	12	350	267	6	8	-1	-38
F-65	1400	7	339	261	5	8	-1	-46
F-66	1400	8	359	279	4	8	-1	88
F-67	1500	10	325	250	2	8	2	59
F-68	1600	12	354	281	0	8	2	-21
F-69	1500	12	323	261	0	8	-1	-38
F-70	1400	10	304	283	2	8	-1	54
F-71	1400	8	313	270	1	8	-1	30
F-72	1500	6	348	277	4	8	2	8
F-73	1600	12	357	231	0	9	-1	25
F-74	1600	10	335	256	4	9	~~-5~~ -.5	~~0~~
F-75	1500	8	329	221	3	9	~~-5~~ -.5	29
F-76	1500	12	350	261	1	9	~~-5~~ -.5	75
F-77	1400	8	330	269	0	9	~~-5~~ -.5	13
F-78	1400	6	309	256	2	9	~~-5~~ -.5	-38
F-79	1600	8	362	269	1	9	~~-5~~ -.5	-33
F-80	1600	10	319	250	0	9	~~-5~~ -.5	-88
F-81	1400	8	327	278	2	9	~~-5~~ -.5	-21

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 35 Interior Floor Survey #02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	Steve Filo	Steve Filo	3-21-02
	Justin Trenidad	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-82	1500	10	306	263	7	8	~~-5~~ -.5	-13
F-83	1400	8	311	266	2	9	~~-5~~ -.5	-30
F-84	1400	8	385	278	3	8	-.5	25
F-85	1500	12	329	271	1	8	-.5	50
F-86	1500	10	338	246	1	9	-.5	-50
F-87	1400	10	328	245	3	9	-.5	-46
F-88	1500	12	324	281	1	9	-.5	-30
F-89	1400	10	319	283	6	9	-.5	84
F-90	1600	4	335	251	4	9	-.5	50
F-91	1400	10	342	285	0	9	-.5	80
F-92	1400	12	347	266	4	9	-.5	-33
F-93	1500	6	385	264	3	9	-.5	21
F-94	1600	14	321	261	2	10	-.5	-33
F-95	1400	6	303	234	2	9	~~-5~~ -.5	-55
F-96	1500	12	330	295	1	9	2.4	~~0~~
F-97	1500	8	323	271	2	9	-.5	.33
F-98	1600	12	343	297	2	10	2.4	42
F-99	1500	8	371	280	1	10	-.5	-33
F-100	1400	8	312	272	6	9	-.5	13
F-101	1600	10	347	288	2	9	-.5	~~0~~
F-102	1600	12	345	282	2	9	-.5	-25
F-103	1600	12	321	282	4	9	-.5	-8
F-104	1500	6	311	243	1	9	-.5	25
F-105	1400	6	322	259	1	9	-.5	-8
F-106	1400	12	353	300	3	9	-.5	25
F-107	1400	10	347	254	1	10	-.5	-13
F-108	1400	6	334	288	3	10	-.5	-42

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg. 35 Interior Floor — Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK Blaucett	Mark Blaucett	3-21-02
	STEVE FILO	Steve Filo	3-21-02
	JUSTIN TRENIDAD	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-109	1400	8	383	339	2	9	2.4	-17
F-110	1400	6	340	281	1	9	-.5	-13
F-111	1500	6	358	304	2	10	2.4	-88
F-112	1200	10	300	272	3	9	2.4	25
F-113	1400	12	291	283	3	9	-.5	0
F-114	1500	8	328	258	1	9	-.5	29
F-114QC	1400	8	341	268	3	9	-.5	29
F-115	1500	6	311	274	2	9	-.5	-54
F-116	1400	14	307	272	2	9	-.5	17
F-117	1400	6	325	274	1	9	2.4	-46
F-118	1500	8	383	278	1	9	-.5	-46
F-119	1400	8	315	254	1	9	-.5	-46
F-120	1600	12	306	254	2	9	-.5	-21
F-121	1500	10	326	261	2	8	-.5	-71
F-122	1500	10	312	276	2	8	-.5	-8
F-123	1400	8	282	272	0	8	-.5	29
F-124	1500	6	349	314	1	9	-.5	4
F-125	144	12	357	307	0	9	-.5	-84
F-126	1500	12	303	285	6	9	-.5	-42
F-127	1500	10	331	247	2	9	-.5	-21
F-128	1500	8	351	270	2	9	-.5	-42
F-129	1500	8	310	282	0	9	-.5	-21
F-130	1500	8	286	280	1	9	2.4	-17
F-131	1600	6	353	296	7	9	-.5	-4
F-132	1500	12	321	249	2	8	-.5	-17
F-133	1400	10	335	275	2	9	-.5	-4
F-134	1400	10	339	337	1	9	2.4	-25

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 35 Interior Floor

Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	STEVE FILO	Steve Filo	3-21-02
	JUSTIN TRENIDAD	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-135	1400	8	303	260	3	9	-.5	-4
F-136	1400	9	318	256	3	8	2.4	-29
F-137	1500	9	356	270	1	9	-.5	-8
F-138	1300	12	317	261	1	9	-.5	-29
F-139	1400	12	311	252	1	9	-.5	-25
F-140	1600	10	320	213	0	9	2.4	4
F-141	1500	9	310	242	0	9	-.5	-17
F-142	1500	14	325	239	7	9	2.4	-4
F-143	1500	11 ~~313~~ NO	313	273	2	10	-.5	-17
F-144	1400	12	337	270	1	9	-.5	46
F-145	1400	12	318	255	4	9	-.5	54
F-146	1600	8	290	257	1	9	-.5	0
F-147	1500	10	319	254	2	8	-.5	-8
F-148	1400	9	352	271	2	8	2.4	54
F-149	1400	9	301	277	3	8	-.5	-13
F-150	1400	10	331	247	3	8	-.5	-25
F-151	1500	12	332	268	4	9	2.4	46
F-152	1500	14	332	273	3	8	-.5	-21
F-153	1600	9	293	274	0	8	-.5	0
F-154	1500	10	353	277	3	8	-.5	8
F-155	1500	10	315	252	6	9	-.5	67
F-156	1400	9	337	290	5	8	-.5	0
F-157	1400	12	337	271	5	9	-.5	-25
F-158	1400	9	349	280	4	8	-.5	-21
F-159	1400	9	317	272	3	8	-.5	-63
F-160	1400	10	326	277	1	8	-.5	-46
F-161	1500	10	333	289	2	8	-.5	-4
F-162	1400	11	338	288	1	8	2.4	33

Bldg. 35

North

Survey # 02-0085

Bkgd 6-8 [illegible]/HR

4	3	2	1
8	7	6	5
12	11	10	9
16	15	14	13
20	19	18	17
24	23	22	21 21QC
28	27	26	25
32	31	30	29
36	35	34	33

Ceiling

Scale: 4m x 4m

3-21-02 Mark Blanciak

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 35 Interior Ceiling Survey # 02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	Justin Trenidad	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
C-1	280	1	295	250	2	9	-.03	-65
C-2	290	2	290	304	2	8	-.03	30
C-3	280	2	330	280	1	8	-.03	18
C-4	260	3	301	294	2	7	2.5	-12
C-5	280	2	285	255	2	7	2.5	24
C-6	260	1	275	266	2	6	-.03	-30
C-7	260	4	273	245	1	6	-.03	0
C-8	280	1.2	267	247	3	6	-.03	12
C-9	280	1.6	241	269	1	6	-.03	-24
C-10	260	1.4	260	245	1	5	-.03	60
C-11	260	1	254	238	2	6	-.03	6
C-12	280	2	271	232	2	6	2.5	6
C-13	260	2	243	222	1	6	-0.3	-42
C-14	280	2	232	239	1	6	-0.3	42
C-15	290	1.6	234	214	1	7	-0.3	48
C-16	280	2	255	200	2	6	-0.3	56
C-17	280	2	251	207	1	6	-0.3	6
C-18	280	1	204	210	2	7	-0.3	6
C-19	260	1	223	230	1	7	2.5	-6
C-20	260	.8	248	230	1	7	-0.3	-18
C-21	280	.6	233	200	1	6	-0.3	12
C-21QC	280	1.2	236	199	2	6	-0.3	-65
C-22	260	1.2	248	215	2	6	2.5	12
C-23	260	1	223	189	1	6	-0.3	42
C-24	280	2	221	201	2	7	-0.3	18
C-25	260	1	226	220	2	6	-0.3	6
C-26	280	1.4	252	206	2	6	-0.3	6

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg 35 Interior Ceiling Survey #02-0085

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	3-21-02
	Justin Trenidad	Justin Trenidad	3-21-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
C-27	260	2	248	228	2	6	-0.3	-60
C-28	280	1	225	223	1	6	2.5	6
C-29	260	1.2	234	220	2	7	-0.3	6
C-30	260	2	216	195	1.6	6	-0.3	-42
C-31	270	1	207	192	3	6	-0.3	-18
C-32	280	.8	182	198	2	6	-0.3	54
C-33	280	1	222	223	1	7	-0.3	-96
C-34	260	2	202	199	2	6	-0.3	24
C-35	270	2	204	205	1	7	-0.3	-6
C-36	270	1.6	244	200	2	6	-0.3	-18

	DDO-138 Radiation Protection Survey Report	Site: Molycorp / Washington, PA

Section 1: Survey Information

Date:	Time:	Location:	Survey Issue Log Number:
3-21-02	1600	Bldg 35	02-0485

RWP Number:	Purpose of Survey:	Page
N/A	☐ RWP ☐ Routine Survey ☐ Unconditional Release ☒ Other:	22 of 22

Survey Title:

2929 # 152202 43-10 # 156519 WAS USED ON 3-20-02 TO COUNT SMEARS W55 - W108 CAL DUE 2-6-03 Bkgd α .12 β⁻ 46 EFF α .344 β⁻ .665 MDA α 12 β⁻ 212

2929 # 115563 43-10 # 127216 WAS USED ON 3-20-02 TO COUNT SMEARS W109-W132 F74 - F163 CAL DUE 6-19-02 Bkgd α .16 β⁻ 72 EFF α .35 β⁻ .239 MDA α 14 β⁻ 176

WAS ALSO USED TO FOR C1-C36

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		

Bkgd Readings:

Legend:

00 = mRem/h gamma | 00 C = mRem/h gamma contact | ⓘ = Smear Location | ▽ = Air Sample Location | -X-X-X- = Rope, Boundary, or Barrier

00 β = mRem/h beta | 00 βC = mRem/h beta contact | —Ⓓ— = Large Area Wipe | = Bulk Material Sample

Section 2: Instrument Used

Instrument Model/SN:	Cal Due Date:	Probe Model/SN:	Cal Due Date:	Detector Eff.: (cpm/dpm)	MDA:	Other
N/A			N/A			N/A

Section 3: Review and Approval

Survey Performed By (Sign):	Area Posted and/or Barricaded:	Date and Time:
[signature]	☐ Yes ☐ No ☒ Not Required	3-21-02

Radiation Safety Officer (Print Name & Sign):	Date and Time:
Mike McDonald [signature]	4-16-02 9:48

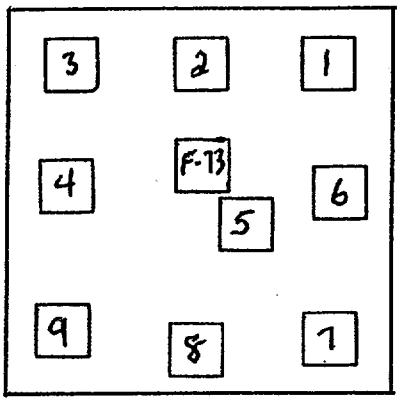
	DDO-138 Radiation Protection Survey Report	Site: Molycorp / Washington, PA

Section 1: Survey Information

Date:	Time:	Location:	Survey Issue Log Number:
4-3-02	1245	Bldg 35	02-0099

RWP Number:	Purpose of Survey:	Page
N/A	☐ RWP ☐ Routine Survey ☐ Unconditional Release ☒ Other:	1 of 2

Survey Title: ONE SQUARE METER SURVEY GRID # F73



Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11	N	A
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		

$545\left(\frac{100}{10{,}000}\right) + 19\left(1-\frac{100}{10{,}000}\right)$

$5.45 + 18.98 = 24.43$ DPM

β^- 1 METER AVE 24.43 dpm α AVE 48.86 AVE

Bkgd Readings: α 2.4 β^- 78

Legend:

00 = mRem/h gamma | 00 C = mRem/h gamma contact | ① = Smear Location | ▽ = Air Sample Location | -X-X-X- = Rope, Boundary, or Barrier

00 β = mRem/h beta | 00 βC = mRem/h beta contact | —①— = Large Area Wipe | = Bulk Material Sample

Section 2: Instrument Used

Instrument Model/SN:	Cal Due Date:	Probe Model/SN:	Cal Due Date:	Detector Eff.: (cpm/dpm)	MDA:	Other
2224/129463	8-6-02	43-89/169230	8-6-02	α .154 β^- .092	α 64 β^- 476	
	N			N		
	A			A		

Section 3: Review and Approval

Survey Performed By (Sign):	Area Posted and/or Barricaded:	Date and Time:
[signature]	☐ Yes ☐ No ☒ Not Required	4-3-02 1245
Radiation Safety Officer (Print Name & Sign): Mike McDonald [signature]		Date and Time: 4-16-02 9:48

Radiological Survey Results - Calculational Sheet

Survey # 02-0099

Location	β Static (unsh) (cpm)	β Static (sh) (cpm)	Gross β	Minus Bkgd = (Net β)	Net β dpm/100 cm²
1	321	261	60	-18	-196
2	337	272	65	-13	-141
3	342	241	101	23	250
4	334	244	90	12	130
5	364	250	114	36	391
6	324	254	70	-8	-87
7	319	256	63	-15	-163
8	342	267	75	-3	-33
9	348	268	80	2	22
					173 / 19

N/A

Instrument Model/SN:	Probe Model/SN:	Detector Eff.: (cpm/dpm)

N/A

Material	Bkgd
Concrete	x2.4 β 78

N/A

DDO-138 Radiation Protection Survey Report

Site: Molycorp / Washington, PA

Section 1: Survey Information

Date:	Time:	Location:	Survey Issue Log Number:
3-27-02	1400	Bldg 35	02-0094

RWP Number: N/A

Purpose of Survey: ☐ RWP ☐ Routine Survey ☐ Unconditional Release ☒ Other:

Page 1 of 2

Survey Title: Remidiation Bldg 35

A Four Foot by Four Foot Section of Concrete in the North East Side of Bldg 35 was Removed Due to Readings > 750 dpm/100 cm² β⁻ the pieces of the concrete floor were taken to an RMA to be stored all Readings in the Rest of the Bldg < 500 dpm/100 cm² β⁻ Dose Rates @ 1 meter from the Soil 32-36 mr/hr

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13	N	A
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		

Bkgd Readings: Static β⁻ 78 α 2.4 Dose Rate 10-12 mr/hr

Legend:
00 = mRem/h gamma; 00 C = mRem/h gamma contact; ① = Smear Location; ▽ = Air Sample Location; -X-X-X- = Rope, Boundary, or Barrier
00 β = mRem/h beta; 00 βC = mRem/h beta contact; —Ⓓ— = Large Area Wipe; = Bulk Material Sample

Section 2: Instrument Used

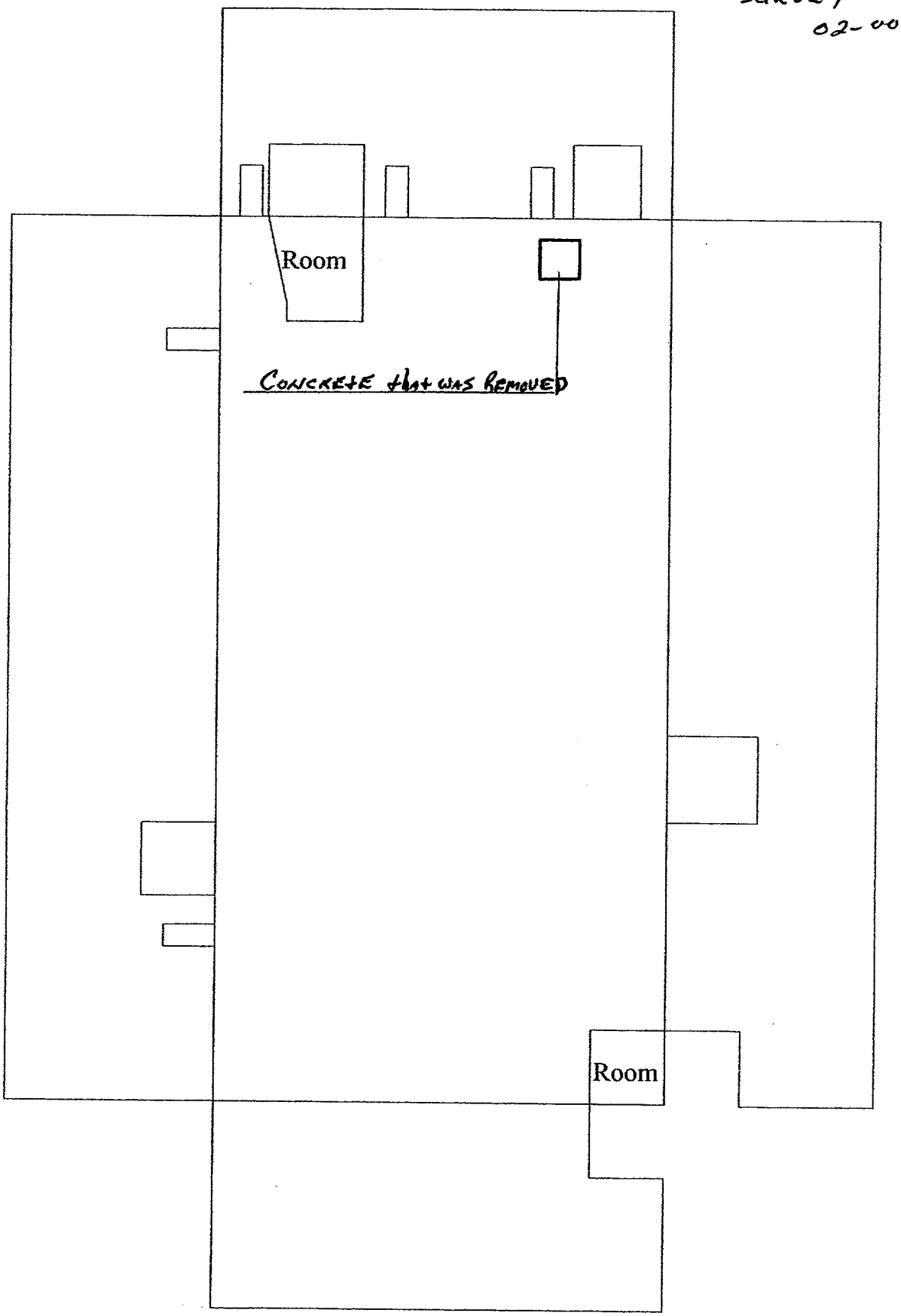
Instrument Model/SN:	Cal Due Date:	Probe Model/SN:	Cal Due Date:	Detector Eff.: (cpm/dpm)	MDA:	Other
2224-1/129463	8-6-02	43-89/169230	8-6-02	α .154 β⁻ .092	α 64 β⁻ 475	
19/115870	8-6-02					
N		N		N		N A
	A		A		A	

Section 3: Review and Approval

Survey Performed By (Sign):	Area Posted and/or Barricaded:	Date and Time:
[signature]	☐ Yes ☐ No ☒ Not Required	3-27-02 1400
Radiation Safety Officer (Print Name & Sign): Mike McDonald [signature]		Date and Time: 4-16-02 9:48

North

SURVEY #
02-0094



Interior

Scale:
4m x 4m

Appendix D

Building 36 Data Package

Molycorp Washington, PA

Building 36 Data Package

This data package contains final status survey information for Building 36, Molycorp, Washington, PA site.

Field data collection forms, survey report forms, statistical test results, and comparisons to release limits are provided.

Summary

No anomalies were reported during the survey of Building 36. Elevated levels of background radiation, from soil radioactivity, continued to be a presence during survey activities.

Results from the final status survey of Building 36 provides evidence that release criteria have been met, demonstrates that residual radioactivity is below the unrestricted use criteria, and confirms that Building 36 is suitable for unrestricted use.

Results of Surface Scans

Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Floor and Floor Trenches (Interior)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
F1	1600	220	9	-4
F2	1520	140	7	-6
F3	1430	50	9	-4
F4	1530	150	10	-3
F5	1580	200	9	-4
F6	1400	20	8	-5
F7	1320	-60	8	-5
F8	1400	20	8	-5
T1				
T2	380	96	4	3.2
T3				
T4				
T5				
T6				
T7				
T8	320	36	5	4.2
T9				
T10				

F = floor, W = wall, T = trench

All floor scans performed with Ludlum 239-1F (2350-1 No.95359) with 43-37 No. 92503

Floor Monitor Info:
Scan MDA Beta - 182 dpm/detector area
Scan MDA Alpha - 23 dpm/detector area
Scan background Beta - 1380 cpm
Scan background Alpha - 13 cpm
Detector Eff. Beta - .27
Detector Eff. Alpha - .207

All trench scans performed with Ludlum Model 2350-1 No.117014 with 43-106 No. 133866

Monitor Info:
Scan MDA Beta - 642 dpm/100cm^2
Scan MDA Alpha - 40 dpm/100cm^2
Scan background Beta - 284 cpm
Scan background Alpha - .8 cpm
Detector Eff. Beta - .248
Detector Eff. Alpha - .211

Results of Surface Scans

Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Walls (Interior)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
W1	260	-24	1	0.2
W2	235	-49	1	0.2
W3	205	-79	2	1.2
W4	247	-37	1	0.2
W5	270	-14	1	0.2
W6	250	-34	3	2.2
W7	260	-24	1.6	0.8
W8	275	-9	1.2	0.4
W9	256	-28	2	1.2
W10	240	-44	2	1.2
W11	220	-64	1.8	1
W12	240	-44	1.4	0.6

All interior wall scans performed with Ludlum Model 2350-1 No.117014 with 43-106 No. 133866

Monitor Info:
Scan MDA Beta - 642 dpm/100cm^2
Scan MDA Alpha - 40 dpm/100cm^2
Scan background Beta - 284 cpm
Scan background Alpha - .8 cpm
Detector Eff. Beta - .248
Detector Eff. Alpha - .211

Results of Surface Scans

Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Exterior (Walls)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
W1	220	-64	2	1.2
W2	220	-64	0	-0.8
W3	200	-84	0	-0.8
W4	240	-44	0	-0.8
W5	200	-84	0	-0.8
W6	200	-84	2	1.2
W7	240	-44	4	3.2
W8	240	-44	0	-0.8
W9	250	-34	0	-0.8
W10	260	-24	0	-0.8
W11	250	-34	1.4	0.6
W12	260	-24	2	1.2

All exterior wall scans performed with Ludlum Model 2350-1 No.117014 with 43-106 No. 133866

Monitor Info:
Scan MDA Beta - 642 dpm/100cm^2
Scan MDA Alpha - 40 dpm/100cm^2
Scan background Beta - 284 cpm
Scan background Alpha - .8 cpm
Detector Eff. Beta - .248
Detector Eff. Alpha - .211

Elevated Scan Readings

Molycorp - Building 36 Survey Unit (Unaffected Area)

Location	Alpha Scan (net cpm)
W6 (I)	2.2
W7(E)	3.2

I = interior, E = exterior

Direct and removable surface measurements performed in locations W6 (I) and W7 (E). Results indicate background levels of radioactivity.

Direct Measurements (Total Activity)
Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Floor and Floor Trenches (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [(1)] (dpm/100cm^2)
F1	351	244	107	78	29	257	236	387	513
F2	317	240	77	78	-1	-9	216	387	-18
F3	284	227	57	78	-21	-186	202	387	-372
F4	365	251	114	78	36	319	240	387	637
F5	317	221	96	78	18	159	229	387	319
F6	276	239	37	78	-41	-363	186	387	-726
F7	269	214	55	78	-23	-204	200	387	-407
F8	268	234	34	78	-44	-389	184	387	-779
T1	348	240	108	78	30	265	237	387	531
T2	307	226	81	78	3	27	219	387	53
T3	268	222	46	78	-32	-283	193	387	-566
T4	360	265	95	78	17	150	228	387	301
T5	306	284	22	78	-56	-496	173	387	-991
T6	364	288	76	78	-2	-18	215	387	-35
T7	318	267	51	78	-27	-239	197	387	-478
T8	322	244	78	78	0	0	217	387	0
T9	336	280	56	78	-22	-195	201	387	-389
T10	284	254	30	78	-48	-425	180	387	-850

All building interior floor direct measurements were performed with
2360 No. 164680 and 43-89 No. 118544

	Beta	Alpha
Floor Efficiency	0.113	0.164
Floor Background (cpm)	78	2.4
Floor MDA (dpm/100 cm^2)	387	60

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Direct Measurements (Total Activity)
Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Walls (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
W1	205	169	36	8	28	248	115	140	496
W2	176	165	11	8	3	27	76	140	53
W3	160	191	-31	8	-39	-345	83	140	-690
W4	186	168	18	8	10	88	88	140	177
W5	171	159	12	8	4	35	78	140	71
W6	147	151	-4	8	-12	-106	35	140	-212
W7	178	191	-13	8	-21	-186	39	140	-372
W8	205	209	-4	8	-12	-106	35	140	-212
W9	205	198	7	8	-1	-9	67	140	-18
W10	185	218	-33	8	-41	-363	87	140	-726
W11	219	194	25	8	17	150	100	140	301
W12	197	181	16	8	8	71	85	140	142

All building interior wall direct measurements were performed with 2360 No. 164680
and 43-89 No. 118544

	Beta	Alpha
Wall Efficiency	0.113	0.164
Wall Background (cpm)	8	3.7
Wall MDA (dpm/100 cm^2)	140	71

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Direct Measurements (Total Activity)
Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Exterior (Walls)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
W1	169	197	-28	8	-36	-319	78	140	-637
W2	208	195	13	8	5	44	79	140	88
W3	129	133	-4	8	-12	-106	35	140	-212
W4	186	195	-9	8	-17	-150	17	140	-301
W5	198	190	8	8	0	0	69	140	0
W6	153	160	-7	8	-15	-133	17	140	-265
W7	194	191	3	8	-5	-44	58	140	-88
W8	199	165	34	8	26	230	112	140	460
W9	203	179	24	8	16	142	98	140	283
W10	214	197	17	8	9	80	87	140	159
W11	213	196	17	8	9	80	87	140	159
W12	208	227	-19	8	-27	-239	58	140	-478

All building exterior direct measurements were performed with 2360
No. 164680 and 43-89 No. 118544

	Beta	Alpha
Efficiency	0.113	0.164
Background (cpm)	8	3.7
MDA (dpm/100 cm^2)	140	71

(1) - A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity determination then sampling.

Elevated Direct Measurements (Total Activity) and Averaging Results
Molycorp - Building 36 Survey Unit (Unaffected Area)

No elevated direct measurements were reported.

Removable Surface Activity Measurements
Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Floor and Floor Trenches (Interior)

Location (see map)	Removable Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm^2)	Uncertainty 95% CL	MDA	Instrument #
F1	-48	35.0	158	-0.3	1.8	11.6	1
F2	18	23.0	158	-0.3	1.8	11.6	1
F3	-55	37.3	158	-0.3	1.8	11.6	1
F4	-30	28.4	158	-0.3	1.8	11.6	1
F5	-67	40.9	158	-0.3	1.8	11.6	1
F6	0	10.5	158	-0.3	1.8	11.6	1
F7	-48	35.0	158	-0.3	1.8	11.6	1
F8	-36	30.8	158	2.6	5.4	11.6	1
T1	-6	15.8	158	-0.3	1.8	11.6	1
T2	0	10.5	158	-0.3	1.8	11.6	1
T3	96	48.4	158	-0.3	1.8	11.6	1
T4	-18	23.0	158	-0.3	1.8	11.6	1
T5	48	35.0	158	-0.3	1.8	11.6	1
T6	12	19.7	158	-0.3	1.8	11.6	1
T7	18	23.0	158	-0.3	1.8	11.6	1
T8	-42	33.0	158	-0.3	1.8	11.6	1
T9	42	33.0	158	-0.3	1.8	11.6	1
T10	30	28.4	158	-0.3	1.8	11.6	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info:

	Beta	Alpha
Background (cpm)	47	0.12
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	158	11.6

Removable Surface Activity Measurements
Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Walls (Interior)

Location (see map)	Removable Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm^2)	Uncertainty 95% CL	MDA	Instrument #
W1	-6	15.8	158	2.6	5.4	11.6	1
W2	-6	15.8	158	2.6	5.4	11.6	1
W3	-54	37.0	158	-0.3	1.8	11.6	1
W4	-30	28.4	158	-0.3	1.8	11.6	1
W5	-67	40.9	158	-0.3	1.8	11.6	1
W6	12	19.7	158	2.6	5.4	11.6	1
W7	12	19.7	158	-0.3	1.8	11.6	1
W8	6	15.8	158	5.4	7.8	11.6	1
W9	60	38.8	158	8.4	9.7	11.6	1
W10	42	33.0	158	-0.3	1.8	11.6	1
W11	-54	37.0	158	2.6	5.4	11.6	1
W12	-12	19.7	158	2.6	5.4	11.6	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info:

	Beta	Alpha
Background (cpm)	47	0.12
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	158	11.6

Removable Surface Activity Measurements
Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Exterior (Walls)

Location (see map)	Removable Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA	Removable Alpha (dpm/100cm^2)	Uncertainty 95% CL	MDA	Instrument #
W1	54	37.0	158	-0.3	1.8	11.6	1
W2	0	10.5	158	-0.3	1.8	11.6	1
W3	-91	47.2	158	-0.3	1.8	11.6	1
W4	-30	28.4	158	-0.3	1.8	11.6	1
W5	-36	30.8	158	-0.3	1.8	11.6	1
W6	-48	35.0	158	-0.3	1.8	11.6	1
W7	-18	23.0	158	-0.3	1.8	11.6	1
W8	48	35.0	158	-0.3	1.8	11.6	1
W9	36	30.8	158	-0.3	1.8	11.6	1
W10	145	59.0	158	2.6	5.4	11.6	1
W11	24	25.9	158	-0.3	1.8	11.6	1
W12	-54	37.0	158	2.6	5.4	11.6	1

#1 - Ludlum 2929 No. 152202 with 43-10 No. 156519 Info:

	Beta	Alpha
Background (cpm)	47	0.12
Bkgd ct. time	60	60
Sample ct. time	1	1
Efficiency	0.165	0.344
MDA	158	11.6

Elevated Removable Surface Activity Measurements
Molycorp - Building 36 Survey Unit (Unaffected Area)

No elevated removable surface activity was reported above limits.

Exposure Rate Measurements
Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Floor and Trenches

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
F1	8	1
F2	8	1
F3	8	1
F4	9	2
F5	8	1
F6	8	1
F7	8	1
F8	8	1
T1	8	1
T2	8	1
T3	5	-2
T4	6	-1
T5	7	0
T6	7	0
T7	7	0
T8	7	0
T9	7	0
T10	8	1

Background dose rate: 6-8 uR/hr with Model 19, No.115870

Exposure Rate Measurements
Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Walls (Interior)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
W1	8	1
W2	8	1
W3	8	1
W4	7	0
W5	7	0
W6	8	1
W7	8	1
W8	8	1
W9	7	0
W10	7	0
W11	8	1
W12	8	1

Background dose rate: 6-8 uR/hr with Model 19, No.115870

Exposure Rate Measurements
Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Exterior (Walls)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
W1	8	0
W2	8	0
W3	8	0
W4	8	0
W5	8	0
W6	8	0
W7	9	1
W8	10	2
W9	10	2
W10	10	2
W11	10	2
W12	9	1

Background dose rate: 7-10 uR/hr with Model 19, No.115870

Exposure Rate Measurements
Molycorp - Building 36 Survey Unit (Unaffected Area)

Building Exterior (Roof)

Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)	Location	Exposure Rate (uR/hr)	Net Exp Rate (uR/hr)
see map	8	0	see map	9	1
see map	7	-1	see map	8	0
see map	7	-1	see map	8	0
see map	8	0	see map	9	1
see map	8	0	see map	9	1
see map	7	-1	see map	8	0
see map	7	-1	see map	8	0
see map	8	0	see map	9	1
see map	8	0	see map	9	1
see map	7	-1	see map	8	0
see map	8	0	see map	8	0
see map	9	1	see map	9	1
see map	8	0	see map	9	1
see map	7	-1	see map	8	0
see map	7	-1	see map	9	1
see map	8	0	see map	9	1
see map	8	0	see map	10	2
see map	7	-1	see map	10	2
see map	8	0	see map	10	2
see map	9	1	see map	9	1

Background dose rate: 6-8 uR/hr with Model 19, No.115870

Summary of Building Surface Direct Reading (Total Activity) Results
Molycorp - Building 36 Survey Unit (Unaffected Area)

Including all building interior and exterior measurements

Beta				Alpha			
n	$\bar{x}$	s	μ_α	n	$\bar{x}$	s	μ_α
42	-60	209.5	-6.1	42	-121	419.1	-12.2

$t_{1-\alpha}$ 1.682

Guidelines/Conditions Satisfied?

Beta	Alpha
Yes	Yes

Summary of Exposure Rate Measurements
Molycorp - Building 36 Survey Unit (Unaffected Area)

Including all building interior and exterior measurements (uR/hr)

n	$\bar{x}$	s	μ_α
82	0.5	0.9	0.6

$t_{1-\alpha}$	1.667

Guidelines/Conditions Satisfied?
Yes

	DDO-138 Radiation Protection Survey Report	Site: Molycorp / Washington, PA

Section 1: Survey Information UNAFFECTED Bldg

Date: 4-3-02	Time: 1600	Location: Bldg-36	Survey Issue Log Number: 02-0100
RWP Number: N/A	Purpose of Survey: ☐ RWP ☐ Routine Survey ☐ Unconditional Release ☑ Other:		Page 1 of 6

Survey Title: UNAFFECTED Bldg

Model 19 #115870 Due 8-6-02

FLOOR BKG
β^- 78 α = 2.4 - BKg
MDA 387 60 - MDA

WALLS BKg
β^- 8 α = 3.7 - BKg
MDA ~~97~~ 140 71 - MDA

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19	N/A	
20		
21		
22		
23		
24		
25		
26		

Bkgd Readings:

Legend:
00 = mRem/h gamma; 00 C = mRem/h gamma contact; ⓘ = Smear Location; ▽ = Air Sample Location; -X-X-X- = Rope, Boundary, or Barrier
00 β = mRem/h beta; 00 βC = mRem/h beta contact; —ⓘ— = Large Area Wipe; = Bulk Material Sample

Section 2: Instrument Used

Instrument Model/SN:	Cal Due Date:	Probe Model/SN:	Cal Due Date:	Detector Eff.: (cpm/dpm)	MDA:	Other BKG
2350-1/95359	8-6-02	43-37/092503	8-6-02	β^- .27 / α .207	β^- 182 α 23	β^- 1380 / α 13
2350-1/117014	8-13-02	43-106/133866	8-6-02	β^- .248 / α .211	β^- 642 α 40	β^- 284 / α .8
2360/164680	7-9-02	43-89/118544	8-6-02	β .113 α .164	See Above	
2929/152202	2-6-03	43-10/156519	2-6-03	β^- .165 α .344	β^- 158 α 11.6	β^- 47 α .12

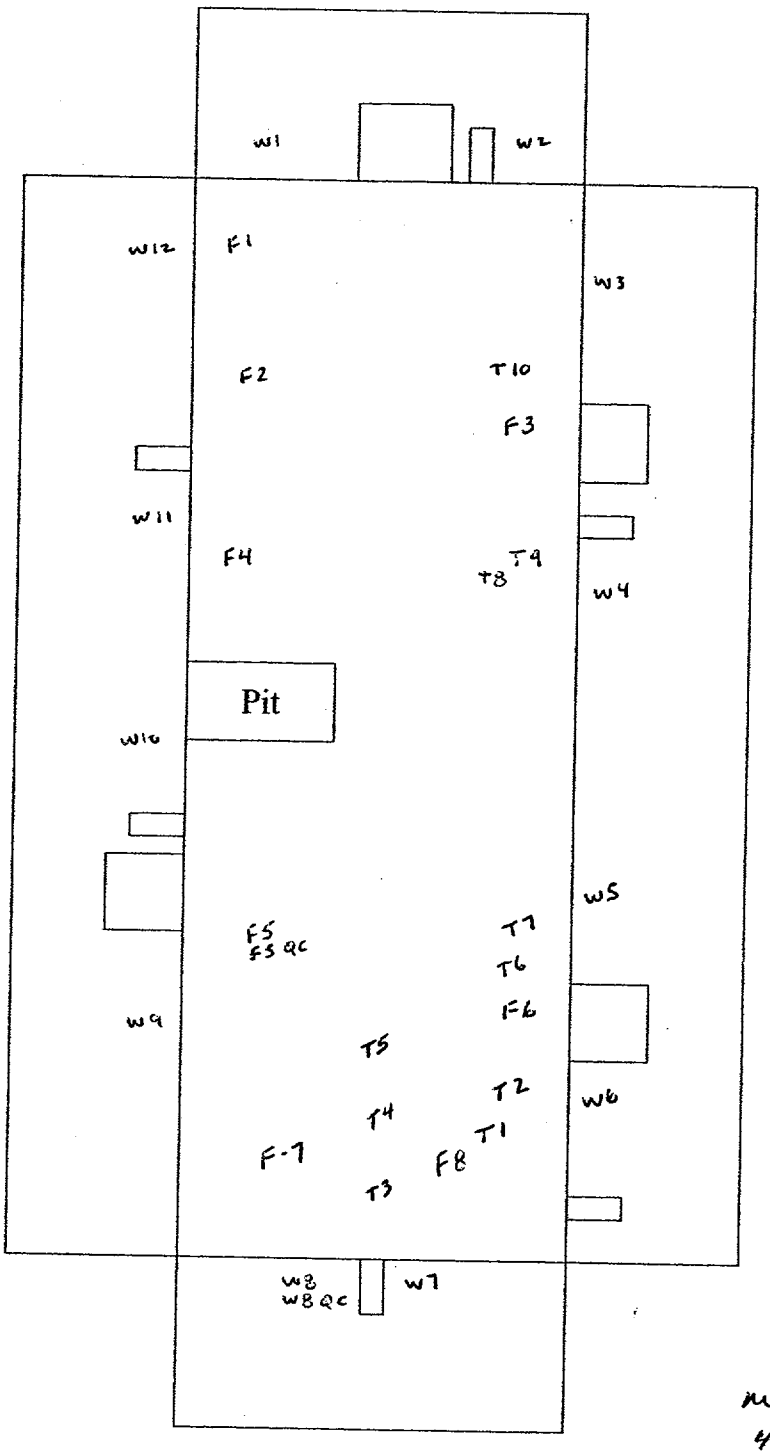
Section 3: Review and Approval

Survey Performed By (Sign): Mark Blancuik / Justin Trinidad	Area Posted and/or Barricaded: ☐ Yes ☐ No ☑ Not Required	Date and Time: 4-3-02 / 1600
Radiation Safety Officer (Print Name & Sign): Mike McDonald		Date and Time: 4-16-02 10:12

Survey # 02-100

Bkgd 6-8 mr/hr

Building 36
North



Mark Blanciak
4-3-02

Interior

Scale:
4m x 4m

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Interior Walls Bldg 36 Survey # 02-100

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
	N/A							

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4-3-02
	Justin Trenidad	Justin Trenidad	4-3-02
	Steve Filo	Steve Filo	4-3-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W-1	260	1	205	169	3	8	2.6	-6
W-2	235	1	176	165	3	8	2.6	-6
W-3	205	2	160	191	1	8	-.3	-54
W-4	247	1	186	168	4	7	-.3	-30
W-5	270	1	171	159	1	7	-.3	-67
W-6	250	3	147	151	3	8	2.6	12
W-7	260	1.6	178	191	1	8	-.3	12
W-8	275	1.2	205	209	3	8	5.4	6
W-8 QC			163	198	5	8	11	-61
W-9	256	2	205	198	3	7	8.4	60
W-10	240	2	185	218	4	7	-.3	42
W-11	220	1.8	219	194	2	8	2.6	-54
W-12	240	1.4	197	181	0	8	2.6	-12
				N/A				

Radiological Survey Results - Survey Location Indicator

Survey Area Information: FLOOR + Trenches in Bldg # 36 survey # 02-100

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

N/A

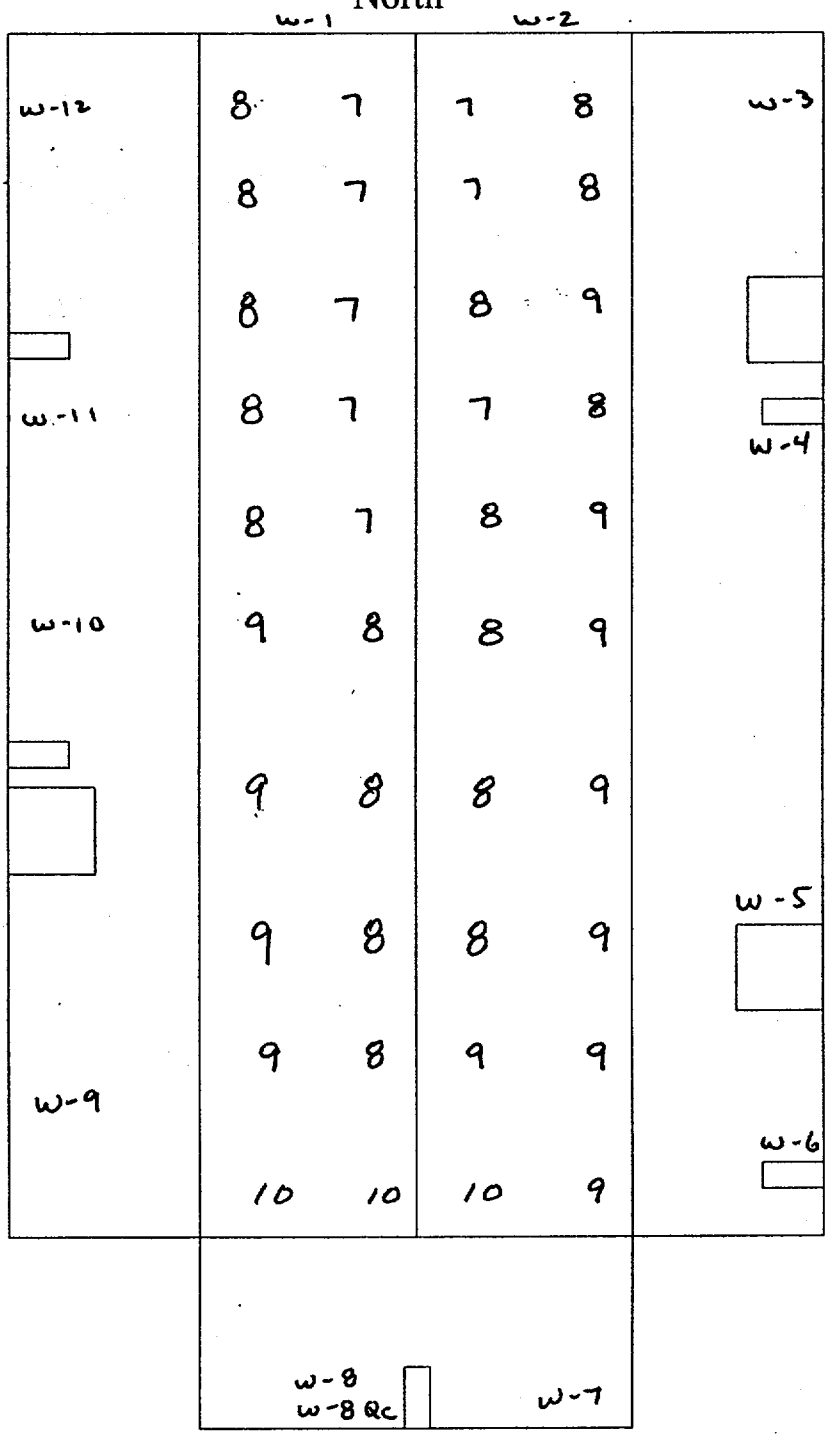
Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4-3-02
	Justin Trenidad	Justin Trenidad	4-3-02
	Steve Filo	Steve Filo	4-3-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
T-1	N/A	N/A	348	240	1	8	-.3	-48
T-2	380	4	307	226	7	8	-.3	18
T-3	N/A	N/A	268	222	2	5	-.3	-55
T-4	↓	↓	360	265	3	5	-.3	-30
T-5			306	284	2	6	-.3	-67
T-6			364	283	1	7	-.3	0
T-7	N/A	N/A	318	267	5	7	-.3	-48
T-8	320	5	322	244	2	7	2.6	-36
T-9	N/A	N/A	336	280	2	7	-.3	-6
T-10	N/A	N/A	284	254	3	8	-.3	0
F-1	1600	9	351	244	3	8	-.3	96
F-2	1520	7	317	240	4	8	-.3	-18
F-3	1430	9	284	227	3	8	-.3	48
F-4	1530	10	365	251	1	9	-.3	12
F-5	1580	9	317	221	2	8	-.3	18
F-5QC			297	221	2	8	-.3	-36
F-6	1400	8	276	239	4	8	-.3	-42
F-7	1320	8	269	214	4	8	-.3	42
F-8	1400	9	268	234	4	8	-.3	30

N/A

Survey # 02-100
BKg 7-10 microRem/hr

Building 36
North



Exterior

Scale:
4m x 4m

Mark Blaauw
4-3-02

Radiological Survey Results - Survey Location Indicator

Survey Area Information: O/S WALLS Bldg 36 Survey # 02-100

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA

Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	4-3-02
	Steve Filo	Steve Filo	4-3-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
W1	220	2	169	197	4	8	-.3	54
W2	220	0	208	195	2	8	-.3	0
W3	200	0	129	133	1	8	-.3	-91
W4	240	0	186	195	5	8	-.3	-30
W5	200	0	198	190	4	8	-.3	-36
W6	200	2	153	160	1	8	-.3	-48
W7	240	4	194	191	7	9	-.3	-18
W8	240	0	199	165	6	10	-.3	48
W8 QC			195	185	8	9	-.3	0
W9	250	0	203	179	7	10	-.3	36
W10	260	0	214	197	4	10	2.6	145
W11	250	1.4	213	196	5	10	-.3	24
W12	260	2	208	227	2	9	2.6	-54

Appendix E

Soil Sample Storage Room Data Package

Molycorp Washington, PA

Soil Sample Storage Room Data Package

This data package contains final status survey information for the Soil Sample Storage Room, Molycorp, Washington, PA site.

Field data collection forms, survey report forms, statistical test results, and comparisons to release limits are provided.

Summary

No anomalies were reported during the survey of the Soil Sample Storage Room.

Results from the final status survey of the Soil Sample Storage Room provides evidence that release criteria have been met, demonstrates that residual radioactivity is below the unrestricted use criteria, and confirms that the Soil Sample Storage Room (Building 19) is suitable for unrestricted use.

Results of Surface Scans

Molycorp - Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Room Floor (Interior)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
F1	1150	-99	6	-7
F2	1220	-29	6	-7
F3	1200	-49	2	-11
F4	1220	-29	0	-13
F5	1240	-9	2	-11
F6	1190	-59	0	-13

All floor scans performed with Ludlum 239-1F (2350-1 No. 95359 with 43-37 No. 92503)

Scan MDA Beta - 193 dpm/detector area
Scan MDA Alpha - 23 dpm/detector area
Scan background Beta - 1249 cpm
Scan background Alpha - 13.2 cpm
Detector Eff. Beta - .27
Detector Eff. Alpha - .207

Results of Surface Scans

Molycorp - Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Room Walls (Interior)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
W1	300	20	0	-16
W2	302	22	0	-16
W3	290	10	0	-16
W4				
W5	280	0	0	-16
W6	260	-20	0	-16
W7				
W8	320	40	0	-16
W9				
W10	320	40	0	-16
W11	280	0	0	-16
W12				
W13	290	10	0	-16
W14	300	20	0	-16
W15				

All wall scans performed with Ludlum 2350-1 No.117566 with 43-106 No. 128912

Scan MDA Beta - 628 dpm/detector area
Scan MDA Alpha - 178 dpm/detector area
Scan background Beta - 280 cpm
Scan background Alpha - 16 cpm
Detector Eff. Beta - .250
Detector Eff. Alpha - .212

Results of Surface Scans

Molycorp - Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Ceiling (Interior)

Location (see map)	Beta Scan gross cpm	Beta Scan net cpm	Alpha Scan gross cpm	Alpha Scan net cpm
C1				
C2				
C3				
C4				
C5				
C6				
C7	320	40	0	-16
C8				
C9				
C10				
C11				
C12	330	50	0	-16
C13				
C14				
C15				
C16				
C17				
C18				
C19	308	28	0	-16
C20				
C21				
C22				
C23	310	30	0	-16
C24				

All wall scans performed with Ludlum 2350-1 No.117566 with 43-106 No. 128912

Scan MDA Beta - 628 dpm/detector area
Scan MDA Alpha - 178 dpm/detector area
Scan background Beta - 280 cpm
Scan background Alpha - 16 cpm
Detector Eff. Beta - .250
Detector Eff. Alpha - .212

Elevated Scan Readings

Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

No elevated scan results were reported.

Direct Measurements (Total Activity)

Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Room Floor (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
F1	221	257	-36	78	-114	-1239	138	475	-2478
F2	245	256	-11	78	-89	-967	174	475	-1935
F3	219	242	-23	78	-101	-1098	158	475	-2196
F4	240	233	7	78	-71	-772	196	475	-1543
F5	215	244	-29	78	-107	-1163	149	475	-2326
F6	240	248	-8	78	-86	-935	178	475	-1870

Floor direct measurements were performed with 2224-1 No. 129463 and 43-89 No. 169230

	Beta	Alpha
Floor Efficiency	0.092	0.154
Floor Background (cpm)	78	2.4
Floor MDA (dpm/100 cm2)	475	64

(1) - Alpha measurements (direct) were obtained with the 43-89 operated in the alpha mode and were recorded on the Radiation Protection Survey Report form. However, actual results were not used as part of the comparison process. A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity.

Direct Measurements (Total Activity)
Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Room Walls (Interior)

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
W1	190	222	-32	8	-40	-435	104	172	-870
W2	240	192	48	8	40	435	159	172	870
W3	190	212	-22	8	-30	-326	80	172	-652
W4	150	206	-56	8	-64	-696	148	172	-1391
W5	200	197	3	8	-5	-54	71	172	-109
W6	120	198	-78	8	-86	-935	178	172	-1870
W7	209	227	-18	8	-26	-283	67	172	-565
W8	223	241	-18	8	-26	-283	67	172	-565
W9	186	239	-53	8	-61	-663	143	172	-1326
W10	185	256	-71	8	-79	-859	169	172	-1717
W11	211	209	2	8	-6	-65	67	172	-130
W12	181	211	-30	8	-38	-413	100	172	-826
W13	240	220	20	8	12	130	113	172	261
W14	220	206	14	8	6	65	100	172	130
W15	180	228	-48	8	-56	-609	135	172	-1217

Wall direct measurements were performed with 2224-1 No. 129463 and 43-89 No. 169230

	Beta	Alpha
Wall Efficiency	0.092	0.154
Wall Background (cpm)	8	3.7
Wall MDA (dpm/100 cm2)	172	75

(1) - Alpha measurements (direct) were obtained with the 43-89 operated in the alpha mode and were recorded on the Radiation Protection Survey Report form. However, actual results were not used as part of the comparison process. A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity.

Direct Measurements (Total Activity)
Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Ceiling

Location	Unshield Beta cpm	Shield Beta cpm	Gross Beta cpm	Bkgd cpm	Net cpm	Direct Beta (dpm/100cm^2)	Uncertainty 95% CL	MDA (dpm/100cm^2)	Direct Alpha [1] (dpm/100cm^2)
C1	245	241	4	8	-4	-43	74	172	-87
C2	242	238	4	8	-4	-43	74	172	-87
C3	269	259	10	8	2	22	90	172	43
C4	268	233	35	8	27	293	140	172	587
C5	270	228	42	8	34	370	151	172	739
C6	268	248	20	8	12	130	113	172	261
C7	298	251	47	8	39	424	158	172	848
C8	261	227	34	8	26	283	138	172	565
C9	286	234	52	8	44	478	165	172	957
C10	296	248	48	8	40	435	159	172	870
C11	263	227	36	8	28	304	141	172	609
C12	267	224	43	8	35	380	152	172	761
C13	255	228	27	8	19	207	126	172	413
C14	262	240	22	8	14	152	117	172	304
C15	270	271	-1	8	-9	-98	56	172	-196
C16	271	244	27	8	19	207	126	172	413
C17	272	244	28	8	20	217	128	172	435
C18	251	224	27	8	19	207	126	172	413
C19	230	250	-20	8	-28	-304	74	172	-609
C20	302	251	51	8	43	467	164	172	935
C21	209	219	-10	8	-18	-196	30	172	-391
C22	280	253	27	8	19	207	126	172	413
C23	274	230	44	8	36	391	154	172	783
C24	281	248	33	8	25	272	136	172	543

Ceiling direct measurements were performed with 2224-1 No. 129463 and 43-89 No. 169230

	Beta	Alpha
Ceiling Efficiency	0.092	0.154
Ceiling Background (cpm)	8	3.7
Ceiling MDA (dpm/100 cm2)	172	75

(1) - Alpha measurements (direct) were obtained with the 43-89 operated in the alpha mode and were recorded on the Radiation Protection Survey Report form. However, actual results were not used as part of the comparison process. A beta to alpha ratio factoring (1:2, beta to alpha) was used to provide a more accurate alpha activity.

Elevated Direct Readings (Total Activity) and Averaging Results
Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

No elevated direct measurements were reported.

Removable Surface Activity Measurements

Molycorp - Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Room Floor (Interior)

Location (see map)	Removable Beta ($dpm/100cm^2$)	Uncertainty 95% CL	MDA	Removable Alpha ($dpm/100cm^2$)	Uncertainty 95% CL	MDA
F1	-6	16.3	202	2	5.2	12.8
F2	12	20.2	202	2	5.2	12.8
F3	-6	16.3	202	2	5.2	12.8
F4	-24	26.2	202	6	8.3	12.8
F5	-36	31.1	202	-5	7.5	12.8
F6	-36	31.1	202	-5	7.5	12.8

Ludlum 2929 No. 152202 with 43-10 No. 156519 Info:

	Beta	Alpha
Background (cpm)	45	0.18
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficency	0.165	0.344
MDA	202	12.8

Removable Surface Activity Measurements

Molycorp - Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Room Walls (Interior)

Location (see map)	Removable Beta ($dpm/100cm^2$)	Uncertainty 95% CL	MDA	Removable Alpha ($dpm/100cm^2$)	Uncertainty 95% CL	MDA
W1	-60	39.0	202	2	4.6	12.8
W2	42	33.2	202	-9	10.0	12.8
W3	6	16.3	202	-9	10.0	12.8
W4	-72	42.5	202	-9	10.0	12.8
W5	-12	20.2	202	-9	10.0	12.8
W6	60	39.0	202	-9	10.0	12.8
W7	-48	35.3	202	-9	10.0	12.8
W8	-42	33.2	202	2	4.7	12.8
W9	-46	34.6	202	-9	10.0	12.8
W10	-48	35.3	202	2	4.6	12.8
W11	-42	33.2	202	2	4.6	12.8
W12	-42	33.2	202	-9	10.0	12.8
W13	-66	40.8	202	-9	10.0	12.8
W14	-6	16.3	202	-9	10.0	12.8
W15	49	35.6	202	-9	10.0	12.8

Ludlum 2929 No. 152202 with 43-10 No. 156519 Info:

	Beta	Alpha
Background (cpm)	45	0.18
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficency	0.165	0.344
MDA	202	12.8

Removable Surface Activity Measurements

Molycorp - Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Ceiling

Location (see map)	Removable Beta ($dpm/100cm^2$)	Uncertainty 95% CL	MDA	Removable Alpha ($dpm/100cm^2$)	Uncertainty 95% CL	MDA
C1	-48	35.3	202	2	4.6	12.8
C2	-6	16.3	202	2	4.6	12.8
C3	-48	35.3	202	2	4.6	12.8
C4	-60	39.0	202	2	4.6	12.8
C5	0	11.3	202	2	4.6	12.8
C6	48	35.3	202	-9	10.0	12.8
C7	66	40.8	202	4	6.7	12.8
C8	-36	31.1	202	2	4.6	12.8
C9	6	16.3	202	-9	10.0	12.8
C10	-24	26.2	202	2	4.6	12.8
C11	-18	23.4	202	2	4.6	12.8
C12	18	23.4	202	-9	10.0	12.8
C13	-12	20.2	202	-9	10.0	12.8
C14	18	23.4	202	2	4.6	12.8
C15	36	31.1	202	-9	10.0	12.8
C16	-18	23.4	202	2	4.6	12.8
C17	-30	28.7	202	-9	10.0	12.8
C18	-48	35.3	202	-9	10.0	12.8
C19	-42	33.2	202	2	4.6	12.8
C20	30	28.7	202	2	4.6	12.8
C21	-48	35.3	202	2	4.6	12.8
C22	60	39.0	202	-9	10.0	12.8
C23	42	33.2	202	-9	10.0	12.8
C24	-54	37.2	202	-9	10.0	12.8

Ludlum 2929 No. 152202 with 43-10 No. 156519 Info:

	Beta	Alpha
Background (cpm)	45	0.18
Bkgd ct. time	50	50
Sample ct. time	1	1
Efficency	0.165	0.344
MDA	202	12.8

Elevated Removable Surface Activity Measurements

Molycorp - Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

No elevated removable surface activity was reported above limits.

Exposure Rate Measurements

Molycorp - Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Room Floor (Interior)

Location	Exposure Rate uR/hr	Net Exp Rate uR/hr
F1	5	-1
F2	6	0
F3	5	-1
F4	5	-1
F5	6	0
F6	6	0

Background dose rate: 6-7 uR/hr

Exposure Rate Measurements

Molycorp - Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Room Walls (Interior)

Location	Exposure Rate uR/hr	Net Exp Rate uR/hr
W1	6	0
W2	6	0
W3	6	0
W4	6	0
W5	6	0
W6	7	1
W7	7	1
W8	7	1
W9	7	1
W10	7	1
W11	6	0
W12	7	1
W13	6	0
W14	6	0
W15	6	0

Background dose rate: 6-7 uR/hr

Exposure Rate Measurements

Molycorp - Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Ceiling

Location	Exposure Rate uR/hr	Net Exp Rate uR/hr
C1	6	0
C2	6	0
C3	6	0
C4	6	0
C5	7	1
C6	7	1
C7	7	1
C8	7	1
C9	7	1
C10	7	1
C11	7	1
C12	8	2
C13	7	1
C14	7	1
C15	7	1
C16	7	1
C17	7	1
C18	7	1
C19	7	1
C20	7	1
C21	7	1
C22	8	2
C23	7	1
C24	7	1

Background dose rate: 6-7 uR/hr

Summary of Building Surface Direct Readings (Total Activity) Results
Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Including all room measurements

Beta				Alpha			
n	$\bar{x}$	s	μ_α	n	$\bar{x}$	s	μ_α
45	-142	507.3	-15.2	45	-284.5	1014.5	-30.3
	$t_{1-\alpha}$	1.681					

Guidelines/Conditions Satisfied?

Beta	Alpha
Yes	Yes

Summary of Exposure Rate Measurements
Building 19, Soil Sample Storage Room Survey Unit (Affected Area)

Including all building interior and exterior measurements (uR/hr)

n	$\bar{x}$	s	μ_α
45	0.6	0.69	0.7

$t_{1-\alpha}$	1.681

Guidelines/Conditions Satisfied?
Yes

DDO-138 Radiation Protection Survey Report

Site: Molycorp / Washington, PA

Section 1: Survey Information

Date:	Time:	Location:	Survey Issue Log Number:
2-27-02	1700	Bldg # 19 Sample Room	02-0037

RWP Number: N/A

Purpose of Survey: ☐ RWP ☐ Routine Survey ☐ Unconditional Release ☑ Other:

Page 1 of 4

Survey Title: Suspect AREA

Bldg # 19 (Sample Room)

1 Minute STATIC

2224-1

BKG Wall
β⁻ = 8
α = 3.7

MDA WALL
β⁻ = 172
α 75

FLOOR
β⁻ = 78
α = 2.4

FLOOR
β⁻ = 475
α = 64

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18	N	A
19		
20		
21		
22		
23		
24		
25		
26		

Bkgd Readings: model 19 6mr/HR

Legend:
00 = mRem/h gamma; 00 C = mRem/h gamma contact; ① = Smear Location; ▽ = Air Sample Location; -X-X-X- = Rope, Boundary, or Barrier
00 β = mRem/h beta; 00 βC = mRem/h beta contact; —①— = Large Area Wipe; ∴ = Bulk Material Sample

Section 2: Instrument Used

Instrument Model/SN:	Cal Due Date:	Probe Model/SN:	Cal Due Date:	Detector Eff.: (cpm/dpm)	MDA:	Other BKG
2224-1/129463	8-6-02	43-89/169230	8-6-02	β⁻=.092 α=.154	See Above	See Above
2350-1/95359	8-6-02	43-37/092503	8-6-02	β⁻=.27 α=.207	β⁻=193 α=23	β⁻=249 α=13.2
2350-1/117566	8-6-02	43-106/128912	8-6-02	β⁻=.251 α=.212	β⁻=628 α=178	β⁻=280 α=16
Model 19/22526	8-6-02	NA				NA
2929/152202	2-6-03	43-10/156519	2-6-03	β⁻=.165 α=.347	β⁻=206 α=14.5	β⁻=45 α=.18

Section 3: Review and Approval

Survey Performed By (Sign): Mark Blanciak

Area Posted and/or Barricaded: ☐ Yes ☐ No ☑ Not Required

Date and Time: 2-27-02 / 1500

Radiation Safety Officer (Print Name & Sign): Mike McDonald

Date and Time: 3-14-02 9:30

Radiological Survey Results - Survey Location Indicator

Survey Area Information: Bldg #19 Sample Room — Survey # 02-0037

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
	N/A							

Performed By:	Print Name	Signature	Date
	Justin Trenidad	Justin Trenidad	2-27-02
	MARK BLANCIAK	Mark Blanciak	2-27-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
F-1	1150	6	221	257	4	5	2.4	-6
F-2	1220	4	245	256	8	6	2.4	12
F-2 QC	1170	4	240	230	8	6	-.5	6
F-3	1200	2	219	242	5	5	2.4	-6
F-4	1220	0	240	233	8	5	5.3	-24
F-5	1240	2	215	244	4	6	-.5	-36
F-6	1190	0	240	248	4	6	-.5	-36
W-1	300	0	190	222	7	6	2.4	-60
W-2	300	1.2	240	192	5	6	-.5	42
W-3	N/A	N/A	190	212	8	6	-.5	6
W-4	N/A	N/A	150	206	5	6	-.5	-72
W-5	200	1.2	200	197	9	6	-.5	-12
W-6	260	0.8	120	198	8	7	-.5	48
W-7	N/A	N/A	209	227	6	7	-.5	-48
W-8	320	1.0	223	241	4	7	2.4	-42
W-9	N/A	N/A	186	239	3	7	-.5	48
W-10	320	1.4	185	256	6	7	2.4	-48
W-10 QC	N/A	N/A	180	250	6	7	2.4	-42
W-11	280	1.0	211	209	4	6	2.4	-42
W-12	N/A	N/A	181	211	3	7	2.4	-42
W-13	N/A	N/A	240	220	6	7	-.5	-12
W-14	300	1.6	220	206	4	6	-.5	-18
W-15	N/A	N/A	180	228	6	7	-.5	6
C-1	↓	↓	245	241	4	7	-.5	48
C-2			242	239	7	7	2.4	-6
C-3			269	259	7	6	2.4	-12
C-4	N/A	N/A	268	233	8	6	2.4	-48

Radiological Survey Results - Survey Location Indicator

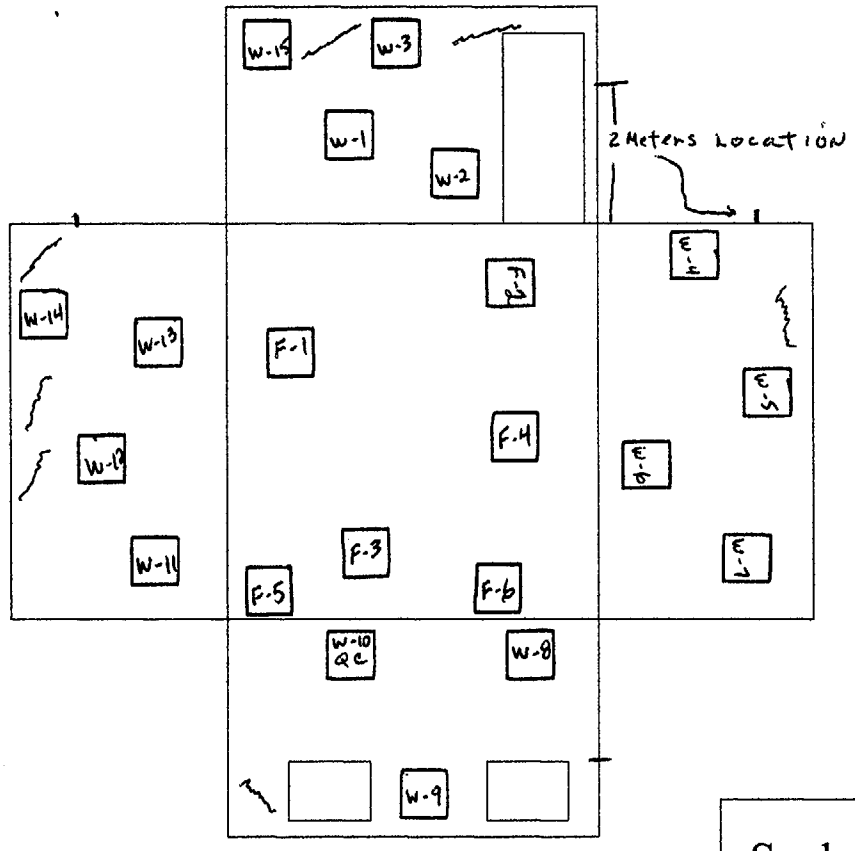
Survey Area Information: Bldg #19 (Sample Room) Survey # 02-0037

Instrument Data	Instrument Model/SN	Cal Due	Probe Model/SN	Cal Due	α Scan MDA	β Scan MDA	α Static MDA	β Static MDA
			N/A					

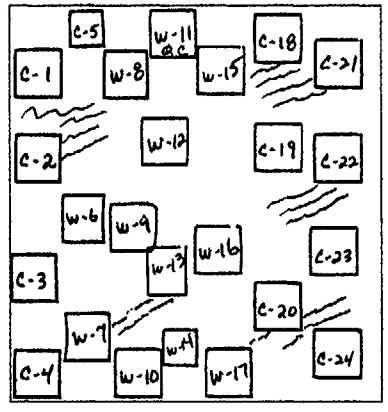
Performed By:	Print Name	Signature	Date
	MARK BLANCIAK	Mark Blanciak	2-27-02
	Justin Trenidad	Justin Trenidad	2-27-02

Location	β Scan (cpm)	α Scan (cpm)	β Static (unsh) (cpm)	β Static (sh) (cpm)	α Static (cpm)	ER (μrem/hr)	Smears (dpm/100 cm²) α	Smears (dpm/100 cm²) β
C-5	N/A	N/A	270	228	7	7	2.4	0
C-6	N/A	N/A	268	248	7	7	-.5	48
C-7	320	1.8	298	251	7	7	2.4	42
C-8	N/A	N/A	261	227	6	8	2.4	-36
C-9	↓	↓	286	234	7	7	-.5	6
C-10			296	248	5	7	2.4	-24
C-11			263	227	7	7	2.4	-18
C-11QC	N/A	N/A	266	230	8	8	2.4	-18
C-12	320	1.2	267	224	7	7	-.5	-18
C-13	N/A	N/A	255	228	7	7	-.5	-12
C-14			262	240	4	7	2.4	18
C-15			270	271	8	7	-.5	18
C-16			271	244	3	7	-.5	36
C-17			272	244	4	8	2.4	-18
C-18	N/A	N/A	251	244	7	7	-.5	-30
C-19	310	1.0	230	250	7	7	-.5	-48
C-20	N/A	N/A	302	251	7	7	2.4	-42
C-21	N/A	↓	209	219	8	7	2.4	-48
C-22	N/A	N/A	280	253	7	8	-.5	48
C-23	310	0.8	274	230	9	7	-.5	42
C-24	N/A	N/A	281	248	7	7	-.5	-54
				N/A				

Building 19
Soil Sample Storage Room
North



Interior



Ceiling

Survey # 02-0037

Scale:
2m x 2m

100% Scan of Floor + 2 Meters up walls No Elevated Readings B⁻ or α
BKG Floor Monitor 1249 B⁻
10% scan of Above 2 meters on Walls + Ceiling No Elevated Readings B⁻ or α

= Scan area's

2-27-02 Mark Blanciak