Final Radiological Status Report
Select Commodity Site Areas
U.S. Army Chemical School
Fort McClellan, AL

APPENDIX A

SAMPLING AND ANALYSIS PLAN

U.S. ARMY FORT McCLELLAN
FORT McCLELLAN, ALABAMA
HQ, OSC PROJECT NUMBER USA 99-100

Release Survey of Ft. McClellan Commodity Storage Sites

SAMPLING AND ANALYSIS PLAN
Revision 1

Prepared by:

Allied Technology Group Inc.
669 Emory Valley Road
Oak Ridge, TN 37830

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U.S. Army Fort McClellan

Release Survey for Commodity Storage Sites

Sampling and Analysis Plan

Approval Page

August 2000

Concurrence: for L. Young via Telecom
Lee Young, ATG Project Manager
Date: 000807

Concurrence:
Mark McHugh, ATG Project Health Physicist
Date: 000807

Concurrence:
Arthur Palmer, ATG Corporate RSO
Date: 8/7/00

RADIOLOGICAL SURVEY FOR UNRESTRICTED RELEASE
COMMODITY SITE AREAS
U.S. ARMY CHEMICAL SCHOOL
FORT McCLELLAN, ALABAMA

1.0 METHODOLOGY

1.1 General Approach

Allied Technology Group (ATG) Inc. has been contracted by the U.S. Army Operations Support Command (OSC) under modification No. P00004 of Contract No. DAAA09-98-C-0039 [assigned ATG Project No. 10036.03] to perform radiological release surveys of designated commodity use areas at the U.S. Army Fort McClellan base in Anniston, AL.

The guidance in NUREG-1575, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), shall be used as the technical basis for planning, performing, interpreting and documenting the radiological survey of the commodity use areas at Fort McClellan. The MARSSIM process, developed collaboratively by the Nuclear Regulatory Commission, Environmental Protection Agency, Department of Energy, and Department of Defense, emphasizes the use of Data Quality Objectives (DQO) and Data Quality Assessment (DQA) processes, along with a sound Quality Assurance(QA)/Quality Control (QC) program.

The objective of MARSSIM is to describe a consistent approach for performance and assessment of building surface and surface soil final status surveys to meet established dose or risk-based release criteria, while at the same time encouraging an effective use of resources. The "graded approach" concept is also used to assure that the greatest survey efforts in those areas where there is the highest probability for residual contamination or the greatest potential for adverse effects from residual contamination.

Some of the site-specific information and methodologies that shall be used in design and development of the radiological survey plan are described herein.

1.2 Historical Site Assessment

The Historical Site Assessment (HSA) is an important step in the Radiation Survey and Site Investigation Process, as described in MARSSIM. The subject commodity sites at Fort McClellan consist of six (6) buildings and three (3) site areas. The designated six (6) buildings are: (1) T-810, (2) T-811, (3) T-812, (4) T-837, (5) 3182, and (6) 3185. The three (3) designated site areas are: (1) the T-836 area; (2) the original Rattlesnake Gulch area; and (3) the Chemical School Radiological Burial Grounds. The HSA process has been performed by Fort McClellan and shall be used as the basis for designing the radiological survey and sampling of these areas. A list of all Commodity Site Survey Areas with dimensions, status, RAM usage, suspected isotope, and survey protocol is in Attachment 1, "Description of Survey Areas." A historical investigation and resultant position shall be developed to indicate the status of the Radiological Survey Area 1, Field Hot Cell area, and Range 25, anticipated to result in a rule-out of field survey efforts being necessary. The results of this investigation will be recorded in the Final Survey Report.

1.3 Contaminants and Derived Concentration Guideline Levels

The radionuclides of historical concern include α, β, and β-γ emitters. The primary radionuclides vary for each area and include the following: Ra-226, Sr-90, Co-60, Cs-137, and H-3. These radionuclides existed both in sealed or contained form primarily in storage areas, where there is little potential for contamination, and in loose form for isotope preparation and/or disposal, for which the potential for residual contamination is increased.

As required in the Statement of Work prepared by the OSC, a copy of which has been included as Attachment 2, the Derived Concentration Guideline Values (DCGLs) shall be the residual surface contamination limits specified in the Federal Register / Volume 62, Number 222/ Wednesday, November 18, 1998, pages 64132-64134. These values are listed in Table 1-1. In addition to the aforementioned DCGLs, all surfaces surveyed shall also meet the requirements of Table 5-2 of Army Regulation 11-9, a copy of which has been included as Attachment 3.

TABLE 1-1: $DCGL_w$ FOR FORT McCLELLAN COMMODITY USE AREAS

Nuclide	Release Criteria Based on 25 mrem/y Release Criteria (dpm/100 cm^2)	Loose Surface Contamination Guidelines (dpm/100 cm^2)
H-3	NA	1.23E+07
Co-60	7.04E+03	7.04E+02
Ra-226	3.13E+02	3.13E+01
Sr-90	8.76E+03	8.76E+02
Cs-137	2.80E+04	2.80E+03

Each survey unit shall be considered as meeting the unrestricted release criteria if:

- the residual contamination above background is below the $DCGL_W$; and
- the residual removable contamination is below $DCGL_{rem}$.

In areas other than Class I (i.e., Bldg. 3182), there is no provision to perform a test for Elevated Measurement Comparison (EMC). In Bldg. 3182 the MDC_{Scan} is anticipated to be less than the $DCGL_W$ for each of the isotopes of concern [see Attachment 4 for anticipated MDC_{Scan} information], thereby requiring no additional samples for the EMC. The parameters upon which these MDC_{Scan} values are based (e.g., background, detector and surface efficiency, etc.) will be verified during the performance of the survey, and documented in the final survey report. If in an area, specific locations are identified that may require such testing, that area, or a portion of that area, shall be reclassified as Class I. In such cases, the OSC shall be notified immediately.

1.4 Area Classification

Specific MARSSIM survey classifications have been defined by OSC/Fort McClellan for all areas. Six (6) areas have been classified as Class III (i.e., based on site operating history, these areas are not expected to contain any residual radioactivity, or are expected to contain levels of residual radioactivity at a very small fraction of the $DCGL_W$). Two (2) areas have been classified as Class II (i.e., there is some potential for residual radioactivity but is not expected to exceed the $DCGL_w$), and one (1) area has been classified as Class I based on the positive findings of discrete areas of elevated activity during the earlier screening survey as a Class III area. In each of the nine (9) areas, if discrepancies are identified during the survey that may warrant reclassification of the area, that OSC shall be notified immediately.

1.5 Survey Units

For the Class III areas, MARSSIM does not place a limit on the size of survey units. For class II areas, MARSSIM recommends a maximum survey unit size of 1,000 m^2 for building floor areas and 10,000 m^2 for land areas. For Class I areas, MARSSIM suggests limiting the survey unit for structures to 100 m^2 of floor area.

The indoor survey units shall include the floor and the lower two (2) meters of each wall in the area. Bldg. 3182 shall be divided into thirteen (13) of these survey units. Each other area shall represent one (1) survey unit each.

Except in Bldg. 3182, contamination is not suspected on surfaces above two (2) meters, but some judgmental samples shall be collected on exposed flat horizontal surfaces located above two (2) meters. In Bldg. 3182 the surface area above the lower two (2) meters of the walls shall constitute two (2) Class II survey units.

1.6 Background Reference Area

Background (reference) levels of gross α and gross β surface activity for applicable surfaces (e.g., concrete, brick, wood, or vinyl) shall be determined in a building of similar construction where there is no record of use or storage of radioactive materials.

1.7 Survey Methodology

Field survey activities shall consist of:

- surface γ scans;
- surface α and β scans;
- measurements of total α and total β surface activity;
- measurements of removable α and β surface activity; and
- measurements of removable H-3 activity in selected areas.

1.7.1 Instrumentation and Sampling Techniques

The instrumentation and sampling protocols are briefly described below. See Attachment 4, "Table of Instrumentation for Radiological Surveys," for instrument parameters and detection sensitivities for each type of instrument and its application.

1.7.1.1 Surface γ Scans

Structures: easily accessible areas of the floor surface in the survey unit as well as the lower two (2) meters of any walls, shall be scanned for γ activity using a Bicron MicroRem Meter. This instrument shall be held as close to the surface being scanned as conditions allow. Scanning shall be performed by moving the detector from side to side in a serpentine motion while progressing across the surface no faster than 0.5 m/s. The percentage of the area to be covered by the γ scan is listed in Table 1-2.

Outdoor Areas: Outdoor areas shall be scanned for γ activity using a Bicron MicroRem Meter. This instrument shall be held at distance no greater than 30" from the ground. Scanning shall be performed by moving the detector from side to side in a serpentine motion while progressing across the surface no faster than 0.5 m/s. With an investigation level of four (4) μR/hour above a nominal background of eight (8) μR/hour, this survey method will ensure adequate detection sensitivity to detect soil concentrations of: 5.2 ρCi/g of Co-60; and 21.5 ρCi/g of ^{137}Cs. See Attachment 5 for supporting calculations. The percentage of the area to be covered by the γ scan is listed in Table 1-2.

1.7.1.2 Surface α and β Scans

Easily assessable areas of the floor shall be surveyed for α and β activity with a large area floor monitor, consisting of a Ludlum Model 231-1F gas proportional detector coupled to a Ludlum Model 2221 rate-meter/scaler, or its equivalent. The lower two (2) meters of any walls in the area, and floor surfaces that are not assessable with large area floor monitor shall be surveyed with a Ludlum 43-68 detector, coupled with a Ludlum Model 3/12 rate-meter/scaler, or its equivalent. The responses of these detector/meters combinations shall be checked with a National Institute of Standards and Testing (NIST) referenced source, or equivalent, prior to use.

The percentage of the area to be covered by the α/β scan is listed in Table 1-2. These instruments shall be held as close to the surface being scanned as conditions allow. Scanning shall progress across the surface no faster than one detector width per second.

1.7.1.3 Measurements of Total α and Total β Surface Activity

A sampling grid shall be established in each area, as described in Section 1.7.4. One minute counts shall be taken with a Ludlum Model 43-68 100 cm^2 gas proportional detector coupled to a Ludlum Model 3/12 rate-meter/scaler, or its equivalent, at each node of the survey grid in the area of interest. The response of this detector/meter combination shall be checked with a NIST referenced source, or equivalent, prior to use.

Replicate measurements are required as part of the data quality objectives described below. Two (2) replicate α/β counts shall be taken in each area. One (1) shall be collected at a randomly selected sampling location on the floor, and the other from a randomly selected sampling location on a wall.

1.7.1.4 Measurements of Removable α and β Surface Activity

Refer to Section 1.7.3.3 for the number of samples to be taken per survey unit. Where removable α/β activity is to be determined, or ruled-out, course swipe media shall be applied over a 100 cm^2 area. The swipe samples shall be maintained individually, and appropriately analyzed on-site on a calibrated low background automated proportional counter. Quality Control analysis of 10% of the samples shall be provided by ATG Richland on a similar counter. The samples shall be batch shipped along with the chain-of-custody record to Richland. Calibration and QC data for the laboratory instrumentation shall be archived along with sample analytical results for the pending report.

Replicate measurements are required as part of the data quality objectives described below. Two (2) replicate α/β smear samples shall be collected in each area. One (1) smear sample shall be collected at a randomly selected sampling location on the floor and the other sample shall be collected from a randomly selected sampling location on a wall.

1.7.1.5 Measurements of Removable H-3 Activity in Selected Areas

Smear samples shall be collected and placed immediately in liquid scintillation vials and sealed for analysis for H-3. These smear samples shall be collected beside the α/β smear samples collected at every direct measurement location in the Bldg. 3182 where H-3 is listed as a radionuclide of concern.

Comparative analysis (QC) shall be performed on 10% of the samples analyzed by ATG per LSC at a qualified third party laboratory (e.g., Barringer Laboratories, Inc.). Of the approximately 460 gross α/β samples to be analyzed by ATG on-site, 46 shall be additionally analyzed at ATG Richland. Of the approximately 225 LSC samples analyzed by ATG Richland, 23 shall be forwarded for comparison counting at the qualified third party laboratory. Third party turn-around of analytical results from the date of sample receipt is estimated to be the routine analysis turn-around of 20 work days.

Replicate measurements are required as part of the data quality objectives described below. Two (2) replicate α/β smear samples shall be collected in each area. One (1) tritium smear sample shall be collected at a randomly selected sampling location on the floor and the other sample shall be collected from a randomly selected sampling location on a wall.

ATG-Richland will additionally provide Liquid Scintillation Counting (LSC) vials for placement of associated swipe samples for screening of low energy β emitters, specifically tritium H-3. The samples shall be batch shipped along with the chain-of-custody record to Richland, for analysis by a liquid scintillation counter. Calibration and QC data for the laboratory instrumentation shall be archived along with sample analytical results for the pending report.

1.7.1.6 In Situ Isotopic γ Qualitative Measurements

In those outdoor areas that have been identified to be above the action level, In Situ γ spectrometry measurements shall be taken to determine the isotopes present. ^{60}Co will be identified by the characteristic photo-peaks at 1173 and 1332 keV. ^{137}Cs will be identified by the characteristic photo-peak of its ^{137m}Ba daughter at 661 keV. The subject γ spectrometry equipment shall be energy calibrated to NIST referenced source(s), or equivalent, prior to use.

1.7.2 Data Quality Indicators

As part of the DQO Process, the data quality indicators for Precision, Accuracy, Representativeness, Completeness, and Comparability (PARCC) shall be established.

- Precision shall be determined by comparison of replicate values from field measurements and sample analysis; the objective shall be a relative percent difference of 30% or less at 50% of the criterion value.
- Accuracy is the degree of agreement with the true or known; the objective for this parameter shall be +/- 20% at 50% of the criterion value.
- Representativeness and Comparability do not have numeric values. Performance for these indicators is assured through the selection and proper implementation of systematic sampling and measurement techniques.
- Completeness refers to the portion of the data that meets acceptance criteria and is therefore useable for statistical testing. The objective is 90% for this project.

1.7.3 Sampling Density

The number of direct measurements in each survey unit is dependent on several parameters, including the desired confidence of the decision criteria (i.e., decision uncertainty), the presence and variation of background interference, some of which are briefly discussed below.

1.7.3.1 Decision Errors

Among the most important parameters affecting survey design and the number of measurements needed to satisfy the Data Quality Objectives are the acceptable decision errors. The OSC has established the Type I (α) decision error at 0.05; this provides a confidence level of 95% that the statistical tests will not incorrectly determine that a surveyed area satisfies release criteria when, in fact, it does not. Similarly, the OSC has established the Type II (β) decision error at 0.05; this provides a confidence level of 95% that the statistical tests will not incorrectly determine that a surveyed area does not satisfy release criteria when, in fact, it does. The Type II decision error is more restrictive than is usually recommended for such surveys. This more restrictive value typically has a potential consequence of indicating unnecessary remediation; however, considering the public relations consequences of failing to identify residual contamination, the more restrictive level is considered prudent.

1.7.3.2 Variability (σ)

The survey units in the commodity use areas are mostly Class III areas with a few Class II areas. It is anticipated that the measurement variability in these areas will be similar to that in the background reference areas. Except for the specific survey units of Bldg. 3182 described herein, it is anticipated that the standard deviation of measurements (σ) will be equal to or less than 75% of average surface activity levels.

The standard deviation of measurements (σ) for the Bldg. 3182 survey unit containing Rooms 14 and 6 can be conservatively bounded at 3.17 $(10)^4$ dpm of ^{137}Cs activity. This is based on the maximum activity noted in the immediate area during the previous survey activities as described in "Commodity Site Survey Final Report," ATG, January 2000.

Once the direct measurements are actually performed, measurement variability shall be monitored and if it is significantly larger than the assumed values, appropriate corrections shall be made and the total number of measurements for the survey unit shall be revised, accordingly.

1.7.3.3 Number of Samples Indicated

A Type I error rate (α) of 0.05 and a Type II error rate (β) of 0.05 are assumed. The Lower Bound of the Gray Region (LBGR) is set at half the $DCGL_w$. This results in a conservatively bounded Relative Shift (Δ/σ) of:

- 0.4 for the previously identified affected survey unit of Bldg. 3182, Room 14, except ^3H; and
- 1.7 for the above survey units for ^3H and all other survey units.

The resultant number of data points can be found for each using MARSSIM Table 5.3:

- 175 for the previously identified affected survey unit of Bldg. 3182, Room 14, except LSC and
- 15 for the above survey units for LSC and all other survey units.

These numbers of data points (N) apply to direct measurements as well as smears for determining the amount of removable activity.

Table 1-2: Survey Requirements

Activities*	Area Classification				
	Class I		Class II		Class III
	Survey Unit with Room 14[1]	Other	Bldg. 3182	Other	All
Surface gamma scans	100%	100%	50%	50%	Judgmental**
Total alpha and beta scans	100%	100%	50%	50%	Judgmental**
Direct measurements for total alpha and total beta activity	175	15	15	15	15
Measurements of removable alpha and beta surface activity	175	15	15	15	15
Measurements of removable H-3 activity (LSC)	15	15	15	NA	NA

1 Survey unit containing previously identified affected areas.

1.7.4 Selection of Sampling Locations in Survey Units

MARSSIM recommends a triangular sampling pattern with a random starting point to increase the probability of identifying small areas of elevated activity (Figure 1 illustrates a triangular sampling pattern). This type pattern shall be used for the Commodity Use Areas, except where a triangular pattern is not practical, because of the size and shape of a specific area to be sampled; for such situations, a square sampling pattern may be used. For example a square pattern is more practical to install and implement than a triangular pattern for survey areas having one dimension less than the calculated average spacing between samples. The spacing (L) between samples on a triangular pattern is determined by:

$$L = [\text{Survey Unit Area}/(0.866)\ (\text{number of samples})]^{1/2}$$

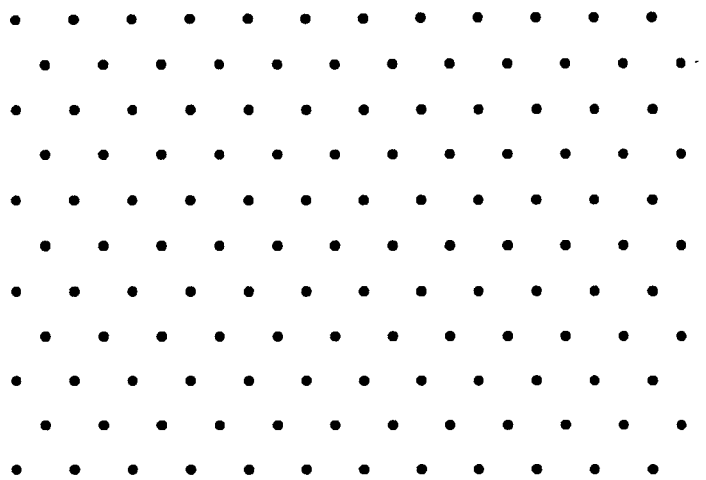

Figure 1-1: Triangular Sampling Pattern

For a Class II survey unit area of 120 m^2 and 15 samples, the area represented by each sample is approximately 8 m^2. The spacing between samples on a triangular pattern for this area is about 3 m. If unusual survey unit dimensions and surface features prevent collection of an adequate number of systematic data points for statistical testing, additional points may be obtained from randomly selected locations within the survey unit.

A hypothetical Class II survey unit in a building with an area of 120 m^2 (including the walls) and walls running north-south and east west is used to demonstrate how a survey grid with a triangular pattern may be established. Select a random starting point in the southwest corner of the survey unit. Next, lay out an east-west line of samples separated by 3-m intervals until the end of the survey unit is reached. Then set up the next line in the grid by locating a point 2.6 m north (or south) and 1.5 m east (or west) of one of these locations, and lay out a second, parallel, east-west line of samples separated by 3-m intervals until the end of the survey unit is reached. Repeat this process until the survey entire area (including the walls up to 2 m) is covered by the triangular pattern.

Alternatively, the grid spacing of the smallest survey unit can be determined, and this grid spacing can be applied to all Class II or Class III survey units. This will result in more grid nodes than is required, and a subset of 15 grid locations can be sampled.

For irregular shaped survey units, where use of east west and north-south grid lines may be inconvenient, the baseline for the sampling pattern may follow the long axis of the survey unit to facilitate implementation.

1.7.5 Selection of Sampling Locations in Background Locations

Samples of background areas do not have to be collected from a designated grid prior to sampling. It is sufficient to collect background samples from separate locations within the background area and record their approximate location.

2.0 MOBILIZATION AND SURVEY EXECUTION

Instrument calibration and personnel mobilization will be closely coordinated with distribution of the Plans and base location access. The initial mobilization event will target instrument set-up, representative background measurements, followed by initiating surveys of indoor areas, and finally of the outdoor areas. The project instrumentation will be dedicated to the effort, and secure storage on-site is expected to be afforded by base personnel.

Custodial records (Department of the Army Radiation Permits –DARP) shall be completed for radioactive calibration and/or check sources brought on-site. Security shall be ensured through locked storage containers and designated facility areas. MSDS forms shall accompany the project material (e.g., P-10 gas for detectors).

The initial mobilization /survey campaign will include the participation of the Project Manager, the Project Certified Health Physicist, and four (4) health physics survey technicians. Targeted vacant commodity sites shall be surveyed by the team to standardize the survey technique, record collection, sample acquisition, quality control, and sample shipment. Future surveys shall include the on-site efforts of the four (4) health physics survey technicians, with off-site data review/reduction, sample analysis, and third party QC analysis.

3.0 PROJECT SCHEDULE

The schedule for the comprehensive survey effort is enclosed as Attachment 6. The brief synopsis includes the investigation of nine (9) areas with varying degrees of investigation for the Class I, Class II and Class III sites. A total of some 1,346 hours is budgeted for the on-site survey effort to ensure defensible and appropriately documented evidence for the release survey, which equates to twenty-two work days for a six (6) person crew, working up to ten (10) hours/day.

4.0 DATA EVALUATION

All survey data shall be carefully screened and reviewed by the Project Lead Evaluator, the Project Manager, and the Project Health Physicist. The scan surveys and sample results shall be evaluated against the unrestricted release criteria to ensure that the area meets the release criteria. This unrestricted release criteria is:

a) the residual contamination above background is below the $DCGL_w$; and

b) the residual removable contamination is below $DCGL_{rem}$.

If any area is at or exceeds the unrestricted release criteria, the OSC shall be immediately notified. An evaluation shall then be conducted by the Project Lead Evaluator, the Project Manager, and the Project Health Physicist on whether the area may need to be reclassified and/or additional surveys and samples taken and evaluated. If reclassification is required, a Change to the Scope of Work shall be required and an amendment to the work plan shall be authored and submitted for approval.

5.0 FINAL REPORT

The final project survey report shall document the comprehensive investigation effort, including the substantiation of discreet area classifications. The MARSSIM protocol shall be adhered to in data analysis and statistical testing of results for determination of suitability for unconditional release or the necessity for subsequent action. The final report shall document all surveys and samples including associated QA documentation for these reports. Instrument calibrations shall also be included along with source checks and source pedigrees to legitimize the associated surveys.

6.0 ATTACHMENTS

- Attachment 1: Description of Survey Areas
- Attachment 2: Description of Work
- Attachment 3: AR 11-9, Table 5-2, Surface Radioactivity Values
- Attachment 4: Table of Instrumentation for Radiological Surveys
- Attachment 5: γ Scan Screening Level Calculations
- Attachment 6: Project Schedule
- Attachment 7: Health & Safety Plan
- Attachment 8: Quality Assurance Plan

ATTACHMENT 1

DESCRIPTION OF SURVEY AREAS

Building 3182

Building 3182 is an 11,696 ft^2 facility built in 1954 for use as an Applied Instruction Building, with one wing having been used by the Fort McClellan Radiological Laboratories in conjunction with the Hot Cell facility. The later served as the Military Police Corps museum. The associated Hot Cell facility was decommissioned in 1995, along with the supporting area of Building 3182. The primary contaminants of concern are Cs-137, from the hot cell, as well as H-3 and Ra-226 associated with lensatic compasses and luminescent dials/gauges of military devices. The facility was surveyed in 11/99 as a MARSSIM Class III area. Discrete areas of elevated surface activity were found which have caused the conservative reclassification as a MARSSIM Class I area. ATG shall perform a Class I survey of the floor and lower two (2) meters of the interior walls, and a modified Class II survey of the upper walls and ceiling.

Building T-810

Building T-810 (originally 811) is an 88' x 26' single story frame structure used historically as a temporary laboratory. The primary contaminants of concern are Cs-137, Ra-226, Co-60, and Sr-90. The facility has a large classroom and men's lavatory with several shower stalls on the west end, with an isolated women's area on the east end. The facility interior shall be surveyed as a MARSSIM Class III area.

Building T-811

Building T-811 (originally 812) is an 88' x 26' single story frame structure used historically as a temporary laboratory. The primary contaminants of concern are Cs-137, Ra-226, Co-60, and Sr-90. The facility was inaccessible during the tour and the contractor was directed by base staff to assume that is of similar layout as Building T-812, having two (2) large open classrooms on opposite ends, with a single small (~10' x 10') office in between. The facility interior shall be surveyed as a MARSSIM Class III area.

Building T-812

Building T-812 (originally 813) is an 88' x 26' single story frame structure used historically as a temporary laboratory. The primary contaminants of concern are Cs-137, Ra-226, Co-60, and Sr-90. The facility has two large open classrooms on opposite ends, with a single small (~10' x 10') office in between. The facility interior shall be surveyed as a MARSSIM Class III area.

Building T-836

Building T-836 has been demolished and removed accept for the concrete block support pedestals, the chimney, and an associated rubble pile. The historical structure was an 88' x 26' single story frame structure used as a temporary laboratory. The primary contaminants of concern are Cs-137, Ra-226, Co-60, and Sr-90. The footprint plus a 5' buffer on each dimension, for a total area of 98' x 36', shall be surveyed as a MARSSIM Class III outdoor area without the disturbance of the existing rubble pile.

Building T-837

Building T-837 (originally 836A) is an 88' x 26' two-story frame structure used historically as a temporary laboratory. The historical record indicated use of the facility to include isotope preparation. The primary contaminants of concern are Cs-137, Ra-226, Co-60, and Sr-90. The facility has several ~ 12' x 12' cubicles/rooms and lavatories on both elevations. The facility interior shall be surveyed as a MARSSIM Class II area.

Building 3185

Building 3185 is a 60' x 136' single story structure used historically as a personnel decontamination center for training purposes. Students used this building to change clothes and to practice decontamination procedures. The primary contaminants of concern are Cs-137, Ra-226, Co-60, and Sr-90. Although Br-82 may have also been of concern, its 35-hour half-life excludes the prospect of residual presence. The facility has several ~ 12' x 12' cubicles/rooms and lavatories on both elevations. The facility interior shall be surveyed as a MARSSIM Class III area under the coordinated observance/participation of the regional EPA representative. A three (3) week advance notification to alert of the tentative start date shall be included in the schedule.

The Original Rattlesnake Gulch Area

The Original Rattlesnake Gulch Area is an outdoor area east of the Anniston (Lemlock) Community Center parking area and is mentioned in historical literature attributed to training drills of the Chemical Corp. The assumed area of concern is a wooded ravine located at a present bike trail on the north side, two concrete markers near the east end at the southern turn in the bike trail, and the grassy bank at the tree line on the west (Community Center/parking area) side. The overall area of concern is 200' wide across the ravine by 400' long. The outdoor area shall be surveyed for gross gamma using the protocol as a MARSSIM Class III area. No samples shall be collected, but any areas of detected elevated activity will be temporarily marked by the shallow placement of wire flags and noted on the survey record.

Additionally, as a result of an area of elevated readings found with a random μR-meter survey by the State and EPA on April 11, 2000, a single point in-situ gamma spectroscopy analysis shall be performed early at the grassy bank located between the parking area and the west end of the subject Original Rattlesnake Gulch Area. Near surface readings in the range of 32 μR/hr gross over a background of ~ 4 μR/hr were found over an area approximately 20' NW of the bike trail sign and 10' inside the grass line (w.). A gamma spectrometry measurement shall be performed prior to the scheduled survey of the Original Rattlesnake Gulch Area to serve as a rule-out of Fort McClellan contaminants of concern. If the elevated activity is determined to be NORM-like, then the Original Rattlesnake Gulch Area shall be surveyed for gross gamma as a MARSSIM Class III area as planned. If the gamma spec exercise reveal positive identification of the above normal background abundances of contaminants of concern (i.e., ^{60}Co and ^{137}Cs), the OSC will be notified for evaluation of the area survey strategy. The embankment will be surface surveyed for gamma activity, and the single-point in-situ gamma spectroscopy analysis shall be performed at the discrete location of highest surface activity.

Radiological Survey Area #1

Radiological Survey Area #1 was an open land area developed by Fort McClellan as a replacement for the Rattlesnake Gulch. Reportedly, the site placed ^{233}U plates on the ground for survey training purposes. A rule-out of the concern attributed to this area shall be included in the pending report with archived data verifying the removal and appropriate disposition of the ^{233}U plates to be provided by others. No radiological survey of this area shall be performed.

The Field Hot Cell

The Field Hot Cell is part of the Radiological Survey Area #1. This was reportedly a temporary structure made out of cinder blocks and sand bags within the envelope of Radiological Survey Area #1. The base is to provide historical verification literature to be imported into the pending report to serve as rule-out for the need to perform a survey of this area. No field survey of the Field Hot Cell shall be performed.

The Chemical School Radiological Burial Grounds

The Chemical School Radiological Burial Grounds is an outdoor wooded area reportedly used by the installation for radiological burials from 1957-1958. This site includes the northeast corner of the Anniston Community Center property. In the 1958-1959 timeframe, the buried radioactive materials were removed. The site conducted a second cleanup in 1971. The observed area covers an assumed area of concern of approximately 400' x 400' and spans both sides of the chain-link fence and the unimproved Perimeter Road, with the majority of the site within the city-side (NW) of the fence line. The area shall be surveyed for gross gamma as a MARSSIM Class II area (revised per Regulator in-put from the SOW-stated Class III). No samples shall be collected, but any areas of detected elevated activity will be temporarily marked by the shallow placement of wire flags and noted on the survey record. Intrusive sampling requires the presence of UXO/EOD personnel provided by others, and neither sampling nor associated analysis shall be performed.

Range 25

Range 25 is an open area of land on the base which was reportedly used for a six-week period to test prototype source actuators. The specific location of concern is between the 300 and 400-yard line of the range. Only Co-60 sources were to have been used. The pending report shall include the verification literature to be provided by others which proves that the subject sources were appropriately leak tested before/after this application period, and their ultimate appropriate disposition. No field survey of Range 25 shall be performed.

U.S. Army Fort McClellan HQ, OSC Project Number USA 99-100 Commodity Site Survey Phase II
ATG Project No. 10036.03
OSC Contract No. DAAA09-98-C-0039 Modification No. P00004

Item	Facility	Location		Dimensions Length (Ft)	Dimensions Width (Ft)	Floor or Ceiling Area (Ft^2)	Survey Area (Ft^2)	Survey Area (M^2)	Status	RAM Useage	Suspect Isotopes	Survey Protocol	Sample Frequency	Sample Quantity Units	ATG α/β	ATG LSC	Analysis 3rd Party α/β	Analysis 3rd Party LSC	Survey Effort man-hrs
1	Bldg 3182	Bottom	114	58	58	3364	4756	442	Vacant	Rad Labs	Ra-226,Cs-137, H-3	Class I	100%	0	0	0	0	0	64.00
	$100m^2$ Units		112	58	58	3364	4756	442		MP Artifacts	Ra-226,Cs-137, H-3	Class I	100%	0	0	0	0	0	64.00
	50 samples per		104	25	22	550	1114	103			Ra-226,Cs-137, H-3	Class I	100%	0	0	0	0	0	25.00
			102	14	12	168	480	45			Ra-226,Cs-137, H-3	Class I	100%	0.0	0	0	0	0	14.00
			103	17	12	204	552	51			Ra-226,Cs-137, H-3	Class I	100%	0.0	0	0	0	0	14.00
			front	24	14	336	792	74			Ra-226,Cs-137, H-3	Class I	100%	0	0	0	0	0	14.00
			101	20	14	280	688	64			Ra-226,Cs-137, H-3	Class I	100%	0.0	0	0	0	0	14.00
			100	92	7	644	1832	170			Ra-226,Cs-137, H-3	Class I	100%	0	0	0	0	0	38.00
			105	14	11	154	454	42			Ra-226,Cs-137, H-3	Class I	100%	0.0	0	0	0	0	14.00
			106	35	22	770	1454	135			Ra-226,Cs-137, H-3	Class I	100%	0	0	0	0	0	31.00
			other	34	23	782	1466	136			Ra-226,Cs-137, H-3	Class I	100%	0	0	0	0	0	31.00
						Total	18344	1704					Totals	13	355	195	36	20	323.00
	Bldg 3182	Top	114	58	58	3364	4060	377	Vacant	Rad Labs	Ra-226,Cs-137, H-3	Class II	50%	0.4	0	0	0	0	32.29
	$1000m^2$ Units		112	58	58	3364	4060	377		MP Artifacts	Ra-226,Cs-137, H-3	Class II	50%	0.4	0	0	0	0	41.72
	15 samples per		104	25	22	550	832	77			Ra-226,Cs-137, H-3	Class II	50%	0.1	0	0	0	0	11.73
			102	14	12	168	324	30			Ra-226,Cs-137, H-3	Class II	50%	0.0	0	0	0	0	7.01
			103	17	12	204	378	35			Ra-226,Cs-137, H-3	Class II	50%	0.0	0	0	0	0	7.51
			front	24	14	336	564	52			Ra-226,Cs-137, H-3	Class II	50%	0.1	0	0	0	0	9.24
			101	20	14	280	484	45			Ra-226,Cs-137, H-3	Class II	50%	0.0	0	0	0	0	8.50
			100	92	7	644	1238	115			Ra-226,Cs-137, H-3	Class II	50%	0.1	0	0	0	0	15.50
			105	14	11	154	304	28			Ra-226,Cs-137, H-3	Class II	50%	0.0	0	0	0	0	6.82
			106	35	22	770	1112	103			Ra-226,Cs-137, H-3	Class II	50%	0.1	0	0	0	0	14.33
			other	34	23	782	1124	104			Ra-226,Cs-137, H-3	Class II	50%	0.1	0	0	0	0	14.44
						Total	14480	1345					Totals	2.0	30	30	3	3	169.09
2	T-810	Entirety	main walls	88	26	2288	3656	340	Vacant	Temp Lab	Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	34	15	0	2	0	10.79
	(originally 811)		showers	2	2	0	672	62			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	6	0	0	0	0	5.25
			internal wal	22	8	0	720	67			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	7	0	0	0	0	5.34
						Total	5048	469					Totals	47	15	0	2	0	21
3	T-811	Entirety	main walls	88	26	2288	3656	340	Vacant	Temp Lab	Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	34	15	0	2	0	10.79
	(originally 812)		showers	0	0	0	0	0			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	0	0	0	0	0	4.00
			internal wal	22	8	0	720	67			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	7	0	0	0	0	5.34
						Total	4376	407					Totals	41	15	0	2	0	20
4	T-812	Entirety	main walls	88	26	2288	3656	340	Vacant	Temp Lab	Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	34	15	0	2	0	10.79
	(originally 813)		showers	0	0	0	0	0			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	0	0	0	0	0	4.00
			internal wal	22	8	0	720	67			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	7	0	0	0	0	5.34
						Total	4376	407					Totals	41	15	0	2	0	20
5	T-836	Demolished soil		98	36	3528	3528	328	Vacant	Foot Print of	Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	33	0	0	0	0	10.56
		Foot print plus 5' each direction				Total	3528	328		Temp Lab			Totals	33	0	0	0	0	11
7	T-837	Entirety	main walls	88	26	2288	12800	1189	Vacant	Temp Lab	Cs-137,Ra-226,Co-60,Sr-90	Class II	50%	595	15	0	2	0	126.91
	(originally 836A)		cubes	12	12	0	4032	375		(Isotope Prep)	Cs-137,Ra-226,Co-60,Sr-90	Class II	50%	187	0	0	0	0	45.46
	Two Story		internal wal	22	8	0	1920	178			Cs-137,Ra-226,Co-60,Sr-90	Class II	50%	89	0	0	0	0	25.84
						Total	18752	1742					Totals	871	15	0	2	0	198
8	BLDG 3185	Entirety	floor	60	136	8160	8160	758	Vacant	Personnel Decon	Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	76	15	0	2	0	19.16
			rooms	10	12	0	3696	343		Center	Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	34	0	0	0	0	10.87
			halls	5	108	0	1356	126			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	13	0	0	0	0	6.52
			room 1	30	60	0	1080	100			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	10	0	0	0	0	6.01

U.S. Army Fort McClellan HQ, OSC Project Number USA 99-100 Commodity Site Survey Phase II
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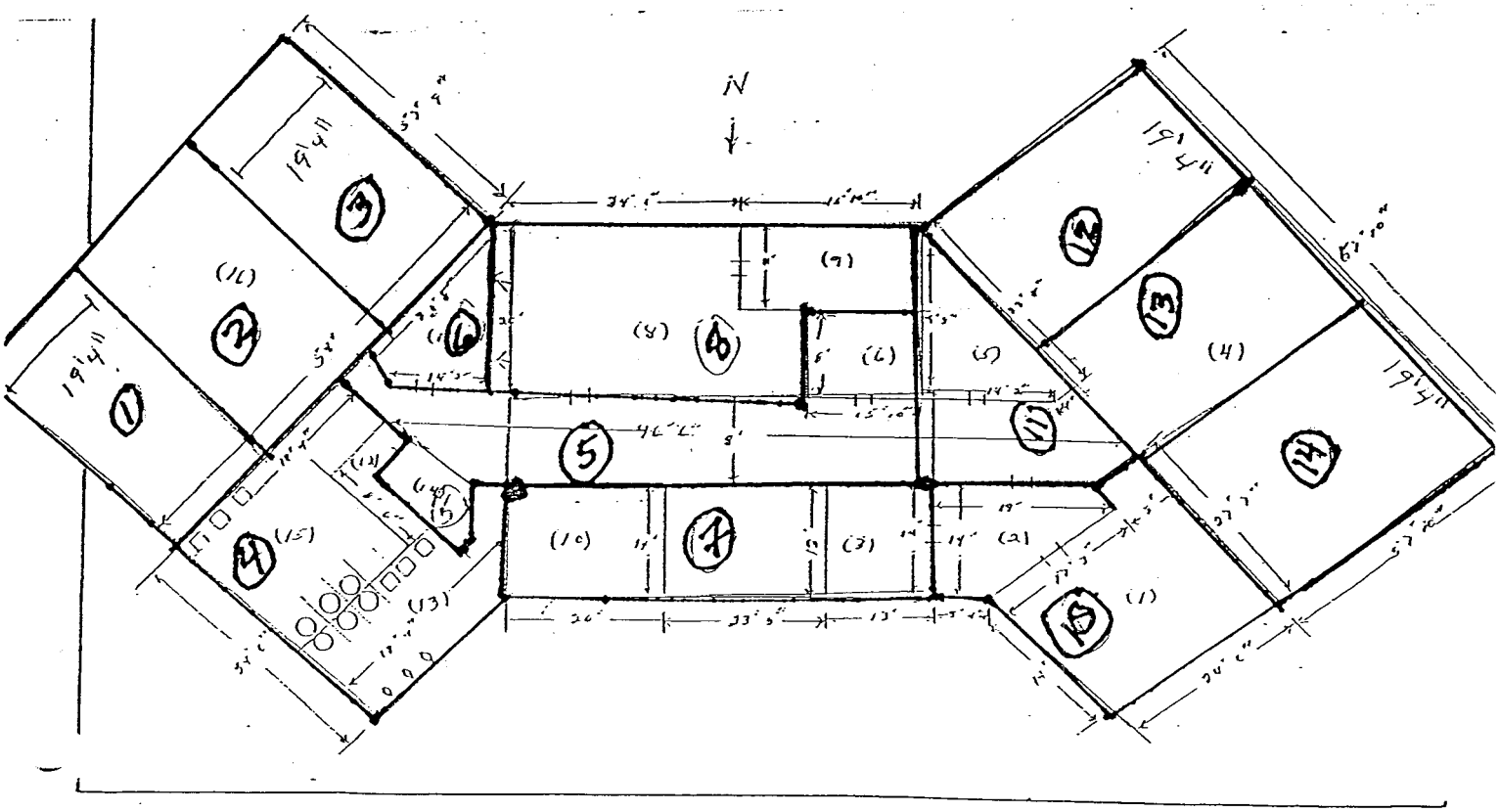
Item	Facility	Location		Dimensions Length (Ft)	Dimensions Width (Ft)	Floor or Ceiling Area (Ft^2)	Survey Area (Ft^2)	Survey Area (M^2)	Status	RAM Useage	Suspect Isotopes	Survey Protocol	Sample Frequency	Sample Quantity	ATG α/β	ATG LSC	Analysis 3rd Party α/β	Analysis 3rd Party LSC	Survey Effort man-hrs
			room 2	30	60	0	1080	100			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	10	0	0	0	0	6.01
			extra	100	0	0	1200	111			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	11	0	0	0	0	6.23
			left room	30	60	0	1080	100			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	10	0	0	0	0	6.01
			extra	109	34	0	1716	159			Cs-137,Ra-226,Co-60,Sr-90	Class III	10%	16	0	0	0	0	7.19
						Total	19368	1799					Totals	180	15	0	2	0	68
9	Orig. Rattlesnake Gulch Area	soil area + single-point gamma spec		400	200	80000	80000	7432	Vacant	Historical Training Site	gross gamma	Class III	10%	743	0	0	0	0	78
							Total	7432					Totals	743	0	0	0	0	78
10	Radiological Survey Area 1 Paper work investigation											Paperwork							
11	Field Hot Cell Paper work investigation											Paperwork							
12	Chemical School Radiological Burial Ground	soil		400	400	160000	160000	14864	Vacant	Historical Disposal Site	gross gamma	Class II	50%	7432	0	0	0	0	153
							Total	14864					Totals	7432	0	0	0	0	153
13	Range 25 Paper work investigation											Paperwork							
	Subtotals														460	225	47	23	1061
																	Man-days		106
																	Work Days		27

Bldg 3182

Class I Survey units
Attachment to FC-02

Unit	Rooms
1	Left 19'4" of Room 16
2	Center 19'4" of Room 16
3	Right 19'4" of Room 16
4	Rooms 12, 13 & 15
5	Rooms 6, 14 & portion of Hall
6	Room 11
7	Rooms 3, 10, and Foyer
8	Rooms 8 & 9
9	Not used
10	Rooms 1 & 2
11	Room 5 and portion of Hall
12	Left 19'4" of Room 4
13	Center 19'2" of Room 4
14	Right 19'4" of Room 4



Bldg. 3182 Survey Unit Description

The attached figure establishes thirteen (13) Class I survey units for the floors and lower six feet (6') of the walls in Bldg. 3182. The upper portion of the building (i.e., the ceilings and walls greater than six feet (6') off the floor) will remain two (2) Class II survey units, as described in the SAP. The number of fixed α/β counts, α/β smears, and ^3H smears are listed below, along with the distance "L" between each sample point for the subject survey unit and sample type.

Unit	Fixed α/β Counts and α/β Smears		^3H Smears	
	Number	L	Number	L
1	15	11'8"	15	11'8"
2	15	10'3"	15	10'3"
3	15	11'8"	15	11'8"
4	15	11'11"	15	11'11"
5	175	3'10"	15	13'1"
6	15	6'5"	15	6'5"
7	15	11'7"	15	11'7"
8	15	13'6"	15	13'6"
9	Not Used			
10	15	10'3"	15	10'3"
11	15	6'5"	15	6'5"
12	15	11'8"	15	11'8"
13	15	10'3"	15	10'3"
14	15	11'8"	15	11'8"

All Class I survey units shall receive a 100% scan.

ATTACHMENT 2

DESCRIPTION OF WORK

DESCRIPTION OF WORK
DEPARTMENT OF THE ARMY
U.S. ARMY CHEMICAL SCHOOL
FORT McCLELLAN, ALABAMA
RADIOLOGICAL SURVEYS FOR COMMODITY USE AREAS
USA 99-100, PHASE II

Fort McClellan is comprised of two parts, the Main Post and Pelham Range. The installation occupies approximately 41,000 acres adjacent to Anniston, AL. The Main Post encompasses 19,000 acres and contains the majority of the facilities. The Pelham Range is approximately 22,000 acres west of the Main Post.

The Army Base Closure and Realignment Committee (BRAC) has identified Fort McClellan as an installation for closure. The Army must resolve several radiological issues before closing the installation. This scope of work is for the buildings and areas that Fort McClellan used for the storage and routine maintenance on Army radioactive commodities.

The contractor shall develop a radiological survey plan describing the survey methodologies and techniques that they will follow for release of the identified structures. This scope does not address decontamination or decommissioning waste. The contractor shall use the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), NUREG-1575, for designing the final release survey. We will address future remedial actions and or disposal activities under a separate scope of work.

The contractor shall participate in a 1-day site walk down and regulatory session before starting this effort. We suggest the contractor wait to submit their cost and technical proposal until after the 1-2 day site meeting. We hope to complete the walk down on 11-12 April 2000.

All operations must comply with all applicable federal, state, and municipal laws, rules and regulations including the Defense Appropriations Act as it pertains to the use of ozone depleting substances.

SCOPE OF WORK

FORT McCLELLAN, ALABAMA
RADIOLOGICAL SURVEYS FOR COMMODITY USE AREAS
USA 99-100, PHASE II

1. COORDINATION. The contractor shall coordinate project activities with the installation environmental point of contact, Ms. Lisa Kingsbury and the HQ, OSC Project Officer, Mr. Mike Styvaert at:

U.S. Army Garrison,
Building 215, 15th Street
ATTN: (Ms. Lisa Kingsbury),
Fort McClellan, AL 36205-5020
Telephone (205) 848-7455
E-mail: kingsburyl@mcclellan-emh2.army.mil

U.S. Army Operations Support Command
ATTN: AMSOS-SF (Mr. Mike Styvaert)
1 Rock Island Arsenal
Bldg 390, 4th flr, SE
Rock Island, IL 61299-6000
Telephone (309) 782-0880
FAX: (309) 782-2988
E-mail: styvaertm@ioc.army.mil

2. REGULATORY CONCERNS. The contractor shall use the surface release limits in "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses, By-product, Source, or Special Nuclear Materials, (NRC 1987)."

2.1. The contractor shall obtain required permits, licenses and authorizations from federal, state, and municipal agencies necessary to complete this effort.

2.2. The contractor shall obtain a Department of Army Radiation Permit (DARP) IAW Army Regulation (AR) 385-11 for radioactive material brought on-site for more than 15 days. This includes check sources. The contractor may obtain copies of the DARP application form (DA 3777) from the Army POC listed in paragraph 1.

2.3. In accordance with the Defense Appropriations Act, the contractor, in performing the efforts as defined by this scope of work, shall in no way construe the government direction as supporting, suggesting, or directing the use of ozone depleting substances. The contractor shall specifically bid and perform all contractual efforts in compliance with this Act.

3. FACILITIES, EQUIPMENT AND SUPPLIES. The installation will provide limited office space, restroom facilities, facsimile equipment and access to a copy machine. The contractor shall supply all other services (including cell phone coverage), facilities, supplies and equipment necessary to complete this scope of work.

4. WORK PLANS AND HEALTH AND SAFETY PLAN. The contractor shall, as a deliverable item, prepare a Radiological Work Plan that details the proposed final status survey methodology. The contractor shall submit the Plan and receive approval by the OSC, Fort McClellan, the Environmental Protection Agency (EPA), the Nuclear Regulatory Commission (NRC) and the State of Alabama before the field work begins. After completion of the field work and survey effort, the contractor shall prepare a Final Report, which is a deliverable item and considered complete once the OSC, Fort McClellan and the regulatory agencies have reviewed and accepted it.

4.1. Survey Plan. The Survey Plan shall address the safety procedures for on-site work, survey and sampling procedures and criteria, and the radiation protection procedures to minimize potential exposures. The Plan shall address the overall technical approach, sampling and analysis and Quality Assurance/Quality Control (QA/QC). The contractor shall follow the survey design guidance prescribed in MARSSIM, NUREG-1575.

4.1.1. MARSSIM Parameters.

a. Derived Concentration Guideline Values (DCGLs). For surfaces, the contractor shall use (as the DCGLs) the residual surface contamination limits specified in the Federal Register/Volume 62, Number 222/Wednesday, November 18, 1998, pages 64132-64134. The contractor shall also reference the surface limits prescribed in Army Regulation 11-9, *Radiation Safety Program*, and apply the most conservative limit.

b. Decision Errors. The contractor shall assume Type I and Type II decision errors of 0.05 for the initial survey design. The values are subject to change after review by the NRC and other applicable regulatory agencies.

c. Sample Variability. Direct measurement frequency is directly related to the assumed final status survey sample variability. The contractor shall identify the proposed methodology for estimating sample variability and the plan for correcting the survey if the actual sample variability exceeds the assumed value.

d. Scan Minimal Detectable Concentration (MDC). The instrumentation scanning MDC may impact the sample frequency for the final status survey. The contractor shall prepare the survey

work plan to include a discussion and the rationale for their scanning instrumentation selection.

e. Area Factors. The contractor survey design shall incorporate the MARSSIM area factor provisions for small-elevated areas of contamination that exceed the DCGL.

f. Area Classifications. We have defined the specific MARSSIM survey classifications in section 5 of this scope of work. If the contractor finds discrepancies with our assumptions during the actual survey work, they shall immediately notify the installation and OSC. We will then investigate the possibility of revising the area classification.

4.2. Health and Safety Plan. The contractor shall develop a Health and Safety Plan (HASP) specific to this project. Radiation protection standards of 10 CFR 20 and OSHA standards of 29 CFR 1910.120 apply for worker and public protection and shall be incorporated into the HASP. The contractor shall provide operational health physics procedures for all tasks to ensure personnel exposures, environmental releases and contamination are controlled to ALARA (as low as reasonable achievable).

4.2.1. The HASP shall address procedures to reduce hazards and protect workers. Existing site hazards include heavy equipment operations, noise hazards, and unstable building structures. Surveyors shall coordinate each day for access to survey areas, and will notify area supervisors of their actions. Contractor personnel shall use safety equipment such as goggles and hearing protection as appropriate. Examples of expected procedures are:

4.2.1.1. Prior to a new action occurring, the work is analyzed to determine what possible hazards, safety and radiation, might exist. Once done, procedures are implemented to reduce the risk of these hazards. A certified Health Physicist shall review these procedures.

4.2.1.2. All contractor personnel shall receive, as a minimum, a briefing on the hazards of the work area, the expected dose, and possible biological effects from receiving that exposure. All contractor personnel working in a restricted area shall wear personal monitoring devices.

4.2.1.3. The environment in all buildings and surrounding areas is expected to be very low dose rate, and the greatest danger from a radiation safety viewpoint is potential contamination. For most of the operations, only disposable anti-contamination clothing is required. For operations where a possible inhalation hazard exists, contractor personnel shall use NIOSH approved respirators with HEPA filters.

4.2.1.4. The contractor shall establish control areas at the boundary to areas where the spread of contamination is possible. Using appropriate instrumentation, they shall monitor material or equipment leaving the controlled area for contamination.

4.2.1.5. The contractor may encounter hazardous materials other than radioactive materials during the survey effort. These materials are likely to include as a minimum, lead based paint, PCBs (including that in light fixture ballasts), mercury (potentially in switches, controls and light tubes and fixtures) and asbestos. The contractor shall identify procedures for the safe handling of such materials in the HASP.

4.3. Quality Assurance/Quality Control (QA/QC) Plan. The contractor shall describe their proposed QA/QC procedures and protocols. Laboratory analyses shall conform to SW-846. If the contractor proposes to use an in-house laboratory for sample analysis then, as a minimum, they shall duplicate 10% of the samples and have analyzed by an independent third party laboratory. The contractor shall verify instrument operation each day with a check source before use.

5. SITE SPECIFICS. The contractor shall develop and conduct radiological release surveys for the following buildings and outdoor areas at Fort McClellan. The contractor shall design the survey protocol to bias sample locations towards areas with the greatest contamination potential (i.e., rough-cracked surfaces, joints, corners, drain traps, change rooms, utility access points, etc.). The contractor may see each area and building during a 1-day pre-proposal site visit. We plan to set up the site walk down no later than mid-April. The Army will provide drawings and maps as appropriate and available.

(1) Building 3182. Status - Vacant. OSC will check for availability of floor plans. Built in 1954 originally as an Applied Instruction Building, the Fort McClellan Radiological Laboratories used one wing in conjunction with the Hot Cell facility. The building served as the Military Police Corps museum. Total square footage is 11,696. Based on findings of residual activity from the previous survey effort, the contractor shall re-survey the building as a MARSSIM Class I area. The primary radionuclides of concern are H3, Cs137 and Ra226.

(2) Bldg T-810. Status - Vacant. The installation used this structure as a temporary laboratory. The contractor shall survey the building as a MARSSIM Class III area. The primary radionuclides of concern are Cs137, Ra226, Co60 and Sr90.

(3) Bldg T-811. Status - Vacant. The installation used this structure as a temporary laboratory. The contractor shall survey the building as a MARSSIM Class III area. The primary radionuclides of concern are Cs137, Ra226, Co60 and Sr90.

(4) Bldg T-812 Status - Vacant. The installation used this structure as a temporary laboratory. The contractor shall survey the building as a MARSSIM Class III area. The primary radionuclides of concern are Cs137, Ra226, Co60 and Sr90.

(5) Bldg T-836. Status - Demolished. The installation used this structure as a temporary laboratory. The contractor shall survey the building footprint as a MARSSIM Class III area. The primary radionuclides of concern are Cs137, Ra226, Co60 and Sr90.

(6) Bldg T-836A. Status - Vacant. The installation used this structure as a temporary laboratory. The contractor shall survey the building as a MARSSIM Class III area. The primary radionuclides of concern are Cs137, Ra226, Co60 and Sr90.

(7) Bldg T-837. Status - Vacant. The installation used this structure as a temporary laboratory. The contractor shall survey the building as a MARSSIM Class III area. The primary radionuclides of concern are Cs137, Ra226, Co60 and Sr90.

(8) Building 3185, Status - Vacant. The installation used this structure as a personnel decontamination center for training purposes. Students used this building to change clothes and to practice personal decontamination procedures. The contractor shall survey the building as a MARSSIM Class III area. The primary radionuclides of concern are Cs137, Ra226, Co60 and Sr90.

(9) Original Rattlesnake Gulch Area. Status - land area, east of the Anniston Community Center parking lot. The installation will provide a map of the area. The contractor shall conduct a gross gamma/gross beta survey of the area in accordance with MARSSIM class III protocol.

(10) Radiological Survey Area #1. Status - open land area. Fort McClellan developed this area as a replacement for the Rattle Snake Gulch. We believe that the site placed uranium-233 plates on the ground for training purposes. The contractor shall conduct a gross gamma/gross beta survey of the area in accordance with MARSSIM class III protocol.

(11) Field Hot Cell. Status - part of Radiological Survey Area #1. Reported this was a temporary structure made out of cinder blocks and sand bags. It is within the envelope of Radiological Survey Area #1. The contractor shall conduct a gross gamma/gross beta survey of the area in accordance with MARSSIM class III protocol.

(12) Chemical School Radiological Burial Grounds. Status - open land area. Reportedly the installation used this site for radiological burials from 1957-1958. This site includes the Northeast corner of the Anniston Community Center. In the 1958-1959 timeframe the buried radioactive materials were removed. The

site conducted a second cleanup in 1971. The contractor shall conduct a gross gamma/gross beta survey of the area in accordance with MARSSIM class III protocol.

(13) Range 25. Status - open land area. The site used this area for a six week period to test prototype source actuators. The radionuclides of concern are Co60 and Cs137. The contractor shall conduct a gross gamma/gross beta survey of the area in accordance with MARSSIM class III protocol.

6. SCHEDULE. The contractor shall prepare to mobilize within 10 working days after contract award. The contractor shall respond to survey scheduling changes with as little as a 5 working day notification.

7. PERSONNEL. The contractor shall propose a project manager with a minimum of 3-years experience in conducting environmental remediation/restoration efforts, primarily with radioactive material.

7.1. The contractor shall provide resumes of technical personnel with the project proposal.

7.2. On-site personnel must have the training mandated by 29 CFR 1910.120 (40 hours plus 3 days on-site experience). Supervisors shall have 8 hours of additional supervisory training. The contractor shall provide written evidence of current Occupational Safety and Health Administration training for each person performing work and a Corporate certification that each person is medically capable of working on a hazardous waste site.

7.3. Contractor personnel shall receive and document a briefing on the hazards of the work area, the expected dose, and possible biological effects from receiving that exposure.

8. FINAL REPORT. The contractor shall provide as a deliverable item 6 hard copies of a preliminary draft final report within 30 days after completion of the on-site activities. The contractor shall incorporate Army comments within 30 days of receipt.

8.1. The contractor shall provide as a deliverable item 13 hard copies of the draft final report within 15 days after receipt of the Army comments.

8.2. The contractor shall incorporate regulatory agency comments within 15 working days of receipt. After incorporating regulatory comments, the contractor shall provide as a deliverable item 13 hard copies and 2 compact disc (CD) copies of a comprehensive final report detailing all radiological release surveys. The final report for the Fort McClellan commodity sites shall detail the survey procedures, instrumentation used, findings, results, suggestions, and QA/QC practices and documentation. The report shall address, in detail, the methodology used for the detection,

removal, and packaging of radioactive contamination recovered as a result of the effort. The report shall address residual radioactive contamination that was not remediated during the survey effort, as well as hazardous materials and/or wastes identified during the on-site effort.

8.3. The report shall address the contractor's QA program, including calibration dates and certificates and details (including records) on how they calibrated and field checked portable instruments.

8.4. The contractor shall describe (in terms of MARSSIM, NUREG-1575 requirements) the final survey design and how the results meet the MARSSIM statistical tests.

8.5. The contractor-prepared plans and reports developed under this effort will become the property of the U.S. Army. The Army reserves the right to distribute the documents without restriction.

8.6. The contractor shall coordinate final report activities with Mr. Styvaert.

9. REFERENCES.

a. NUREG-1575, Multi-Agency Radiation Survey and Site Investigation Manual, MARSSIM, December 1997.

b. NUREG-1500, Working Draft Regulatory Guide on Release Criteria for Decommissioning: NRC Staff s Draft for Comment.

c. Memorandum, Subject: DA-Wide Policy on Radiological Surveys at BRAC Commodity Sites, dated January 20, 1998.

d. Radiological Historical Assessment, Main Post, Ft. McClellan, AL, U.S. Army Corps of Engineers, St. Louis Engineer District, November 1999.

e. Radiological Historical Assessment, Pelham Range, Ft. McClellan, AL, U.S. Army Corps of Engineers, St. Louis Engineer District, November 1999.

Mark McHugh

From: "Styvaert, Mike" <StyvaertM@osc.army.mil>
To: "'Kingsbury, Lisa'" <kingsburyl@mcclellan.army.mil>; <Leeyoungtn@aol.com>; "Styvaert, Mike" <StyvaertM@osc.army.mil>
Sent: Tuesday, July 25, 2000 11:32 PM
Subject: RE: Comments on Sampling and Analysis plan

Lisa/Lee - I'll revise it and forward a clean copy in the next few days, but here are the changes you sent me following the site visit.

Changes to SOW are as follows:
Section 5
(6) Delete all of Bldg T-836A
(7) Change to Class II
(9) 3rd sentence should read "The contactor shall conduct a gross gamma survey of the area and gamma spectrum analysis of 1 hot spot in accordance with MARSSIM class III protocol."

(12) Change to Class II
I believe the cost increase is due to the Class IIs we added.
Thanks.....Lisa

mss

-----Original Message-----
From: Kingsbury, Lisa [mailto:kingsburyl@mcclellan.army.mil]
Sent: Tuesday, July 25, 2000 8:46 AM
To: Leeyoungtn@aol.com; Mike Styvaert
Subject: RE: Comments on Sampling and Analysis plan

Mike,
Did you revise the scope of work? Need you to send it to Lee so he can put it in the workplan.
Thanks.....Lisa

J.M. Waller Associates, Inc.
Providing BRAC Environmental Program Management to
U.S. Army Garrison, Environmental Office, Fort McClellan, AL
Phone: (256)848-7455
Fax: (256)848-5517

-----Original Message-----
From: Leeyoungtn@aol.com [mailto:Leeyoungtn@aol.com <mailto:Leeyoungtn@aol.com>
]
Sent: Tuesday, July 25, 2000 8:21 AM
To: Kingsbury, Lisa; mchughm@atgusa.com

ATTACHMENT 3

AR 11-9, TABLE 5-2, SURFACE RADIOACTIVITY VALUES

Table 5-2.
Surface Radioactivity Values in dpm/100 cm^2

Nuclide[a]	Removable[b, c]	Total (Fixed + Removable[b, d]
^{nat}U, ^{235}U, ^{238}U, and associated decay products	1,000	5,000
Transuranics, ^{226}Ra, ^{228}Ra, ^{230}Th, ^{228}Th, ^{231}Pa, ^{227}Ac, ^{125}I, ^{129}I	20	500
^{nat}Th, ^{232}Th, ^{90}Sr, ^{223}Ra, ^{224}Ra, ^{232}U, ^{126}I, ^{131}I, ^{133}I	200	1,000
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except ^{90}Sr and others noted above[e]	1,000	5,000
Tritium and tritiated compounds[f]	10,000	NA

a. See para 5-3 for applicability of this table. This table is extracted from 10 CFR 835, appendix D. The values in this table apply to radioactive contamination deposited on, but not incorporated into the interior of, the contaminated item. Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, apply the limits established for alpha- and beta-gamma-emitting nuclides independently.

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

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

d. The levels may be averaged over one square meter provided the maximum surface activity in any area of 100 cm^2 is less than three times the value specified. For purposes of averaging, any square meter of surface shall be considered to be above the activity guide G if: (1) From measurements of a representative number n of sections it is determined that $\frac{1}{n}\sum_{i=1}^{n} S_i \geq 3G$, where $S_i \geq G$ is the dpm/100 cm^2 determined from measurement of section i, or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 area exceeds $3G$.

e. This category of radionuclides includes mixed fission products, including the ^{90}Sr which is present in them. It does not apply to ^{90}Sr which has been separated from the other fission products or mixtures where the ^{90}Sr has been enriched.

f. Tritium contamination may diffuse into the volume or matrix of materials. Evaluation of surface contamination shall consider the extent to which such contamination may migrate to the surface in order to ensure the surface radioactivity value provided in this table is not exceeded. Once this contamination migrates to the surface, it may be removable, not fixed; therefore a "Total" value does not apply.

ATTACHMENT 4

TABLE OF INSTRUMENTATION FOR RADIOLOGICAL SURVEYS

INSTRUMENTATION FOR RADIOLOGICAL SURVEY

This table illustrates the radiological detection and measurement instrumentation to be employed for the survey activities, along with typical parameters and detection sensitivities for the type of instrument and its application.

Type of Measurement	Instrumentation		Background Rate	4π Efficiency	Detector Sensitivity
	Detector	Meter			
Surface Scan (beta-gamma)	Gas Proportional Ludlum 43-68	Ratemeter Ludlum Model 3, Model 18 or Equivalent	400 cpm	0.15	980 DPM/100cm²
Surface Activity (alpha)	Gas Proportional Ludlum 43-68	Scaler Ludlum Model 3, Model 18 or Equivalent	5 cpm	0.15	110 DPM/100cm²
Exposure Rates (beta-gamma)	Tissue Equivalent Detector	Bicron Micro R Meter	-	-	< 1 μR/hr
Accessibility Surface Scan Dose Rates	Gas Proportional Ludlum Model 239-1F	Rate Meter Ludlum Model 2221 or Equivalent	10 cpm α	.17	23 DPM / Probe Area
			400 cpm βγ	.25	98 DPM / Probe Area

Scan Sensitivity based on:

$$\text{MDA (DPM/100cm}^2) = 4.65 \sqrt{\frac{\frac{\text{Background (cpm)}}{2 \times \text{Tc (min)}}}{\text{Efficiency} \times \text{A}/100}}$$

Surface Measurement Sensitivity based on:

$$\text{MDA (DPM/100cm}^2) = 2.71 + 4.65 \sqrt{\frac{\text{Background (cpm)} \times \text{Tc (min)}}{\text{Efficiency} \times \text{A}/100}}$$

ATTACHMENT 5

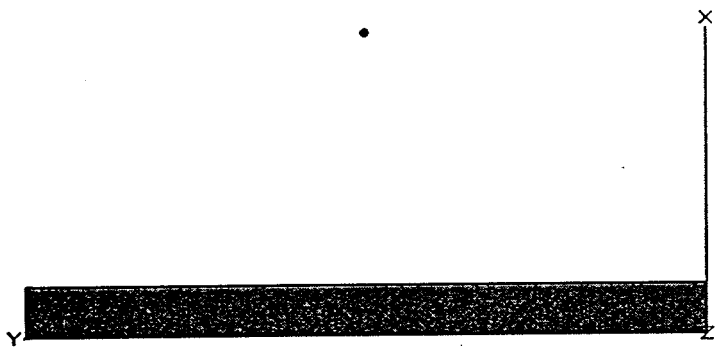
γ SCAN SCREENING LEVEL CALCULATIONS

MicroShield v5.01 (5.01-01003)
Allied Technology Group, Inc.

Page : 1
DOS File : CSSOIL.MS5
Run Date: July 17, 2000
Time: 11:13:20 AM
Duration : 00:00:15

File Ref: NA
Date: 000715
By: ZZ
Checked:

Case Title: Cs-137 @ 21.5 pCi/g
Description: 2mx2mx6" thick slab of Cs-137 Contaminated Soil @ 21.5 pCi/g
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	15.24 cm	6.0 in
Width	203.2 cm	6 ft 8.0 in
Height	203.2 cm	6 ft 8.0 in

Dose Points

	X	Y	Z
# 1	91.44 cm	101.6 cm	101.6 cm
	3 ft	3 ft 4.0 in	3 ft 4.0 in

Shields

Shield Name	Dimension	Material	Density
Source	3.84e+04 in³	Concrete	1.6
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 4
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Ba-137m	2.0478e-005	7.5768e+005	3.2542e-005	1.2041e+000
Cs-137	2.1647e-005	8.0093e+005	3.4400e-005	1.2728e+000

Buildup
The material reference is : Source

Integration Parameters

X Direction	25
Y Direction	25
Z Direction	25

Results

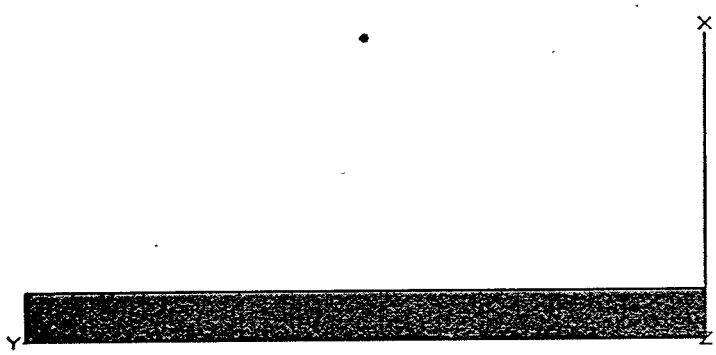
Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.0318	1.569e+04	1.072e-04	1.306e-04	8.931e-07	1.088e-06
0.0322	2.894e+04	2.063e-04	2.528e-04	1.661e-06	2.035e-06
0.0364	1.053e+04	1.151e-04	1.514e-04	6.539e-07	8.601e-07
0.6616	6.818e+05	1.101e+00	2.063e+00	2.135e-03	3.999e-03
TOTALS:	7.369e+05	1.102e+00	2.063e+00	2.138e-03	4.003e-03

MicroShield v5.01 (5.01-01003)
Allied Technology Group, Inc.

Page : 1
DOS File : COSOIL.MS5
Run Date: July 17, 2000
Time: 11:19:08 AM
Duration : 00:00:12

File Ref: NA
Date: 00075
By: TT
Checked: ____ ____

Case Title: Co-60 @ 5.2 pCi/g
Description: 2mx2mx6" thick slab of Co-60 Contaminated Soil @ 5.2 pCi/g
Geometry: 13 - Rectangular Volume



Source Dimensions

Length	15.24 cm	6.0 in
Width	203.2 cm	6 ft 8.0 in
Height	203.2 cm	6 ft 8.0 in

Dose Points

	X	Y	Z
# 1	91.44 cm	101.6 cm	101.6 cm
	3 ft	3 ft 4.0 in	3 ft 4.0 in

Shields

Shield Name	Dimension	Material	Density
Source	3.84e+04 in³	Concrete	1.6
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 3
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Co-60	5.2229e-006	1.9325e+005	8.3000e-006	3.0710e-001

Buildup
The material reference is : Source

Integration Parameters

X Direction	25
Y Direction	25
Z Direction	25

Results

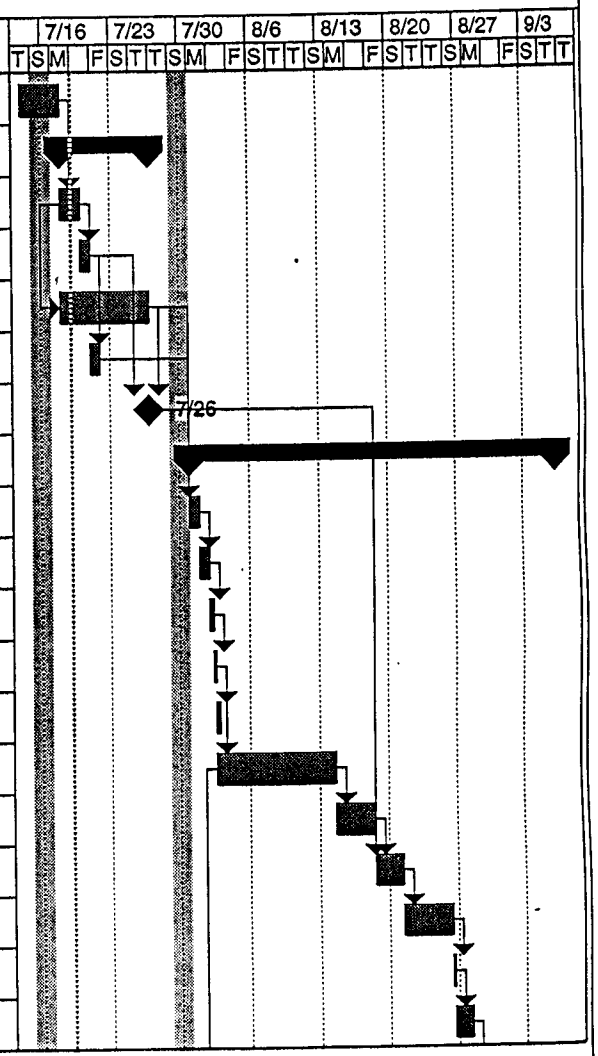
Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.6938	3.152e+01	5.424e-05	1.001e-04	1.047e-07	1.932e-07
1.1732	1.932e+05	6.682e-01	1.057e+00	1.194e-03	1.889e-03
1.3325	1.932e+05	7.902e-01	1.208e+00	1.371e-03	2.096e-03
TOTALS:	3.865e+05	1.458e+00	2.265e+00	2.565e-03	3.985e-03

ATTACHMENT 6

PROJECT SCHEDULE

U.S Army Fort McClellan Commodity Storage Sites Suvey
OSC Project Number USA 99-100, Phase II
Contract DAAA09-98-C-0039, Mod. P00004 ATG, Inc.

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
1	1	Contract Mod. Issue	2 days	Fri 7/14/00	Mon 7/17/00	
2	**2**	**Phase I - Planning**	**7 days**	**Tue 7/18/00**	**Wed 7/26/00**	
3	2.1	Develop SAP	2 days	Tue 7/18/00	Wed 7/19/00	1
4	2.2	Submit SAP - FYI	1 day	Thu 7/20/00	Thu 7/20/00	3
5	2.3	Calibrate Instrumentation	7 days	Tue 7/18/00	Wed 7/26/00	3SS
6	2.4	Consensus Plan Review	1 day	Fri 7/21/00	Fri 7/21/00	4
7	2.5	Notify Regulators of Bldg 3185 Sched.	0 days	Wed 7/26/00	Wed 7/26/00	4,5,6
8	**3**	**Phase II - Site Surveys**	**31.5 days**	**Mon 7/31/00**	**Wed 9/6/00**	
9	3.1	Mobilization / Travel	1 day	Mon 7/31/00	Mon 7/31/00	5,6,7FS+2 days
10	3.2	Instrumentation Set-up	1 day	Tue 8/1/00	Tue 8/1/00	9
11	3.3	Training to SAP	0.25 days	Wed 8/2/00	Wed 8/2/00	10
12	3.4	Task Overview / Tour	0.5 days	Wed 8/2/00	Wed 8/2/00	11
13	3.5	Gamma Spec Near RSG	0.25 days	Wed 8/2/00	Wed 8/2/00	12
14	3.6	Bldg. 3182 Class I Survey	10 days	Wed 8/2/00	Mon 8/14/00	12
15	3.7	Bldg. 3182 Class II Survey	4 days	Mon 8/14/00	Fri 8/18/00	14
16	3.8	Bldg. 3185 Class III Survey	1.5 days	Fri 8/18/00	Mon 8/21/00	15,7
17	3.9	Bldg. T-837 Class II Survey	5 days	Mon 8/21/00	Sat 8/26/00	16
18	3.10	Bldg. T-810 Class III Survey	0.5 days	Sat 8/26/00	Sat 8/26/00	17
19	3.11	Bldg. T-811 Class III Survey	0.5 days	Sat 8/26/00	Mon 8/28/00	18

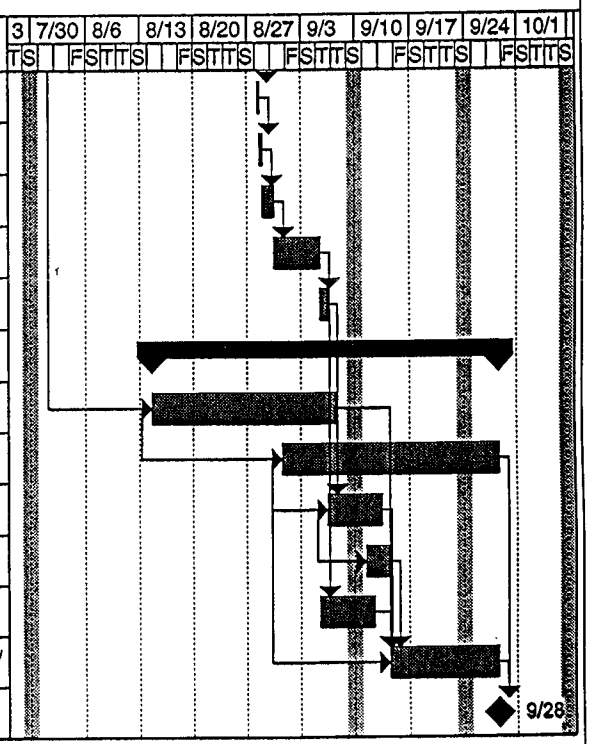


Project: No 0036.03
Date: Wed 7/19/00

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary

U.S Army Fort McClellan Commodity Storage Sites Suvey
OSC Project Number USA 99-100, Phase II
Contract DAAA09-98-C-0039, Mod. P00004 ATG, Inc.

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
20	3.12	Bldg. T-812 Class III Survey	0.5 days	Mon 8/28/00	Mon 8/28/00	19
21	3.13	Area of Bldg. T-836 Class III	0.25 days	Mon 8/28/00	Mon 8/28/00	20
22	3.14	Old Rattlesnake Gulch Class III	1.5 days	Tue 8/29/00	Wed 8/30/00	21
23	3.15	Chem. Schl. Rad. Burial Grnd. Class II	4 days	Wed 8/30/00	Tue 9/5/00	22
24	3.16	Demobilization / Travel	1 day	Tue 9/5/00	Wed 9/6/00	23
25	4	**Phase III - Report**	**35 days**	**Mon 8/14/00**	**Thu 9/28/00**	
26	4.1	In-house Sample Analysis	20 days	Mon 8/14/00	Thu 9/7/00	14SS+10 days
27	4.2	Third Party QC Analysis	20 days	Thu 8/31/00	Thu 9/28/00	26SS+15 days
28	4.3	Data Review	5 days	Wed 9/6/00	Wed 9/13/00	27SS,24
29	4.4	Data Assembly	3 days	Mon 9/11/00	Thu 9/14/00	28SS+3 days
30	4.5	Survey Evaluation	5 days	Tue 9/5/00	Tue 9/12/00	23
31	4.6	Report Summary	10 days	Thu 9/14/00	Thu 9/28/00	30,26,27SS+3 day
32	4.7	Submit Report	0 days	Thu 9/28/00	Thu 9/28/00	31,27



Project: No. 10036.03
Date: Wed 7/19/00

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary

ATTACHMENT 7

HEALTH & SAFETY PLAN

U.S. ARMY FORT McCLELLAN
FORT McCLELLAN, ALABAMA
HQ, OSC PROJECT NUMBER USA 99-100

Release Survey of Ft. McClellan Commodity Storage Sites

HEALTH AND SAFETY PLAN

Prepared by:

Allied Technology Group Inc.
669 Emory Valley Road
Oak Ridge, TN 37830

July 2000

U.S. Army Fort McClellan

Release Survey for Commodity Storage Sites

Project Health and Safety Plan

Approval Page

July 2000

Concurrence: Lee A. Young Date: 7/19/00
Lee Young, ATG Project Manager

Concurrence: Date: 000719
Mark McHugh, ATG Project Health Physicist

Concurrence: Date: 7/19/00
Arthur Palmer, ATG Corporate RSO

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1.0 INTRODUCTION

The Project Health and Safety Plan incorporates the health and safety procedures and practices to be followed during the activities specified in the Fort McClellan'Commodity Storage Sites' Sampling and Analysis Plan (SAP). This Project Health and Safety Plan will be used to support the work activities and will be verified with the guidelines specified in the Allied Technology Group, Inc. (ATG) Corporate Health and Safety Plan. This Project Health and Safety Plan includes radiological, industrial, environmental, and biological health and safety concerns and considerations.

The radiological surveys of the 'Commodity Sites' at Fort McClellan are to be performed by ATG under contract number DAAA09-98-C-0039 Modification number P00003; internally tracked as ATG project number 10036.02.

2.0 SCOPE OF WORK

The fifteen (15) buildings and two (2) outdoor sites which comprise the 'Commodity Storage Sites' at Fort McClellan near Anniston, Alabama will be radiologically surveyed by ATG personnel following the guidelines specified in the project-specific Sampling and Analysis Plan. The verification surveys are to achieve unconditional release using the protocols of the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM, NUREG-1575) for the historical general license use areas.

No adverse impacts are expected during the performance of this contract. There will be no expected air emissions, liquid releases, personnel exposures or environmental impacts during the Class 2 and 3 area surveys. The work tasks will be performed by trained and qualified personnel. Project oversight and monitoring will additionally be performed by trained and qualified personnel in accordance with the Health and Safety Plan procedures.

3.0 HAZARD ASSESSMENT

Hazard assessment will be evaluated in eight categories; radiological hazards, industrial hazards, environmental hazards, bloodborne pathogens, lead hazards, polychlorinated biphenyls (PCBs), asbestos and mercury hazards. Appropriate personnal protective equipment, monitoring devices and data acquisition will be applied for existing potential and actual hazards.

3.1 Radiological Hazards

It is expected that an individual performing work on this project will receive an external occupational exposure of less than 10 millirem (mRem), which is the sensitivity limit of the TLD vendor. Existant conditions yield essentially

'background' radiation levels, and only a rule-out of elevated surface contamination is anticipated. However, the suspected potentially present radionuclides of concern in the buildings are Pu-239, Ni-63, Sr-90, H-3, Ra-226, Am-241, Th-232, Co-60, Mn-54, Cs-137, Au-198, Na-22, and P-32. The ATG crew is entirely comprised of appropriately trained and qualified health physics technicians, and both corporate and project oversight is provided by Certified Health Physicists. There is little potential for loose contamination, if it exists, to be suspended by project activities such that airborne contamination attributes to an internal dose concern. Project tasks entail surveying into facilities for discernment of the gross radiological characterization, and the structures/areas will be otherwise uninhabited by base occupants during the surveys.

In the event that residual contamination is found to warrant area re-classification up to and including ultimate decontamination and subsequent verification surveys, the airborne concentration will be maintained below the the acceptable airborne concentration limit of 10% of DAC for the isotope of interest or respiratory protection will be worn in order to ensure that there will not be an internal radiological hazard.

Additional exposure to radiation will come from the reference sources used in performance tests of the radiation detection equipment and from the samples taken to assess the potential hazards. The reference sources will be used by the radiation protection technicians and will be maintained in a labeled and locked container. Samples taken to monitor the potential hazards will be sealed and handled appropriately and in as short amount of time as possible. The radiation protection technicians will screen and package the samples employing the appropriate precautions to prohibit personal cross-contamination and limit external exposure.

3.2 Industrial Hazards

Industrial hazards for this project should be limited to mechanical failures, possible heavy loads (moving residual materials to access survey areas), suspended loads, physical stress (climbing, lifting, reaching) and extreme temperature exposure. Lifting, suspending, moving and packaging of materials could cause wear and tear on the equipment or fatigue to the workers. Mechanical failure will be reduced by using equipment in near new condition and not over-loading the equipment. Equipment will be visually inspected prior to each use to reduce the potential for failure. Personnel safety equipment shall be required for field work on this project. Safety shoes, hard hats, and safety glasses will be required for personnel at the discretion of the Project Manager or designated alternate.

Physical stress could occur if an individual tries to lift items that are too heavy or

oversized. Individual lifting limits will be 50 lbs. Items that are odd shaped or bulky will be lifted by more than one individual or by a mechanical means.

Accidents will be handled on a case by case basis and will be evaluated by theProject Manager or designated alternate to determine if preventive measures can be applied to preclude the accident from recurring.

Complications from high temperature exposure, such as heat stress, will be handled with medical treatment as deemed necessary by the Project Manager or designated alternate. The timing of the project reduces the concern for heat stress and raises the alternative cold weather issue to some extent. Under either cold or high temperature scenarios, the first round of treatment is prevention through appropriate training, monitoring, and regimented practices.

3.3 Environmental Hazards

Hazards from the environment could most likely occur from abnormal weather, an accident or from carelessness while performing the work tasks. Controlling the amount of unsealed material, at any given time, will reduce the extent of an environmental impact. Affected materials, as suspected prior to screening and as verified by subsequent radiological monitoring, will be addressed as soon as practical. Immediate project action regarding discovered elevated surface contamination will include prominant posting and notification of site (base) and client (IOC) representatives.

Other environmental hazards which may be encountered and for which precautions should be extended for avoidance in the static areas may be lighting constraints, insects (bees, ticks, spiders), snakes, rodent and bird infestation and/or droppings, high wind and precipitation.

3.4 Bloodborne Pathogens

Bloodborne pathogens are micro-organisms in human blood that can cause disease. Although health care workers have long worked with the threat of exposure to bloodborne pathogens, exposure was viewed in a different light once AIDS was recognized.

Because the virus that causes AIDS is said to always be fatal, there has been increased concern about bloodborne pathogens in the last 15 years. AIDS, however, is not the only source of concern; other diseases caused by micro-organisms include malaria, syphilis and hepatitis-B virus (HBV).

The purpose of this plan is to establish requirements with the intent to protect those employees who have a significant potential of exposure to Bloodborne Pathogens which may cause such disease as Human Immunodeficiency Virus and Hepatitis-B Virus. Principally at risk are those designated to be first-aid providers/first-responders. Specific information is found in section 4.2.6.

3.5 Lead

Lead-based paint is expected to be present or an issue of concern at the project site. Either chipping paint or lead-based paint material having already fallen to the ground due to deterioration of a facility and lack of upkeep may be prevelant. Proper PPE and training guidelines will be followed in accordance with 29 CFR 1926.62. These areas will be avoided by all employees if at all possible. As applicable to the scope of the survey effort, identification of the potential for the presence of lead and avoidance (PPE or literal occupancy) is the matter of course.

3.6 Polychlorinated Biphenyls (PCBs)

It is possible that PCBs could be encountered during work activities on this project (i.e. light fixture ballasts). Should this be the case, the PCB containing materials will be handled, if necessary, with radiological controls in place. Proper PPE and training will be performed in accordance with the guidelines set forth in 40 CFR 761, 40 CFR 302, 40 CFR 116, and 40 CFR 117. These items will be avoided by all employees under routine project tasking.

3.7 Asbestos

Asbestos could be encountered during work activities on this project. Proper PPE and training guidelines will be followed in accordance to 29 CFR 1101, 40 CFR 61, and 40 CFR 763. Proper precautions will be taken to prevent any airborne releases. Suspected Asbestos Containing Material (ACM) will be covered, if necessary, and avoided by all employees.

3.8 Mercury

Mercury is potentially a concern at the site and may be present in such items as switches, controls and light tubes, and fixtures. Proper PPE and training guidelines will be followed in accordance with 29 CFR 1910.95 and 29 CFR 1910.252. Proper precautions will be taken to prevent any release to the workers or to members of the public. These materials will be covered if necessary and avoided by all employees.

4.0 WORKER PROTECTION

4.1 Personnel Protection

The field work on the surveying of the 'Commodity Storage Sites' involves the hazards typically present during radiation work, in addition to the dynamic conditions from unstable building structures . In general, ATG work procedures are in effect for safety of our workers and others. However, the following points are to be emphasized.

4.1.1 Contamination Control

ATG will conduct all work activities with radiological controls in place, using qualified and appropriately trained personnel. Proper PPE will be worn when entering the controlled areas and will be discarded appropriately upon exiting. The activity on this project does not represent a significant hazard but should not be allowed to be distributed outside of the controlled area in order to maintain doses to personnel ALARA.

4.1.2 Industrial Safety

Industrial safety is an important consideration on this job. There are several existing hazards that are of concern on this job site. These hazards include heavy equipment operations, noise hazards, and unstable building structures.

4.1.2.1 Heavy equipment operations exist throughout the site. All personnel will receive a pre-job briefing on all existing job-site hazards. Personnel will be made aware of areas in which heavy machinery is being used. The buddy system will be employed on this contract, thus providing a spotter for each other. Personnel will notify the operator(s) if they are to be performing work in proximity where equipment operations are taking place.

4.1.2.2 Noise hazards are a concern with the work being performed on site. Existing conditions in the area will be monitored and noise-suppression will be used if necessary. If noise levels in the work area reach or exceed 85 dBA, hearing protection will be required. The hearing protection provided must be able to lower noise levels below 85dBA when worn.

4.1.2.3 Unstable building structures are a concern with some of the buildings on-site. A pre-job briefing will be performed with all the

employees before work begins to highten their awareness concerning these areas. If possible, these areas will be barricaded off to prevent any unauthorized access.

4.1.2.4 All personnel will be required to wear safety glasses, steel toe shoes, and hard hats while in any work area during operations. These requirements may be altered at the discretion of the Project Manager or designee.

4.1.3 Procedures

4.1.3.1 Site Control

The work site will be clearly marked and access will be limited to ATG personnel and authorized visitors. Walkways and paths will be rerouted as necessary to limit access to the area. Postings will be in place to notify people of restricted access, hazards associated, and PPE required.

4.1.3.2 Confined Space Entry

A confined space is any space that has a limited means of egress and is subject to an accumulation of toxic or flammable contaminants or has an oxygen-deficient atmosphere. Confined spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation, or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open-top spaces more than four feet in depth such as pits, tubs, vaults, and vessels.

A confined space will not be entered until atmospheric conditions are monitored and the area is verified safe. A valid "Confined Space Entry Permit" must be posted, reviewed, and in effect prior to entry. Fuel operated equipment will not be used in or near the opening or air intake for a confined space due to the potential for carbon monoxide build up. Confined space blowers will be used if necessary to ventilate the area and refresh the air. All entrants and spotters must review the rescue procedures before entry. All personnel entering the confined space must wear a safety harness with a secured lifeline in the event they need to be pulled out of the area.

A spotter will remain in continuous visual and voice contact with

personnel in the confined space. The spotter must account for all entrants and will not leave the post unless relieved by a competent person. The area will be continuously monitored while personnel are in the confined space due to the potential of changing atmospheric conditions.

4.1.3.3 Hazardous Energy Control

All personnel that work on or near energy sources should have completed and documented Site Training which covered this subject. Danger tags are used only to prevent operation of a switch, valve, or piece of equipment in cases where someone may get hurt or equipment may be damaged. Lockout/Tagout procedures will be used to prevent energy sources from becoming energized while personnel or equipment are in the area. The personnel working in the hazardous energy area must personally lock and tag the energy source out. A signed and dated tag will be placed on the system after it is locked out.

The system must be tested after locking to ensure it is de-energized prior to starting work. Prior approval must be obtained before de-energizing a system. Only the person that placed the lockout/tagout on a system can remove it and only after all personnel are clear from the work area. All personnel that are working in the area must have their own lockout / tagout in place on the system. Personnel cannot remove a lockout/tagout that was put in place by someone else. Once a tag is removed it must be destroyed and a new one used each time a system is locked out.

All electrical components will be treated as if they are energized regardless if lockout/tagout procedures are in place. Personal protective equipment will be inspected and worn when working on energy systems. Test equipment will be used to ensure systems are de-energized. Grounding equipment will be applied after the system has been de-energized. Caution must be used when removing enclosure covers, panels, or opening doors to expose electrical systems.

Work on or near electrical circuits will only be performed by qualified personnel who have been authorized to do the work.

Non-metal frame safety glasses are required when performing

electrical work. Other conductive items such as metal hard hats, rings, watches, necklaces, earrings, etc. will not be worn when working on or near electrical systems. Electrical rated rubber gloves must be inspected for cracks, punctures, tears, etc. prior to wearing them.

Hand tools and power tools rated and insulated for electrical work will be used on or near power sources. Drills and penetrating equipment must be grounded so that accidental contact with an unexpected energized electrical source will be cleared quickly by the circuit protective device. Double insulated equipment cannot be relied on to provide protection when accidental contact is made with energized circuits.

4.1.3.4 Tools

Equipment and tools will be used for their specific design and not rigged for purposes other than those specified by the manufacturer. Tools will not be used beyond their designed capacity. Tools will be inspected prior to each use. Damaged or worn tools will not be used and will be taken out of service. Tools taken out of service will be marked with a "Do Not Use" tag or sticker until they can be properly disposed of or repaired. Tool subject to impact will be dressed to prevent flying steel fragments. Tools cannot be brought into or out of a radiological area without prior approval from a health physics technician.

4.1.3.5 Ladders

Ladders will be inspected prior to each use. Ladders will not be painted except to be marked with an identifier. If ladders must be placed in a doorway, the door will be barricaded and warning signs will be posted. If the doorway is a marked exit, then the door cannot be barricaded and a spotter must be used. A hand line will be used to raise or lower tools or materials so personnel do not carry anything in their hands when ascending or descending a ladder. The ladder position will be changed as often as necessary to prevent excessive leaning or stretching on a ladder. When working from a ladder, both feet will be kept on the rungs and the person will be facing the ladder. If it is necessary to work backwards from a ladder, then the person must wear a safety belt and be tied off to a secure area and not to the ladder. Only one person is allowed on a ladder

at one time unless "two-man" stepladders are being used. Metal ladders will not be used for electric welding or near any electrical lines or services. Ladders may be used on scaffolds only if secured and the user is tied off with a safety belt. If a ladder must be built to use on-site, it must conform with established OSHA standards and be approved by the Health and Safety Representative or designated alternate. Areas around the top and base of the ladder must be cleared of tripping hazards. Ladders will not be placed against moving objects. Broken or damaged ladders will not be used. Ladders to be repaired must be tagged out and taken out of service. Step off distance from ladders must not exceed one foot.

4.1.3.6 Straight and Extension Ladders

Straight and extension ladders must be placed using a 4:1 ratio (for every 4 feet in height from the ground to the point of contact on the supporting surface, the ladder base must be placed 1 foot away from the supporting surface). Ladders must extend at least 3 feet beyond the supporting object. The ladder must have non-skid safety feet and be secured. When the extension ladder is raised to the desired height, the safety dogs or latches must be engaged and the extension rope secured to a rung on the base section of the ladder. Extension ladders must overlap a minimum of three rungs.

4.1.3.7 Stepladders

Stepladders must have all four feet on a level surface. The spreaders must be locked in place. Stepladders will not be used as a straight ladder. Tools or materials will not be placed on steps or the platform. The maximum height for stepladders without a safety platform is 12 feet and with a safety platform is 16 feet. If a ladder is over eight feet in height, it will be tied off.

4.1.3.8 Weather Conditions

The weather conditions may include possible thundershowers during the anticipated work schedule. If the potential for lightening is present, work will be stopped and personnel will move to a safe sheltered area until weather conditions improve. Any other severe or adverse weather conditions may require work to be stopped and personnel to move to a sheltered area.

4.1.3.9 Inadequate Lighting

Work performed on-site must have adequate lighting. If daylight does not provide the adequate 5-foot candle requirement (29 CFR 1910.120) then artificial light must be provided or all work must stop in time for personnel to exit the area during adequate daylight.

4.1.3.10 Good Housekeeping

Personnel will be expected to maintain good housekeeping within and around the work site. Materials or equipment that could be potential trip hazards will be moved out of walkways. Uneven walkways will be cleared or have restricted access. Materials will not be stacked in such a way that they may fall on personnel or equipment. Open pits will be roped off and labeled to prevent falls.

4.1.3.11 Electrical

Only power sources rated to handle the load required for equipment on-site will be used. Power sources will be required to have ground fault circuit interrupters unless the equipment has built in ground faults. Ground faults will be tested daily prior to using electrical equipment. Electrical equipment, plugs, and extension cords will be used and stored away from water sources. Electrical equipment that is not properly grounded, damaged, insulated, or have exposed wiring will be taken out of service and marked "Do Not Use". Extension cords with frays, exposed wire, damaged or missing prongs, or not insulated will be taken out of service and marked "Do Not Use". Electrical equipment cords and extension cords can not be taped to cover damaged areas or for any other reasons. Metal or conductive ladders will not be used near energized electrical lines or equipment.

4.1.3.12 Dust

Work operations will be designed as to generate little or no dust. Airborne concentrations will be monitored. Personnel will wear the proper PPE in accordance with RWP requirements if dust is generated.

4.1.3.13 Noise

Heavy equipment used on-site may generate elevated noise levels and will require hearing protection. Noise levels will be monitored and noise-suppression will be used when possible. If noise levels reach or exceed 85 dBA, hearing protection will be required and the area should be posted "Hearing Protection Required". The hearing protection provided must be able to lower noise levels below 85 dBA when worn.

4.1.3.14 Motor Vehicles

ATG personnel will abide by all traffic laws on base as well as pedestrian right-of-ways. Speed limits will be adhered to and seat belts will be worn by all passengers in the vehicle. Drivers will have a current drivers license and will not drive under the influence of drugs or alcohol. Special precautions will be taken in the event that road conditions become hazardous.

4.1.3.15 Hazardous Material Storage

No more than 10 gallons of flammable/combustible materials will be stored on-site unless these materials are stored in an approved flammable storage cabinet or tank. Chemicals stored together must be compatible. Containers must be stored in an area that has limited traffic and little chance for containers to be broken, toppled, or spilled. A spill kit will be kept on-site in the unlikely event that a spill were to occur. Appropriate personnel at Fort McClellan will be notified immediately in the event of a spill. Containers should be placed in a designated posted area. The storage area should be diked if possible. The fire department must be aware of where the storage area is located and what it contains. Flammable and/or combustible materials must be stored away from ignition sources. All containers must be properly labeled and an MSDS must be on-site for the material. Gas cylinders must be secured in an upright position with a cap over the valve when not in use.

4.1.3.16 Fire Awareness

Fire extinguishers will be on-site in a designated area readily accessible to personnel. Combination ABC fire extinguishers will be provided and inspected by a qualified person on a monthly basis or as needed. Personnel will be trained in the proper use of a fire extinguisher. Exits will be clearly marked to the containment tent in the event of a fire. Directional arrows will be placed around the lower portion of the tent to guide personnel to the closest exit. The fire department will be notified immediately in the event of a fire.

4.1.3.17 First Aid

A first aid kit will be on-site in a designated area clearly identified by a "First Aid" sign. The first aid kit will be readily accessible to personnel and visitors to the site. A minimum of two personnel trained in first aid/CPR will be present at the site at all times work is being performed.

4.1.4 Respiratory Protection

Respiratory protection may be required during certain operations. All personnel assigned respiratory protection must be medically qualified, trained on the use of the equipment, and when appropriate, have qualitative fit testing. All personnel in respirators must be clean shaven. All respirators must be cleaned and checked daily. Engineering practices may be employed to reduce airborne contamination. Respiratory protection will be mandated for area workers when the concentration of airborne contamination is found to $\geq$ 10% of the DAC for the specific isotope of interest.

4.1.5 Personnel Dose

The commodity site areas typically have no history of the use/handling of loose radioactive materials. Direct surface measurements will be obtained for comparison with background radiation levels in close proximity. Any finding of significant contamination will require re-classification of the area and deferred actions. External dosimetry is not required by regulation. However, as a conservative measure, ATG will require dosimetry for all project personnel.

4.1.6 Radiation Work Permit

The routine verification surveys to be performed of the commodity sites DO NOT warrant the adoption of an RWP. Should widespread elevated contamination be discovered, area re-classification will be planned and subsequent action which involves the increased potential for personal exposures will require implementation under a completed RWP.

Should site conditions and an expanded contractual scope of work issuance of a Radiation Work Permit (RWP), all personnel working at the Fort McClellan project will be assigned to a specific Radiation Work Permit, (ATGF-002 - Previously ATG Form 113), applicable to the job being performed (see note in section 4.1.6). A Radiation Work Permit Sign In Sheet (ATGF-023) will be attached to each Radiation Work Permit if deemed necessary by the Project Manager or designee. All personnel assigned to a job, requiring a Radiation Work Permit, shall sign the RWP Sign In Sheet.

4.1.7 ALARA (As Low As Reasonably Achievable)

It is the intent of all radiological work practices that the efforts performed will be done in such a manner as to subject the individual to the lowest possible dose. Practices that will ensure these are compliant to the project Sampling and Analysis Plan, Health and Safety Plan, and Quality Assurance Plan. Also, activities will be in compliance to procedural practices detailed in ATG Field Procedure, AD-004, 'Administrative/Regulatory/ALARA Compliance - Policy and Procedure' and ATG Field Procedures. All radiological work activities will be performed under radiation work permits (see note in section 4.1.6). Morning 'tailgate meetings' will be held to discuss safety issues and brief all personnel on the daily scheduled work activities and the performance of assigned tasks. These tailgate meetings will be documented and signed by all individuals in attendance on ATG Form ATGF-027, 'Daily Training Record'. All equipment will be tested before being used in the field. All individuals involved in the performance of the work have 'stop work authority'. If for any reason a job is not being performed safely or correctly, the job may be stopped and management notified until the situation may be remedied.

4.2 Personnel Monitoring

Occupational exposure will be continually monitored for all personnel on this ATG project. Personnel monitoring for this project will be supplied by Allied Technology Group using the following procedure.

4.2.1 Occupational Exposure Guides

Allied Technology Group Administrative Control Levels per calendar year;

4.2.1.1	Whole Body	1.0 Rem
4.2.1.2	Extremities	5.0 Rem
4.2.1.3	Skin	5.0 Rem

The ATG Corporate Health Physicist shall approve any authorization for exposure above the annual control levels. This approval will only be given if the dose is necessary and shown to maintain collective dose on the project ALARA.

4.2.2 Site Registration Form

All personnel assigned to work on the project must complete a Site Registration Form, ATG Form 109, prior to starting work. Completed Site Registration Forms will be retained with the personnel exposure files.

4.2.3 Occupational Radiation Exposure History

Before an individual will be permitted to work in a controlled area, a U.S. Nuclear Regulatory Commission Form 4 must be completed and reviewed by the Project Manager or designee.. Exposure results shall be listed on the NRC Form 4.

An Occupational Radiation Exposure History Letter, (ATGF Form 047) will be completed for all personnel assigned to the job. Copies of this letter are sent to the individual and the Allied Technology Group office in Oak Ridge, TN., within 30 days of obtaining the monitoring results.

4.2.4 Thermoluminecent Dosimetry

TLDs shall be the permanent record of an individual's occupational radiation exposure. The TLDs used by Allied Technology Group are supplied and

evaluated by a NVLAP approved vendor. All personnel assigned to the project will be issued a TLD for the job or on a monthly basis as the work requires.

The individual's name, social security number, issue date, and a date of return are to be recorded on the TLD Issue Log, (ATG Form 111a). In the event of a lost TLD, immediate notification to the Project Manager or designee. is required. A Lost TLD Report (ATG Form 111), will be completed and filed in the individual's exposure file. TLD results will be documented. The NRC Form 4 will be updated when the TLD results are received and will be maintained in the individual's exposure file.

4.2.5 Bioassays

Routine bioassay sampling and analysis is not required for the base survey activities, unless elevated contamination is found AND subsequent action is contractually committed. In which case, entry bioassay samples will be collected to provide a baseline, and exit bioassay samples will be submitted at project completion. The samples (urine) will be analyzed per third party gamma spectroscopy to determine the extent of uptake and to calculate the attributing dose, if any, as warranted. Dependant upon the discrete work areas involved and the identity of suspected radioisotopes relevant to the location, additional analytical parameters may be required.

4.2.6 Bloodborne Pathogens

The purpose of this notice is to establish requirements with the intent to protect those employees who have a significant potential of exposure to Bloodborne Pathogens which may cause such disease's as Human Immunodeficiency Virus and Hepatitis-B Virus.

Key Definitions:

Bloodborne Pathogens: Micro-organisms present in human blood that can cause disease in humans include, but are not limited to, Hepatitis-B virus (HBV) and Human Immunodeficiency Virus (HIV).

Exposure Incidents: A specific eye, mouth, other mucous membrane, non-intact skin or penetrable contact with blood or other potentially infectious materials that results from performing required tasks.

Occupational Exposure: A reasonably anticipated skin, eye, mucous

membrane or other penetrable contact with blood or other potentially infectious material that might result from performing required tasks.

Penetrable Contact: A piercing of mucous membranes or the skin barrier by means of a needle stick, human bite, cut and/or abrasion.

Potentially Infectious Materials: Materials that might be present in a first-aid emergency, including blood, vomit, urine or other body fluids.

4.2.7 ATG Field Project Potential

ATG has conducted a thorough evaluation of the processes and tasks which are performed in relation to Contractual Field Projects and has determined the potential for employee exposure to be minimal. However, because of the potential for accidents and injuries resulting in the possible contact of body fluids, ATG shall require additional training. Although the likelihood of accidental exposure is minimal, the following information shall be discussed with assigned site personnel prior to work activity.

4.2.8 The following is the ATG policy for field operations.

Training: All ATG personnel who receive Basic First-Aid training and are designated as Emergency Medical Response personnel shall receive additional training in Occupational Bloodborne Pathogen awareness.

Vaccinations: All ATG personnel trained in Basic First-Aid shall be offered the Hepatitis-B series of inoculations at no cost to the individual. This shall be offered on a voluntary basis and because the risk is minimal and First-Aid treatment of others is voluntary, no statement of refusal of the vaccine shall be required. All ATG personnel who are designated and certified as Emergency Medical Technicians shall be required to receive the Hepatitis-B inoculations. This shall be at no cost to the individual.

Handling of Sharps: All ATG personnel who handle materials containing sharps shall be required to wear puncture resistant gloves. Any injuries received while working with such materials shall be reported to their immediate supervisor. In addition, personnel exposed to blood or other body fluids while aiding an injured individual, no matter how minor, shall report to their immediate supervisor. The supervisor shall then promptly log and report the incident to the Project Manager.

Protective Equipment: Protective Equipment such as gloves, masks and

respiratory barriers are provided in each first-aid kit. All personnel responding to a first-aid situation in which there is a potential for exposure to blood or other body fluids are expected to use these devices for protection of both themselves and the personnel they are aiding.

4.3 Training

Individuals assigned to this project will be trained and qualified radiation workers. Training records will be supplied as part of the Project Quality Assurance Plan. Training specific to the project will be performed prior to the start of work by the Project Lead Investigator and recorded on the Training Record, (ATGF Form 027 - Previous ATG Form 102). Requirements of the Project Decommissioning Plan, Project Quality Assurance Plan and the Project Health and Safety Plan will be covered in the on-site training.

4.4 Decontamination

Contamination control barriers will be established and personal protective equipment will be required to minimize the potential for areas or personnel to become contaminated. In the event that personnel contamination is detected, the following procedure will be used to remove or contain the contamination.

4.4.1 Explanation

This section is a follow-up to ATG Field Procedure, HP-OP-0 1 3, Personnel Decontamination which describes how a radiation worker detects personal contamination. Once detected, this procedure will explain where and how to decontaminate to acceptable levels. It further provides for ongoing documentation to assure adequate review and improvement of existing procedures.

4.4.2 Decontamination Methods

4.4.2.1 Personnel Decontamination

When contamination is found on the worker, the worker shall notify a Health Physics Technician and the Project Manager or designee. immediately that he/she has become contaminated. The worker will indicate where he/she believes the contamination occurred, and the route taken to where the surface contamination was detected. This information will assist the Health Physics Technician in determining which areas to survey to avoid the contamination of

other personnel. After notifying the Health Physics Technician, the individual who is contaminated shall, if possible, isolate the contaminated item or items by the use of clean plastic bags and remain in the personnel survey area. Any method of decontamination used will require monitoring and documentation of the results for each step in the procedure. All liquids used for decontamination purposes, will be considered contaminated and handled as radioactive waste. A spray solution of RadiacWash or equivalent mild detergent solution should be used as the primary agent to remove skin contamination. RadiacWash foam will be sprayed on the contaminated area, allowed to soak for a few minutes, then wiped clean. Radiation surveys will be performed between each wash.

NOTE: **UNDER NO CIRCUMSTANCES WILL THE SKIN BE ABRADED WITHOUT DIRECT MEDICAL SURVEILLANCE. NOTIFY THE ATG RADIATION SAFETY OFFICER AND THE CORPORATE RADIATION SAFETY OFFICER SHOULD THIS BE RECOMMENDED.**

Additional washing may be required if the affected area contamination levels are not reduced to below acceptable limits. If needed, lava soap, a soft brush and small amounts of water can be used with light pressure to produce a heavy lather. Only wash 3 times for about 2 minutes each. Rinse and monitor. Use care not to scratch or erode the skin. Apply lanolin or hand cream to prevent chapping. Continued washing will abrade the skin. Any additional decontamination techniques shall be approved by the Radiation Safety Officer on a case by case basis.

4.4.2.2 Clothing Decontamination

When contamination is found on clothing, the worker shall immediately notify a Health Physics Technician and inform him/her of the situation, including where the worker believes the contamination occurred and the route taken to where the contamination was detected. This information will assist the Health Physics Technician in determining which areas to survey to avoid the contamination of other personnel. The contaminated clothing shall be removed, taking special care not to further contaminate additional clothing or personnel. The item(s) shall be surveyed to determine the degree of contamination. Depending on the source of

contamination, decontamination methods such as using tape to adhere the contamination to or scraping a shoe with a knife may be used. If the contaminated item cannot be easily decontaminated without using soap and water methods, the item shall be disposed of as radioactive waste.

4.4.3 Documentation

In order to fully assess the degree of contamination, the skin dose to personnel and to critique the incidents to improve future procedures, documentation is necessary. Documentation of the event should start and continue from the initial detection of contamination to the final release. Personnel contamination that requires decontamination will be classified in two categories, skin and clothing. A separate form shall be used for each, along with a Contamination Report Index, (ATG Form 116) to chronologically categorize all personnel contamination.

A Personnel Contamination Report, (ATG Form 117), and a Clothing Contamination Report, (ATG Form 118) shall be completed by the individual performing the decontamination and submitted to the Project Manager for evaluation and filing. The Contamination Report Index shall be maintained by the Project Manager. The contamination reports shall be maintained in the individual's exposure file.

5.0 SAFETY RULES

5.1 Purpose

The purpose of the safety rules section is to provide a code of conduct which will allow for a smooth operation of the job site with as little time loss as possible due to violation of Safety Rules and Regulations. The safety rules apply to both the workers assigned to the project and visitors.

5.2 General Requirements

Compliance with the Safety Rules is considered a condition of employment, and as such, disciplinary action may be taken for violations as necessary. Safety rule violation and disciplinary action will be determined by ATG management. All workers have the responsibility to report safety violations to their supervisor.

5.3 Safety Rules

The following safety rules have been compiled and reviewed by ATG management and will be accepted by all employees prior to employment. A copy of the Safety Rules and Regulations will be available at the job site and will be made available to any employee requesting a personal copy.

5.3.1 Employees must be in working clothes and ready for work at the designated starting time.

5.3.2 Employees may take lunch breaks only during designated times and must eat in the assigned area while on the job site. There will be no smoking, eating or drinking while handling any hazardous materials or within the work site.

5.3.3 Personnel will not quit work before the time designated for the conclusion of the work shift. There will be sufficient time allocated for removal of protective clothing or work clothes.

5.3.4 Employees must report to work each regularly scheduled work day. One hour call in time will be allowed to notify your superior of an absence. Excessive absentees will not be tolerated.

5.3.5 No employee will report to work under the influence of alcohol or drugs. Likewise, it is forbidden to carry or use alcohol or drugs on the job site or company property.

5.3.6 Personnel must comply with both verbal and written instructions from the Project Manager or designee..

5.3.7 All personal work injuries must be reported to the Project Manager or designee. or Health and Safety Representative (or designated alternate).

5.3.8 All unsafe conditions, or unsafe acts must be reported to the Project Manager or designee..

5.3.9 Any required personal protective devices and clothing must be properly worn by all personnel while on the job site.

5.3.10 Radiological monitoring equipment such as air samplers must not be tampered with or altered.

5.3.11 Good housekeeping by all personnel is considered mandatory.

5.3.12 Employees will not engage in malicious horse play, practical jokes or mischief while on the job site.

5.3.13 Fighting or attempting bodily injury to another employee while on the job site is not permitted.

5.3.14 Carrying a concealed weapon on the job site is expressly forbidden.

5.3.15 Falsifying company records or falsifying data will not be tolerated and will result in disciplinary action.

5.3.16 Equipment marked "Out Of Service" or "Do Not Use" shall not be used.

5.4 Disciplinary Actions

The following steps will be administered in a fair and nondiscriminatory manner:

5.4.1 All Disciplinary actions will be documented and maintained in the employee's personnel file.

5.4.2 Supervisory personnel are responsible for giving appropriate and specific safety instructions and are responsible for assuring that the instructions are clearly understood.

5.4.3 A violation of the safety rules will be promptly corrected. The violations will be documented by the supervisor and the employee will be given a copy of the written violation report.

5.4.4 Individual safety rule violations will be assessed on their merit with appropriate consideration given to the seriousness of the violation, the effect on the other employees, the employee's prior work record and previous safety violations. Any disciplinary action to be taken will be approved by the Project Manager or designee..

5.4.5 There may be some situations where the safety rule violation is so serious that modification or total disregard of the steps may be warranted. In these situations the employee may be suspended or terminated. It is suggested that in cases of this type, the employee be suspended pending the outcome of a full investigation of the incident and the employee's previous safety history. When this method is followed, the results of the investigation should

determine the severity of the discipline to be administered.

6.0 STOP WORK CONDITIONS

During the performance of this contract, certain conditions may be encountered that will require specific work tasks to be immediately halted. Conditions such as; discovery of explosive materials, excessive contamination levels in an uncontrolled environment, high wind speeds, extreme high or low temperatures, severe storms or flash floods. Depending on the specific work task that is being performed at the time on such an adverse condition, work may be halted until a safe condition exists to restart the task.

If time permits, the Project Manager or designated alternate will communicate with the Government representative to determine the appropriate action to be taken at a given time. The following guidelines will be used to aid in determining stop work conditions.

6.1 Excessive Contamination Levels in non-controlled areas means that contamination levels in excess of 1000 dpm/100 cm^2 have been detected in non contamination controlled areas. All work tasks will immediately be halted and a concerted effort will be made to clean the affected area. The Radiation Safety Officer will be immediately notified of such conditions and work will not restart without his approval. This activity will be documented in the Daily work log and by survey documentation.

6.2 The guidance for the determination of working conditions for heat stress will be determined per the guidance given in the American Conference of Governmental and Industrial Hygienists (ACGIH), "Threshold limit values for Chemical Substances and Physical Agents and Biological Exposure Indices" under the Heat Stress Section. Working conditions will be explained to the workers each day by the Health and Safety Representative or designated alternate during the safety meetings and documented in the Final Report.

Extreme High Temperatures means in excess of 105 degrees. Heat stress to the workers may occur. When high temperatures are occurring, specific work tasks that are hampered will be halted. Work tasks that require physical work or work tasks that protective clothing is required may be affected. The Project Manager or designated alternate will evaluate the conditions and determine if work tasks will be halted.

6.3 Extreme Low Temperatures means less than 10 degrees. When low temperatures are occurring, specific work tasks that are hampered will be halted. The Project Manager or designated alternate will evaluate the conditions and determine if work tasks will be halted

6.4 High Wind Speed means a steady wind speed in excess of 25 mph or wind gusts of 40 mph that seem to be ongoing throughout the day. Unsealed sources of radioactive material may be spread to uncontrolled areas if wind speeds are excessive. During high wind speeds the soil packaging activity will be performed inside a sheltered area but may still be affected by steady winds or wind gusts. If excessive winds are encountered, the soil packaging activity will cease and the soil containers will be sealed and the remaining soil covered with plastic. Other work activities may be halted at the discretion of the Site Coordinator..

6.5 Severe Storms or Flash Floods could cause all work tasks to be halted. Water damage to the controlled areas and wind barriers will cause all work tasks to be halted until the areas can be repaired. Should these type of conditions occur, the equipment and areas will be secured and evacuated. Prior to the restart of work, the Site Coordinator will receive approval from the contract administrator or the Radiation Safety Officer.

6.6 Natural Disasters will be handled on a case by case basis. Depending on the type and magnitude of the disaster, work operations will be determined by the Site Coordinator.

6.7 Discovery of unidentified underground utilities could cause all work tasks to be halted until the utilities are identified and disconnected by the proper authorities.

6.8 Unauthorized person(s) entering the exclusion zone would constitute work to be stopped and the proper authorities notified. The incident would be properly documented.

7.0 ACCIDENT REPORTING

NOTE: **All accidents, injuries, fires, or any emergency incidents will be reported following the guidance of the Section 10.0 of this procedure, the EMERGENCY PLAN, under part 10.3 'Radiological Incident'.**

7.1 Insurance

ATG's Worker Compensation Carrier has the responsibility for the following:

7.1.1 Making sure that every claimant is entitled to a fair investigation of his/her claim and a prompt decision as to its merit.

7.1.2 Determining how much a particular liability case is worth and negotiating a settlement within that range.

7.1.3 Making sure that cases of no liability, tenuous liability or those tainted by fraud are vigorously resisted.

7.1.4 Consulting with the company's Controller on all claims requiring settlement in excess of $5,000.00.

7.1.5 Consulting with the company's President or Vice President on all claims requiring settlement in excess of $10,000.00.

7.1.6 Maintaining the risk management reporting system, the risk detail report and forwarding monthly report updates to the company's President or Vice President.

7.2 Accident or Injury Reporting Requirements

All injuries shall be promptly reported to the ATGProject Manager or designee., and the Fort McClellan Safety Office.

To make sure that each incident is properly and appropriately reported and recorded, the Foreman's Report of Injury or Illness (ATG Form 133) is required. The Foreman's Report of Injury or Illness will provide all of the information to generate the employees first report of an injury. It can also be used as the company's medical authorization. The Foreman's Report of Injury or Illness must be completed in detail for every accident, injury or illness which occurs to an ATG employee, visitor or subcontractor either in connection with or on company property or on a contracted job site. Every effort should be made to complete this form as quickly as possible following notification of the incident. The injured worker's foreman is responsible for completing this form. Once completed, the form should be reviewed and signed by the Health and Safety Representative or designated alternate and a copy forwarded to the insurance carrier. Copies shall be provided to U.S. Army Industrial Operations Command.

Accidents resulting in any fatality, lost-time injury or illness, hospitalization of 3 or more personnel, or property damage to government or contractor property (which occurred during performance of the contract) equal to or exceeding $2000.00 must be telephonically reported to USA, IOC as soon as possible, but not later than 2 hours after occurrence and reported in writing within 5 days of occurrence on DA Form-285. All other accidents/incidents must be reported by telephone to USA, IOC, (309) 782-0880, within 8 hours of occurrence.

7.3 Employee's First Report of Injury

Each state within the United States has either developed its own Employer's First Report of Injury Form or has indicated a willingness to accept a suitable substitute. Generally where a state does not have its own form, the substitute is that form used by the employer's Workman's Compensation Carrier. Every state requires some type of injury notification.

The Project Manager or his/her designee shall report immediately by telephone, or in writing, to the nearest District Office of the Division of Occupational Safety and Health any serious injury, accident or death of an employee. "Immediately" is defined for this purpose to mean as soon as practical but no longer than twenty four hours after the employer knows of or should have known of the death, illness or serious injury. The Project Manager will notify the nearest office of the Division of Occupational Safety and Health whenever a State, County, or Local Fire or Police Agency is called to an accident involving an employee that has suffered a serious injury, illness or death.

7.4 OSHA Forms

The OSHA Form 200 Log and Summary of Occupational Injury and Illness along with the OSHA Form 101, Supplementary Record, will be completed and maintained at the ATG Corporate office in Fremont, California.

The corporate office has the responsibility to record and report OSHA reportable incidents. All forms are available on request.

8.0 HAZARD COMMUNICATION PROGRAM

8.1 Purpose

The purpose of this written Hazard Communication Program is to comply with the requirements of the Code of Federal Regulations, Title 29, Part 1910.1200, "Hazard Communication". This program is site specific.

8.2 Policy

ATG as an employer engaged in a business within the Standard Industrial Classification, Codes 20 through 39, where chemicals or hazardous materials are either used or are produced for use. This program will assure that the hazards of all chemicals found in the work place will be evaluated and that information concerning their hazard will be transmitted to all affected employees.

The known hazard that will be handled on this project will be radioactive material and potential biological hazards. The hazards have been evaluated in this Project Health and Safety Plan. Communication to the employees will be handled in the project training and verified through the Project Quality Assurance Plan. Identification of the radiological hazard is required by posting radiological controlled areas and labeling containers or items that contain radioactive material in accordance with 10 CFR 20. All potential biological hazards will be properly labeled and the work site will have the proper postings.

Any currently unknown hazards will be handled in the same manner when they are encountered. The Project Manager or designated alternate will be responsible for conducting the evaluation, communication and identification.

Material Safety Data Sheets (MSDS) will be provided for all materials brought onto the site. All MSDS's will be placed alphabetically in a labeled notebook and in a designated highly visible area that is readily accessible for personnel and visitors. A copy of all MSDS's for the materials on-site will be provided to the fire department. The fire department will also be notified of the quantity of the material and the storage location. All personnel will be briefed on the materials on-site, the location of the MSDS's, and the proper way to use the MSDS's.

9.0 PROJECT ROLES AND RESPONSIBILITIES

ATG Project Manager

The Project Manager or his/her designee is responsible for the overall project. He/she is to assure the project meets the objectives and contracted commitments. He/she has the direct management responsibility and authority for cost, schedule, quality and technical performances of all activities in support of the project. He/she is ultimately responsible for the implementation of all quality related activities. Other responsibilities include: selecting project staff and assigning duties, budgets and schedules, and identifying and resolving project specific problems. The Project Manager will assure the tasks are completed in a professional, efficient, and safe manner.

ATG Project Lead Investigator

The ATG Project Lead Investigator or his designated alternate will have overall responsibility for ATG's on-site conduct of the project and will report to the Project Manager for oversight and management control. He/she will be the primary point of contact. He/she is responsible for implementing and monitoring compliance with the operations plan and implementing corrective actions.

ATG Field Personnel

ATG Field Personnel will take all reasonable precautions to prevent injury to themselves and to their fellow workers by remaining alert to potential harmful situations. All tasks must be performed in accordance with the Project Sample Analysis Plan and the Health and Safety Plan. Any unsafe conditions must be reported immediately to the Project Manager or designated alternate. Personnel must report any medical conditions that may be affected by the work environment. All injuries must be reported - no matter how minor. The Field Personnel must read and comply with all postings and rules at the work site. Spilling and splashing of materials must be kept to a minimum. Good housekeeping must be maintained within and around the work area.

10.0 EMERGENCY PLAN

The objective of emergency response actions is to minimize adverse health risks to site workers, the environment, and local community. The Project Manager or designee. will be the site emergency coordinator.

The following is a course of action for any accidents or emergencies that may occur during this project and the immediate actions to be pursued. In any situation outside the scope of the work identified in this work plan, the actions taken should be to stabilize the area, notify appropriate personnel, contain the area and prevent unauthorized personnel from entering the area (thus minimizing their exposure and contact), surveying the area for all hazards, and then formulating a plan for recovery from the accident or situation. The following will be performed prior to work on site:

a. Locate the nearest telephone.

b. Confirm and post emergency telephone numbers.

c. Post site map of work areas marked with evacuation routes.

d. Inventory and check site emergency equipment and supplies.

e. If a radio is supplied, ensure it is charged and in good working condition.

Work is expected to be performed by ATG personnel over weekend periods and during installation non-duty hours. Special arrangements will be made with the appropriate emergency service organizations.

10.1 Evacuations

In the event of an emergency that requires evacuation of the site, verbal instructions will be given by the Health and Safety Representative or designated alternate. During an emergency evacuation, personnel will proceed to the assembly point designated on the map unless conditions cause the assembly point to be unstable or harmful. Verbal instructions will be given if evacuation beyond the assembly point is required. Personnel working on-site should not take time to monitor for contamination unless time allows. Contaminated personnel and areas they have been in contact with will be monitored when the conditions are stable and considered safe.

The following conditions would require evacuation:

- Fire
- Chemical Release
- Radiological Release
- Any event that an injury is incurred
- Any other event that would cause the working conditions to be unstable and no longer safe

The Project Manager or designee. will account for all personnel, ascertain information about the emergency, and advise further instructions to the on-site personnel.

In the event that an evacuation occurs, the following will be performed prior to reentry:

a. The conditions resulting in the evacuation have been corrected.

b. The hazards have been reassessed.

c. The Work Plan and Health and Safety Plan have been revised accordingly and approved by the Project Manager or designee., and the appropriate facility personnel.

d. Site personnel have been informed on changes to the site and work conditions.

e. Site personnel have been informed on precautions to take and any change in PPE requirements.

f. TheProject Manager or designee. has given the approval for reentry.

10.2 Medical Emergencies

If a situation occurs that results in the injury of personnel or visitors, the following actions shall be taken:

10.2.1 Stop all work activities. Ensure the area is in a safe condition.

10.2.2 Qualified personnel will provide first aid to the injured person.

10.2.3 In the event the injury is severe, the Project Manager or designee. will act as the emergency point of contact. Ensure the emergency personnel are aware that contamination may be present.

10.2.4 For any incident, accident, or injury, notify the Emergency Response Organization at phone number 911, the Base Security Post, and the ATG Project Manager or designated alternate.

10.2.5 If the injuries and time allow, the injured person will be surveyed for contamination and decontaminated if necessary.

10.2.6 If a hazardous material gets on the person's skin or eyes, the area will be flushed immediately with clean water until medical personnel arrive.

10.2.7 If a person succumbs to heat stress, the following should be used as a guide:

a. Heat cramps: Caused by heavy sweating and inadequate water and electrolyte replacement.

Symptoms: muscle spasms; pain in the hands, feet, and abdomen.

Treatment: drink Gatorade to replace fluids and electrolytes.

b. Heat Exhaustion: Caused by sustained exertion in a heated environment. Lack of acclimatization and failure to properly rehydrate may contribute.

Symptoms: clammy skin; heavy sweating; dizziness; nausea; and fainting.

Treatment: Promptly remove individual to a cooler environment and give water or Gatorade to replace fluids and electrolytes. If medical assistance is needed, contact emergency personnel

immediately.

c. Heat stroke: the most serious form of heat stress occurs when temperature regulation fails and the body temperature rises to critical levels.

Symptoms: Red, hot, and dry skin; lack of, or reduced perspiration; nausea; dizziness or confusion; strong rapid pulse; and coma.

Treatment: Immediately summon emergency medical services. While waiting for emergency services to arrive, and if facilities are available, cool person by immersion in cold water or by wrapping in a wet sheet with vigorous fanning with cool dry air. Treat for shock.

d. High concentrations will be identified by the Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs) as referenced in the Reference List.

10.3 Radiological Incident

A radiation incident may be defined as an unforseen occurrence, either actual or suspected, involving exposure or radiation. An accident is considered to occur over a short period of time, from seconds up to several days. Chronic occupational or other long-term exposure is not considered accidental.

There are two ways in which humans can be exposed to ionizing radiation:

1. External. The source of ionizing radiation may be outside of the body so that the radiation strikes the individual and is absorbed. Radiation from x-ray generators, particle accelerators, sealed sources of radionuclides, and reactors are examples. The radiation may be beta, gamma, or neutron. Alpha emitters present no significant external hazard.

2. Internal. The source of ionizing radiation may gain entrance into the human body by inhalation, ingestion, injection, or absorption through intact or abraded skin. Radionuclides may also be formed within the body following exposure to an external source of neutrons. All persons who are known or suspected to have been internally exposed to radioactive material will be reported to the Fort McClellan Radiation Protection Office.

SPECIFIC GUIDELINES

In the event of an emergency, the Project Manager or designee. will assume control of the situation and direct activities until relieved by proper authority. The exact actions and sequence of actions to be taken will be determined by the nature of the emergency. The following actions are typical responses to emergency situations, however, the sequence of these actions are highly variable.

10.3.1 Stop all work activities

10.3.2 Leave the area in a safe condition

10.3.3 Limit the radiation exposure and the spread of radiation contamination, if undue hazard to personnel does not result. For example:

a. Return sources to shield containers
b. Place absorbent material on spills
c. Turn off ventilation and equipment
d. Extinguish flames, heaters, etc.
e. Restrict access to the area

10.3.4 Perform radiological surveys (airborne, contamination, and radiation) to determine the nature and extent of the release and spread of contamination.

10.3.5 Contain the area with herculite or an equivalent material to prevent the continued spread of radioactive material and/or hazardous material to the environment.

10.3.6 Evacuate and survey all personnel to a identified safe area.

NOTE: In the event of any injury, this will take precedence to evacuate and place the injured individual in a safe condition. Immediate medical attention will be obtained for any injuries occurring during this operation. All injuries will result in immediate work stoppage and evaluation of the conditions prior to recommencing activities under the direction of the Project Manager or designated alternate.

10.3.7 Radioactively contaminated personnel will receive all necessary medical care and treatment at the earliest practical time.

10.3.8 Radiation and radioactive contamination will not deter medical personnel in efforts to save life or limb, although slightly different techniques must be employed, e.g. rotating medical personnel to minimize exposure to any one individual, keep individual exposures As Low As Reasonably Achievable (ALARA), etc.

10.3.9 Radioactively contaminated personnel will be decontaminated at the earliest opportunity consistent with their medical needs.

10.3.10 Every effort will be made to minimize radiation exposure and the spread of contamination during medical treatment.

10.3.11 The ATG Project Manager or designated alternate will advise the Site RPO of the extent of contamination and exposure of the individual.

10.3.12 At the earliest possible time consistent with the patient's medical needs, the attending physician will allow decontamination to begin. Decontamination will be provided under the guidance of ATG Radiation Protection personnel.

10.3.13 All contaminated clothing, equipment, and waste material will be retained by ATG Radiation Protection personnel.

10.3.14 Contaminated valuables will be retained by ATG Radiation Protection personnel who will account for them, and will decontaminate them as soon as the situation permits so that they may be returned or disposed of properly. Valuables and personal property will not be disposed of as contaminated waste without written consent of the owner.

10.3.15 Formulate a recovery plan, obtain approval as required, and commence recovery operations.

10.4 Responsibilities

10.4.1 Personnel

All personnel are responsible for the following:

Become thoroughly familiar with the contents of this regulation prior to using radioactive material.

Take adequate precautionary measures to protect all personnel from unnecessary exposure to radiation.

Seek advice and assistance from ATG Radiation Protection personnel concerning the safety of an operation.

Prescribe rules, procedures, or protocols for the use of radioactive materials under his control to ensure proper and safe use. These will be made available to any radiation worker in the area and will be furnished for review and comment by Allied Technology Group.

Ensure that all rules, procedures, and practices of radiation safety are rigorously followed in the work area.

Report actual or potential emergency situations to the Project Manager or designee..

Promptly contact ATG Radiation Protection personnel. Exposed individual(s) should cooperate in any and all attempts to evaluate his/her radiation exposure.

If working with radioactive material, maintain a current inventory of the quantity of radioactive material on hand to be readily available to the RPO upon request. The inventory will include the radionuclide(s), current activity, and form.

Evacuating the area immediately.

If qualified, provide first aid to the injured.

10.4.2 Management

All supervisors are responsible for the following:

Anticipate hazardous conditions and prevent them from occurring.

Ensure personnel are trained on emergency situations.

Ensure emergency contact numbers are current.

Ensure evacuation routes are clear.

Alert emergency personnel and act as the point of contact.

Account for all personnel.

The overall health and safety of their workers.

Limiting possible radiation exposure to the general public.

Notification of the Base RPO if a radiation incident should occur involving contractors.

Generation of a written report of all incidents involving radiological hazards including the following as a minimum:

- The type of radiation incident: internal contamination, external contamination, or exposure.
- The number of contaminated individuals and their condition.
- The type of radioactive material.
- Efforts, if any, that have been made to decontaminate the individual at the accident site.

Levels of radiation measured on the patient.

10.4.3 The Fort McClellan Radiation Protection Office will respond to all radiological emergencies and will:

Provide technical advice as necessary.

Arrange for additional resources, e.g. personnel, supplies, and equipment.

Provide assistance as needed.

Provide advice and radiation monitoring.

Provide exposure control and monitoring of staff personnel attending the patient.

Direct decontamination of the personnel at the earliest time consistent with medical needs.

If required, make a prompt investigation of the incident.

Issue specific guidance to minimize exposure of the staff or spread of

contamination.

Such guidance will be developed on the scene by the Fort McClellan Radiation Protection Office.

Make appropriate reports to MEDCOM, the Nuclear Regulatory Commission (NRC), and other agencies in accordance with pertinent directives.

10.4.4 Medical Personnel

The medical personnel present at the scene of an accident will:

Evaluate the injury

Apply first aid

Take the person to a designated decontamination area

Employ contamination control measures

Follow recommendations whenever possible since radioactive contamination can necessitate very costly decontamination operations and result in the loss of facilities for many days.

Notify the Fort McClellan Radiation Protection Office.

10.5 Safety Signals

Vehicle, tractor, and portable gas-operated horns are used for safety signals as follows:

One Long Blast	**WARNING ALARM** - prepare for emergency response
Two Short Blasts	**ACTIVATION ALARM** - initiate emergency response activities as directed by the Project Manager or designee..
Three Short Blasts	**ALL CLEAR** - return to normal activities.

10.6 Emergency Information

Emergencies may include fires, fire hazards, accidents requiring first aid, or other incidents requiring emergency procedures. ATG and its subcontractors will, at all times, minimize potential emergencies. The following section lists emergency phone numbers which should be posted in all work areas:

EMERGENCY PHONE NUMBERS

Ambulance (Fire Department)	(256) 848-2315
Hospital (Emergency Room)	(256) 235-8900
Fire Department	(256) 820-1117
Security	(256) 848-5159 or 3560
Center for Disease Control (CDC)	(404) 452-4100
RCRA Hotline	(800) 424-9346
Poison Control Center	(619) 543-6000
National Response Center	(800) 424-8802

DIRECTIONS TO HOSPITAL

The nearest hospital is Stringfellow Memorial of Anniston which is 5 miles from the project site on 301 East 18th Street

10.7 Key ATG Personnel

POSITION	NAME	PHONE
Project Manager	Lee Young	(865) 220-8030
Project Health Physicist	Mark McHugh	(865) 425-5011
Corporate RSO	Arthur Palmer	(865) 425-5033

10.8 Key Contracting Personnel

POSITION	NAME	PHONE
US Army OSC Health Physicist	Mike Styvaert	(309) 782-0880
US Army OSC Contract Officer	Robert Matthys	(309) 782-5554

10.9 Key Facility Personnel

POSITION	NAME	PHONE
Fort McClellan RPO	John May	(256) 848-5737
Fort McClellan Env. Contact	Lisa Kingsbury	(256) 848-7455

11.0 SPILL PREVENTION AND CONTROL

Spill prevention control shall be as follows:

The use and spread of materials will be initially prevented by the elimination of unnecessary materials being introduced to the site. The basic survey effort requires that only exempt quantity radioactive check sources, instrument batteries, and P-10 gas (10% methane, 90% argon) be mobilized for routine use.

The control of spills is thus intended for encountered or discovered materials on the base as the result of or during the radiological surveys.

11.1 Spill Response

If a spill of hazardous material occurs, the following actions will be taken:

Notify the Project Manager or designated alternates immediately.

Take immediate measures to control and contain the spill within site boundaries.

Keep unnecessary personnel away, isolate the hazardous area, and deny entry.

Stay upwind and keep out of low-lying areas.

Allow no flares, smoking, or flames in the hazard area.

For liquids, keep combustibles away from the spilled material.

Take necessary steps to clean up the spill and all contaminated material.

12.0 ACRONYMS

ACGIH	American Conference of Governmental and Industrial Hygienists
ALARA	As Low As Reasonably Achievable
ATG	Allied Technology Group
BEI	Biological Exposure Indices
CDC	Center for Disease Control
CFR	Code of Federal Regulations
EOD	Explosive Ordnance Disposal
HBV	Hepatitis-B Virus
IOC	Industrial Operations Command
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
NRC	Nuclear Regulatory Commission
OSHA	Occupational Safety & Health Association
PPE	Personnel Protective Equipment
RCRA	Resources Conservation and Recovery Act
RPO	Radiation Protection Office(r)
RSO	Radiation Safety Officer
RWP	Radiation Work Permit
TLD	Thermoluminescent Dosimeter
TLV	Threshold Limit Value
UXO	Unexploded Ordnance

13.0 REFERENCES

29 CFR 1910, OSHA Standards for General Industry.

29 CFR 1926, OSHA Standards for Construction.

U.S. Nuclear Regulatory Commission Division of Industrial and Medical Safety, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material".

ATG Corporate Health and Safety Manual.

ATG "Decommissioning Plan for the Fort McClellan 'Burial Mound' for the IOC, December 1998.

ATG "Project Quality Assurance Plan for the Fort McClellan 'Burial Mound' for the IOC, December 1998.

ATG Respiratory Protection Program.

American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices".

ANSI A14 Series - 1992, Safety Standard for Ladders.

ANSI B30 Series, Safety Standards for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Stings.

ANSI B56 Series, Safety Standard for Powered industrial Trucks.

ANSI Z41 - 1991, Personnel Protection - Protective Footwear.

ANSI Z49.1 - Safety in Welding and Cutting.

ANSI Z87.1 - 1989, Practice for Occupational and Educational Eye and Face Protection.

ANSI Z89.1 - 1986, Protective Headwear for Industrial Workers.

ANSI Zl 17.1 - 1989. Safety Requirements for Confined Spaces.

NUREG/CR 2082 "Monitoring for Compliance with Decommissioning Termination Survey Criteria".

NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)"

NUREG-1515, "A Non-Parametric Statistical Mehodololgy for the Design and Analysis of Final Status Decommissioning Surveys".

NUREG-1517, "Minimum Detectable Concentrations with Typical Survey Instruments for Various Contaminants and Field Conditions".

NRC Decommissions and Regulatory Issue Branch Technical Position, "A Summary of NRC and Interim Radiological Cleanup Criteria and Current Dose Rates" (Nov, 1992).

NUREG/CR5512,"Residual Contamination from Decommissioning".

Industrial Radiation Study No. 27-MH-0987-R2-97, Pelham Range Burial Mound Site Fort McClellan, Alabama 29 August - 15 September 1995 and 14-28 January 1996, U. S. Army Center for Health Promotion and Preventive Medicine.

14.0 FORMS

ATG Form-027	Training Record
ATG Form-047	Occupational Radiation Exposure History Letter
ATG Form-109	Site Registration
ATG Form-112	Radiation Exposure Record
ATG Form-116	Contamination Report Index
ATG Form-117	Personnel Contamination Report
ATG Form-118	Clothing Contamination Report
ATG Form-133	Foreman's Report of Injury or Illness

TRAINING RECORD

TRAINING DATE:	INSTRUCTOR:
LOCATION:	TOTAL CLASS HOURS:

TRAINING COURSE TITLE:

SCOPE OF TRAINING:

NAME OF STUDENT	SOCIAL SECURITY NO.	SIGNATURE

TRAINING APPROVED BY (Project Director):

Allied Tec[illegible]gy Group, Inc.
47375 [illegible]nt Blvd.
Fremont, Ca[illegible]rnia 94538
(800) 227-2840

OCCUPATIONAL RADIATION EXPOSURE HISTORY
Exposure Year 1999

Name:_____ Social Security Number:_____

Address:_____ Date of Birth:_____

City:_____ State: _____ Zip: _____

The Occupational Radiation Exposure listed below was received by the above individual while assigned by Allied Technology Group

Project/Location Monitored	Monitoring Method TLD/Film Badge	Record/Estimate	NRC License Number(s):
	TLD Badge #		

Abbreviations: NC - Not Calculated ND - None Detected NM - Not Monitored SA - See attached

Monitoring Period		Deep-Dose Equivalent			Shallow-Dose Equivalent		LDE	CEDE	CDE	TEDE	TODE
From	To	X or γ	Neutron	Total DDE	Skin SDE, WB	Extremity SDE, ME	Lens	$H_{E,50}$	$H_{T,50}$	DDE+CEDE	DDE+CDE

THIS REPORT IS FURNISHED TO YOU UNDER THE PROVISIONS OF THE NUCLEAR REGULATORY COMMISSION REGULATION 10 CFR PART 20 TITLED "STANDARDS FOR PROTECTION AGAINST RADIATION". YOU SHOULD PRESERVE THIS REPORT FOR FURTHER REFERENCE. ALL DOSE EQUIVALENT VALUES ARE REPORTED IN MILLIREM.

Radiation Safety Officer:_____ Date:_____

SITE REGISTRATION FORM
ALLIED TECHNOLOGY GROUP, INC.

PERSONAL INFORMATION

Name:			Date:
Social Security:	Date of Birth:	Project Name:	
Permanent Address:			
City:		State:	Zip:

EMPLOYER INFORMATION

Employer's Name:	
Employer's Address:	
Name of Emergency Contact:	
Address of Emergency Contact:	
Emergency Contact Phone:	
Signature:	

MEDICAL HISTORY

List any condition or ailment that may affect your ability to perform your job:		
Indicate if you are epileptic or diabetic:		
List any allergies you have:		
List any medications you are now taking:		
Last Tetanus Shot date:	Date of Last Physical:	
Signature:		Date:

FINAL PAYCHECK ADDRESS

Address:	
City:	
Phone:	
FedEx: ☐	Check box at left if you want your check Federal Expressed to you. ATG must deduct a $15.00 fee from your final pay for this service. If not checked, paycheck will be sent regular mail.

1995 RADIATION EXPOSURE RECORD

AME:	
SOCIAL SECURITY NO:	BIRTH DATE:
EXTREMITY BADGE NO:	LM BADGE NO:
LIFETIME WHOLE BODY EXPOSURE:	

	WHOLE BODY	SKIN	EXTREMITIES		LIFETIME HIGHEST WHOLE BODY
			LEFT	RIGHT	
JANUARY					
FEBRUARY					
MARCH					
QUARTER TOTALS					
APRIL					
MAY					
JUNE					
QUARTER TOTALS					
JULY					
AUGUST					
SEPTEMBER					
QUARTER TOTALS					
OCTOBER					
NOVEMBER					
DECEMBER					
QUARTER TOTALS					
ANNUAL TOTALS					

ALLIED TECHNOLOGY GROUP, INC. FORM ATGF-112

CONTAMINATION REPORT INDEX

DATE	DATE	TYPE CLOTHING PERSONNEL	LOCATION OF CONTAMINATION	COMMENTS

PERSONNEL CONTAMINATION REPORT

NAME	DATE
LOCATION WHERE CONTAMINATION OCCURRED:	RWP#
EXTENT OF CONTAMINATION:	
A. INITIAL SURVEY RESULTS:	
B. SURVEY RESULTS AFTER DECONTAMINATION:	
C. RELEASE SURVEY RESULTS:	

SKIN DOSE EVALUATION:

A. Maximum contamination level conversion from dpm to mrad/hr maximum skin dose rate

_____ dpm (4,000 dpm/mrad/hr) = _____ mrad/hr.

B. Maximum skin dose rate Total time skin contaminated

Total maximum skin dose _____ mrad/hr x_____ hr* =_____ mrad**.

* If skin contamination cannot be removed, assume a residence time of 48 hours. Contact the Radiation Safety Officer in all cases where skin contamination cannot be reduced below 1000 dpm.

** If 75 mrad, contact the Radiation Safety Officer. (75 mrad is equivalent to 75000 cpm on the skin for 4 hours.)

RADIATION SAFETY OFFICER COMMENTS:

SIGNATURE (TECHNICIAN)	DATE
SIGNATURE (INDIVIDUAL)	DATE
SIGNATURE (SUPERVISOR)	DATE

CLOTHING CONTAMINATION REPORT

NAME:	BADGE NO.:
WORK AREA:	
DATE OF OCCURRENCE:	TIME OF OCCURRENCE:
LOCATION WHERE CONTAMINATION OCCURRED:	
JOB BEING PERFORMED:	
WAS WORK COVERED BY RWP? ☐ YES OR ☐ NO	IF YES, RWP#
ANTI-C's WORN? ☐ YES OR ☐ NO	
DESCRIBE:	
EXTENT OF CONTAMINATION, INCLUDING APPROXIMATE AREA:	
CAUSE OF CONTAMINATION:	
METHOD OF DECONTAMINATION:	
RADIATION PROTECTION COMMENTS:	
SURVEY SECTION:	
A. INITIAL SURVEY RESULTS:	
B. AFTER DECONTAMINATION:	
C. RELEASE SURVEY RESULTS:	
HEALTH AND SAFETY OFFICER	DATE
INDIVIDUAL'S SIGNATURE	DATE

ALLIED TECHNOLOGY GROUP, INC. - FORM 118

FOREMAN'S REPORT OF ACCIDENT, INJURY OR ILLNESS

EMPLOYER'S NAME:	
EMPLOYER'S ADDRESS:	
WORK LOCATION:	
WORK LOCATION ADDRESS:	
EMPLOYEE'S NAME:	DATE OF BIRTH:
EMPLOYEE'S ADDRESS:	
IS THIS A WORK RELATED INJURY OR ILLNESS?	☐ YES ☐ NO ☐ N/A
DATE OF OCCURRENCE:	TIME OF OCCURRENCE:
ACCIDENT OR INJURY DESCRIPTION:	
IS THIS A LOST TIME ACCIDENT, INJURY OR ILLNESS?	☐ YES ☐ NO
IS THIS AN OSHA RECORDABLE ACCIDENT OR ILLNESS?	☐ YES ☐ NO
WAS MEDICAL TREATMENT NECESSARY?	☐ YES ☐ NO
EMPLOYEE SIGNATURE	DATE
WITNESS SIGNATURE	DATE
WITNESS SIGNATURE	DATE
FOREMAN'S SIGNATURE	DATE
PROJECT MANAGER SIGNATURE	DATE

ATTACHMENT 8

QUALITY ASSURANCE PLAN

U.S. ARMY FORT McCLELLAN
FORT McCLELLAN, ALABAMA
HQ, OSC PROJECT NUMBER USA 99-100

Release Surveys for Commodity Storage Sites

QUALITY ASSURANCE PLAN

Prepared by:

Allied Technology Group Inc.
669 Emory Valley Road
Oak Ridge, TN 37830

July 2000

U.S. ARMY FORT McCLELLAN

Release Surveys for Commodity Storage Sites

QUALITY ASSURANCE PLAN

APPROVAL PAGE

Concurrence: Lee a. Young
Lee Young, ATG Project Manager

Date: 7/19/02

Concurrence:
Mark McHugh, ATG Project QAM

Date: 020719

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1.0 INTRODUCTION

1.1 Background

Allied Technology Group (ATG) has been contracted by the U.S. Army Industrial Operations Command (IOC) Radioactive Waste Disposal Office for the radiological release surveys of commodity storage sites at Fort McClellan near Anniston, Alabama. As a supporting part of the overall work plan for the project, this Project Quality Assurance Plan has been integrated into the Decommissioning Plan to provide the necessary controls to successfully complete the contract requirements. Performance of project activities is obligated to ATG under contract DAAA09-98-C-0039, Modification P00003. The internal ATG project number if 10036.02.

1.2 Scope and Objectives

The project Quality Assurance Plan has been developed to meet the applicable regulations and requirements and to assure compliance with the work objective, and requirements of the project Sampling and Analysis Plan (SAP) and the Project Health and Safety Plan (HASP).

Management and supervisory personnel will be on site to provide instruction and guidance to project personnel in the implementation of this plan.

2.0 QUALITY ASSURANCE PROGRAM

2.1 Project Quality Assurance Plan

The Project Quality Assurance Plan is committed to ensuring that all activities to be performed during this radiological survey project which affect quality are prescribed by and performed in accordance with procedures. The Project Quality Assurance Plan is implemented for the activities specified in the Sampling and Analysis Plan and the Project Health and Safety Plan for the Fort McClellan project. The Project Quality Assurance Plan highlights project specific aspects of the applicable quality assurance elements. The specific quality assurance tasks are defined in the plan.

2.2 Quality Assurance Training

The Project Manager or designated alternate will perform the initial quality assurance training of the project personnel at the start of the project.

If additional personnel are added to the project, they will receive quality assurance training prior to participation in the project activities. Quality assurance training will consist of a review and discussion of the project Sampling and Analysis Plan and supporting documents which shall include the ATG Field Operating Procedures and any additional procedures referenced in the Sampling and Analysis Plan, Health and Safety Plan and the Quality Assurance Plan. Special emphasis will be placed on documentation of work, quality control checks, equipment performance, identification and control of radioactive material and safety procedures.

Each participant shall acknowledge that he/she has received training and that he/she understands the quality assurance requirements relevant to the project by signing and dating the Training Record, ATG Form 027

2.3 Technical Training and Personnel Qualifications

Allied Technology Group management will review written statements of qualification and resumes with reference to the position necessary to perform the work as described in the Sampling and Analysis Plan to establish personnel capabilities and qualification to perform the assigned task. If comparison of personnel qualification, including education, experience, and training do not fulfill the requirements of the position description to meet project needs, appropriate training including "read and study" and "on-the-job" training will be performed or other appropriately qualified individuals will be assigned to perform the task.

The Project Manager or designated alternate shall review all personnel qualifications and determine the type of training or experience required to ensure that an individual is qualified to perform the work. This review will be documented on the Review of Personnel Qualification, ATG Form 103. Personnel records shall be maintained in the quality assurance record file and shall include a record of the initial qualifications, documentation of review by the Project Manager or designated alternate and acceptance of current qualifications or the need for additional training and a record of the completion of training. Project management shall monitor the performance of individuals involved in activities affecting quality and shall determine if there is a need for retraining or replacement. Retraining or replacement of individuals will be initiated immediately upon identification of the need for such actions. The following guidelines shall be used to determine the proficiency and ability of the workers assigned to this project:

2.3.1 Qualification Requirements:

2.3.1.1 Physically capable of performing the work tasks.

2.3.1.2 Demonstrated capability to perform the specific function in accordance with approved procedures.

2.3.1.3 Familiarity with technical aspects of the equipment and procedures, and capability to verify that the equipment is in proper working condition.

2.3.2 Capability Demonstration:

2.3.2.1 The Project Manager or designated alternate shall determine the type of training or experience required to determine if personnel are qualified to perform the specific tasks.

2.3.2.2 The individual workers shall review the approved project Plans.

2.3.2.3 The individual workers shall demonstrate their understanding of the project Plans.

2.3.3 Support Personnel

2.3.3.1 Minimum personnel will be used to support the survey.

2.3.3.2 All support personnel at Fort McClellan will be trained on the applicable hazards on which they are working. This training shall be documented on Training Record ATG Form 027.

2.3.3.3 All support personnel involved in the survey activities shall be monitored for exposure (TLD).

2.3.3.4 All support personnel involved in the survey activities shall be under the direct surveillance of the ATG Lead Investigator (HP) while performing work.

3.0 ORGANIZATION

The Project Quality Assurance Plan oversight will be performed by Headquarters, Industrial Operations Command and the base Chemical School. The ATG Quality Assurance Director

will report independently of the on-site project management. The Industrial Operations Command will perform unannounced inspections to include a review of ATG QA/QC procedures and their implementation on site during the survey activities.

The QA Manager is responsible for assuring that the Project Quality Assurance Plan is implemented and is adhered to on site. All project records and documents will be submitted to the QA Manager for final approval.

The Project Manager reports to the QA Manager, for the purpose of QA/QC control, and will act as an on-site quality auditor. The on-site audit reports and records will be submitted to the QA Manager. Quality items that will impact the performance of the contract will be immediately submitted to IOC. Copies of all reports, records or correspondence will be maintained on site for review.

4.0 CONTROL OF DATA

4.1 Planning

The work tasks necessary to complete this contract will be performed in a planned, systematic manner. To assure adequate project planning, the Sampling and Analysis Plan will be approved prior to the start of work. The Sampling and Analysis Plan will specify the required data collection and records to verify that the contract commitments have been met.

4.2 Data Collection

Data collection will be performed by the individual performing the tasks or their supervisor. Data collection will be performed in accordance with the Sampling and Analysis Plan, Project Quality Assurance Plan and the Project Health and Safety Plan requirements.

4.3 Documentation

Data collection shall be fully documented on the appropriate data records and daily project logs. All records shall be complete and thorough as possible hand written, legible and in ink. Personnel making a change to a record shall cross out the old entry with one line, add the new information and initial and date the change. Under no circumstances shall the old entry be scratched out, whited out, erased or otherwise removed or made illegible. When applicable, an explanation should accompany the

change or correction.

4.4 Quality Control Checks

All data shall be reviewed and checked by a technically qualified person such as the Corporate Health Physicist or the Project Manager. If the Project Manager does the Quality Control check, then he/she shall not review their own work. These checks shall be made to assure that both the technical, operational and quality assurance requirements have been met.

The following guidelines will be used to perform the quality control checks:

4.4.1 Verify that the record contains;

4.4.1.1 The project name or task description

4.4.1.2 Name or initials of the performer

4.4.1.3 Date of performance

4.4.1.4 Page number if pertinent.

4.4.2 And, if applicable, that the record has;

4.4.2.1 Conformed with the appropriate procedures.

4.4.2.2 Instrument calibration data (instrument identification, calibration date, certificate of calibration, etc.) of survey instruments used is current

4.4.2.3 Completeness and adequacy of the performance and documentation

4.4.2.4 Accuracy of material documented.

If the material being checked conforms to the guidelines, the individual performing the quality control check shall sign and date the record. If the material is rejected, it shall be handled in one of two ways:

4.4.2.4.1 Discuss and correct minor deviations with responsible personnel resulting in subsequent acceptance or,

4.4.2.4.2 Initiate corrective action procedures in the form of a Nonconformance Report, Form ATGF-108.

4.5 Management Review

The Project Manager or designated alternate shall review all data records prior to submitting them to the QA Manager. The same steps shall be taken with the review that are taken with the quality control checks.

5.0 PROCUREMENT DOCUMENT CONTROL

Procurement or acquisition of packages, plastic bags, protective clothing, safety equipment and radiological survey equipment, etc. may be needed to perform the work tasks. The procurement documents and packing lists will be reviewed upon receipt by the Project Manager or designated alternate to verify that appropriate quality assurance and technical requirements have been met. These records will be maintained with the other project records.

6.0 SAMPLING AND ANALYSIS PLAN

The Sampling and Analysis Plan for the activities at Fort McClellan and the associated supporting documents shall be reviewed and approved by Allied Technology Group management, IOC, and the pertnant regulatory agencies (i.e., NRC, EPA, State).

The Sampling and Analysis Plan will have systematically numbered steps and pages, a cover page and an approval page. Distribution of copies to pertinent personnel will be accordance with Section 7 of this Quality Assurance Plan, Document Control.

If revisions to the Sampling and Analysis Plan are necessary during the performance of the project, ATG shall submit any major changes to the NRC for approval. Minor plan revisions or minor field changes that do not affect the quality of work, objectives, or cause a potential health and safety impact will not require submittal to the NRC for approval. Major changes include revisions that would result in an unreviewed safety question or a change in a license condition. In accordance with Administrative Procedure AROP No. 102, 'Revisions to the Operational Procedures' and the use of Form 104, 'Project Work Plan Change Request', the Project Manager or designated alternate will review all proposed changes to determine if the change is significant. All changes will be documented and highlighted by change bars in the

right margins of the text.

7.0 DOCUMENT CONTROL

The Sampling and Analysis Plan and associated supporting documents shall be issued as a controlled document to assure that the current approved revision is in use. Controlled copies of these documents will be issued to project personnel by the Project Manager or designated alternate who will maintain a distribution list of the controlled copies. Personnel assigned controlled documents will be required to acknowledge receipt of the document and all subsequent revisions to the document.

A document Distribution Record, ATG Form 105, shall be maintained to assure that current documents are distributed. When issuing a current document or document revision, a Document Transmittal Record, ATG Form 106 shall be submitted to the recipient. This record will demonstrate that current documents have been issued and are in use. The transmittal record shall be acknowledged and returned to the QA Director.

The recipient of the controlled document shall return the document to the QA Director when the requirements for its use ends. Upon return of the controlled document, the QA Director shall enter the date of return on the Document Distribution Record.

8.0 INSPECTIONS

All quality-affecting work activities data shall be reviewed and checked by an independent Quality Assurance person, per Section 4.4, Quality Control Checks, to verify that they meet project requirements. For radiological measurements, quality control inspections will be performed by randomly verifying survey techniques and survey meter results.

The Project Manager or designated alternate will be responsible for completing the Daily Quality Control Checklist, ATG Form 107. The checklist is designed to account for project Decommissioning Plan activities that pertain to project tasks and radiation protection concerns.

Unsatisfactory items will be immediately rectified to bring the item to a satisfactory condition. The checklist is to be completed at the end of each shift for that days activities.

9.0 CONTROL OF MEASURING AND TEST EQUIPMENT

Measuring and test equipment shall be controlled and properly maintained to assure that the indicated results are accurate. Measuring and test equipment will not be used for any other purpose than that which the manufacturer intended. The equipment shall be stored, when not in use, in a controlled area so that environmental or physical damage does not occur. Only personnel qualified to use the equipment will be allowed to perform work with the equipment.

Measuring and test equipment that do not perform properly or do not provide good, reproducible results shall be taken out of service. The equipment shall be tagged with an "out of service" tag and removed from the normal equipment storage area.

9.1 Calibration

Radiological survey meters will be supplied from the ATG Oak Ridge Technical Support Office. Meters used by ATG, Inc. are calibrated by a certified calibration facility at a minimum frequency of annually.

Copies of the primary calibration certificates will be sent with the meters to the job site. In addition, survey meters have an attached calibration sticker that indicate the calibration date and the calibration due date. Radiation survey meter performance testing and maintenance will be performed in accordance with the Radiation Survey Procedure.

10.0 HANDLING, STORAGE AND SHIPPING

All radioactive material will be packaged, handled and stored according to the appropriate health and safety procedures. Packages (swipe samples) shall meet the Department of Transportation (DOT) regulations. The Project Manager (or designated ATG lead inspector) shall inspect and sign the shipping airbills.

11.0 CONTROL ON NONCONFORMANCE ITEMS

Procedures have been established and documented to control equipment and activities that do not conform to work plan requirements or whose quality does not meet the intended use. Nonconforming items, including reviewed data, shall be identified, documented, segregated or disposed of as appropriate. Nonconformance includes noncompliance with the technical procedures, contract documents or errors in documented analyses or results. Nonconformance reports shall be prepared, including a description of the nonconformance

and the proposed corrective action or disposition such as accept, reject, repair or rework. Nonconforming items or data shall be marked as nonconforming and shall not be used in any further activity until corrective action has been satisfactorily completed or an acceptable disposition approved by the Project QA Manager.

Persons determining corrective action or disposition shall have demonstrated competence, have an adequate understanding of the requirement, and have access to pertinent background information. Proposed corrective action or disposition and completion of corrective action shall be reviewed and approved in accordance with Section 12.0, Corrective Action.

11.1 Identification and Reporting of Nonconformances

A nonconformance exists if there is a deviation from or noncompliance with the Sampling and Analysis Plan or contract specifications. Nonconformances also include major errors in documented analysis, data or results and deficiencies in documentation or any other aspect of the project that affects quality. Personnel who identify a nonconformance shall report the condition by:

11.1.1 Completing Part A of the Nonconformance Report, ATG Form 108;

11.1.2 Request a nonconformance number from the Project Manager or designated alternate;

11.1.3 Distribute the nonconformance report to IOC, the Project Manager or designated alternate, and the Project QA Manager;

11.1.4 Notification of all nonconformances and copies of all Nonconformance Reports will be provided to the IOC Health Physicist and the NRC Representative.

11.2 Evaluation of Nonconformance Reports

IOC and the Project QA Manager will review the nonconformance report to determine if any of the following conditions exist and document the findings by completing Part B of the Nonconformance Report.

11.2.1 IOC may elect to evaluate the nonconformance item with the Project Manager or designated alternate, and Project QA Manager to determine if the nonconformance item could invalidate the results of ongoing work. If the nonconformance(s) incident in any way affects the health of workers and/or

the environment, it shall be reported to all appropriate facility personnel. If work is stopped, it shall be so noted on the nonconformance report. All affected work shall be immediately stopped and the Project QA Director notified. Work shall not be restarted until corrective action is approved and work authorized to restart by IOC.

11.2.2 If the nonconformance constitutes a significant condition adverse to quality, determine the cause of the condition. Examples of significant conditions adverse to quality include significant failures to implement the project Sampling and Analysis Plan or major errors in data or analysis which had previously been approved.

11.2.3 If the nonconformance has any impact on previously obtained data or reports submitted to the Fort McClellan or the IOC representatives, the Project Manager or designated alternate shall note the impact in the remarks section of the nonconformance report and notify in writing all individuals and organizations that may be affected by the nonconformance and resulting data.

11.3 Tracking Nonconformance Reports

The Project QA Director shall monitor nonconformance reports to determine if trends adverse to quality are developing. If such trends are developing, such as repetitive reports related to a particular activity, a written report will be submitted to all project personnel identifying the particular problem. The Director will evaluate the identified problem and propose and implement a written corrective action program to prevent recurrence of the nonconformance.

12.0 CORRECTIVE ACTION

Corrective action for conditions adverse to quality will be determined and implemented in a timely manner. Conditions adverse to quality are any of the following: failures, malfunctions, deficiencies, defective items and nonconformances. A significant condition adverse to quality is one which, if uncorrected, could have a serious effect on safety, operability or validity of data. The cause of the condition will be determined and action taken to preclude the recurrence of the nonconformance item. IOC shall verify that the corrective action has been implemented and, if necessary, that the Detailed Work Plan has been revised.

12.1 Recommendation of Corrective Action

The project personnel that recommend the corrective action will document the recommendation on Part C of the Nonconformance Report. In the case of a nonconformance which is a significant condition adverse to quality, the corrective action shall be such as to preclude recurrence of the non-conformance. The recommended corrective action will be reviewed and approved by IOC.

12.2 Corrective Action Implementation and Verification

The approved corrective action shall be implemented by the appropriate project personnel. When implementation is verified by IOC, the Project QA Manager, and the Project Manager, Part D of the Nonconformance Report will be completed. The completed nonconformance report will be maintained on site with the nonconformance record log in the project file.

13.0 QUALITY ASSURANCE RECORDS

A quality assurance records system for the project will be implemented and maintained. Records shall be in ink, legible, identifiable and retrievable. The quality assurance records will be sufficiently detailed to properly reflect all work activities in the performance of this contract.

These records may be in the form of data sheets, notes, graphs, comments, computations and other graphic or written data generated in connection with the work activities. Records will be considered valid only if the individual completing the record has initialed or signed and dated the record. If revisions or changes to the quality assurance records are required, the changes will be made to the original records by crossing out the old entry with one line, adding the new information and initialing and dating the change.

The Project Manager or designated alternate will be responsible for maintaining and protecting the records. The records will be maintained on site with the project files. File access will be limited to project personnel and authorized contract personnel. At the completion of the project, the Project Manager or designated alternate will submit all project QA records to the QA Director. A copy of all project documents will be provided with the Final Report to the Fort McClellan representative, IOC Health Physicist, and IOC Contracting Officer.

14.0 QUALITY ASSURANCE AUDITS

No formal quality assurance audits are planned for this activity. A quality assurance audit

may be performed if the QA Director deems necessary. Quality Assurance records will be evaluated and audited by the QA Director at the end of the project.

15.0 REFERENCES

15.1 U.S. Code of Federal Regulations, Title 10, "Energy", Part 19 and Part 20.

15.2 U.S. Code of Federal Regulations, Title 29, "Labor", Part 120.

15.3 U.S. Code of Federal Regulations, Title 40, "Protection of the Environment".

15.5 NUREG-1575 / EPA 402-R-97-016, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)", December 1997.

15.6 U.S. Nuclear Regulatory Commission Division of Industrial and Medical Safety, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material (August 1987)".

15.7 Allied Technology Group "Health and Safety Plan for the Release Survey of Fort McClellan Commodity Storage Sites'".

15.8 Allied Technology Group "Sampling and Analysis Plan for the Release Survey of Fort McClellan Commodity Storage Sites".

16.0 FORMS

16.1	ATGF-027	Training Attendance Record
16.2	ATGF-103	Review of Personnel Qualifications
16.3	ATGF-104	Project Work Plan Change Request
16.4	ATGF-105	Document Distribution Record
16.5	ATGF-106	Document Transmittal Record
16.6	ATGF-107	Daily Quality Control Checklist
16.7	ATGF-108	NonConformance Report

TRAINING RECORD

TRAINING DATE:	INSTRUCTOR:
LOCATION:	TOTAL CLASS HOURS:

TRAINING COURSE TITLE:

SCOPE OF TRAINING:

NAME OF STUDENT	SOCIAL SECURITY NO.	SIGNATURE

RAINING APPROVED BY (Project Director):

REVIEW OF PERSONNEL QUALIFICATIONS

NAME:	POSITION:
EDUCATION, TRAINING AND EXPERIENCE:	
QUALIFICATIONS ACCEPTED (Yes / No)	ADDITIONAL TRAINING REQUIRED:
NOT FIT FOR DUTY:	
REVIEWED BY (PROJECT DIRECTOR):	DATE:
ADDITIONAL TRAINING ASSIGNMENT:	
QUALIFICATIONS ACCEPTED (Yes / No)	
REVIEWED BY (PROJECT DIRECTOR):	DATE:

PROJECT WORK PLAN CHANGE REQUEST

CHANGE REQUESTED BY:	DATE:

REASON FOR CHANGE:

CHANGE REQUESTED:

SIGNATURE:	DATE:

WORK CHANGE REQUEST REVIEWED BY (Health and Safety Officer):

REMARKS:

DISPOSITION OF WORK PLAN CHANGE REQUEST:

FINAL WORK CHANGE REQUEST REVIEW:

ROJECT DIRECTOR:

DOCUMENT DISTRIBUTION RECORD

NAME OF DOCUMENT:	
DOCUMENT REVISION:	DOCUMENT DATE:
NAME AND TITLE OF RECIPIENT	DATE SENT
APPROVED BY (Project Director):	

ALLIED TECHNOLOGY GROUP, INC. - FORM 105

DOCUMENT TRANSMITTAL RECORD

AME AND TITLE OF RECIPIENT:	
DOCUMENT NAME:	
REVISION NUMBER:	DOCUMENT DATE:
INSTRUCTIONS OR REMARKS:	

DOCUMENT SENT BY THE PROJECT DIRECTOR TO:

AME:		TELEPHONE:	
STREET ADDRESS	CITY	STATE	ZIP

PLEASE COMPLETE THE FOLLOWING, SIGN AND RETURN TO SENDER:

☐ I acknowledge that I received the document or document revision and that I have updated my records.

☐ I am returning the document with this transmittal record.

SIGNATURE:	DATE:

DOCUMENT TRANSMITTAL RECORD COMPLETE AND APPROVED

SIGNATURE (Project Director):	DATE:

DAILY QUALITY CONTROL CHECKLIST

DATE: _____

		S	NS
1.	PERSONNEL MONITORING		
	DOSIMETRY		
	RWP REQUIREMENTS MET		
	RWP ACCESS LOG COMPLETE		
2.	INDUSTRIAL SAFETY		
	HARD HATS AND EQUIPMENT SAFETY GLASSES WORN		
	SAFETY EQUIPMENT USED		
	WORK AREAS SECURED		
	SAFETY RULE VIOLATIONS INVESTIGATED		
3.	WORK PLAN REQUIREMENTS		
	WORK PLAN PROCEDURES FOLLOWED		
	SCHEDULE COMMITMENTS MET		
	WORK AREAS CLEANED AND SET UP FOR NEXT DAY		
4.	RADIATION SURVEYS		
	ROUTINE SURVEYS COMPLETE		
	AREA POSTINGS UPDATED		
	BARRELS LABELED		
	SURVEY RESULTS ACCEPTABLE		
5.	STOP WORK CONDITIONS		
	STOP WORK ORDERS INVESTIGATED		
	CORRECTIVE ACTION IMPLEMENTED		

S = SATISFACTORY NS = NOT SATISFACTORY

SIGNATURE (Health and Safety Officer):	DATE:

NONCONFORMANCE REPORT

NONCONFORMANCE REPORT NO: _____

PART A	
Description of Nonconformance:	
PART B	
Evaluation of Nonconformance:	
Work Stoppage Required (Yes / No)?	Impacts Previous Data (Yes / No)?
SIGNATURE:	**DATE:**
PART C	
Recommended Corrective Action:	
SIGNATURE:	**DATE:**
PART D	
Corrective Action Implemented:	
Corrective Action to Nonconformance Approved:	

ATG Health & Safety Officer	Date	ATG Project Director	Date

APPENDIX B

MDC_{SCAN} INFORMATION

Appendix B
MDC_{Scan} Information

Purpose

Surface scans were performed using the 500 cm^2 Ludlum 43-37 gas-flow proportional floor monitor. The worse case scanning Minimum Detectable Concentration (MDC_{Scan}) value is calculated herein, utilizing the guidance provided in Section 6.7.2.1of MARSSIM and the bounding conditions present during the subject surveys.

Calculating the Minimum Detectable Count-Rate (MDCR)

To calculate the MDCR, first S_i (i.e., the value for the minimum detectable number of net source counts during a scanning interval) is required to be calculated. Field technicians performing scans did not exceed a scanning speed of one (1) detector width per second, thereby ensuring a counting interval (i) of at least one (1) second. The maximum ambient count-rate (i.e., background) on the 43-37 floor monitor for any of the subject areas was 1,434 counts per minute (cpm). The α and β uncertainty percentages are defined by the DQOs at 0.05 each.

Using MARSSIM Table 6.5, the desired performance (d') is 3.28. From the above information, the background counts per scanning interval (b_i) is 1,434/60 or 23.9 counts. Therefore, using MARSSIM Equation 6-8, s_i equals d' times the square root of b_i or 16 counts.

Using MARSSIM Equation 6-9, the MDCR equals s_i times 60/i, or 962 cpm. This is to say, the scanning technician can be expected to detect ~ 960 cpm above ambient with a probability acceptable to the defined DQOs (i.e., a reasonably conservative assumption).

Calculating MDC_{Scan}

To calculate the MDC_{Scan}, a number of efficiencies are required to be defined. The surveyor efficiency (p), as recommended by MARSSIM, is conservatively bounded at 0.5. The instrument efficiency (ε_i), as determined during its calibration and recorded on the associated calibration certificate and survey records, is 0.236. The surfaces scanned were smooth painted wood, concrete, or tiled surfaces, resulting in a conservative assumption of 0.5 for the surface efficiency (ε_s).

Using MARSSIM Equation 6-10, the MDC_{Scan} value can be bounded at a value of 2,306 dpm /100 cm^2, which is less than the $DCGL_W$ for the associated β emitting isotopes.

Note on ^{226}Ra

As discussed in MARSSIM Section 6.7.2.2, the MDC_{scan} value does not directly apply to α emitting activity. This is due to the low (i.e., almost zero (0)) ambient (i.e., background) α count-rate. Using the above methodology to calculate a MDC_{Scan} for α activity, with the maximum α b_i of 0.1167 and α ε_i of 0.216, results in a MDC_{Scan} of 176 dpm /100 cm^2, which is less than the $DCGL_W$ for ^{226}Ra. Using the methodology defined for α scanning, as described in MARSSIM Section 6.7.2.2, and these parameter values, the scan interval (i) of one (1) second is more than adequate to detect the $DCGL_W$ for ^{226}Ra.