APPENDIX A

SITE RECONNAISSANCE

of SWMUs 20 AND 37

Group 3 SWMUs Site Reconnaissance Trip Report
Deseret Chemical Depot
Tooele, Utah

Activities Conducted from 19-21 May 1998
SAIC Personnel: John Carter (Project Manager); Knut Torgerson (Field Manager)

Purpose of Site Reconnaissance:
The purpose of the site reconnaissance was to field validate the need for additional site investigation activities at the Group 3 SWMUs. The site reconnaissance included the following activities: a detailed record search of historical activities conducted at SWMUs 20 and 37; interviews with DCD employees that worked at SWMU 20; a review of engineering drawings related to SWMUs 20 and 37; and a visual inspection of SWMUs 19, 20, 33, and 37. In addition, water level measurements were collected from groundwater monitoring wells located at SWMUs 11 and 19.

Trip Report Attachments:
Chronology of Site Reconnaissance Activities
History of Building 520
Summary of Personnel Interviews
Summary of Visual Inspections of SWMUs 20 and 37
Summary of *Thermate Bomb Residue Cleanup* Report
Water Level Measurements, SWMUs 11 and 19

Chronology of Site Reconnaissance Activities

19 May 1998

1. Interview conducted with Ms. Renee Williams (Safety Specialist); Ms. Williams is a current DCD employee who worked at Building 520 from 1983-1986. See attached interview summary.
2. Interview conducted with Mr. Leon Jackson (Electronics Mechanic); Mr. Jackson is a current DCD employee who has worked on the installation from March 1976 to present. See attached interview summary.
3. Interview conducted with Mr. Robert Valenzuela (Ammunition Inspector); Mr. Valenzuela is a current DCD employee who worked at Building 520 from 1979-1985. See attached interview summary.

4. Interviewed conducted with Mr. Richard Trujillo (Risk Management Division); Mr. Trujillo is a current DCD employee who is familiar with past operations and has contacts with former DCD employees. See attached interview summary.
5. Conducted search of DCD engineering drawings; all historical DCD engineering drawings are maintained at Tooele Army Depot (i.e., North Area). POC: Mr. Bob Thurston.
6. Interview of Mr. Tanislau Sandoval conducted by Mr. Trujillo. Mr. Sandoval worked as a surveillance officer at Building 520 from the mid-1960s to the early 1970s. (Mr. Sandoval is a retired DCD employee; Mr. Trujillo is a friend of Mr. Sandoval and therefore was more apt to gain information than if the interview were conducted by SAIC.) See attached interview summary.

20 May 1998

1. Continued review/search of DCD engineering drawings located at Tooele Army Depot.
2. Conducted site walkover at SWMU 37 with Mr. Kevin Dolan (Chief of DCD Chemical Inspection Division) and Mr. Nam Doan.
3. Collected water level measurements from monitoring wells located at SWMUs 11 and 19.
4. Interview conducted with Mr. Troy Johnson (Base Waste Coordinator); Mr. Johnson is a current DCD employee who conducted limited maintenance at Building 520 in early 1992.
5. Interview conducted with Mr. Bob DuBois (Chemical Munitions Inspector); Mr. DuBois is a current DCD employee who worked at Building 520 from the mid-1970s to the mid-1980s.

21 May 1998

1. Obtained copies of pertinent engineering drawings from Mr. Thurston.
2. Conducted visual inspection/site walkover of Building 520 and the associated septic tank (structure 521). Visual inspection identified an effluent pipe that is directed south from the tank. The septic tank appears to be directly south of the bathroom/shower area of Building 520. Inspection conducted by SAIC personnel.
3. Meeting conducted with Keller Davis (UDEQ/TTEMI), Brad Lauchnor (UDEQ), Nam Doan (DCD) to discuss proposed additional field investigation activities for the Group 3 SWMUs and the findings of the records search/interviews. (See meeting minutes dated 5 June 1998)
4. Obtained copy of Thermate Bomb Residue Cleanup report (March 1977) from Troy Johnson.
5. Conducted visual inspection/site walkover at SWMUs 20 (Building 520) and 37 with Mr. Keller Davis (TTEMI/UDEQ), Mr. Brad Lauchnor (UDEQ), and Mr. Doan.
6. Contacted Ms. S. Pierce, current DCD employee who worked at Building 520; interview request was denied.

History of Building 520

(Also identified on engineering drawings as Building T-520 and 4520)

The following is a summary of the history of Building 520 based on personnel interviews conducted with current and former DCD employees, review/interpretation of available engineering drawings, and information presented in previous RFI reports.

~1947 to mid-1960s Carpentry Shop, Inspection Facility

Carpentry Shop - Building 520 originally was created as a carpentry shop. Exact date of construction is unknown. The engineering drawing - *Building T-520, Electrical*, drawing # S2-178/55-75, Sheet 1 of 3, dated June 3, 1951 – details the electrical specifications of the building, specifying outlets for lathes, saws, a jointer, router, mortise, doweler, printer, planer, shaper, and an edger. (The wiring and outlets are currently visible in the building.)

Dunnage Warehouse - Building 520 is designated as a Dunnage Warehouse on an untitled map – file # 63-88; an untitled drawing identifies a lumber storage shed T-519 due south of 520yard that may have supported the dunnage activities. The engineering drawing - *Toxic Area Dunnage Warehouse Bldg. No. T-520*, drawing # S2-179/55-77, dated June 13, 1947 – details the addition of loading docks and ramps to all sides of Building T-520.

Less Than Carload Facility - Building 520 was identified as a less than carload facility for inspecting smoke pots. Dates unknown. (EBASCO Revised Final Suspected Releases RFI Report, 1993)

Idle - Building 520 was idle. Dates unknown. (EBASCO Revised Final Suspected Releases RFI Report, 1993)

~1965 to mid-1970s Surveillance Change House

Surveillance Change House/Lunch Room - By the mid-1960s, Building 520 was being used as a Surveillance Change House and Lunchroom. (Sandoval 1998) Building 520 was renovated to include restrooms, showers, an office, lunchroom, and an associated 1750 gal/day septic tank. Dates of renovation are unknown. The septic tank and associated 6" concrete line extending from the building to the tank are located south of the building. (Engineering drawing – *Wastewater Existing Condition Map*, drawing # 18-02-02, sheet 23 of 49, April 1991) (An associated leach field is not identified on this drawing or any other Building 520 associated drawing.) Engineering drawing – *Renovation of Building 520 at South Area TEAD*, drawing # S2-180.01/FE2295, Sheet 1 of 1, dated October 27, 1977 – confirms that the existing structure, prior to renovation, contained bathrooms and showers. The building was renovated in 1977 to expand the office and lunchroom area and expand/install a women and men's shower/bathroom/locker facility. (Engineering drawing – *Renovation of Building 520 at South Area TEAD*, drawing # S2-180.01/FE2295, Sheet 1 of 1, dated October 27, 1977)

The building was used during this period for the inspection of conventional small arms munitions such as hand grenades and land mines. Inspections were conducted on munitions prior to loading them onto railcars for shipment. Reportedly chemical munitions were not inspected within the building. (Sandoval 1998)

1979 – 1985 Surveillance Change House

Surveillance Change House - The surveillance crew that operated out of the building supported Areas 2, 9, and 10. Laboratory chemicals (excess supplies that remained from the DATS – Mobile Chemical Lab) were stored in a flammables cabinet in the western end of the building. (Valenzuela 1998) Chemicals stored in the cabinet included banana oil and isopropyl alcohol. These chemicals were not used as part of the daily operations of the building. (Williams 1998) Chemical resistant rubber suits used by the surveillance crew were decontaminated within Area 10, folded, placed into ammunition boxes, and stored either in the western or eastern end of Building 520. Over packs and leak containers also were stored in Building 520. (Williams 1998) The M8, M18, and A2053 kits used to support the surveillance mission, and their associated reagents, were stored within Building 520. The M18 kits contained enzyme tickets; these tickets were treated as hazardous waste and disposed of within Area 10. All spent chemicals, paper, tickets, or other material used by the surveillance crew were treated as hazardous and left in Area 10 following the daily surveillance activities. (Valenzuela, Williams 1998) Reportedly, chemical agent contaminated material was not transported to Building 520. (Valenzuela 1998) The rail lines associated with the building were not used during this period. (Valenzuela 1998) Building 522 (a small wooden shed north of Building 520) was used for the storage of gasoline cans and tools.

Periodic inspections of conventional and chemical munitions were conducted in the western portion of Building 520. Conventional weapons were visually inspected for surface damage (e.g., rust, faded markings, faded paint) and deficient munitions were repaired (e.g., re-painted) and then shipped. (DuBois 1998) Inspection of the chemical munitions included removing a plug from the round and collecting an air sample from within the core/well chamber using an M-18 kit. (DuBois 1998) Reportedly chemical agent never was identified as part of these inspections (i.e., no leakers). (DuBois 1998) The chemical munitions inspected in Building 520 included the following: Mustard 4-Deuce projectiles, and 155 projectiles. Rabbits were stored onsite for the testing of chemical agent. (DuBois 1998)

Reagents mixed within Building 520 for the colormetric chemical agent test kits included the following: sodium pyrophosphate, and indol (both in dry form). These reagents were mixed with small quantities of deionized water (8 ml) and carried in amber eyedropper bottles as part of the chemical agent inspection kits. The reagent solutions degraded in sunlight and were good for one to two days. (Williams 1998) Some of the equipment stored in the western end of the building included: plugs for rocket tubes, overpack containers for MC-1 bombs, and decontaminated Bullpup containers. (Williams 1998)

~1985 - Present

Idle – In approximately 1985 the surveillance operations were relocated to an upgraded change house in Area 10. (Valenzuela, Williams 1998) Since the surveillance operations have been relocated Building 520 has occasionally been used for security police/SWAT team exercises. Dates unknown. (Valenzuela 1998)

The building was identified to demolished in 1992. (Engineering drawing – *General Site Map*, drawing #MP-01, April 1983)

The engineering drawing - *Master Plan, Basic Information Maps, General Site Map, Area 2*, drawing # 18-02-02, Sheet 5 of 49, September 1986, shows the septic tank (structure 521) at Building 520 to be "Abandoned in Place".

Currently the building is not maintained, is open to the environment, and is in a state of general disrepair. The building and associated septic tank are scheduled to be removed/demolished in FY99. (Doan 1998)

Summary of Personnel Interviews

Interview Date: 5/19/98
DCD Employee: Renee Williams
Job Title: Safety Specialist
Interview Topic: Building 520

- Worked in Building 520 from approximately 1983 to 1985 (when the building was condemned and operations were moved to Area 10).
- Building 520 functioned as a Surveillance Change House and lunchroom.
- Solutions for the M18 chemical agent test kits were mixed daily within Building 520. (Solutions consisted of sodium pyrophosphate and indol powder dissolved in deionized water.)
- A flammable cabinet in the northwest end of the building contained chemicals left over from the DATS project (mobile chemical lab). Some of the chemicals were banana oil, isopropyl alcohol, some colormetric chemical to test for explosive residue on shells, and other lab chemicals.
- Rubber suits (used in chemical area) were stored in the southeast end of the building.
- The northwest end of the building functioned only as a storage area for various types of unused equipment. Some of the equipment stored there: overpacks for MC-1 bombs, plugs for rocket tubes, and deconned Bullpup containers.
- Rail lines no longer in use.
- No rounds were brought to Building 520 (conventional or chemical). All inspections of chemical munitions were conducted within Area 10.

Interview Date: 5/19/98
Employee Name: Leon Jackson
Job Title: Electronics Mechanic
Interview Topic: Building 520

- Worked at DCD from 1976 to present.
- Estimated that the 1750gal/day septic tank and leach field were installed in the late 50's to early 60's.
- Building 4519 (boiler room) supplied steam to heat Building 520.
- The concrete abutment north west of Building 520 served as part of a concrete batch plant for the construction of the new igloos. The batch plant had its own water line.

Interview Date: 5/20/98
Employee Name: Kevin Dolan
Job Title: Chief of DCD Chemical Inspection Division
Interview Topic: Classification of Metal Debris at SWMU 37

- Metal debris located at SWMU 37 is not from any type of munitions.
- The tan bricks scattered throughout the area appear to be furnace bricks.

Interview Date: 5/19/98
Employee Name: Robert Valenzeula
Job Title: Ammunition Inspector
Interview Topic: Building 520

- Worked at Building 520 from 1979 to 1985. Moved to Area 10 when Building 520 was condemned.
- Surveillance supported activities in areas 9, 10, and 2.
- Building 522 (small wooden shed north of Building 520) was used to store gasoline cans and tools.
- Lab chemicals (left over from the DATS mobile chemical lab) were stored in a flammable cabinet in the northwest end of Building 520.
- Rubber suits were deconned within Area 10, folded, placed into ammunition boxes, and stored in Building 520.
- M8, M18, A2053 test kits along with their reagents were stored in Building 520. The enzyme tickets associated with the M18 kits were treated as hazardous waste and disposed of within Area 10.
- All remaining chemicals at the end of a shift/day were given to the ChemLab or Area 10 personnel; chemicals that were never used were turned in to Area 10 personnel.
- All deconned equipment and anything that may have been contaminated in Area 10.

- Building 520 was used to store air sampling and miscellaneous supplies to support surveillance operations.
- No chemical munitions were ever brought to Building 520 for inspection.
- Rail lines were not used from 1979-85.
- Building 520 has since been used for SWAT team exercises.

Interview Date: 5/20/98
Employee Name: Troy Johnson
Job Title: Base Waste Coordinator
Interview Topic: Building 520

- Removed several drums of NaOH that were stored outside Building 520 in 1992.
- Never worked at Building 520.
- The metal fragments identified at SWMU 37 are thermate bombs (incendiaries)
- The fragments at SWMU 37 are the same as those located at SWMU 25; these bombs were burned at SWMU 25 and are maintained in windrows.
- The slag pile located north of Building 520 is from operations conducted at Building 4519 (boiler room); Building 4519 supplied steam heat for Building 520.

Interview Date: 5/19/98
Employee Name: Tanislau Sandoval (former employee)
Job Title: Surveillance Technician
Interview Topic: Building 520
Interview conducted by Richard Trujillo (DCD Risk management Division); see attached Memorandum for Record.

Interview Date: 5/20/98
Employee Name: Bob Dubois
Job Title: Chemical Munitions Inspector
Interview Topic: Building 520

- Worked occasionally within Building 520 since 1979.
- Periodic inspections of conventional and chemical munitions did occur in Building 520.
- Conventional weapons were visually inspected for rust, faded paint, etc.
- Mustard 4-Deuce and 155 projectiles were inspected at Building 520.
- No "leaker" was ever identified within Building 520.
- Rabbits were kept in cages within Building 520 (for the testing of chemical agent).
- Building 520 had a sump and a contingency plan for leaks.

- Concrete bunker northwest of Building 520 provided protection when loading/unloading explosive rounds.

Summary of SWMU 37 Visual Inspection

Inspection conducted by: N. Doan (DCD); K. Dolan (DCD); J. Carter (SAIC); K. Torgerson (SAIC)

- Stressed vegetation was noted on the northwestern bank of the gravel pit.
- Metal debris (identified as thermate bomb residue) found throughout the stressed areas; the metal debris also was identified throughout the pit; the majority of the debris is located on the floor and northwestern bank of the pit.
- Tan colored bricks were identified throughout the pit bottom; these brick may be furnace bricks (Dolan 1998).
- Miscellaneous metal debris (e.g., bomb residue, bolts, and tracks from vehicles) was identified throughout the area.

There is no historical information available related to the operations that were conducted within SWMU 37. It appears that it may have been used as a gravel borrow pit. The majority of the metal fragments found in the pit area are identical to thermate bomb residue is present at SWMU 25. It is unknown if the bomb residue was transported to SWMU 37 from SWMU 25 following destruction/demilitarization activities, or if destruction of the thermate bombs occurred at SWMU 37. Slag material removed from SWMU 37 during previous RFI activities may have been related to the thermate bomb debris.

Summary of SWMU 20 Visual Inspection

Inspection conducted by: N. Doan (DCD); K. Davis (TTEMI/UDEQ); B. Lauchnor (UDEQ); J. Carter (SAIC); K. Torgerson

- The building is unoccupied; no materials are stored in or out of the building.
- The floor of the western portion of the building is constructed of wooden planks, with a concrete dock area extending along the southern portion of the building. There are no visible stains on the floor.
- The floor of the eastern portion of the building is covered with tile with the majority of the tile broken or missing. All utility lines (e.g., plumbing and electrical) appear to have been removed from the building. There are no visible stains on the floor.
- Influent and effluent pipes were identified in the septic tank located south of Building 520; these pipes are connected to the tank within 6 inches of the ground surface.
- There are no visual indications of an associated septic field (e.g., no surface depression, no variation in vegetative cover)

- The septic tank is holding water; this is a good indication that the tank is intact. There was no sheen on the surface of the water in the tank. (The presence of a sheen may have indicated petroleum products were discharged to the tank.)
- The tank is aligned with the bathroom/shower area located in Building 520.
- A pile of slag was noted in the former parking area north of the building. The pile was approximately 6 feet in diameter and 3 feet high. The origin of the slag is unknown.

Building 520 and the associated septic tank are scheduled to be removed/demolished during FY99.

Summary of "Thermate Bomb Residue Cleanup" Report

Report Title: Study for Tooele Army Depot South Area, Thermate Bomb Residue Cleanup, March 1977. AEO Report 5-77.

This summary presents only the items that would be relevant to the presence of thermate bombs at SWMU 37. The metal debris identified at SWMU 37 appears to be residue from thermate incendiary bombs. This conclusion is based on a comparison of pictures of thermate bomb residue included in the report and the metal debris present at SWMU 37, and a visual identification by T. Johnson (DCD).

- An estimated 4,000 to 5,000 tons of residue was generated during 1958 and 1959 from the demilitarization of M50 Series Thermate Incendiary Bombs.
- The residue generated during demilitarization typically consists of sheet metal from cluster covers and bomb tail fins, steel nose weights, magnesium bomb bodies, and miscellaneous aluminum and steel components. Ash and slag are generally mixed with this material.
- The demilitarization of these bombs reportedly occurred at the South Area bomb washout plant.
- There are explosive and non-explosive types of thermate bombs; explosive bombs reportedly were detonated at the demolition range located on the South Area.
- The M50 Series thermate bomb is a magnesium type incendiary bomb; the body of the bomb is hollow and made of magnesium alloy; the tail section is made of sheet metal.
- The cavity in the body is filled with a priming charge of approximately 10 ounces of thermate (TH3); the firing assembly is covered with a layer of FF20 (First Fire Mixture).
- Upon impact/detonation of the bomb, the burning thermate ignites the magnesium body section, which burns at an intense heat of 2300-2500°F for approximately 5 to 8 minutes.
- One type of M50 Series bomb (AN-M50TA2) contains cadmium.
- One type of M50 Series thermate bomb (AN-M50XA1) is filled with an antipersonnel explosive element of 170 grains of black powder.
- One type of M50 Series thermate bomb (AN-M50XA3) contains an explosive charge of tetryl pellets.

- Approximately 20% of the M50 Series bombs in a cluster are of the explosive type. There is no positive way to distinguish between explosive and non-explosive type from outward appearance.