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From: Jack Nyhan [mailto:jwn@lanl.gov]
Sent: Monday, March 07, 2005 5:45 PM
To: kIRK.W.OWENS@saic.com; Roles, Gary W.
Cc: Susan D. Radzinski
Subject: Short Write-ups on MDAs A and T from our February 2005 Teleconference

Ron Rager came through on 2 of the 3 short MDA write-ups he promised us on our February 2005 Teleconference. He sent us the attached write-ups for MDAs A and T (but not MDA-B yet).

Enjoy!!

Jack

Remediation Alternatives for MDA-A (March 2005)
(S-SWEIS information for MDA A from Ron Rager)

Preferred (Baseline Alternative) – CAPPING/PARTIAL REMOVAL

It is proposed to cap MDA A and MDA T as a single unit because of the physical proximity between them (separated by approx. 120 feet). However for this discussion, only MDA A is considered. An evapo-transpiration cap alternative RCRA cover with 1000 year design life is assumed as the preferred alternative. The cap would extend approximately 100 feet beyond the limits of the fence surrounding MDA A, thus covering 2.7 acres. The cap will cover the General's tanks and the central pit. An additional 1.6 acres will be disturbed (the distance between the cap and the perimeter fence – assumed 50 feet). It is assumed the cap would be one-meter thick, resulting in 14,045 cubic yards of fill.

Because of the potential for shallow perched water in the soil overlying bedrock (evidenced in a 1994 investigation) a shallow cutoff barrier is likely. The barrier would be sheet HDPE installed in a slot trench backfilled with bentonite slurry. The barrier would extend along the north and east sides of the cap edge, or 800 feet. The depth of the barrier will range from 20 to 30 feet, assuming the barrier is seated 5 feet into the bedrock. The average depth will be closer to the 20-foot depth because a paleochannel located at the west side of the cap forms the deeper limit and has limited lateral extent.

It is assumed the two eastern trenches will be removed and any contaminated soil under the former drum storage area removed. The trenches are 18 by 125 by 12.5 feet deep. Assuming the pits would be excavated to two feet below the bottom of the trenches, a total volume excavated is estimated to be 2417 cubic yards (bulks to 3141 cubic yards of waste for disposal at 30% bulking factor). Since there is no characterization of the site, assume 50 cubic yards of contaminated soil under the former drummed storage area. Equal volumes of imported backfill will be required to restore the site grade.

The General's tanks require grouting of the tank bottom sludge (heel) using the AEA grout mixing technology with proven in-tank mixing capability. The resulting cement grout volume is approximately 1500 gallons. The remaining 45,000 gallons of each tank will be grouted in a separate cement-bentonite grout mix to fill the void space.

Water tower 21-342 and above grade diesel tank 21-57 are assumed removed under a TA-21 D&D program planned for FY 2008, just prior to capping. (Schedule is currently being developed). Removal will also include foundations and buried gas and water pipes because they lie in the outer 50-feet of cap.

An 8- inch cross-mesa buried gas pipeline located between MDA T and MDA A requires relocation to the east of MDA A. Approximately 350 feet of pipe will be abandoned in place after filling with solidifying foam. Another 100 feet of the pipe will require full removal. The relocated gas line is 1250 feet long (This is discussed in MDA T but left in here as a reminder).

A 1520-foot long fence will be required around the perimeter of the cap.

Alternate - FULL REMOVAL

Full removal will include the excavation of the 2 eastern trenches, the central pit, contaminated soil from the former drum storage area, and the two General's tanks and contents. In addition to the former drum storage area contaminated soil and the eastern pits discussed above, the central pit contains approximately 6000 cubic yards of demolition debris from building 21-012. It is assumed that once debris is removed, the base of the pit will not require further material removal and an equal volume of fill will be required to return to site grade.

Removal of the waste from the General's tanks will use the same AEA technology. Since the material is removed it may be grouted in a separate pug mill mixer and placed in 55 gallon drums. (There is a potential this may be considered TRU waste and require disposal at WIPP.) The General's tanks would be cleaned using the AEA technology to allow exhumation, cutting and disposal off-site.

The base of the tanks are approximately 20 feet below grade. A 44 x 86 foot excavation is required. Assuming 3:1 sideslopes, an 10,750 cubic yard excavation is required. The soil is assumed clean and will be sufficient to restore site grade.

Alternate – CAPPING WITH GROUTED CONTENTS

This option incorporates all actions associated with the preferred alternative plus grouting of the central pit demolition debris. The depth of groutable material below the ground surface is approximately 10 feet. The resulting volume of grouted void space, assuming 35% voids, is 2,100 cubic yards. Grouting would be accomplished using a cement-bentonite or chemical grout injected through boreholes at numerous locations over the pit area. Placement would occur prior to installation of the cap.

S-SWEIS information for MDA T

Preferred (Baseline Alternative) - CAPPING

It is proposed to cap MDA A and MDA T as a single unit because of the physical proximity between them (separated by approx. 120 feet). However for this discussion, only MDA T is considered. An evapo-transpiration cap alternative RCRA cover with 1000 year design life is assumed as the preferred alternative. The cap would extend approximately 100 feet beyond the limits of the fence surrounding MDA T, thus covering 6.2 acres. An additional 2.4 acres will be disturbed (the distance between the cap and the perimeter fence – assumed 50 feet). It is assumed the cap would be one-meter thick, resulting in 32,251 cubic yards of fill.

Because of the potential for shallow perched water in the soil overlying bedrock (evidenced in a 1994 investigation) a shallow cutoff barrier is likely. The barrier would be sheet HDPE installed in a slot trench backfilled with bentonite slurry. The barrier would extend along the north and west sides of the cap edge, or 1150 feet. The depth of the barrier will range from 20 to 30 feet, assuming the barrier is seated 5 feet into the bedrock. The average depth will be closer to the 20-foot depth because a paleochannel located at the west side of the cap forms the deeper limit and has limited lateral extent.

The north edge of the cap will be too steep to control surface water run-off without riprap. Approximately ¾ acre of the cap will require riprap.

Building 21-257 and associated structures (tanks) are assumed removed under a TA-21 D&D program planned for FY 2008, just prior to capping as is approximately ½ of the remaining building 21-228 slab. (Schedule is currently being developed). The above grade portion of structures will be removed. The concrete slab, concrete sumps, and concrete tank pads will be reduced to rubble and left in place along with the below grade concrete foundations and buried pipes. Pipes may be filled with a solidifying foam prior to terminating within 50-foot of the cap edge. From a distance of 50’ out to the cap edge, the pipes will be removed under other SWMU activities.

Portions of buildings 21-005, 21-150 and all of building 21-286, the above ground petroleum tank 21-57, ½ of the remaining slab of building 21-228, and water tower 21-342 will require removal to accommodate the cap. Removal will also include foundations and buried gas and water pipes because they lie in the outer 50-feet of cap.

An 8- inch cross-mesa buried gas pipeline located between MDA T and MDA A requires relocation to the east of MDA A. Approximately 350 feet of pipe will be abandoned in place after filling with solidifying foam. Another 100 feet of the pipe will require full removal. The relocated gas line is 1250 feet long.

A 2000-foot long fence will be required around the perimeter of the cap.

Alternate - FULL REMOVAL

Full removal will include the excavation of the 4 absorption beds, the vertical waste disposal shafts located between the beds, contaminated soil and rock associated with waste disposal operations, pipes and foundations associated with 21-257 (see above capping discussion for associated demolition activities). An excavation approximately 100 feet deep is required to remove contamination above SSL and SAL values (no cleanup criteria have been established).

An excavation 150 feet wide by 300 feet long (the width of the absorption beds plus building 21-35 and the length of the absorption beds) is assumed. ½ horizontal by 1 vertical slopes are assumed for the rock portion of the excavation and 3 horizontal to 1 vertical for the upper 20-foot of soil excavation. This results in an excavated volume of 74,000 cubic yards of soil and 192,000 cubic yards of rock. Assuming a 30% bulking factor, a total waste volume of 345,800 cubic yards of radioactive contaminated waste would be hauled from the site and replaced with an equal volume of imported soil backfill.

NOTE: Assumption for removal is the waste is high activity low-level radioactive waste (not mixed). There are some entombed drums of uranium turnings and the "bathospheres" of plute. Assume material can legally be shipped in bulk to NTS; however volume limitations may apply to meet activity based DOT shipping requirements. (In reality, the feasibility of removal and shipping off site has not been evaluated and the disposal path is unkown.)

Alternate – CAPPING WITH GROUTED CONTENTS

This option incorporates all actions associated with the preferred alternative plus grouting of the absorption beds (note the shafts are already filled with grout). each absorption bed is assumed to match the construction drawings and contains the 20 feet by 100 feet and contains a 4-foot depth of groutable rock and grave. The depth of groutable material below the ground surface is approximately 10 feet. The resulting volume of grouted void space, assuming 35% voids, is 11,200 cubic feet. Grouting would be accomplished using a cement-bentonite grout injected through boreholes at numerous locations in each absorption bed. Placement would occur prior to installation of the cap.