DOE/EA-1044

Environmental Assessment

Melton Valley Storage Tanks Capacity Increase Project

Oak Ridge National Laboratory Oak Ridge, Tennessee

April 1995

U.S. DEPARTMENT OF ENERGY
Oak Ridge Operations Office
Oak Ridge, Tennessee

DOE/EA-1044

ENVIRONMENTAL ASSESSMENT

MELTON VALLEY STORAGE TANKS CAPACITY INCREASE PROJECT

OAK RIDGE NATIONAL LABORATORY OAK RIDGE, TENNESSEE

April 1995

U.S. DEPARTMENT OF ENERGY
Oak Ridge Operations
Oak Ridge, Tennessee

CONTENTS

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ALARA	as low as reasonably achievable
BA	biological assessment
BMAP	Biological Monitoring and Abatement Program
Ci/gal	curie per gram
CFR	Code of Federal Regulations
CWA	Clean Water Act
DOE	U.S. Department of Energy
EA	environmental assessment
EDE	effective dose equivalent
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
FFA	Federal Facilities Agreement
FONSI	finding of no significant impact
FWS	U.S. Fish and Wildlife Service
GW	gaseous waste
HEPA	high-efficiency particulate air (filter)
HFIR	High Flux Isotope Reactor
HNO_3	nitric acid
HSWA	Hazardous and Solid Waste Amendments
LGWOD	Liquid and Gaseous Waste Operations Department
LLLW	liquid low-level waste
MSL	mean sea level
MVST	Melton Valley Storage Tank
nCi/g	nanocurie per gram
NAAQS	National Ambient Air Quality Standards
NaOH	sodium hydroxide
NEPA	National Environmental Policy Act of 1969
NFPA	National Fire Protection Association
NFS	Nuclear Fuel Services, Inc.
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NW	nonradiological waste
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
OSHA	Occupational Safety and Health Administration
PMF	probable maximum flood
PM-10	particulate matter—10 μm in diameter
PVC	perforated polyvinyl chloride
PW	process water
PWTP	Process Waste Treatment Plant
RCRA	Resource Conservation and Recovery Act
REDC	Radiochemical Engineering Development Center
SHPO	State Historic Preservation Officer
SLLW	solid low-level waste
SWSA	solid waste storage area
TDEC	Tennessee Department of Environment and Conservation

TRU	transuranic
TSCA	Toxic Substances Control Act
TWRA	Tennessee Wildlife Resources Agency
U	uranium
WEAF	Waste Examination and Assay Facility
WMRAD	Waste Management and Remedial Action Division

SUMMARY

The U.S. Department of Energy (DOE) proposes to construct and maintain additional storage capacity at Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee, for liquid low-level radioactive waste (LLLW). New capacity would be provided by a facility partitioned into six individual tank vaults containing one 100,000 gal LLLW storage tank each. The storage tanks would be located within the existing Melton Valley Storage Tank (MVST) facility. This action would require the extension of a potable water line approximately one mile from the High Flux Isotope Reactor (HFIR) area to the proposed site to provide the necessary potable water for the facility including fire protection. Alternatives considered include no-action, cease generation, storage at other ORR storage facilities, source treatment, pretreatment, and storage at other DOE facilities.

If construction were undertaken during the winter and spring months when water tables tend to be elevated, groundwater seepage into the working area could occur. Seepage water control would require maintenance of graded slopes to areas where gravity drainage would carry the water to the ephemeral drainage channel to the east of the site. Portions of the trench for the potable water pipeline could be below the groundwater table. During construction activities, water would accumulate in the trench and would have to be pumped out of the trench, resulting in a temporary localized lowering of the groundwater table. Containment features incorporated into the design of the MVST Capacity Increase Project (from now on referred to as the proposed site) (e.g. sloped floors, dikes, and lined and monitored sumps) would minimize the potential for movement of contaminants from these facilities into groundwater.

Site regrading of 1.5 acres for the proposed site could result in soil erosion and subsequent sedimentation in nearby bodies of water. Best management practices using barriers such as silt fences should minimize impacts. Under conditions of unusually wet weather, influxes of runoff into construction areas could result in increased temporary erosion and sediment transport to the ephemeral drainage east of the site. Offsite perennial streams would not be impacted.

Clearing approximately 2 acres for construction of a water line from HFIR to the proposed site would result in the potential for erosion and sediment transport into Melton Branch. The potential for impacts to Melton Branch would be greatest during construction of the water line where it would cross Melton Branch. An elevated pipeline would be used to cross the stream so that there would be no construction through the stream channel; however, sedimentation could occur from construction in the immediate vicinity of the stream. In order to minimize impacts to the stream, construction

equipment would use existing roads to access the pipeline route on either side of the stream; and use of practices such as erosion fences or hay bales for sediment retention would minimize potential impacts to adjacent surface waters and aquatic biota. Because the total area that would be affected is small, clearing it should have little impact on the terrestrial ecology of the region. A Tennessee Aquatic Resource Alteration Permit would be required for the water pipeline crossing of Melton Branch. In compliance with 10 CFR 1022, a Floodplain Assessment was done for the water pipeline crossing over the Melton Branch floodplain.

Sedimentation impacts to aquatic biota in upper Melton Branch as a result of clearing and construction at the proposed site and along the pipeline route would be minimized by sediment fences and measures to prevent sediment and any stored hazardous materials (e.g., fuels used during construction) from being carried by runoff from the site. Measures to minimize the overall impacts on aquatic resources in Melton Branch from construction of the expanded site and the pipeline would protect both the diversity and density of benthic invertebrates in the upstream reaches of Melton Branch. After completion of the proposed construction and subsequent soil stabilization activities, only minimal potential should exist for impacts from site runoff and sediment transport. Adequate maintenance of drainage control structures at the proposed site would be required to divert moisture or water flows around the facilities. Adverse impacts on surface water quality would not be expected from operation of the potable water pipeline.

The proposed storage tanks would be fully contained and enclosed, thereby minimizing the possibilities of LLLW coming into contact with surface waters or aquatic organisms. If a leak or spill occurred, the LLLW would be contained in single walled tanks surrounded by secondary containment that allow for sampling to determine potential leakage. Any accidental leakage from the storage tanks would be detected, using conductivity elements, and contained by the double-walled construction before it could reach the ground surface, surface water, or groundwater.

Adverse impacts on human health from radiation or chemical contamination would not be anticipated during the construction of the proposed facility. During incident-free operation, human exposures would be unlikely. Because the storage tanks would fully contain the LLLW concentrate, direct human exposure would not be of concern. In addition, nitric acid (HNO_3) and sodium hydroxide (NaOH) would be transported by tanker truck to the truck station and pumped directly into the storage tanks, thereby avoiding human exposure. Low-probability accidents could cause the release of material to the environment and possibly the exposure and injury of on-site or off-site individuals. A break in the double-walled underground pipeline would not be expected to result in human exposure because the system is designed to shut down if a leak is detected to minimize spills of LLLW. A

truck accident involving the transport of HNO_3 or NaOH could cause the release of a large quantity of these chemicals, which could pose an immediate danger to life and health if inhaled as vapor (HNO_3) or dust or mist (NaOH). Such an accident could result in acute exposure either through inhalation or direct contact. Adverse effects would require that an individual be in direct or close contact with the spill before it dispersed to non toxic levels; therefore, the truck driver would have the highest risk of exposure.

DOE has proposed the construction and operation of several other waste management activities in Melton Valley through the year 1995. Construction and operation of the proposed facilities in Melton Valley are not expected to have any major impacts on groundwater hydrology and quality, air quality, wetlands, archaeological resources, and human health and safety. The impacts of construction of the proposed site would make a minor, but detectible, contribution to the cumulative impacts to terrestrial ecology of all currently proposed, and reasonably foreseeable future DOE actions on the Oak Ridge Reservation (ORR). Each action may have insignificant impacts because each action by itself affects only a small area; however, in total, such actions have had cumulative impacts on ORR vegetation and wildlife.

1. INTRODUCTION

1.1 PURPOSE AND NEED

The U.S. Department of Energy (DOE) proposes to construct and maintain additional storage capacity at Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee, for liquid low-level radioactive waste (LLLW) concentrate. The primary isotopes found in LLLW are strontium (^{90}Sr), cesium (^{137}Cs), curium (^{244}Cm), and europium (^{152}Eu). Based on analyses of existing LLLW at ORNL, the LLLW generated is characterized as a transuranic-contaminated mixed waste (Sears et al. 1990). Mixed waste refers to the mixture of radioactive and hazardous waste. The LLLW contains trace amounts of Resource Conservation and Recovery Act (RCRA) hazardous waste. The LLLW concentrate would include toxic compounds of nitrates, hydroxides, chlorides, carbonates, dilute water soluble organics, and some heavy metals in a few parts per million concentrations (Myrick 1992).

It is necessary to provide a way to handle LLLW now being generated (13,000 gal/year) and accommodate both present and future LLLW storage requirements. The Federal Facilities Agreement (FFA) (DOE 1992a) between the U.S. Environmental Protection Agency (EPA), the U.S. Department of Energy (DOE), and the Tennessee Department of Environment and Conservation (TDEC) requires that singly contained or leaking LLLW tank systems be upgraded or replaced to meet new secondary containment standards and leak detection requirements. The purpose and need for the action is to comply with the terms of the FFA by providing the additional storage capacity required to allow the LLLW system to remain operational and to support future operations and environmental restoration programs at ORNL.

1.2 BACKGROUND

ORNL, located in eastern Tennessee approximately 7 miles from the City of Oak Ridge (Fig. 1), is a large, multipurpose DOE research laboratory, with a primary mission of expanding basic applied knowledge in areas related to energy. Facilities include a nuclear reactor, chemical pilot plants, research laboratories, radioisotope production laboratories, accelerators, and support facilities.

ORNL-DWG 91M-13341R2

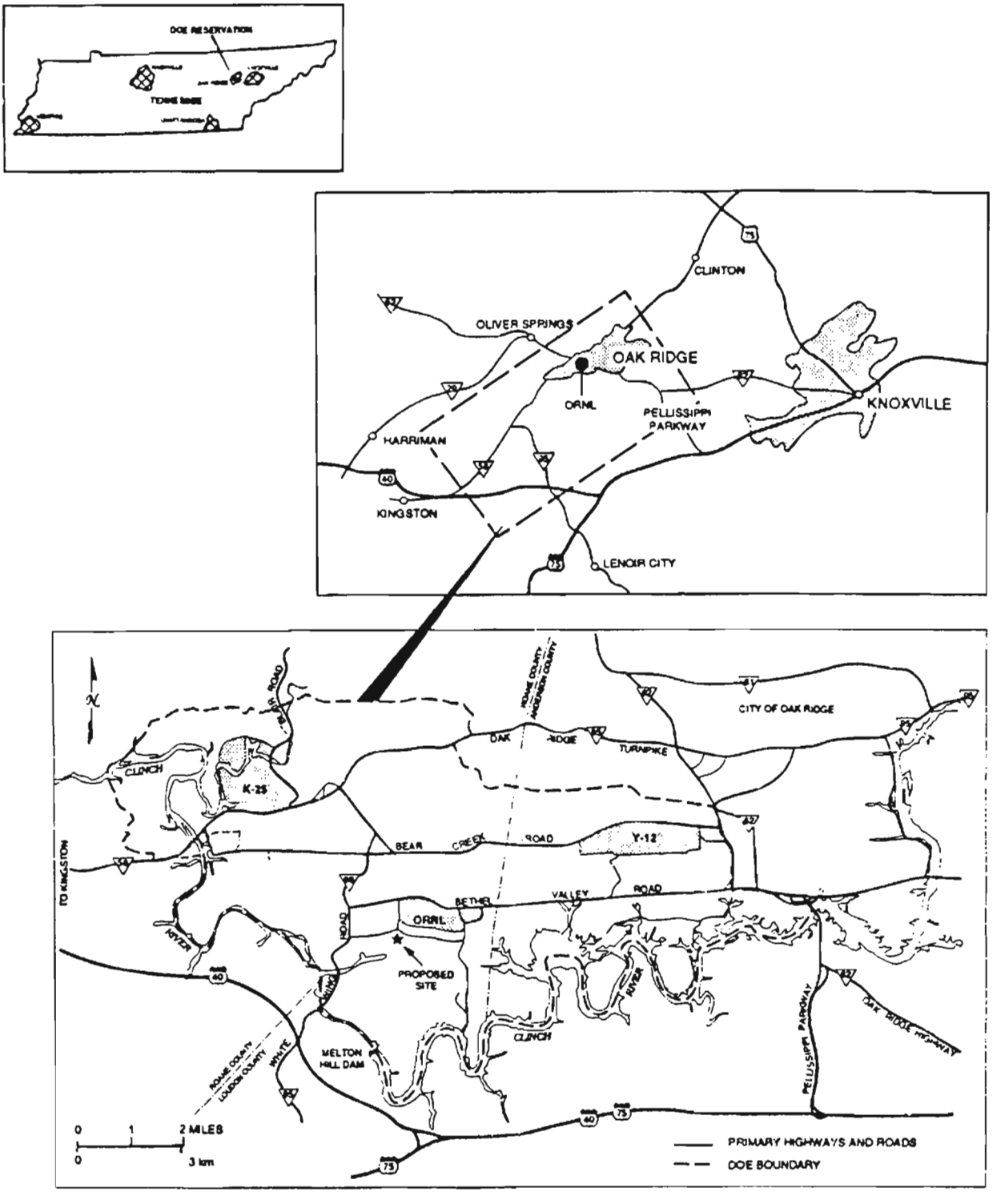


Fig. 1. General location of Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee.

In the last 5 years, most of ORNL's LLLW has been generated by the Radiochemical Engineering Development Center (REDC), the Process Waste Treatment Plant (PWTP) and the HFIR (ORNL 1991) (Fig. 2). LLLW continues to be generated from reactor operations and from cleanup and decommissioning of isotope production facilities. In addition, future facilities (e.g., a reactor) could be built that would generate LLLW. LLLW is collected through a liquid waste collection and transfer system. It is then concentrated by processing in the LLLW evaporator in Bethel Valley, and the resulting concentrate is pumped into the eight existing MVSTs that are nearly full (Fig. 3). Condensate from the evaporator is transferred to the ORNL process waste system.

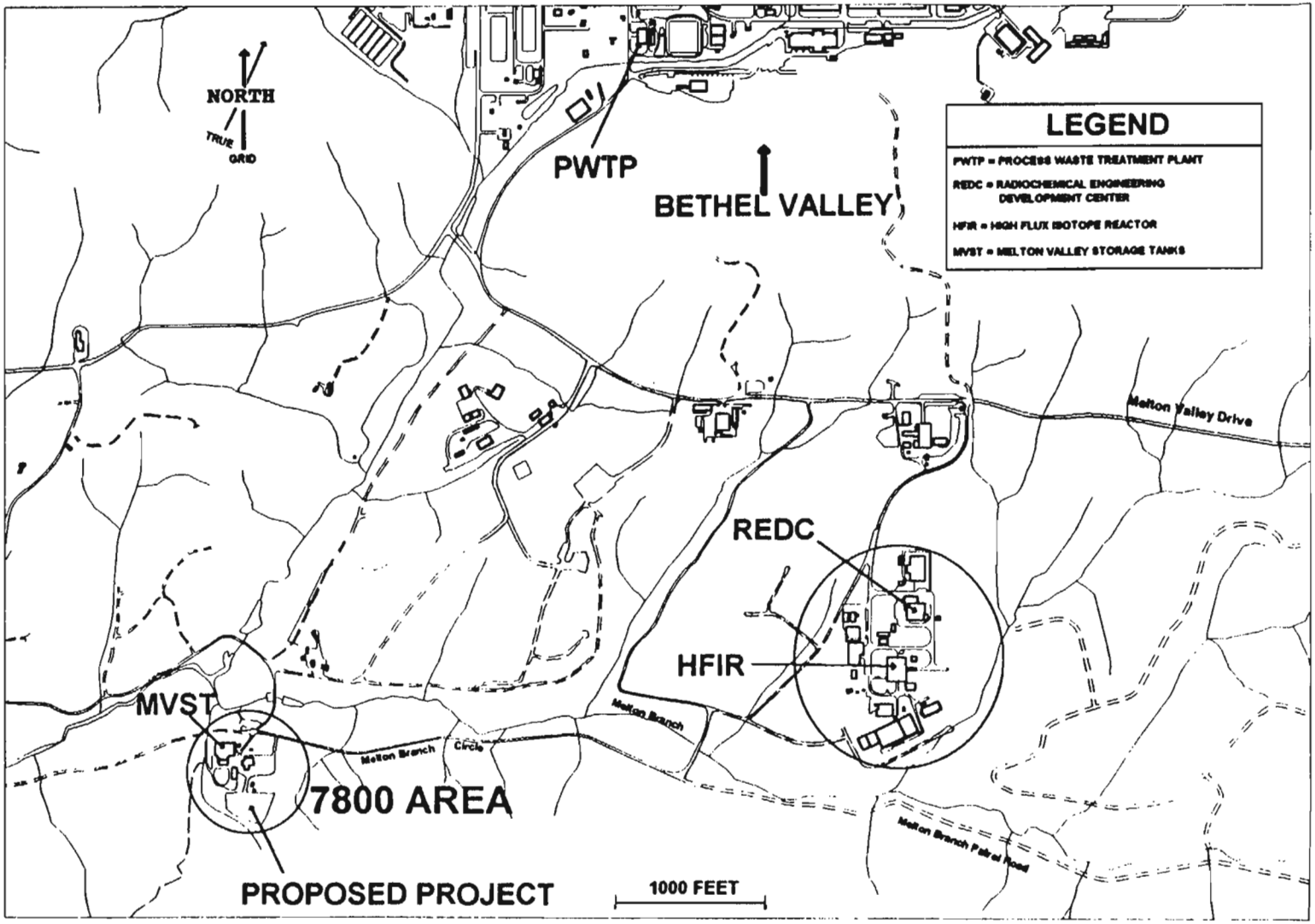


Fig. 2. Location of proposed project in relation to Melton Valley and Bethel Valley facilities at Oak Ridge National Laboratory.

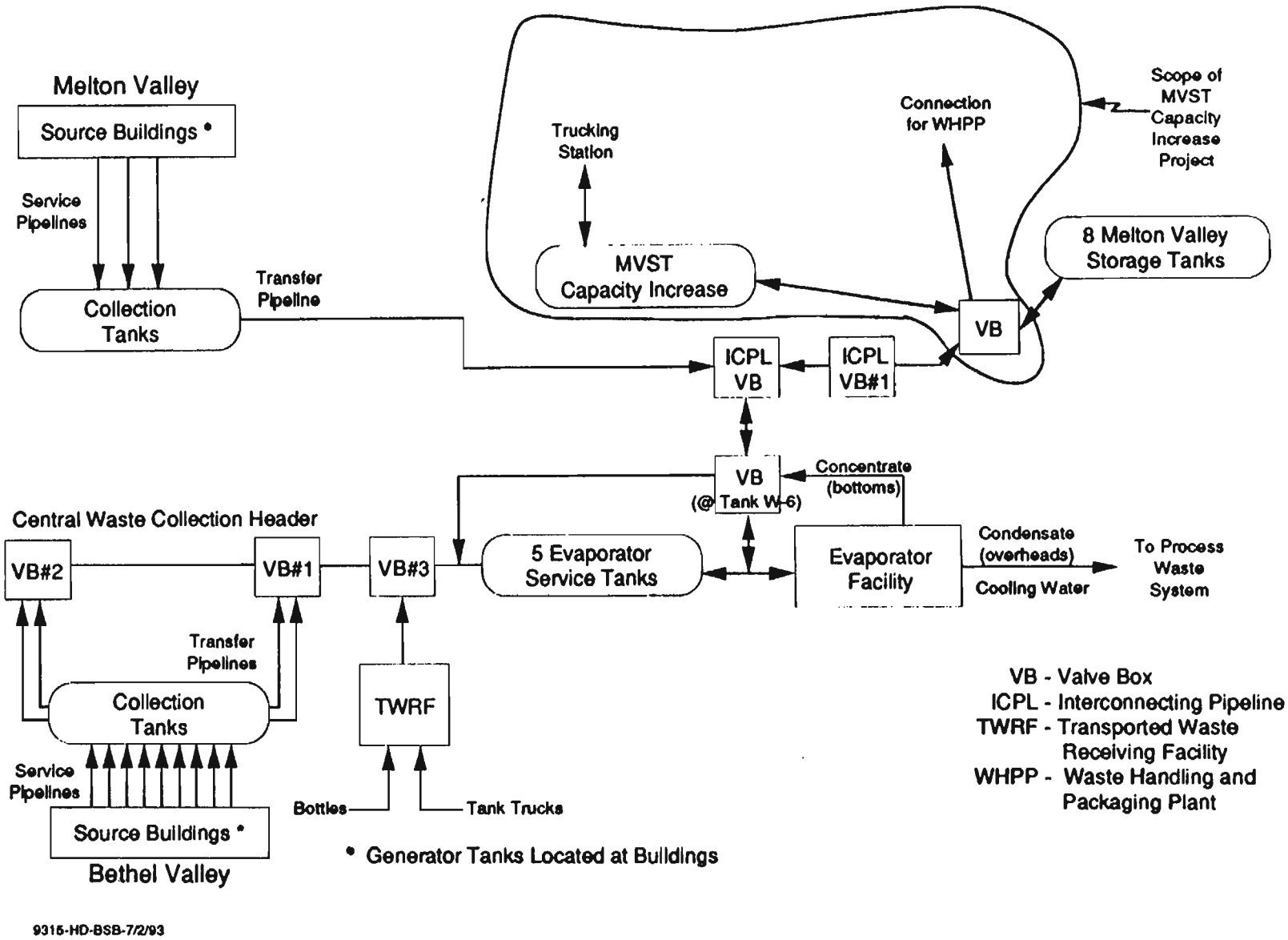


Fig. 3. Liquid low-level waste flow diagram showing Melton Valley Storage Tank Capacity Increase Project.

2. THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION—PREFERRED ALTERNATIVE

DOE proposes to construct and maintain an enclosed facility partitioned into six individual partially below-grade tank vaults containing one 100,000-gal LLLW storage tank each (Fig. 4). The storage tanks would be located at ORNL in Oak Ridge, Tennessee (Fig. 1) within the MVST facility, 7800 Area (Fig. 2). This action would be adding to an existing LLLW system.

The proposed facilities would serve to store LLLW until a disposal option is decided (ORNL 1991). Three 100,000-gal tanks would be constructed in Phase A (completed by the year 1998) and three 100,000-gal tanks in Phase B (completed by the year 2000). Each tank would allow for 10% free board (unused capacity). Five of the tanks would be placed in general use, while one would be kept as emergency capacity. Storage capacity of 450,000 gal with a 90,000-gal reserve (total 540,000 gal) capacity would result. The new system will have the capacity to transfer waste back and forth with the existing system.

Along with the additional storage tanks, the facility would include the following: (1) a stainless steel lined vault adjacent to the tank vaults to provide containment for the associated process pumps and valves; (2) a ventilation system to maintain the tanks and vaults under negative pressure; (3) a buried and lined valve pit to connect the new piping to the existing MVST and the LLLW Evaporator in Bethel Valley; (4) a truck unloading station consisting of a diked concrete pad and piping connections capable of receiving chemicals from trucks or pumping liquid process waste into a process waste tanker; and (5) a control, instrument, and equipment room that houses support equipment required to operate the above facilities and equipment (Fig. 4). Extension of an underground potable water line a distance of approximately 1 mile from the HFIR area to the proposed MVST site would also be required (Fig. 2).

When ready for use, the new tanks would receive approximately 170,000 gal of LLLW currently in the existing LLLW system including the South Tank Farm (W-5, W-6, W-7, W-8, W-9, W-10) and North Tank Farm (W-1A, W-1, W-2, W-4, W-13, W-14, W-15) in Bethel Valley and the Old Hydrofracture Facility (T-1, T-2, T-3, T-4, T-9) in Melton Valley. Transfer of LLLW presently contained in these tanks is necessary to comply with the FFA stipulation that these singly contained or leaking LLLW tank systems be upgraded or replaced to meet new secondary containment standards and leak detection requirements. In addition, approximately 150,000 gal LLLW would be transferred

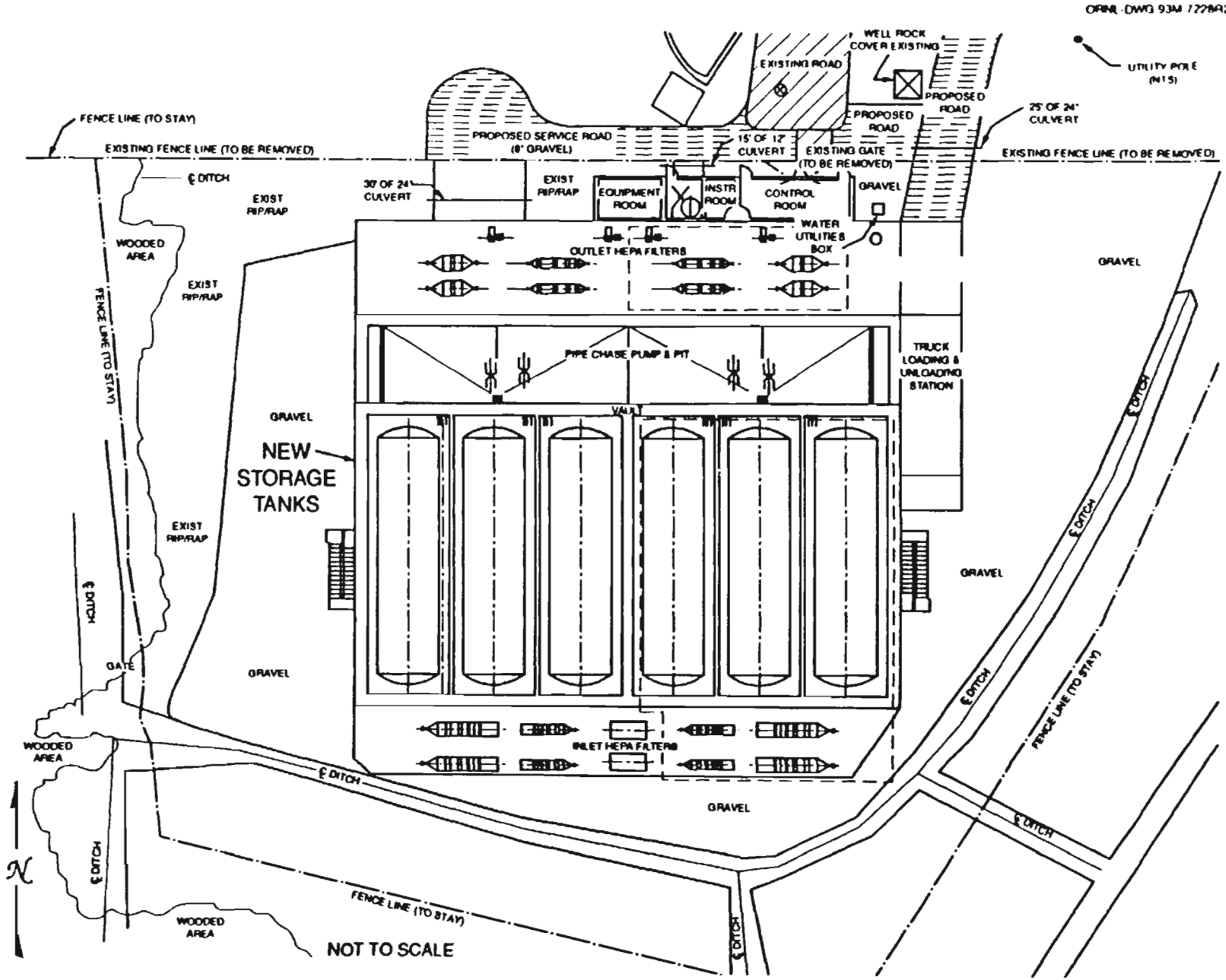


Fig. 4. Proposed site of the Melton Valley Storage Tank Capacity Increase Project storage tank facility.

from storage at the Evaporator Facility (Fig. 3). The new tanks would also accommodate small amounts of LLLW from 16 small tanks used by the Environmental Restoration Program during remediation activities. The remaining capacity of the new tanks (approximately 220,000 gal) would allow storage of 130,000 gal of LLLW from future ORNL operations with a 90,000 gal of reserve capacity. Project design lifetime would be 30 years and decommissioning would be evaluated under separate NEPA documentation.

2.1.1 Design Requirements

Design requirements for the proposed low-level radioactive waste tank system are established in Section IX, Appendix F of the FFA (DOE 1992a) between the EPA, DOE, and the TDEC. The primary objective of the FFA as it relates to the proposed action is to ensure that structural integrity, secondary leak containment and detection, and LLLW source control are maintained pending final remedial action at the site. The FFA also requires the transfer of LLLW from existing tank systems that are not in full compliance to tanks that comply with the FFA. The FFA regulations for detection and containment of releases in new tank systems are based on Section 264.193 of 40 CFR 264. The design of the proposed action will meet the leak detection requirements in 40 CFR 264 and 40 CFR 280 for the interstitial monitoring method, and the spill and overfill protection requirements in 40 CFR 280.20.

The vault structure would be located partially below grade as noted on Figure 5. The facility location/elevation was established to provide adequate bearing support for the vault foundation, and to minimize costs associated with rock excavation and disposal of excess cut materials not needed in site grading. Drainage piping would be provided below and around the perimeter of the vault structure to minimize the potential for groundwater inleakage into the vault during construction and operation. Locating the vault further below grade would drive site preparation costs higher and would increase the potential for groundwater inleakage.

2.1.2 Site Development

The proposed project site plan and site location are shown in Figs. 4 and 6, respectively. Site development would be done in accordance with DOE Order 4320.1B (Site Development Planning). A previously conducted Health Physics survey of the area found no evidence to indicate radioactively contaminated soils at the site (Anderson 1991). Site work will consist of excavation (approximately

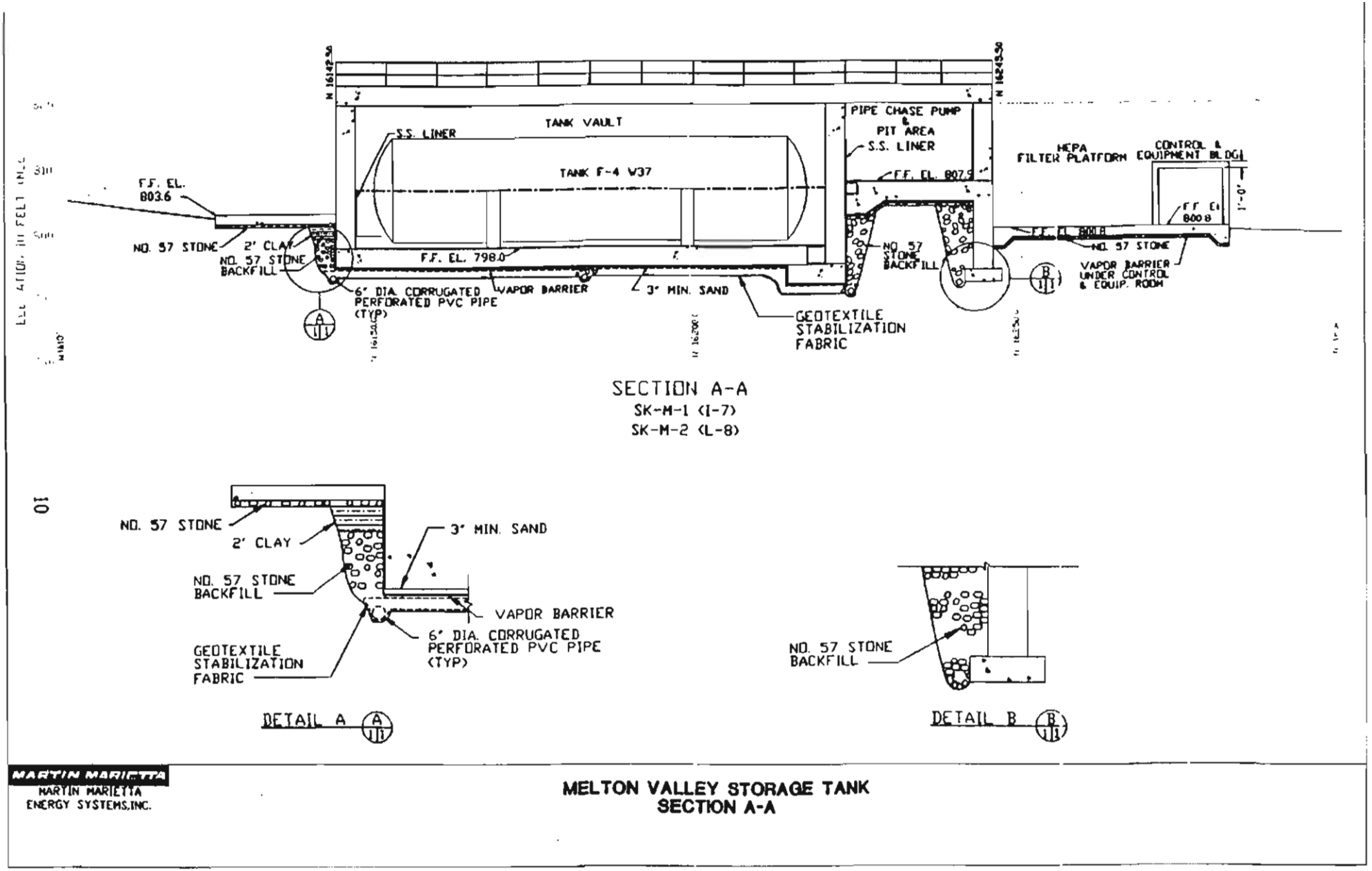


Fig. 5. Cross section of the vault structure design.

8 ft below grade) and minimal grading to provide proper subgrades for the new tank vault and truck loading station. Stripping and stockpiling the top layer of gravel (approximately 1.5 ft) would be included. This gravel would be used in developing a final grade or for access road and laydown area construction (DOE 1992a).

Storm water management would be required to ensure that precipitation runon and runoff would not come in contact with chemicals or LLLW. Perforated polyvinyl chloride (PVC) pipes would be provided around the vault facility for foundation drainage. In addition, containment features including sloped floors, dikes, and lined and monitored sumps would be incorporated into the design of the project.

The access road to the truck unloading station would be connected to the existing road south of Building 7860 (the New Hydrofracture Building) as shown in Fig. 6. The access road would be required to accommodate acid [nitric acid (HNO_3)]/caustic [sodium hydroxide (NaOH)] transfer tankers and trucks, transport trailers, maintenance vehicles and small trucks. The service road would be located north of the Control and Equipment Building and would provide access for maintenance work at the outlet high-efficiency particulate air (HEPA) filter platform and control building.

2.1.3 Utilities

The required utilities for this project would be potable water, fire protection water, process water, instrument air, fire alarm, voice and data communications and electrical power.

Extension of a potable water line from the HFIR area to the proposed site would be required to provide the necessary potable water for the eye wash/safety shower at the truck station, fire protection water, and process water and lines for flushing LLLW lines after LLLW transfers. A new underground potable water main (3 ft deep) would be connected to the existing potable water line near HFIR and extended approximately 1 mile to the proposed site as shown in Fig. 6. This pipeline would be elevated to cross Melton Branch to avoid construction through the stream channel.

Fire protection piping would be designed and sized in accordance to National Fire Protection Association (NFPA) standards (NFPA-13 and -24). Sprinklers would be installed in the control room, instrument room, and equipment room. A fire detection and alarm system meeting the requirements of NFPA-72 would be installed. The fire alarm system would include a master fire alarm box, local energy fire alarm control panel, automatic and manual initiating devices, and a lightning arrestor.

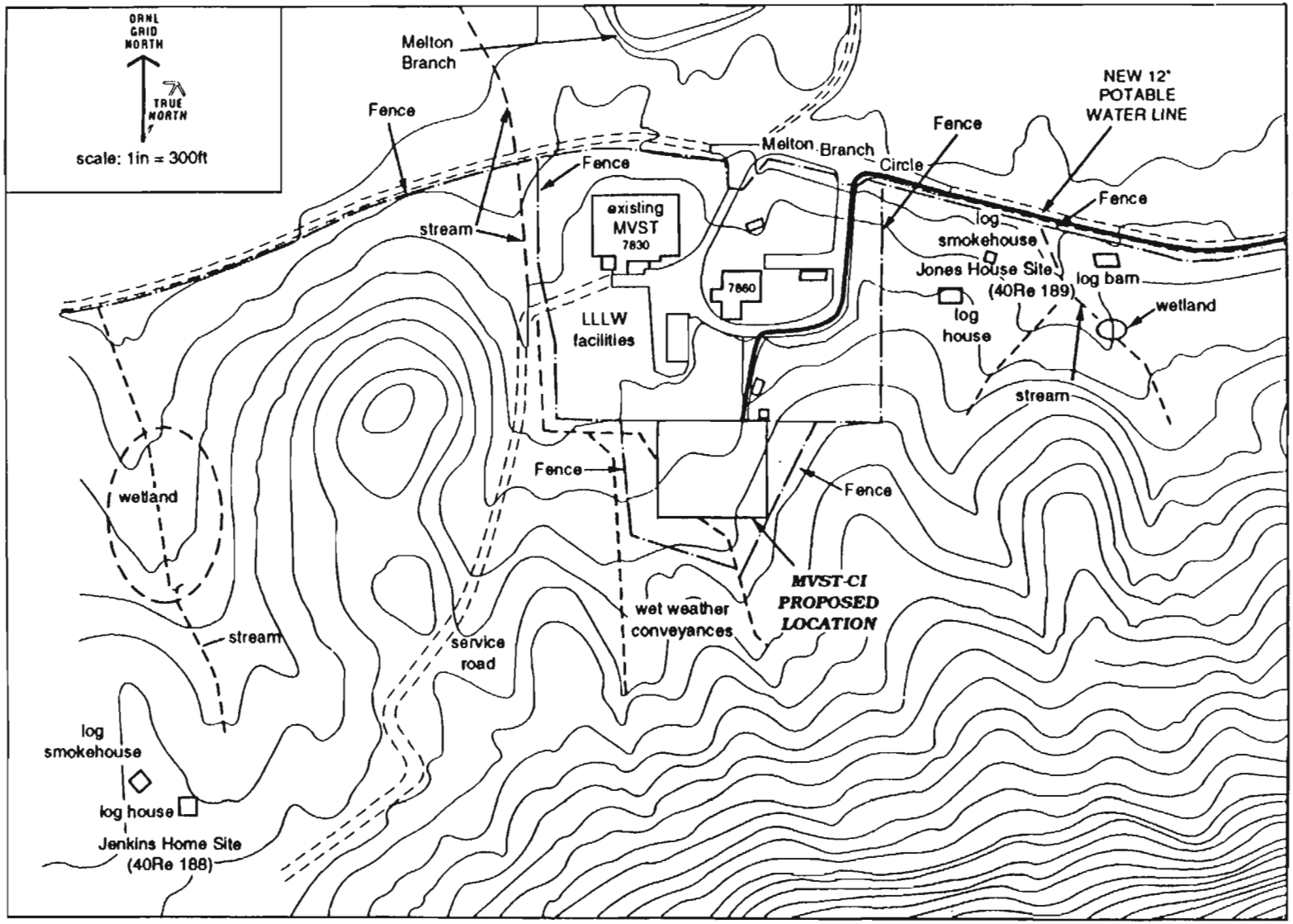


Fig. 6. General layout of the Melton Valley Storage Tank Capacity Increase Project and water line extension.

Electricity would be provided by extending an existing circuit system around the existing Waste Solidification Facility to a new pole located at the west side of the control building.

2.1.4 Buildings

Buildings for the proposed site would include a concrete vault structure containing the 6 new storage tanks, pumps, and valves; a control building; and a truck station (Fig. 4). The vault would house the six storage tanks, and, in a separate area, the pumps and valves. The valve and pump and the tank vaults would be lined with stainless steel liners and sloped to monitored, lined sumps. The Control and Equipment Building would be a separate 840 sq. ft concrete block building containing three rooms (control, instrument, and equipment rooms).

The truck station would have the capability to accommodate a 40-ft semi-tractor/trailer process waste truck as well as smaller chemical supply trucks. The station would consist of a check valve, transfer line connection point; a sloped and diked concrete truck staging pad; and a monitored sump. A safety shower and eye wash station would also be located at the pad.

2.1.5 Process Equipment—Phase A

Three 100,000-gal capacity tanks would be installed during Phase A of the project, providing 270,000 gal of usable storage capacity and 10 percent free board. The tanks would be the single-wall, horizontal type, constructed of stainless steel. Each tank would be approximately 16 ft in diameter by 68 ft long, supported by stainless steel saddles. A layout of the storage tanks is shown in Fig. 4.

The double-wall, buried transfer line would change to single-wall pipe upon entering the lined valve and pump vault. The line would then connect to a pipe manifold capable of diverting flow to any of the tanks by the proper valve operation. The lines would be sized to achieve required transfer rates between any of the storage tanks or back to the evaporator in Bethel Valley. Chemical addition piping would be provided to allow for chemicals for pH adjustment to be unloaded at the trucking station and added to any of the tanks.

2.1.6 Process Equipment—Phase B

In Phase B, three 100,000-gal storage tanks would be installed, providing 180,000 gal of usable storage capacity, 30,000 of unused capacity, and a spare tank (90,000 gal of reserve capacity)

for emergency use. Completion of Phase B would bring the proposed site usable storage capacity up to 450,000 gal with 90,000 gal reserve capacity. The same pumps installed during Phase A would be used for Phase B. Tank vault liners, tanks, ventilation, and piping identical to those used in Phase A would be installed in Phase B.

2.1.7 Collection and Transfer Piping

The ORNL LLLW system flow is shown in Fig. 3. The primary LLLW transfer direction is from the Bethel Valley evaporator to the MVST storage tanks. An existing transfer line from the evaporator in Bethel Valley to the MVST site would be used for the proposed project. The interface with the existing system would be at a tie-in with the existing transfer line where it enters the MVST pipe tunnel. A lined concrete valve box would be constructed at this tie-in. Valves would be provided to tie into the line so that transfers can be diverted to either the existing MVSTs or to the new storage tanks. In the event that a leak is detected either by the liquid detection or annulus pressure instrumentation, the transfer pumps would be shut down and the valves closed to isolate the system. Liquid which accumulates in the vault or valve box sumps as a result of a leak would be transferred to a storage tank after the transfer line and tank integrity are confirmed.

2.1.8 Special Equipment

Tank sampling would be done manually using a grab-sample device totally contained within a glove box shielded enclosure. This enclosure would be lifted and transported from one sample port to another on the three adjacent Phase A or Phase B tanks by an A-frame hoist, which would traverse on a trolley beam between the tanks. The samples would be analyzed about every two years for specific chemical and radionuclide content based on program and operational needs. HNO_3 and NaOH, chemicals used to adjust pH of the tanks, would be transported by tanker truck to the truck station and pumped directly into the storage tanks, if required. The tanker truck holds two tanks, one for the acid and one for the caustic chemical. The acid tank holds approximately 500 gal of HNO_3 and the caustic tank holds approximately 300 gal of NaOH. Only one chemical would be transported at a time.

The Central Control System located in the control building would provide the capability to monitor the operation of the facility and provide all nonsafety-related interlock and supervisory control. Safety systems would be controlled separately from the Central Control System and would

ensure the termination of LLLW transfer in the event of a pipe break. These systems would be designed with the necessary redundancy to ensure that a single failure would not lead to a system malfunction.

2.1.9 Operation

Operation of the facility involves two primary tasks: (1) transferring LLLW to and from the facility and (2) monitoring the stored waste. LLLW would be transferred to and from the facility by utilization of the existing LLLW system (Fig. 3). During waste transfers, personnel would be at the site to operate piping controls and locally monitor systems. The stored waste would be monitored in several ways: (1) level indicators and remote alarms would be monitored continually at the existing Waste Operations Control Center located in Bethel Valley, and operating personnel would take local instrument readings at least once a shift; (2) the stored waste would be sampled periodically for chemical analysis as required to satisfy programmatic and operational needs; and (3) the immediate surrounding area would be periodically monitored for possible contamination. The conductivity elements to be employed for detection of liquids in sumps will alarm on a failure. Redundant instruments are provided in the case where detection of leakage is taken credit for in the Safety Analysis Report (40 CFR 280.43).

The tanks, tank vaults, and pump and valve vault would be maintained at a partial vacuum. The tank ventilation system (HEPA filters to remove particulate radionuclides) would be separate from the vault system. The inlet to the tank vault system and outlets of both systems are HEPA filtered to remove particulate radionuclides. HEPA filters will be disposed of in accordance with established procedures. Based upon radionuclide emissions from the existing MVST stack and conservatively estimated ventilation flow rates for the proposed capacity increase, dose assessment modeling using the EPA approved methods demonstrated that emissions result in an effective body dose less than 0.1 mrem/year at the property line and at a maximally exposed receptor location. Consequently, neither a State nor a Federal air permit is expected to be required (ORNL 1993a). During normal operations only the tank ventilation outlet would release minimal amounts of airborne radionuclides. The tank and the vault air inlets would also incorporate heater units to keep the tanks from freezing during extremely cold periods. The tank inlet and outlet ducts would be equipped with connections for nitrogen purge. Should the combustible gas monitors detect unacceptable levels of combustibles in the tank exhaust ducting, the tanks could be purged with nitrogen by connecting the

purge piping to a nitrogen supply. This action would purge the tank atmosphere and would create an atmosphere incapable of sustaining combustion.

Transfer pump pressure, vault pressures, and tank pressures would be monitored. Alarm settings would be provided to indicate that waste levels were approaching 90% of tank capacity. Instrumentation for primary and secondary ventilation would consist of temperature elements, differential pressure transmitters, and flow monitors. Flush water connections that extend through the vault roof would be provided for all process equipment.

The diked truck loading/unloading station would be provided to facilitate off-loading of vault sump accumulations determined to be process waste and to allow for the off-normal addition of chemicals for pH adjustment.

2.1.10 Best Management Practices

Best management practices would be employed as part of the proposed action to minimize impacts on the environment. These include (1) erosion control (hay bales, silt fences), (2) dust suppression (surface wetting agents), (3) minimization of removal of hardwood forest, and (4) revegetation with native species to stabilize soil erosion. In addition, groundwater impacts would be minimized by controlling seepage of groundwater at construction sites providing drainage piping below and around the perimeter of the vault structure, avoiding contact with groundwater, and backfilling permeable material in the potable water pipeline trench. During operation, the tank leak detection system and visual walk through inspections would minimize impacts to the environment. The Vault tank exhaust system is equipped with HEPA filters to minimize release of airborne radionuclides. Although continuous monitoring is not expected to be required, the stack will be designed to allow periodic confirmatory measurements of emissions.

2.2 NO-ACTION ALTERNATIVE

Under the no-action alternative, the proposed storage facilities would not be built. Current tank capacity at the MVST is about 500,000 gal. LLLW would continue to accumulate until storage capacity is reached (by the year 2000). Currently, the MVST are nearly filled (about 67,000 capacity remaining) (Sect. 1.2, DOE 1992a, DOE 1992d). When they reach capacity, ORNL waste-generating operations, ongoing research and development, and decontamination and clean-up activities would halt.

The LLLW treatment system and other treatment systems [process waste, nonradiological waste (NW), and gaseous waste (GW)] are all integrated and are subject to National Pollutant Discharge Elimination System (NPDES) permit requirements. If the treatment system or a portion of it were to shut down (as a result of lack of storage space and termination of LLLW generating operations), NPDES violations would occur on a daily basis because acceptable levels of contaminants would be exceeded in the effluent (see Sect. 2.3.1). Surface water releases exceeding NPDES permit concentration limits could affect the health and safety of the general public that uses the water resources located downstream from White Oak Dam (an NPDES-permitted discharge point for ORNL). In addition, noncompliance with the terms of the FFA could result in; (a) potential health and safety risks to workers and the public; (b) EPA and TDEC ordered shut-down of vital ORNL operations and programs; and (c) EPA-stipulated penalties against DOE of up to $10,000 per week.

2.3 ALTERNATIVES ELIMINATED FROM CONSIDERATION

The alternatives listed below are not evaluated in this EA because none would meet the FFA requirements for present and future collection and storage for LLLW at ORNL.

2.3.1 Cease Operation

LLLW generated at ORNL results from decontamination activities, nuclear research projects, and waste treatment. Therefore, stopping generation would require suspension or termination of these activities (ORNL 1993b) and ultimately shutting down all research activities.

Ceasing activities that generate LLLW would not, however, eliminate all LLLW generated at ORNL. Much of the liquid waste (process and low-level) that is collected and treated at ORNL results from passive generating sources, such as contaminated groundwater and leakage of rainwater into existing facilities that is then processed through the LLLW system. At this time, these sources of contaminated wastewater cannot be eliminated. If this contaminated water were not collected and treated, it would quickly add to contamination now present in the White Oak Creek watershed and could eventually contaminate public water supplies downstream from ORNL.

2.3.2 Storage at Other Existing ORR Storage Facilities

There are no other existing tanks on the ORR that provide ample shielding, monitorability, and storage capacity for the projected or estimated quantities (450,000 gal) of LLLW. The existing MVSTs provide approximately 500,000 gal of total capacity (ORNL 1992a) with 67,000 gal remaining. Other tank systems at ORNL are either at or near capacity.

2.3.3 Source Treatment of LLLW

Source treatment (i.e., treatment at the waste originator facility) would vary depending on the generation facility and the waste constituents. Source treatment of LLLW would generate solid waste forms that presently do not have a means of final disposal; and solid secondary wastes that cannot currently be handled by the ORNL solid low-level waste system. This is an alternative that is not, at this time, economically feasible and an option that could not meet storage requirements for LLLW required by the FFA (S. Robinson, Oak Ridge National Laboratory, Chemical Technology Division, personal communication to M. C. Wade, Oak Ridge National Laboratory, Oak Ridge, Tenn., April 20, 1993). Some additional capacity would also be required to store waste prior to treatment.

2.3.4 Pretreatment of LLLW at the Source

The pretreatment alternative would require LLLW pretreatment capability at each source of generation and would also require building a new LLLW treatment facility to produce segregated solid wastes. Examples of pretreatment include; (1) removal of Resource Conservation and Recovery Act (RCRA) wastes at REDC to eliminate mixed waste; (2) removal of transuranic waste at REDC to take the transuranic waste out of the LLLW system; and (3) substitution of sodium for potassium in off-gas scrubbing to eliminate potassium from the waste and make it easier to process ^{137}Cs wastes (S. Robinson, Oak Ridge National Laboratory, Chemical Technology Division, personal communication to M. C. Wade, Oak Ridge National Laboratory, Oak Ridge, Tenn., April 20, 1993). The required building expense of the new facility and time constraints make this option prohibitive. Some additional capacity would also be required.

2.3.5 Storage at Other DOE Facilities

No other DOE facilities have been identified to accept the shipment of LLLW from ORNL. Furthermore, no mechanism has been developed to process and prepare the LLLW for shipment at ORNL if another DOE facility was identified.

This alternative would include removing and transporting LLLW to another DOE facility. This would cause much greater potential for risks to human health and the environment than for the liquid waste to remain in the closed LLLW system. This alternative, therefore, is not considered reasonable.

3. EXISTING ENVIRONMENT

3.1 PROPOSED PROJECT SITE

The proposed site is an existing cleared area set in a wooded site directly south of the existing MVST facility in Melton Valley at ORNL (Fig. 6). The footprint of the new storage tank facility would be approximately 240 × 240 ft, and approximately 1.5 acres would be regraded for construction. Access to the site is via Melton Branch Patrol Road.

3.1.1 Aquatic Resources

Landforms to the southeast of the proposed site rise steeply for 400 ft to the ridge crest. The proposed site is located on a small topographically high area at elevations ranging from 810 to 830 ft MSL. Water level monitoring data from well number 1217, located approximately 500 ft southwest of and in a similar topographic and geologic setting to the proposed site, indicate that the groundwater table in the vicinity of the site lies within 10 ft below the design grade for the facility (Lee and Ketelle 1989). No surface drainages, seeps or standing water are located on or near the site. The proposed route of the potable water pipeline intersects several small ephemeral drainages and crosses Melton Branch. Elevations along the route of the proposed potable water line range from approximately 770 to 820 ft.

Waters that drain the project site and proposed pipeline route flow overland into Melton Branch, which discharges into White Oak Creek and ultimately into the Clinch River downstream of Melton Hill Dam (Fig. 7). Base flow discharge in Melton Branch is typically low with periods of no flow, particularly during the summer (McMaster 1967; Loar 1988; Loar 1992).

Extensive studies of Melton Branch, conducted as part of the ORNL Biological Monitoring and Abatement Program (BMAP), include instream ecological monitoring, studies of the periphyton communities, toxicity testing, radioecological studies, and bioaccumulation of nonradiological contaminants. Results of the 1986 through 1990 studies were reported in a series of annual reports by Loar et al. (1987, 1988, 1989, 1990 and 1991).

In Melton Branch, there is sufficient flow during the non-summer months to allow the establishment of a relatively diverse benthic macroinvertebrate community and a small fish community (Ryon 1988 and Smith 1988a, 1988b). A weir on Melton Branch upstream of mile 1.3 serves as a

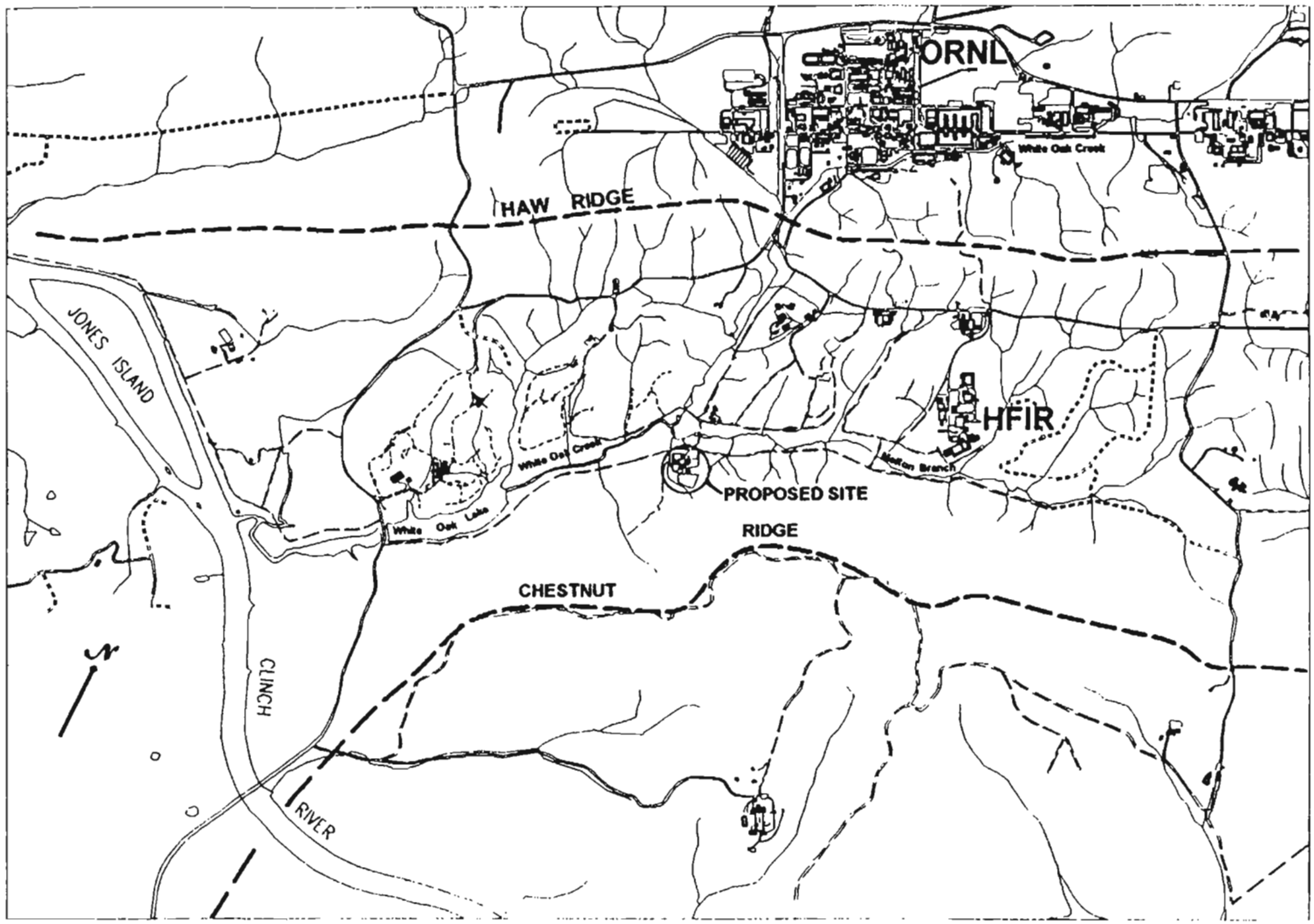


Fig. 7. Surface water drainage patterns of Melton Valley.

barrier to movement of fish upstream. Fish survey reports for 1990 showed only creek chubs and blacknose dace in the uppermost Melton Branch sampling sites miles 0.86 and 1.30. Samples in lower Melton Branch mile 0.4 above its confluence with White Oak Creek contained creek chubs, blacknose dace, and redbreast sunfish (Loar 1991). The densities and standing crops of fish in lower Melton Branch are comparable to values from other small headwater streams in the area (Loar 1991).

Most of the benthic taxa occurring in the upper portion of Melton Branch and in the MVST and SWSA (solid waste storage area) 7 vicinity are typical of moderately disturbed and relatively undisturbed streams, respectively, on the DOE Oak Ridge Reservation (Smith 1988a, 1988b). The relative abundance and biomass of disturbance-intolerant species of benthic insects [Plecoptera (stoneflies) and Ephemeroptera (mayflies)] in upper Melton Branch mile 1.3 were greater than the composition of the downstream sampling sites miles 0.75 and 0.37 (Smith 1992).

3.1.2 Terrestrial Resources

Vegetation in the vicinity of project site is a mixture of pine and hardwoods on the slope adjacent to Melton Valley Circle and adjacent to the existing MVST area. This forest is typical of abandoned, eroded farmland on the ORR. Further upslope from the existing MVST site, vegetation is mixed hardwood, primarily oak-hickory, and is typical of undisturbed wooded sites on the ORR. The proposed site, however, has been heavily disturbed and current vegetation cover is primarily grass and weeds. The proposed water line right-of-way intersects the following forest communities: (1) pine-hardwoods near the project site and parallel to Melton Valley Circle, (2) riparian woodlands adjacent to Melton Branch Creek, and (3) highly disturbed mixed hardwoods and pine-hardwoods near the connection with the existing pipeline (Cook 1992). Wildlife at the project site and along the pipeline right-of-way is typical of wildlife found on the ORR and Melton Valley.

The proposed site was checked for the presence or absence of wetlands in accordance with the 1987 Army Corps of Engineers definitions (USACOE 1987) and the 1989 interagency definitions (Federal Interagency Committee for Wetland Delineation 1989). Neither the project site nor the right-of-way contain wetlands (Rosensteel 1992a, 1992b, 1992c, 1992d, Appendix B). The pipeline, however would cross floodplains along Melton Branch Creek (Cook 1992, Rosensteel 1992a). Permits would be required for the water pipeline crossing of Melton Branch. These include an Aquatic Resource Alteration Permit from the Tennessee Department of Environment and Conservation, Division of Water Pollution Control (Tennessee Water Quality Act, Tennessee Code Annotated 69 ETSEQ, TDEC Chapter 1200-4-7.08).

Surveys have not found federally listed, federal candidate, or state listed plant or animal species or sensitive habitats on the Project site or the pipeline right-of-way (Cook 1992, Rosensteel 1992a, 1992c, 1992d; Appendix B).

An archaeological survey of the subject tract of land has identified the Jones House site, which is considered eligible for inclusion in the National Register of Historic Places pursuant to 36 CFR Pt. 60.4(d). This House is located approximately 400 ft northeast of the proposed project site (Fig. 6). No other archaeological sites or cultural material were identified on the project property (DuVall and Associates 1992). Consultation with the State Historic Preservation Officer (SHPO) is included in Appendix C.

3.2 ANNUAL RADIATION DOSE

3.2.1 Background

The average annual radiological effective dose equivalent (EDE) to an individual residing in the United States is approximately 360 mrem/year (NCRP 1987). The sources and approximate doses of this total exposure are as follows:

Radon and its progeny	200 mrem/year
Other natural sources	100 mrem/year
Medical exposures	50 mrem/year
Consumer products	9 mrem/year
Other sources	1 mrem/year
Total	360 mrem/year.

According to Kornegay et al. (1991), a typical annual, 50-year committed EDE to a hypothetical maximally exposed individual due to direct radiation from ORNL is about 6 mrem, which is about 1.7% of the EDE to the average U.S. resident due to natural and other sources of radiation. The 1990 50-year committed EDE from ORNL waterborne discharges to an individual drinking water from the nearest public water supply was 0.04 mrem. The maximum exposure expected from eating contaminated fish in 1990 was 0.3 mrem. It is expected that the nearest population (Kingston, Tennessee) would receive an annual collective committed EDE of about 0.7 person-rem from drinking water and eating fish. This represents about 0.03% of the annual dose from background radiation (2250 person-rem) to this population (Kornegay 1991). A conversion factor of

5×10^{-4} rem^{-1} for the public can be used to estimate cancer fatality risks from radiation doses (ICRP 1991, NAS 1990). This factor is most appropriately applied to population exposures in the 0.1 to 10 rem range. Therefore, the 0.7 person-rem committed EDE for the population of Kingston, Tennessee would be statistically associated with a 3.5×10^{-4} cancer fatality risk. The background radiation dose of 2250 person-rem to this population would be statistically associated with about one cancer fatality due to radiation exposure. Note that a factor of 4×10^{-4} rem^{-1} is used for occupational exposures (ICRP 1991). These conversion factors are not applied to the low (mrem) individual exposures in the following sections of this document due to the uncertainties associated with such extrapolations.

3.2.2 Occupational Radiation Dose

The annual average EDE to all types of radiation workers in the United States (e.g., medicine, industry, nuclear fuel cycle, government, etc.) is approximately 220 mrem/year (NCRP 1987). At ORNL, the Liquid and Gaseous Waste Operations Department (LGWOD) of the Waste Management and Remedial Action Division (WMRAD) would be responsible for operation of the proposed facility, among many other activities. Ten out of the 37 LGWOD workers in 1991 had measurable exposures with an average penetrating dose (from gamma radiation) of 8 mrem and an average dose to the skin (from beta radiation) of 14 mrem. The maximum exposures were 85 mrem and 103 mrem for penetrating dose and dose to the skin, respectively (ORNL 1992b). Exposures from MVST operations cannot be separated from the overall LGWOD exposures because workers are involved in several other activities.

In addition to LGWOD workers, work crews from ORNL's Plant and Equipment (P&E) Division are assigned to support the LGWOD on a rotating basis. Twenty-eight out of 41 individuals were exposed in 1991 and the average EDE for all 41 persons was 8.5 mrem. The maximum exposure was 52 mrem. The Instrumentation and Controls (I&C) Division and the Health Physics Division also provide support to the LGWOD. All 10 I&C personnel that support LGWOD were exposed in 1991 with an average exposure of 28.9 mrem and 5 out of 10 Health Physics support personnel were exposed with an average exposure of 8.1 mrem. The maximum I&C exposure was 73 mrem and the maximum Health Physics exposure was 38 mrem (ORNL 1992b). However, when P&E and I&C personnel are not assigned to the waste operations group they work within other areas of ORNL and are subject to radiation exposure at those areas; therefore, their average doses are not received solely from waste management operations.

It should be noted that doses to ORNL workers are all significantly lower than the DOE limit of 5 rem/year (5000 mrem/year). DOE Order 5480.11, "Radiation Protection for Occupational Workers," establishes radiation protection standards and program requirements for DOE and DOE contractor operations with respect to the protection of workers from ionizing radiation. DOE's limiting value for a worker's radiation dose is 5 rem/year (annual EDE) from both internal and external sources received in any year for the whole body. DOE also has a policy that requires exposures to be as low as reasonably achievable (ALARA). ORNL's 1993 ALARA goal is to keep individual occupational exposures below 0.75 rem/year. Permission from an ORNL division director is required if exposure is to exceed 0.75 rem/year. ORNL's more aggressive "absolute" ALARA goal is 1.0 rem/year, requiring permission from the Energy Systems President to exceed this level.

4. ENVIRONMENTAL CONSEQUENCES

This section evaluates impacts that would result from the construction and operation of additional storage capacity at the MVST facility and its related supporting activities. This section also evaluates the cumulative impacts of other nearby proposed sites in the Melton Valley area. The following issues have been identified as having a potential for environmental impacts as a result of constructing and operating LLLW storage facilities: air quality, groundwater, surface water, terrestrial and aquatic ecology, and health and safety. Due to the very small workforce being affected by this proposed site, socioeconomic impacts are assumed to be negligible and are not assessed in this section. In addition, noises created at and by the facility would not be expected to be noticeable. Noise impacts to people off the site would be negligible as the facility would be flanked by ridges and the nearest potentially affected receptor is approximately 1.9 miles to the southeast.

DOE is preparing a Programmatic Environmental Restoration and Waste Management EIS (55 *Federal Register* 42637–38) for DOE-wide waste management activities. The proposed action in this EA would provide additional permitted storage for LLLW and continuation of ORNL waste management operations until treatment and disposal methods for these wastes are evaluated in the programmatic EIS and decisions are made on the ultimate fate of the wastes.

4.1 CONSTRUCTION

4.1.1 Groundwater

As mentioned in Section 3.1, water level monitoring data in the vicinity of the proposed site, indicate that the groundwater table lies within 10 ft below the design grade for the facility (Lee and Ketelle 1989). If construction were undertaken during the winter and spring months when water tables tend to be elevated, groundwater seepage into the working area could occur. Seepage water volumes would be small because of the relatively low permeability of site soils. Seepage water control would require maintenance of grade slopes to areas where gravity drainage would carry the water to the ephemeral drainage channel to the east of the site (Fig. 6). Accidental spills of construction liquids might cause minor contamination of localized areas of soil. Rapid spill emergency response would minimize impacts to groundwater. Any soil contaminated by a spill would be collected and disposed

of at appropriate ORNL waste disposal facilities in accordance with the *ORNL Spill Prevention, Control, Countermeasures and Contingency Plan* (September 1985). The design of the facility will include drainage piping below and around the perimeter of the vault structure to minimize the potential for groundwater inleakage into the vault during construction and operation (Sect. 2.1.1).

Portions of the trench for the potable water pipeline could be below the groundwater table. During construction activities, this water would have to be pumped out of the trench, resulting in a temporary localized lowering of the groundwater table.

4.1.2 Surface Water

Excavation and regrading of 1.5 acres for the proposed tank facility and construction of the truck unloading facility, buildings, and fences could result in soil erosion and subsequent sedimentation in nearby bodies of water (Melton Branch, White Oak Creek, and perhaps White Oak Lake); however, properly constructed barriers such as silt fences, should minimize impacts. During dry conditions no adverse effects on surface water quality are anticipated because standard erosion control practices would be utilized. Under conditions of unusually wet weather, unanticipated influxes of runoff into construction areas could result in temporarily heavy erosion and sediment transport in the ephemeral drainage to the east of the site or in the ephemeral drainages intersecting the proposed pipeline route. Adverse impacts to perennial streams would not be expected.

An elevated pipeline would be used to cross the stream so that there would be no construction through the stream channel; however, sedimentation could occur from construction in the immediate vicinity of the stream. In order to minimize impacts to the stream, construction equipment would use nearby existing roads to access the pipeline route on either side of the stream and construction in the immediate vicinity of the stream would be done to minimize the potential for sediment transport. Such actions including but not limited to erosion fences or hay bales, for sediment retention would minimize potential impacts to adjacent surface waters and aquatic biota. In addition, construction would conform with requirements of the Tennessee Water Quality Control Act [TWCA 69-3-108(b)] which requires a permit before any "alteration of the physical, chemical, radiological, biological, or bacteriological properties of any waters of the state" could occur.

4.1.3 Floodplain Assessment (Water Line Crossing)

The proposed action includes the construction of a water line which will cross the 100-year floodplain of Melton Branch (Cook 1992, Rosensteel 1992a, Appendix B). In accordance with 10 CFR 1022 a Notice of Floodplain/Wetlands Involvement was published in the *Federal Register* on October 4, 1993 (see Appendix D) and the following assessment was completed.

The pipeline route (from the 16-inch tie in at HFIR to the proposed site) and the floodplain crossing are shown on Fig. 8. The pipeline crossing over Melton Branch would be elevated. The concrete footers (i.e., supports) for the pipeline will be located in the existing gravel roadbed (Melton Branch Circle) which crosses Melton Branch. It is expected that 3 footers would be required within the 120 ft distance that the road currently occupies within the floodplain. Because each footer is expected to displace less than 60 cubic feet of soil, it is estimated that a total of less than 180 cubic feet of soil would be displaced for the pipeline crossing. This would result in the potential for only minor erosion and sediment transport into Melton Branch.

As discussed in Sect. 3.1.2, the proposed site, including the pipeline route, was checked for the presence or absence of wetlands. The proposed pipeline right-of-way did not contain wetlands (Rosensteel 1992a; 1992b, 1992c, 1992d, Appendix B). Surveys have not found federally listed, federal candidate, or state listed plant or animal species or sensitive habitats on the pipeline right-of-way (Cook 1992, Rosensteel 1992a, 1992c, 1992d, Appendix B).

Since there are no wetlands, endangered species, or threatened species within the floodplain area, and the pipeline crossing is to be elevated and within an existing roadbed, only minor short-term impacts would be possible as a result of the construction of the pipeline. In addition, best management practices would be strictly implemented during construction to avoid erosion, siltation, and other indirect impacts to Melton Branch (Sect. 2.1.10).

The only other alternative to the proposed pipeline would be no action. This alternative would not provide the potable water service needed for the proposed MVST-CIP facility. The proposed pipeline route is the best way to minimize environmental impacts since it would follow a previously disturbed gravel roadbed. Any other crossing along the route would require more disturbance within the Melton Branch floodplain.

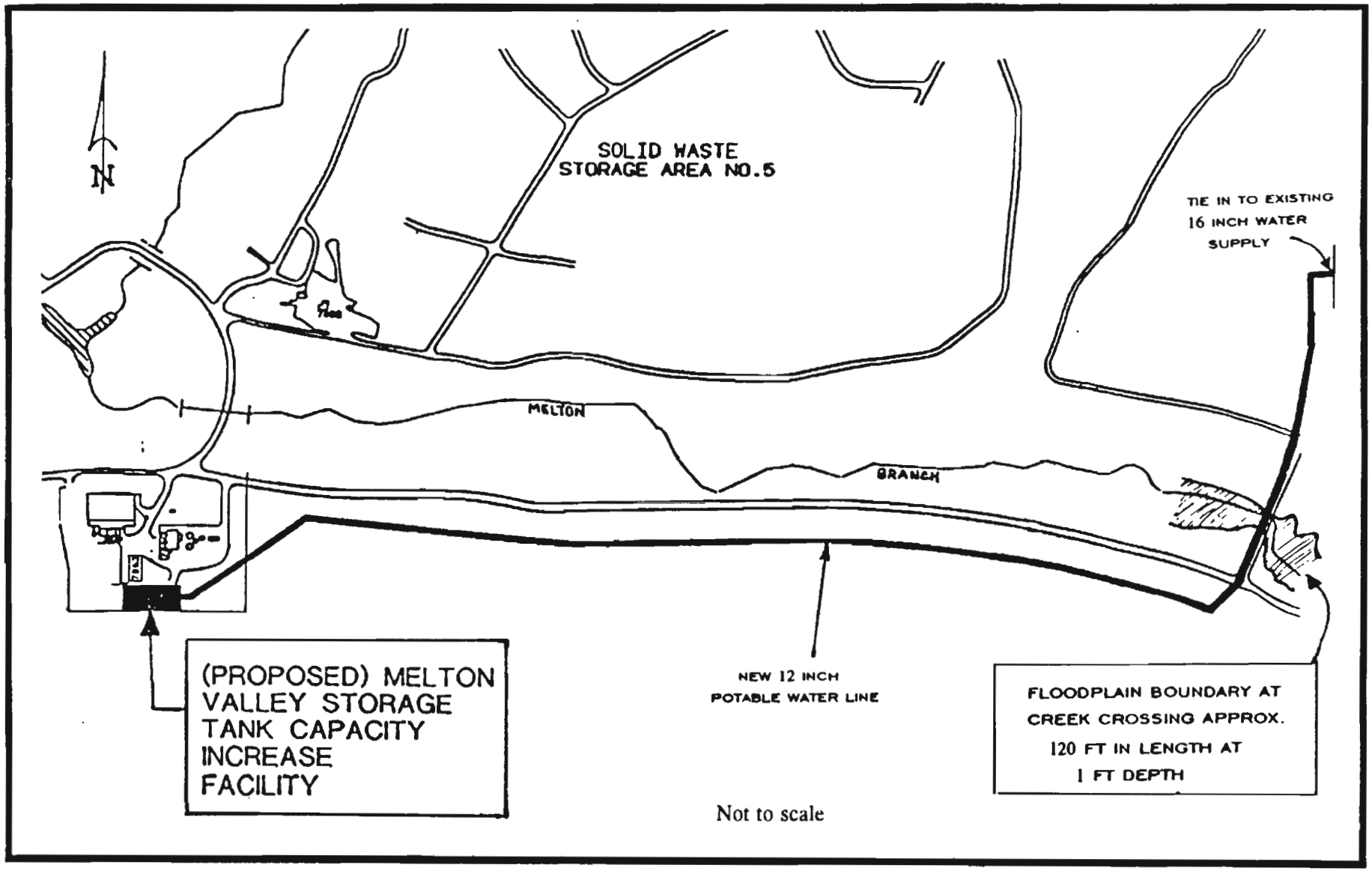


Fig. 8. Water pipeline route and Melton Branch Crossing.

4.1.4 Aquatic Ecology

Impacts, specifically sedimentation, to aquatic biota in upper Melton Branch as a result of clearing and construction at the project site and along the pipeline route would be minimized by sediment fences and other measures to prevent sediment and any stored hazardous materials (e.g., fuels) from being carried by runoff from the site. Measures to minimize the overall impacts on aquatic resources in Melton Branch from construction of the expanded site and the pipeline would protect both the diversity and density of benthic invertebrates in the upstream reaches of Melton Branch.

4.1.5 Terrestrial Ecology

About 2 acres of mixed hardwood-pine forest would be disturbed by the pipeline construction and an additional 1.5 acres would be regraded for the project. Most of the project site is currently nonforested. Because the total area that would be affected is small, its clearance should have little impact on the terrestrial ecology of the region. This cleared area would represent less than 0.04% of the roughly 9,000 acres of pine forest and 14,300 acres of hardwood forest remaining on the ORR. The loss of forest habitat would result in a correspondingly small reduction in populations of forest dwelling wildlife on the site.

Leveling the site would create some opportunity for erosion on the exposed slopes. These areas would be planted with vegetation to stabilize the soil surface, using native species, as outlined in Executive Order 11987 (Exotic Organisms) DOE-5400.1/AI-1, which restrict the introduction of exotic species into natural ecosystems on federally owned land.

4.1.6 Health and Safety

Radiation or contamination problems would not be anticipated during the construction of the proposed facility. All activities would be conducted in full accordance with ORNL, Martin Marietta Energy Systems, Inc., and DOE policies regarding protection of personnel and the environment. This includes procedures in the *ORNL Environmental Protection Manual*, the *ORNL Safety Manual*, the *ORNL Health Physics Procedures Manual*, and the *ORNL Industrial Hygiene Manual*. Health Physics and Industrial Hygiene personnel would monitor the site during any excavation activity in accordance with ORNL/M-116/R1, *Health, Safety and Environmental Protection Procedure for Excavating*

Operations. In addition, all activities would be conducted in accordance with ALARA objectives (DOE Order 5480.11). All materials removed from the construction site, such as wastes, would be contained and checked for radioactivity and handled and disposed of commensurate with the content of the waste. To avoid exposure from potential spills of liquids, including hydraulic fluid, lubricating oil, fuels, and ethylene glycol during construction (e.g., if construction equipment overturned), construction personnel would be trained in accordance with ORNL's spill prevention control countermeasures and contingency plans (Eisenhower et al. 1985).

Occupational hazards associated with construction of the facility would be considered standard industrial hazards. Such hazards are defined as meeting one of the following criteria: (1) routinely encountered or accepted by the public in everyday life; (2) encountered in general industry and significantly affecting a large number of people; or (3) encountered in general industry and controlled through the application of recognized codes and safety standards [e.g., Occupational Safety and Health Administration (OSHA) standards]. Workers would comply with the applicable DOE Order 5480.9, "Construction Safety and Health Program" and all applicable OSHA provisions.

4.1.7 Air Quality

A screening model was run for construction at the proposed site under worst-case meteorological conditions, with the wind blowing across flat terrain in the direction of the nearest residence. Results indicate that the annual average PM-10 (particulate matter—10 μm in diameter) would be 25 $\mu g/m^3$ (which includes a background value of 20 $\mu g/m^3$). This is well below the NAAQS of 50 $\mu g/m^3$, therefore, effects of the proposed site would not be expected to lead to any exceedances of NAAQS.

4.1.8 Historic Resources

The project would have no effect on any property included in or eligible for inclusion in the *National Register of Historic Places* pursuant to 36 CFR Pt. 60.4(d). The Jones house, which is considered eligible for inclusion, would not be impacted by the proposed site because it is located approximately 400 ft to the northeast of the site and will not be within the area disturbed by construction equipment. National Historic Preservation Act, Sect. 106 consultation with the SHPO has confirmed these findings.

4.1.9 Environmental Justice

Executive Order 12898 requires federal agencies to achieve environmental justice "to the greatest extent practicable" by identifying and addressing "disproportionately high and adverse human health or environmental effects of its ... activities on minority populations and low-income populations...." For the proposed action and other alternatives considered in this EA, the effects identified would not disproportionately affect any minority group or low-income group. The proposed action is an expansion of an existing LLLW system (MVST facility) which is located entirely on federal land. Selection of the proposed site was primarily based on the proximity to the existing MVST Facility. The MVST facility is not located near low-income or minority neighborhoods and, therefore, there is no unequal distribution of costs of income or minority groups.

4.2 OPERATION

4.2.1 Groundwater

Under normal conditions impacts are not anticipated on groundwater. Under conditions of unusually wet weather, groundwater seepage might occur as described in Sect. 4.1.1. Adequate maintenance of drainage and seepage control structures (e.g. storm water ditches and perforated PVC pipes around the tank building) would be required to divert moisture or water flows around the project facilities (Sect. 2.1.1). Containment features incorporated into the design of the tank vault, control and equipment building, and truck station (e.g. sloped floors, dikes, and lined and monitored sumps) would minimize the potential for movement of contaminants from these facilities into groundwater. Material used in backfilling of the potable water pipeline trench could be more permeable than native soils, creating a preferred pathway for groundwater movement.

4.2.2 Aquatic Resources

When construction of the storage facilities and potable water pipeline and subsequent soil stabilization are completed, there should be minimal potential for impacts from runoff and sediment transport from the site. Adequate maintenance of drainage control structures at the project site would be required to divert moisture or water flows around the facilities. Containment features (e.g. sloped

floors, dikes, and lined and monitored sumps) incorporated into the design of the facilities would minimize the potential for movement of contaminants into surface waters. Adverse impacts on surface water quality would not be expected from operation of the potable water pipeline.

The proposed storage tanks would be fully contained and enclosed, thereby minimizing the possibilities of LLLW coming in contact with surface waters. The location of the tanks would also minimize the potential for impacts to surface waters from an accidental spill. The LLLW materials would be contained on the project site in single walled tanks surrounded by secondary containment, which allow for sampling to determine potential leakage. Any leakage from the storage tanks would be identified and contained by the double-walled construction before it could reach the ground surface, surface water, or groundwater.

The design (e.g. sloped floors, dikes, and lined and monitored sumps) of the extended storage tank facility should prevent leakage or runoff from the site. Therefore, no impacts on aquatic biota from operation of the proposed site facility are anticipated.

4.2.3 Terrestrial Ecology

Operation of the proposed site would not impact terrestrial resources since the project site is already cleared.

4.2.4 Health and Safety

Adverse health effects associated with the harmful materials at the proposed facility can only occur if there is exposure to these materials. During incident-free operation, human exposures would be unlikely. LLLW would be transferred in double-walled, underground pipelines to the proposed MVSTs. The storage facility would be controlled and monitored in a separate concrete block building. The tanks would also be sampled manually using a grab-sample device that is totally contained within a glove box shielded enclosure (Sect. 2.1.8). Therefore, no direct contact with the waste would be expected. Sampling of the waste in the tanks would be conducted about every two years. HNO_3 and NaOH, chemicals used to adjust pH of the tanks, would be transported by tanker truck to the truck station and pumped directly into the storage tanks, if required. At the existing MVSTs, there have been no exposures from routine operation of the tanks (see Sect. 3.2.2 for additional data on exposures from all waste operations workers). Furthermore, because no HNO_3 or NaOH has been added to the existing MVSTs in the past, there have been no exposures to these chemicals from past

MVST operations (C. Scott, ORNL, Liquid and Gas Waste Operations Department, personal communication with M. L. Socolof, ORNL, Energy Division, June 22, 1994). No exposures would be expected during normal operations of the proposed facility.

The LLLW concentrate that would be stored in the new storage tanks would contain special nuclear material (e.g., fissionable materials), radiation, and toxic constituents (see below). Special nuclear material can result in an accidental nuclear criticality if the quantities are sufficient and certain conditions are met (e.g., moderation, reflection). However, the Safety Assessment (Green and Platfoot 1992) has determined that a nuclear criticality at the proposed site is not credible.

The radiation sources in the form of alpha-, beta-, and gamma-emitting radionuclides in the LLLW concentrate could have the potential to result in external and internal radiation exposures to on-site and off-site individuals. Based on the maximum levels of radiation to be accepted at the storage tanks, the maximum activity would be the ingestion dose equivalent of 2 Ci/gal of ^{90}Sr (Snow 1993). However, radiation hazards to humans are only of concern if there is exposure. Because the storage tanks would fully contain the LLLW concentrate, direct human exposure would not be of concern.

Accidents could cause the release of LLLW and possibly the exposure of on-site or off-site individuals. A break in the double-walled underground pipeline would not be expected to result in human exposure because, in order to minimize accidental spills of LLLW, the system would be designed to shut down upon detection of a leak. Furthermore, a release from any credible accident that would cause a tank to rupture would be contained by the lined secondary containment structure. The released liquid would be processed back into the LLLW system. There have been no accidents at the existing MVSTs (C. Scott, ORNL, Liquid and Gas Waste Operations Department, personal communication with M. L. Socolof, ORNL, Energy Division, June 22, 1994).

Two other chemicals to which individuals might be exposed during operation of the proposed facility are HNO_3 (acid) and NaOH (caustic). If the pH (acidity) of the tank needs adjustment, a tanker truck would transport the chemical to the truck station at the proposed facility. The chemical would then be transferred directly into the tanks. The tanker truck holds two tanks, one for the acid and one for the caustic chemical. The acid tank holds approximately 500 gal of HNO_3 and the caustic tank holds approximately 300 gal of NaOH. Only one chemical would be transported at a time. The amounts of these chemicals required for operation of the storage tanks are unknown as the chemicals would only be needed if the pH were not sufficiently adjusted upstream in the collection system. Therefore, the frequency of potential chemical delivery trips is unknown but expected to be infrequent.

A truck accident involving the transport of HNO_3 or NaOH could cause the release of a large quantity of these chemicals that could be immediately dangerous to life and health if inhaled as vapor (HNO_3) or dust or mist (NaOH). Such an accident would be of low probability and could result in acute exposure either through inhalation or direct contact. HNO_3 is volatile and inhalation of vapors could cause severe nose and throat irritation with delayed fever, cyanosis and pulmonary edema, cough, breathing difficulty, and bronchopneumonia. Upon skin contact, HNO_3 produces immediate chemical burns. Exposure to concentrated aqueous solutions would cause early sensation of pain and painful ulcers. As a liquid or vapor, HNO_3 could also cause severe eye irritation, chemical burns, and permanent visual defects or blindness (MMES 1992). NaOH is also toxic and can cause irritation to eyes, respiratory system, skin, and lungs; and it is corrosive to body tissues (Sittig 1985). Adverse effects would require that an individual be in direct or close contact with the spill before it dispersed to nontoxic levels; therefore, the truck driver or anyone assisting him or in the immediate vicinity of the release could be exposed. Because no HNO_3 or NaOH has been added to the existing MVSTs in the past, there have been no associated accidents at the MVSTs. However, tanks of these chemicals are frequently used at ORNL in other applications and there have been no accidents associated with the transfer of these chemicals at ORNL (C. Scott, ORNL, Liquid and Gas Waste Operations Department, personal communication with M. L. Socolof, ORNL, Energy Division, June 22, 1994).

4.2.5 Air Quality

Adverse air quality impacts are not expected from operation due to anticipated negligible releases and realizing the facility will include HEPA filters (see Sect. 2.1.9).

4.3 CUMULATIVE IMPACTS

DOE has proposed the construction and operation of other waste management activities in Melton Valley (Fig. 9) through 1995. NEPA documentation is being prepared for each of these proposed sites. The cumulative impacts from the implementation of these proposed actions in Melton Valley are assessed in this section. Cumulative impacts from these facilities are in addition to ongoing ORNL operations. All assessments are currently in preparation except for the EA for receipt and storage of waste from NFS (DOE 1992c), which has been completed and for which DOE has issued a finding of no significant impact (FONSI).

ORNL-DWG 93M-7229R2

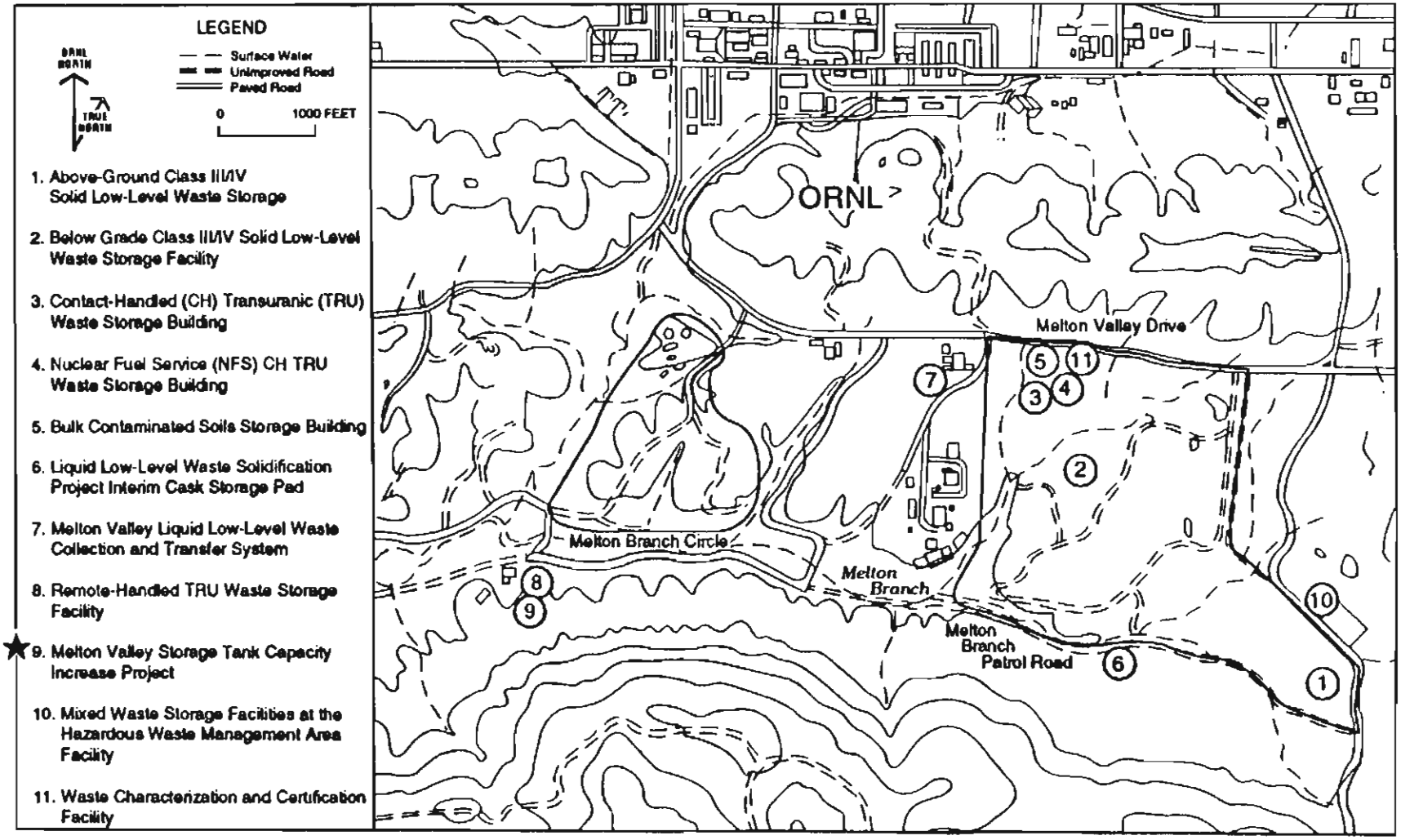


Fig. 9. Locations of Oak Ridge National Laboratory's proposed waste management projects for Melton Valley through 1995.

- **Contact-handled and remote-handled transuranic waste storage buildings** (sites 3 and 8 on Fig. 9). Two CH-transuranic waste storage facilities and one CH-transuranic waste staging and storage facility are proposed to be constructed and operated in Melton Valley. These metal buildings would store CH-transuranic and mixed CH-transuranic waste. Approximately 3 acres would be cleared and leveled for this project. The proposed RH-transuranic waste storage facility would consist of one reinforced concrete bunker to store casks of RH-transuranic and RH-transuranic mixed waste generated at ORNL. The building would be in Melton Valley, and approximately 1 acre would be cleared. All transuranic waste facilities would be permitted under the RCRA.
- **Class III/IV Solid Low-Level Waste (SLLW) Storage Facilities** (sites 1 and 2 on Fig. 9). These proposed facilities would consist of four below-grade and one above-grade SLLW storage facilities to be constructed and operated in Melton Valley. Construction of these facilities would result in clearing approximately 13 acres (4 acres for the above-grade facility and 9 acres for the four below-grade facilities). Construction and operation of the below-grade facilities would occur consecutively as required over approximately 10 years.
- **NFS CH-transuranic Waste Storage Building** (site 4 on Fig. 9). A metal building is proposed to store mixed waste being transported from the NFS facility in Erwin, Tennessee. This facility would be located in Melton Valley. Approximately 3 acres would be cleared (DOE 1992c).
- **Bulk Contaminated Soils Storage Building** (site 5 on Fig. 9). A metal building is proposed to be built in Melton Valley to store radioactively contaminated soils excavated at ORNL. Approximately 1 acre would be cleared.
- **Melton Valley Low-Level Waste Collection and Transfer System** (site 7 on Fig. 9). This project proposes to replaces existing underground LLLW transfer lines from the Radiochemical Engineering Center in Melton Valley to existing waste lines in the main ORNL complex, located in Bethel Valley. The project also includes the proposed construction of a monitoring and control station for collection of LLLW from Melton Valley facilities and the addition of an ion exchange system in the HFIR building for treatment of HFIR waste. Dewatered and dried spent ion exchange resins (Class II SLLW) would be stored as part of the Class III/IV above-grade inventory. Approximately 4 acres of land would be disturbed by construction associated with the upgrade.
- **LLLW Solidification Project Interim Storage Pad** (site 6 on Fig. 9). This project would involve constructing and operating a gravel storage pad to store concrete casks of solidified

LLLW. The proposed site is located adjacent to Melton Valley. Approximately 4.2 acres of land would be cleared.

Other Melton Valley waste management projects under consideration, but not included in this cumulative impact assessment, are listed below. These projects are in the early stages of planning. Additional analysis of cumulative impacts will be completed as the NEPA documentation for these projects is prepared.

- **Mixed Waste Storage Facilities** (site 10 on Fig. 9). These facilities will be proposed to expand the storage capacity of hazardous mixed waste storage facilities located in Melton Valley. Approximately 0.25 acre of land would be affected by construction of proposed buildings.
- **Waste Characterization and Certification Facility** (site 11 on Fig. 9). This project is now on hold and is expected to be expanded to a central ORR verification facility. A possible site for this facility is in Melton Valley near the site of the proposed CH-transuranic and NFS storage facilities. This facility would replace the Waste Examination and Assay Facility for the characterization of CH-transuranic waste and SLLW. The amount of land to be disturbed by this project has not been determined at this time.

Approximately 33 acres of land would be cleared for all proposed projects through 1995. Operation of these facilities would result in the transport and storage of low-level, TRU, and mixed wastes at ORNL. Releases of hazardous material or radioactive isotopes from storage facilities would not be expected under normal operation. The cumulative impacts of these reasonably foreseeable actions are discussed in the following paragraphs.

4.3.1 Groundwater

Construction and implementation of the proposed sites in Melton Valley would be expected to have minimal cumulative impacts on groundwater hydrology and quality. Implementation of groundwater suppression techniques at individual sites could have minimal localized effects on the groundwater table. Lowering of the water table by approximately 1 ft could occur over small areas. Materials used in the backfilling of pipeline trenches could be more permeable than native soils, creating preferred pathways for groundwater movement. Containment features incorporated into the design of the facilities would minimize the potential for movement of contaminants from these

facilities into groundwater. During construction, accidental releases of construction liquids could occur. However, rapid spill emergency response would minimize impacts to groundwater.

4.3.2 Surface Water

Construction of the proposed storage tanks, in addition to the other Melton Valley proposed sites included in this cumulative assessment, would result in clearing and grading additional lands totaling to 33 acres and potential sediment mobilization and transport into nearby surface waters. The potential for eroded material to reach the stream and have an adverse impact on water quality increases as more area in the watershed is disturbed. However, the impact to surface water is expected to be minimal because (1) most of the other proposed facilities are remote from the construction site, (2) many of the streams in the construction areas are intermittent during part of the year, (3) only a portion of the total area would be under construction at any one time, and (4) best management practices (i.e., hay bales and silt fences) would be implemented to reduce impacts. Further, the BMAP, which surveys water quality in Melton Valley and has shown improvement in water quality in the last few years, will continue to monitor water quality in Melton Valley.

Operation of numerous production and storage facilities in Melton Valley increases the potential for accidental releases of contaminants and potential transport of these contaminants into the aquatic environment. However, clean up of any spill of hazardous materials would minimize the potential for impacts to surface waters.

4.3.3 Wetlands

The proposed facilities in Melton Valley are not anticipated to have separate or cumulative adverse effects on wetlands. Wetland surveys have been conducted for each proposed site. While, wetlands do occur near some of the proposed sites, all wetlands would be delineated prior to construction to ensure their protection. In addition, coordination with the Army Corp of Engineers as well as the state of Tennessee would be completed as appropriate.

4.3.4 Aquatic Ecology

The effects of sedimentation in small streams are generally additive and result in habitat degradation or loss and ultimately in changes in community composition of the aquatic environment.

Disturbance of only a small portion of the overall area at any one time by construction activities, in addition to use of best management practices during construction and operation at all sites, would minimize impacts to surface water quality and, consequently, to aquatic biota. As more land in the watershed is disturbed, the potential for eroded material to reach the stream, to accumulate, and to have an adverse impact on aquatic biota increases. The BMAP surveys have shown an increase in fish and macroinvertebrate populations in Melton Branch in the last few years. Without adequate planning and control measures, this trend could be reversed by increased sedimentation and habitat alteration. Employment of best management practices and disturbing only a small portion of the overall area at any one time would prevent impacts from becoming significant.

4.3.5 Terrestrial Ecology

Construction and the resulting alteration of habitat poses the largest potential for impacts to terrestrial ecosystems locally and regionally. Construction and operation of each facility in Melton Valley would result in a loss of native forest habitat and associated wildlife. These effects are generally additive. Forest fragmentation affects some wildlife species (e.g., the ovenbird, which requires large areas of undisturbed forest), but not others. In general, as forest cover is removed from more areas within Melton Valley, smaller populations of species that require large forested areas would occupy the surrounding forest. Other species, however, which use openings and edges of forests, would increase in abundance. These species already occupy abundant habitat associated with existing disturbed sites. Some species that require forested areas, especially neotropical migratory warblers, could be adversely affected by increased predation and parasitism from species that live in openings and edges and hunt in surrounding forest. The overall impact on the wildlife of ORR and the surrounding region would be relatively small because the entire acreage of the proposed sites is approximately 33 acres. About 85% of the land is forested on approximately 2000 acres of Melton Valley between Highway 95 and the eastern boundary of Melton Valley. Construction for these proposed sites would, therefore, result in less than an additional 1% of cleared forest in this part of Melton Valley. However, ORR is a uniquely large and continuously forested area in comparison to the surrounding landscape, and progressive fragmentation of forest on ORR could have a disproportionately negative effect on interior forest populations and migratory bird species in the region. Minimizing clearing of hardwoods during construction would help reduce forest fragmentation and help prevent surface runoff.

Site clearing would create some opportunity for erosion. These areas would need to be planted with vegetation to stabilize soil erosion using native species outlined in Executive Order 11987, "Exotic Organisms," and DOE Order 5400.1/AI-1, which restricts the introduction of exotic species into natural ecosystems on federally owned land.

The wetland and floodplain areas where the state-listed endangered lilies are growing in Melton Valley would be protected from disturbance, runoff, and siltation. The lily could be indirectly affected if there were changes in hydrology. The proposed sites in Melton Valley are not anticipated to have separate or cumulative adverse effects on wetlands or the listed lily populations. Other listed plants known to occur in Melton Valley would not be affected by this or other projects.

The cumulative impacts of construction and operation of each of these proposed facilities in Melton Valley to red-shouldered hawks that currently nest in Melton Valley are unknown. A 656 ft (200 m) buffer around the nest site may provide adequate protection. This species commonly nests close to roads, so traffic is not expected to be disruptive; however, continued disturbance and fragmentation of the existing forest with openings containing paved surfaces and facilities could eventually result in unsuitable habitat for nesting. Cumulative effects on other state-listed wildlife populations are assumed to be additive. Appendix A summarizes compliance with the Endangered Species Act of 1973.

The impacts of the proposed site would make a minor contribution to the cumulative impacts of all recent (i.e., last 10 years), currently proposed, and possible future DOE actions on ORR. DOE's past, current, and future actions, including property sales and numerous construction projects in various areas on ORR, individually have had insignificant impacts because each action by itself affects only a relatively small acreage. In total, however, such actions have considerable cumulative impact on ORR vegetation and wildlife. These impacts include loss of natural vegetation and reductions in wildlife populations as a result of habitat loss and forest fragmentation.

4.3.6 Air Quality

Because the background air quality of the region is good and because construction impacts would be minor, localized, and temporary, no significant cumulative impacts on air quality would be expected. Fugitive dust from construction of the proposed facility and eight other storage facilities has been modeled under the assumptions that no dust suppression measures (e.g., sprinkling with water) would ever be used and that construction would occur at all nine sites simultaneously under worst-case meteorological conditions with the wind blowing across flat terrain in the exact direction of the

nearest residence (DOE/EA-0349). Results from a screening model incorporating the above assumptions indicated that the annual average PM-10 concentration at the nearest residential area (Shoreline Estates, in Knox County) could exceed the National Ambient Air Quality Standard (50 $\mu g/m^3$) by a few percent (i.e., modeled concentrations as high as 51 $\mu g/m^3$ were simulated in the nearest portions of the subdivision). This includes a background value of 31 $\mu g/m^3$ and a modeled contribution from construction of 20 $\mu g/m^3$. No exceedances of the 24-hour average PM-10 standard were simulated. Sprinkling would be used as a mitigative measure, if necessary, to reduce fugitive dust.

The conservative nature of the screening model and of the assumptions incorporated therein lead to appreciable overestimates of air quality impacts. Therefore, cumulative effects of the proposed site and simultaneous construction activities would not be expected to lead to any exceedances of NAAQS.

4.3.7 Archaeological Resources/Historical Sites

Archaeological and historical surveys have been or will be completed for the proposed facility sites in Melton Valley. The only currently known historical sites in Melton Valley include the Jones and Jenkins house sites (DuVall 1992). All proposed projects would conduct National Historic Preservation Act, Sect. 106 consultation with the SHPO. Recommendations received from the SHPO would be followed to ensure adherence to proper measures to protect archeological resources during construction and operation of facilities. No construction would begin at any site until Sect. 106 consultation had been completed.

4.3.8 Health and Safety

The construction and operation of proposed facilities in Melton Valley could result in additional injuries, illnesses, or radiation exposures. Injuries from construction and operation equipment are considered to be standard industrial accidents. Workers would comply with OSHA regulations (29 CFR 1926) and ORNL safety provisions to mitigate the incidence of equipment-related injuries or illnesses.

The proposed waste storage facilities in Melton Valley (Fig. 9) would represent an increase in the radioactive waste management activities at ORNL. However, waste operators at ORNL would continue to rotate between jobs, comply with DOE Order 5480.11, and make every effort to meet

ALARA goals. Precise changes in exposures due to all the proposed sites are difficult to estimate. The annual dose to waste operations radiation workers would not be expected to vary much from the 1991 average measurable exposure of 40 mrem/year. This dose is well below the DOE limit of 5 rem/year and the ORNL ALARA goals of 0.75 rem/year and 1.0 rem/year. Therefore, no increased radiological risk to workers would be expected, and the cumulative impacts on worker health and safety during incident-free operation of this action would be negligible.

Some of the proposed facilities would handle mixed waste, thereby potentially exposing workers to hazardous materials. These facilities would only handle small amounts of hazardous material (e.g., 25 mg/L of cadmium) that would be mixed with a larger inventory of radioactive waste (e.g., in a 55-gal drum). The hazardous waste component of individual operations at the proposed facilities would not pose a threat because the quantities would be sufficiently small, and any health hazard would be overshadowed by radiological concerns. Measures taken to control radiological hazards would also protect workers from the small amounts of hazardous constituents in the mixed waste.

Public risk from radiological or hazardous materials would also be negligible because all the waste would be well contained and the overall radiological doses to off-site individuals would only slightly increase (probably unmeasurable). DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, limits the EDE that an off-site individual may receive from all exposure pathways and all radionuclides released from ORR during 1 year to no more than 100 mrem. In 1990, the EDE from exposure through all pathways was 8 mrem, 8% of the DOE Order 5400.5 limit (Kornegay 1991). A small increase due to cumulative impacts from the waste storage activities assessed in this section would not be expected to measurably change current experience, which is well below the DOE limit. The cumulative impact on health and safety of the waste operation facilities would be negligible.

The proposed facilities would represent an increase in radioactive waste inventory in the immediate area, thereby increasing the health hazard to the workers and members of the public who may travel near the area. However, the hazard is passive and could only become a problem (risk) if the radioactive material were to become mobilized during an accident. Operation of numerous storage facilities in an area increases the potential for accidental releases of contaminants to that immediate area but does not materially change the overall potential for accidents per storage facility. Individual incidents do not change in probability; however, with more facilities, there is a greater likelihood for an effect at the region of greater facility density. Even with all the proposed plans, impacts on the public health are anticipated to be well below regulatory limits.

4.3.9 Transportation

Transportation operations associated with the proposed Melton Valley facilities are expected to have negligible cumulative impacts during normal operations. Of the assessments completed (for CH- and RH-transuranic waste storage buildings, Class III/IV Solid LLLW, and LLLW Solidification Project Interim Storage Pad), the transportation risks due to both incident-free and accident conditions have been negligible for each individual facility.

Operating proposed facilities in Melton Valley would not alter the transportation risks of a particular facility, but the operation of multiple facilities could increase the overall health hazard potential to the workers and the public in the immediate area because of the increased cumulative quantities of radioactive waste being shipped. Even after a postulated accident, the effects would be localized and the actions of emergency response teams should prevent any significant population exposures. Increased traffic flow would increase the risk of a vehicular accident, but this fact was considered in this and previous assessments by using conservative traffic volumes and accident rates.

Cumulative risks from shipment of radiological or hazardous materials, therefore, would be expected to remain negligible even during the concurrent operation of multiple facilities. However, it is not possible to quantitatively assess cumulative transportation risk for on-going transportation activities and proposed transportation activities because the information needed to complete this risk assessment is not available for on-going operations. Individual risks associated with each facility would be well below other operational risks—such as worker dose from the package handling—that occurs during waste transfer to storage casks.

4.3.10 Summary

No major cumulative impacts on any potentially affected environments were found to result from this proposed action because of the small areas being disturbed, the lack of anticipated releases, and applicable DOE and ORNL radiation protection standards. The impacts of construction of MVST facilities would make a minor, but detectable, contribution to the cumulative impacts on terrestrial ecology of all currently proposed and reasonable foreseeable future DOE actions on the ORR.

Overall, the cumulative impact from the construction of the proposed action would only add a small increment to the total cumulative impacts on Melton Valley. Each individual project would have a separate analysis to assess the individual impacts, as well as the incremental impacts, to the cumulative effects on Melton Valley. It can also be noted that none of the projects listed in this

section on cumulative impacts are connected to the proposed action. Furthermore, the proposed action discussed in this EA would not bias the decision for other waste management actions being addressed in a related programmatic EIS.

5. REGULATORY COMPLIANCE AND AGENCY CONSULTATION

The Resource Conservation and Recovery Act (RCRA) of 1976 is the principal federal legislation governing the management of the hazardous waste component of the LLLW. Applicable EPA regulations implementing RCRA are included in 40 CFR 260 through 271 and 280 through 281. Although RCRA hazardous wastes are expected to be stored in the proposed facility, the facility is exempted from permitting under RCRA [40 CFR 264.1 (g) (6) and 265.1 (g) (10)] as a hazardous wastewater treatment/storage facility because it meets the definitions of a "wastewater treatment unit" and an "elementary neutralization unit" as defined in 40 CFR 260.10 and TN Rule 1200-1-11-.01 (TN effective 2/14/94). Prior to February 1992, submittal of a "permit-by-rule" application for the ORNL wastewater treatment units was required by the state of Tennessee to obtain the wastewater treatment unit exclusion. Under the current state rules, as long as the facility only receives hazardous wastewaters that are generated on-site, the state no longer requires the resubmittal of the "permit-by rule" application to obtain the exclusion. Federal rules do not require that an application be submitted to obtain "permit-by-rule" status; compliance with the NPDES/Clean Water Act (CWA) permit and recordkeeping conditions satisfy federal requirements.

Actions undertaken as part of the proposed site would comply with the following additional federal statutes and regulations: the Clean Air Act and its amendments; RCRA as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984; the CWA and its amendments; the Toxic Substances Control Act (TSCA); the Endangered Species Act of 1973; Section 106 of the Historic Preservation Act; OSHA (29 CFR 1910, Subpart G, *Occupational Health and Environmental Controls*, 29 CFR 1910, Subpart I, *Personal Protective Equipment*, 29 CFR 1910, Subpart J, *General Environmental Controls*, 29 CFR 1926, *Safety and Health Standards for Construction*); and 10 CFR 1022, DOE review requirements for floodplains and wetlands. The proposed sites would also comply with Tennessee state laws, including the Tennessee Water Quality Control Act (TCA 69-3-108) and the Tennessee Burial Law (TCA 39-17-311, TCA 39-17-312). In addition, at a minimum, the following DOE orders would be adhered to: DOE Order 5820.2A, "Radioactive Waste Management"; DOE Order 6430.1A, "General Design Criteria"; DOE Order 5480.5, "Safety of Nuclear Facilities"; DOE Order 5480.3, "Safety Requirements for the Packaging and Transportation of Hazardous Material, Hazardous Substances, and Hazardous Wastes"; DOE Order 5480.9, "Construction Safety and Health Program," DOE Order 5480.11, "Radiation Protection for Occupational workers"; DOE Order 5400.5, Radiation Protection of the Public and the

Environment," DOE Order 5483.1A, "Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned contractor-Operated Facilities"; and DOE Order 5480.10, "Contractor Industrial Hygiene Program." Handling and storage of ORNL solidified LLLW will also adhere to the policies and procedures established in the ORNL Standard Practices and Procedures Manual.

Consultation with the United States Fish and Wildlife Service is documented in Appendix A as required by the Endangered Species Act of 1973. Appendix A also summarizes the endangered species regulations as they apply to the ORR. Consultation with the SHPO is documented in Appendix C.

6. REFERENCES

Anderson, D. R. 1991. *Memo to R. Macon*, ORNL Radiological Survey Results of 7856 Area "Proposed Vault Location for MVST-C1", November 21.

Cook, R. 1992. *Memo to D. Mabry, ORNL.* Rare Plant Survey —MVST Capacity Increase Project, July 9.

DOE (Department of Energy) 1992a. *Federal Facilities Agreement for the Oak Ridge Reservation*, DOE/OR-1014, Oak Ridge, Tenn., January 1.

DOE (Department of Energy) 1992b. *Conceptual Design Report for the Melton Valley Storage Tank Increase Project*, prepared by EBASCO Services Incorporated, Oak Ridge, Tenn.

DOE (Department of Energy) 1992c. *Environmental Assessment—Receipt and Storage at Oak Ridge National Laboratory, Oak Ridge, Tennessee of Transuranic Waste, Mixed Transuranic Waste and Mixed Oxide Waste from Nuclear Fuel Services, Inc.*, DOE/EA-0617, prepared by Oak Ridge National Laboratory for the Department of Energy, Oak Ridge, Tenn.

DOE (Department of Energy) 1992d. *Key Decision #1 Briefing, Melton Valley Storage Tanks Capacity Increase*, Oak Ridge Field Office, Oak Ridge, Tenn.

DuVall (DuVall and Associates) 1992. *An Archaeological Reconnaissance of the Remote Handled Transuranic Waste Storage Bunker (RH-TRU WSB) and Melton Valley Storage Tank Capacity Increase Project*, Oak Ridge Reservation, Oak Ridge, Tenn., December.

Eisenhower, B. M., B. A. Kelly, B. D. Barkenbus, and E. A. Moore 1985. The Spill Prevention Control Countermeasures and Contingency Plans for Oak Ridge National Laboratory, ORNL-5945, Oak Ridge National Laboratory, Oak Ridge, Tenn. September.

Federal Interagency Committee for Wetlands Delineation 1989. *Federal Manual for the Identification and Delineation of Jurisdictional Wetlands*. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and USDA Soil Conservation Service, Cooperative Tech. Pub., Washington, D.C.

Green, M. A., and J. H. Platfoot 1992. *Safety Assessment—Melton Valley Storage Tank Capacity Increase Project*. System Safety Engineering, Martin Marietta Energy Systems, Inc., ORNL/ENG/SA-2241, Oak Ridge, Tenn., January 24.

ICRP (International Commission on Radiological Protection) 1991. *1990 Recommendations of the International Commission on Radiological Protection*, ICRP Publication 60, Annals of the ICRP, Vol. 21, No. 1-3, Pergamon Press, N.Y.

Kornegay, F. C. et al. 1991. *Oak Ridge Reservation Environmental Report for 1990*, Vol. 1 and 2. Martin Marietta Energy Systems, Inc., ORNL/ES/ESH-18, Oak Ridge National Laboratory, Oak Ridge, Tenn., September.

Lee, R. R., and R. H. Ketelle 1989. *Waste Handling and Packaging Plant (WHPP) Site FY 1989 Geohydrology Data Package*, ORNL/CF-89/291, Oak Ridge National Laboratory, Oak Ridge, Tenn., September.

Loar, J. M. et al. 1987. *First Annual Report on the ORNL Biological Monitoring and Abatement Program*, Draft Report, ORNL/TM-10399, Oak Ridge National Laboratory, Oak Ridge, Tenn., pp. 1-354.

Loar, J. M. et al. 1988. *Second Annual Report on the ORNL Biological Monitoring and Abatement Program*, Draft Report, ORNL/TM Report, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Loar, J. M. et al. 1989. *Third Annual Report on the ORNL Biological Monitoring and Abatement Program*, Draft Report, ORNL/TM Report, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Loar, J. M. et al. 1990. *Forth Annual Report on the ORNL Biological Monitoring and Abatement Program*, Draft Report, ORNL/TM Report, Oak Ridge National Laboratory, Abatement Program, Draft Report, ORNL/TM Report, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Loar, J. M. et al. 1991. *Fifth Annual Report on the ORNL Biological Monitoring and Abatement Program*, Draft Report, ORNL/TM Report, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Loar, J. M., et al. 1992. *Sixth Annual Report on the ORNL Biological Monitoring and Abatement Program*. Draft Report, ORNL/TM-12083, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Martin Marietta Energy Systems, Inc. (MMES) 1992. *Material Safety Data Sheet*, Nitric Acid, September 29.

McMaster, W. M. 1967. *Hydrologic data for the Oak Ridge area*, Tennessee, U.S. Geological Survey-Water Supply Paper No. 1839-N. U.S. Government Printing Office, Washington, D.C., 60 pp.

Myrick, T. E. et al. 1992. *The Emergency Avoidance Solidification Campaign of Liquid Low-Level Waste at Oak Ridge National Laboratory*, Martin Marietta Energy Systems, Inc., ORNL/TM-11536, Oak Ridge National Laboratory, Oak Ridge, Tenn., January.

NAS (National Academy of Sciences) 1990. *Health effects of Exposure to Low Levels of Ionizing Radiation*, BEIR V Report, National Academy Press, Washington, D.C.

NCRP (National Council on Radiation Protection and Measurements) 1987. *Ionizing Radiation Exposure of the Population of the United States*, NCRP Report No. 93, Bethesda, Md.

ORNL 1991. *Systems requirement document for the Melton Valley Storage Tank Capacity Increase Project*, Waste Management Division, Oak Ridge National Laboratory, Oak Ridge, Tenn.

ORNL 1992a. *Operational Safety Requirements for the LLLW System*, ORNL 4/TM-7262, Rev. 3, Oak Ridge National Laboratory, Oak Ridge, Tenn., November 10.

ORNL 1992b. *ALARA plan for the Liquid and Gaseous Waste Operations Department*, Internal, unpublished document.

ORNL 1993a. *Design Criteria for Melton Valley Storage Tank Capacity Increase*. Oak Ridge National Laboratory, Doc.#X-OE-684, Oak Ridge, Tennessee.

ORNL 1993b. *Oak Ridge National Laboratory Waste Minimization/Reduction and Pollution Prevention Program Plan*, TM-11853/R4, Oak Ridge National Laboratory, Oak Ridge, Tenn., January.

Rosensteel, B. 1992a. *Memo to L. Jacobs, ORNL.* Wetland and rare plant survey—MVST Capacity Increase Project, March 13.

Rosensteel, B. 1992b. *Memo to D. Mabry, ORNL.* MVST Capacity Increase Project—Revised wetland survey information, August 21.

Rosensteel, B. 1992c. *Memo to D. Mabry, ORNL.* MVST Capacity Increase Project—Possible new location and possible location for new water storage tank, November 19.

Rosensteel, B. 1992d. *Memo to R. Saylor, ORNL.* Expanded area wetland and rare plant survey for the RH Bunker, August 31.

Ryon, M. G. 1988. Fishes. pp. 203–232. IN J. M. Loar (ed.), *Second annual report on the ORNL Biological Monitoring and Abatement Program*, Draft ORNL/TM Report, Oak Ridge National Laboratory, Oak Ridge, Tenn., 475 pp.

Sears, M. B. et al. 1990. *Sampling and Analysis of Radioactive Liquid Wastes and Sludges in the Melton Valley and Evaporator Facility Storage Tanks at ORNL*, Martin Marietta Energy Systems, Inc., ORNL/TM-11652, Oak Ridge National Laboratory, Oak Ridge, Tenn., September.

Sittig, M. 1985. *Handbook of Toxic and Hazardous Chemicals and Carcinogens—Second Edition.* Noyes Publications, Park Ridge, New Jersey.

Smith, J. G. 1988a. Benthic macroinvertebrates. pp. 164–202. IN J. M. Loar (ed.), *Second annual report on the ORNL Biological Monitoring and Abatement Program. Draft ORNL/TM Report*, Oak Ridge National Laboratory, Oak Ridge, Tenn., 475 pp.

Smith, J. G. 1988b. Benthic macroinvertebrates. pp. 109–155. In G. R. Southworth (ed.), *Ecological evaluation of Bear Creek 1984–1987. Draft ORNL/TM Report*, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Smith, J. G. 1992. "Benthic Macroinvertebrates," pp. 109–155. In G. R. Southworth (ed.), *Ecological Effects of Contaminants and Remedial Actions in Bear Creek*, ORNL/TM-11977, Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory, Oak Ridge, Tenn.

Snow, C. M. 1993. *Safety Assessment Melton Valley Storage Tank Capacity Increase Project*, System Safety Engineering, Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn., ORNL/ENG/SA-2241/R1, May 6.

United States Army Corps of Engineers 1987. *Wetland Delineation Manual*. Tech. Rept. Y-87-1. Waterways Exp. Sta. Vicksburg, Miss.

7. LIST OF PREPARERS

Oak Ridge National Laboratory.

A. H. Curtis, M.S., Geology, Colorado State University; B.S., Soil and Water Science, University of California at Davis; 2 years experience in environmental assessment.

R. R. Lee, M.S., Geology, Temple University; B.S. Geology, Temple University; 7 years experience in environmental assessment.

L. K. Mann, M.S., Plant Ecology, The University of Tennessee; B.S., Botany, The University of Tennessee; 3 years experience in environmental assessment.

R. L. Miller, M.S., Meteorology, The Pennsylvania State University; B.S., Meteorology, The Pennsylvania State University; 9 years experience in environmental assessment.

R. E. Saylor, M.S., Environmental Studies, The University of Rochester; B.S., Industrial Engineering, The University of Tennessee; B.S., Geology, State University of New York at Buffalo; 10 years experience in environmental assessment.

M. L. Socolof, M.S., Environmental Health Management, The Harvard School of Public Health; B.A., Human Ecology, Connecticut College; 2 years experience in environmental assessment and 4 years experience in environmental management.

V. R. Tolbert, Ph.D., Ecology, The University of Tennessee; M.S. Ecology, The University of Tennessee; B.S., Biology, East Tennessee State University; 14 years experience in environmental assessment.

M. C. Wade, M.S., Environmental Science, Long Island University; B.S., Forest Biology, SUNY School of Environmental Science and Forestry at Syracuse; 9 years experience in environmental assessment.

APPENDIX A

ENDANGERED AND THREATENED SPECIES CONSULTATION AND INFORMATION

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

August 3, 1993

Mr. Murray C. Wade
Energy Division
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, Tennessee 37831-6200

Re: FWS #93-1910

Dear Mr. Wade:

Thank you for your letter and enclosures of July 2, 1993, regarding a proposal for construction of liquid low-level waste and solidified liquid low-level waste storage facilities on the Oak Ridge National Laboratory in Roane County, Tennessee. The Fish and Wildlife Service (Service) has reviewed the information submitted and offers the following comments.

Review of the Bethel Valley quadrangle of the Service's National Wetlands Inventory maps reveals that there are no forested, emergent, or scrub-shrub wetlands in the vicinity of the proposed project. Therefore, the Service anticipates that there will be no project-related adverse impacts to valuable wetland resources.

We have reviewed the proposed construction project with regard to endangered species. Based on our records, it is our belief that there are no federally listed or proposed endangered or threatened plant or animal species in the impact area of the project. In view of this, we believe that the requirements of Section 7 of the Endangered Species Act have been satisfied and no further consultation is needed at this time. However, obligations under Section 7 of the Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified to include activities not considered in this review, or (3) a new species is listed or critical habitat determined that may be affected by the identified action.

Thank you for the opportunity to comment on this action. If you have any questions, please contact Jim Widlak of my staff at 615/528-6481.

Sincerely,

Lee A. Barclay, Ph.D.
Field Supervisor

OAK RIDGE NATIONAL LABORATORY
MANAGED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE U.S. DEPARTMENT OF ENERGY

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831-6200

July 2, 1993

Mr. Jim Widlak
U.S. Fish and Wildlife Service
446 Neal Street
Cookeville, Tennessee 38501

Dear Mr. Widlak:

Oak Ridge National Laboratory is assisting the U.S. Department of Energy (DOE) by preparing two Environmental Assessments:

1. Melton Valley Storage Tank Capacity Increase Project—This action entails the construction of six 100,000 gallons tanks to contain Liquid Low-Level Waste. The tanks would be an expansion of the existing Melton Valley facility and would include the clearing of 1.5 acres of land (Figure 1 attached).

2. Construction for a gravel storage pad to store Solidified Liquid Low-Level Waste—This storage area would accommodate up to 270 concrete storage casks, each of which is approximately 8 ft 8 in. in diameter and weighs approximately 35 tons. approximately 4.2 acres would be cleared for construction (Figure 2 attached).

We are requesting information about terrestrial and aquatic species of plants and animals listed or proposed to be listed as endangered, threatened, or candidate, or of special concern which may be present on either of the two sites. Information concerning any critical habitats which may be in the area would also be useful. It should be noted that no wetlands have been identified on either of the project sites.

Please provide any concerns or information which you may have about the proposed projects. If you have any questions please call me at 615-574-8632.

Sincerely,

Murray C. Wade
Energy Division

MCW:mh

Enclosure

cc: Richard Saylor

A.1 COMPLIANCE WITH REGULATIONS FOR THREATENED AND ENDANGERED SPECIES

This appendix summarizes (1) endangered species regulations as they apply to the management of ORR by DOE, (2) recommendations of the U.S. Fish and Wildlife Service (FWS) and the state of Tennessee for endangered species activities on ORR, and (3) DOE actions in response to these recommendations as well as to endangered species regulations. Copies of letters from FWS and the state are included in this appendix. Federal regulations under the Endangered Species Act of 1973 (16 U.S.C. Sect. 1531 et seq.) require that DOE consider the impacts of its actions on plant and animal species listed by FWS as threatened or endangered, on species proposed to be listed as threatened or endangered, and on areas designated or proposed as critical habitats.

A biological assessment (BA) for a proposed site must be submitted to FWS if the action is a "major construction activity" (50 CFR Pt. 402.02) constituting a major federal action significantly affecting the quality of the human environment and if a listed species or critical habitat may be affected [50 CFR Pts. 402.01(a) and 402.12]. Whether a proposed project is a major construction activity constituting a major federal action (40 CFR Pt. 1508.18) significantly affecting the quality of the human environment is determined by an environmental assessment (EA) (40 CFR Pt. 1508.9) prepared in accordance with the National Environmental Policy Act. If a threatened or endangered species would be affected by a small DOE construction project, the project might have to be defined as "significantly" (40 CFR Pt. 1508.27) affecting the environment and as a major federal action requiring an EIS in accordance with 40 CFR Pt. 1502.3. If a BA determines that a listed species or critical habitat (or species or habitat proposed for listing) may be affected, DOE must request formal consultation with FWS. A BA is not required for a project that is not a major construction activity or major federal action.

If DOE determines that a proposed minor construction project may affect a listed species, DOE must request formal consultation with FWS. If DOE determines that no impact would occur, no formal consultation is required. Informal consultation with FWS is optional (50 CFR Pt. 402.13).

During any consultation, FWS may recommend discretionary studies or surveys (e.g., Barclay 1990; Bay 1991) that may provide a better information base for assessing impacts on listed species [50 CFR Pt. 402.12(d)(2)]. Such studies are optional and not required.

The Tennessee Code Annotated, Title 70, Chapter 8, and regulations of the Tennessee Wildlife Resources Commission protects animal species listed by the state as endangered, threatened, or in need of management. No person or agency may knowingly destroy a listed species or its habitat without a permit from the state.

Plant species listed by the Tennessee Department of Conservation are provided limited protection by the Tennessee Rare Plant Protection and Conservation Act of 1985 (Tennessee Code Annotated, Title 11-26, Sects. 201-214). This act protects listed plants from indiscriminate collecting by plant collectors but does not prohibit landowners such as DOE from destroying listed plants on their own property. Thus, apart from federal requirements, DOE is not required to perform surveys for state-listed plants or to ensure that its proposed sites do not impact listed plants. Nevertheless, DOE attempts to protect all state-listed plant species occurring on ORR.

A summary of the above regulations charges DOE to ensure protection of animals listed under the Endangered Species Act, plants listed under the Endangered Species Act, and animals listed by the Tennessee Wildlife Resources Commission. DOE is not required by state regulations to protect state-listed plant species on its own property.

A.2 FISH AND WILDLIFE SERVICE RECOMMENDATIONS

FWS has made the following recommendations.

1. On-site surveys (discretionary) should be conducted whenever a proposed project would result in loss or disturbance of aquatic or terrestrial habitat (Barclay 1990; Bay 1991).
2. During the early planning stages of any construction that would adversely impact aquatic or terrestrial habitat, potential effects to endangered or threatened species should be assessed and a determination made about whether construction or operation may affect them (Barclay 1990).

A.3 STATE OF TENNESSEE RECOMMENDATIONS

The TWRA and the Tennessee Department of Conservation are being requested to provide written descriptions of any surveys and documentation required for compliance with state law.

A.4 DOE ACTIONS CONCERNING STATE AND FEDERAL RECOMMENDATIONS

Personnel. The DOE Resource Management Organization for ORR includes two persons designated for coordination of issues concerning threatened and endangered species—one person for plant species and one for animal species. These individuals serve as coordinators for consultation with state and federal agencies and surveys for listed plants and animals on ORR. Activities of the DOE National Environmental Research Park on ORR also support studies of listed species, primarily plant species that are known to occur on ORR; however, no staff positions are designated and funded specifically for surveys or studies of listed species. Therefore, such surveys and studies are limited.

Planning and documentation. As part of the planning process for construction projects, DOE has prepared literature reviews and conducted surveys to determine whether any listed plant or animal species would be affected. The two endangered species coordinators of the Resource Management Organization have reviewed literature and other information on the status of listed plants and animals on ORR (Kroodsma 1987; Parr 1984).

Field surveys are conducted as necessary, and documentation is provided in categorical exclusions, EAs, and EISs. If an FWS-listed species or a species proposed for listing could be affected by a proposed minor construction project being addressed by an EA, formal consultation would be requested with FWS; however, because no such species is known to occur on ORR, formal consultation has not been requested. A BA would likely be prepared for any major construction activity constituting a major federal action. If breeding or nesting habitat of a state-listed animal species would be affected, DOE would apply for an appropriate permit from the TWRA.

Surveys. There is no evidence that any FWS-listed plant species occurs on ORR (Table A.1). Therefore, surveys for rare plants are not required. Nevertheless, an attempt is made to conduct plant surveys for all state-listed and FWS-listed plants at all sites with natural habitats that would be affected by construction or operation of a proposed project. Many state-listed plant species occur on ORR and are sometimes found on proposed construction sites.

There is also no evidence that any FWS-listed animal species occurs on ORR (Table A.1). Therefore, surveys are not required. The Indiana bat is the only FWS-listed animal species for which there was sufficient evidence to indicate the possibility of its presence on ORR and to justify field surveys. Field surveys were conducted during the spring and summer of 1992 in habitat that appears suitable for this species (floodplain of East Fork Poplar Creek). No Indiana bats were found during

Table A.1. Status of rare species on the Oak Ridge Reservation[1]

Species		Legal status[2]	
		Federal	State
	Plants		
Aureolaria patula	spreading false foxglove	C1	E
Cimicifuga rubifolia	Appalachian bugbane	C2	T
Delphinium exaltatum	tall larkspur	C2	E
Juglans cinerea	butternut	C2	
Cypripedium acaule	pink lady-slipper		E
Liparis loeselii	fen orchid		E
Diervilla lonicera	northern bush-honeysuckle		T
Fothergilla major	mountain witch-alder		T
Hydrastis canadensis	goldenseal		T
Lilium canadense	Canada lily		T
Panax quinquifolius	ginseng		T
Platanthera flava var hebiola	tuberculed rein-orchid		T
Platanthera peramoena	purple fringeless orchid		T
Elodea nuttallii	Nuttall's waterweed		S
Saxifraga careyana	Carey's saxifrage		S
Spiranthes ovalis	lesser ladies tresses		S
	Fish		
Polyodon spathula	paddlefish	C2	
Phoxinus tennesseensis	Tennessee dace		NM
	Amphibians and reptiles		
Aneides aeneus	green salamander	C2	NM
Cryptobranchus alleganiensis	hellbender	C2	NM
Cnemidophorus sexlineatus	six-lined racerunner		NM
Notophthalmus viridescens	eastern newt		NM
Trachemys scripta	pond slider		NM
	Birds		
Haliaeetus leucocephalus[3]	bald eagle	E	E
Aimophila aestivalis[4]	Bachman's sparrow	C2	E
Ammodramus henslowii[3]	Henslow's sparrow	C2	
Chlindonias niger[3]	black tern	C2	
Dendroica cerulea[4]	cerulean warbler	C2	
Lanius ludovicianus	loggerhead shrike	C2	
Thyromanes bewickii	Bewick's wren	C2	T
Pandion haliaetus[3]	osprey		E
Ammodramus savannarum[4]	grasshopper sparrow		T
Accipiter striatus	sharp-shinned hawk		T
Accipiter cooperii	Cooper's hawk		T
Circus cyaneus[3]	northern harrier		T

Table A.1. (continued)

Species		Legal status[2]	
		Federal	State
Buteo lineatus	red-shouldered hawk		NM
Coragyps atratus	black vulture		NM
Limnothlypis swainsonii[4]	Swainson's warbler		NM
Melanerpes erythrocephalus	red-headed woodpecker		NM
Nycticorax nycticorax	black-crowned night-heron		NM
Phalacrocorax auritus[3]	double-crested cormorant		NM
Sphyrapicus varius[3]	yellow-bellied sapsucker		NM
Tyto alba	common barn owl		NM
	Mammals		
Felis concolor[5]	eastern cougar	E	
Sorex longirostris	southeastern shrew		NM

[1]From Parr and Evans (1992), Cunningham et al. (draft).

[2]E = endangered, T = threatened, C1, C2 = candidate, NM = in need of management, S = special concern in Tennessee.

[3]Uncommon visitor or migrant. Does not currently nest on ORR.

[4]Summer

[5]Frequently reported, but no conclusive evidence of the presence of a cougar population (Kroodsma 1987).

this survey. Also, incidental or reconnaissance surveys for state-listed and FWS-listed animal species are conducted occasionally for proposed construction projects.

A.5 REFERENCES

Barclay, L. A. 1990. U.S. Fish and Wildlife Service letter to R. L. Kroodsma, Oak Ridge National Laboratory, Oak Ridge, Tenn., June 13.

Bay, R. T. 1991. U.S. Fish and Wildlife Service letter to R. L. Kroodsma, Oak Ridge National Laboratory, Oak Ridge, Tenn., March 7.

Kroodsma, R. L. 1987. *Resource Management Plan for the Oak Ridge Reservation, Vol. 24: Threatened and Endangered Animal Species*, ORNL/ESH-1/V24, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Parr, P. D. 1984. *Resource Management Plan for the Oak Ridge Reservation, Vol. 4: Endangered and Threatened Plant Species*, ORNL-6026/V4, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Parr, P. D. and J. W. Evans 1992. *Resource Management Plan for the Oak Ridge Reservation*, Vol. 27: Wildlife Management Plan, ORNL/NERP-6, Oak Ridge National Laboratory, Oak Ridge, Tenn.

APPENDIX B

FIELD SURVEY MEMOS

OAK RIDGE NATIONAL LABORATORY
MANAGED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE U.S. DEPARTMENT OF ENERGY

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

March 13, 1992

Lorelei Jacobs, Bldg 1000, MS-6342

WETLAND AND RARE PLANT SURVEY - MVST-CIP

I. INTRODUCTION

The preliminary wetlands investigation for the above referenced site has been completed. Existing published information was studied to determine the approximate extent of wetlands on the site. Published information included the the USFWS National Wetlands Inventory (NWI) map (Bethel Valley, TN quadrangle) and existing ORR maps and reports. A field investigation of the site was performed on February 18 and March 11, 1992 by Rebecca Cook and Barbara Rosensteel.

Field methodology followed procedures established in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (Federal Interagency Committee for Wetland Delineation,1989). Use of this methodology is required on Department of Energy land by the US Army Corps of Engineers. In order to be identified as a wetland, an area must have hydrophytic vegetation, hydric soils, and be saturated by groundwater or inundated by surface water for at least seven days during the growing season. In certain situations an area can be identified as a wetland without possessing all three wetland parameters.

II. RESULTS OF FIELD INVESTIGATION

A. Project Area Description

The existing MVST Facility is located on Melton Valley Circle at the road junction with Chemical Waste Area Access Road. A part of the proposed project at the MVST Facility, a proposed 12" potable water line, will be extended from the HFIR area. The proposed route of the water line will cross Melton Valley Circle north of Melton Branch Creek, continue as an elevated crossing of Melton Branch Creek, cross Melton Valley Circle south of the creek, then will continue west paralleling the road to the MVST Facility.

The area traversed by the proposed water line is currently undeveloped upland forest, and floodplain forest adjacent to Melton Branch Creek.

B. Wetland Survey Results

The section of the water line which will parallel Melton Valley Circle is located near the bottom of a slope. The dominant species include white oak (Quercus alba; FACU), Virginia pine (Pinus virginiana; not listed, therefore, assumed to be an upland species), red cedar (juniperus virginiana; FACU), and Japanese honeysuckle (Lonicera japonica; FAC). No wetlands were identified in this section. There are, however, several narrow intermittent stream channels which drain the upper slopes. Obstruction or disturbance of these stream channels should be avoided.

Wetlands were identified in the floodplain on the south side of Melton Branch Creek. The vegetation species in this area include loblolly pine (Pinus taeda; FAC) in the canopy, red maple (Acer rubrum; FAC), sycamore (Platanus occidentalis; FACW), and silky dogwood (Cornus amomum; FACW+) in the subcanopy/shrub layer, and cane (Arundinaria gigantea; FACW) and Microstegium nepal (FAC+) in the herbaceous layer. The vegetation is classified as hydrophytic due to the dominance of facultative (FAC) and facultative wetland (FACW) species.

The soil in this area has a chroma of 2 (7.5YR 5/2 and 10YR 5/2) with reddish-brown, brown, and dark gray mottles. The soil was saturated to the surface in many locations in the wetland. Ponded water was also present throughout the area.

The floodplain area north of Melton Branch Creek was not identified as wetland. The vegetation species in this area include loblolly pine, hackberry (Celtis occidentalis; FACU), red maple, sycamore, and Japanese honeysuckle. Other species present include rose (Rosa sp.), and flowering dogwood (Cornus florida; not listed). There was no cane growing in the north floodplain area. The soils are brown to yellowish-brown (10YR 5/4 and 5/3). Few dark gray mottles were observed at a depth of approximately 15 inches, however, the matrix chroma is greater than 2, therefore, the soil is not hydric. The soil was not saturated and there was no evidence of ponding in the area. The lack of wetland development in the floodplain north of the creek in this particular location may be attributable to it's slightly higher elevation which may reduce the frequency and duration of flooding episodes.

The USFWS NWI maps palustrine broad-leaf deciduous forest, temporarily flooded (PF01A) along the entire length of Melton Branch Creek. Our field findings concur with this mapping.

C. Rare Plant Survey Results

The rare plant survey could not be conducted in conjunction with the wetland survey due to the season. A rare plant survey will be conducted during the growing season (some time after mid-April) and the findings will be presented at that time.

The results of this investigation are preliminary. A detailed wetlands delineation would need to be performed in order to accurately establish the wetland boundaries in the project area. Please feel free to contact me if you have any questions or comments.

Barbara A. Rosensteel

Barbara A. Rosensteel, Coordinator, Rare Plant and Wetland Surveys, Bldg. 1506, MS-6034, (6-8123) ORNL

cc: D. Mabry, Bldg 3550, MS-6291
R. Macon

July 9, 1992

D. Mabry, Mitchell Bldg., MS-6282

RARE PLANT SURVEY - MVST-CIP

I. INTRODUCTION

The initial rare plant investigation for the above referenced site has been completed. A field investigation of the site was conducted on June 2 and June 23, 1992 by Rebecca Cook.

During the rare plant survey, the site is searched for plant species that are listed or proposed for listing by state or federal agencies as endangered, threatened, or of special concern and for potential habitat for these species. Currently on the ORR there are 14 species that are listed by the Tennessee Department of Conservation as either endangered, threatened, or of special concern. The U.S. Fish and Wildlife Service is reviewing 3 of these for possible listing as threatened or endangered species. An additional 10 state listed species are known to occur in the vicinity and may be present on the ORR.

Certain species can be accurately identified only during certain parts of the growing season. If suitable habitat for rare species is found in the survey area, additional visits may be required to confirm their presence or absence.

II. RESULTS OF FIELD INVESTIGATION

A. Project Area Description

The existing MVST Facility is located on Melton Valley Circle at the road junction with Chemical Waste Area Access Road. A part of the proposed project at the MVST-CI Facility, a proposed 12" potable water line, will be extended from the HFIR area. The proposed route of the water line will cross Melton Valley Circle north of Melton Branch Creek, continue as an elevated crossing of Melton Branch Creek, cross Melton Valley Circle south of the creek, then will continue west paralleling the road to the MVST Facility. The area traversed by the proposed water line includes undeveloped areas of mixed hardwood forest on upland slopes and in the riparian area adjacent to Melton Branch Creek. The proposed site for the new MVST-CI is a cleared upland area located immediately behind a developed site.

B. Preliminary Rare Plant Survey Results

The northern end of the proposed project, where the new line would connect with an existing line, is located in an upland hardwood-pine forested area. Overstory vegetation includes sweet gum (Liquidambar styraciflua), white oak (Quercus alba), beech (Fagus grandifolia), shortleaf pine (Pinus echinata), and Virginia pine (Pinus virginiana). Understory species include flowering dogwood (Cornus florida), sugar maple (Acer saccharum), beech, and sweet gum. Ground cover species include Japanese honeysuckle (Lonicera japonica), nepal grass (Eulalia viminea), elephant's foot (Elephantopus tomentosus), and Christmas fern (Polystichum acrostichoides). Some portions of this area are dominated by Virginia pine with a sweet gum understory. Groundcover species are similar to those listed above.

The proposed water line route also crosses Melton Branch and its floodplain. Overstory vegetation in this area includes red maple (Acer rubrum), sweet gum, loblolly pine (Pinus taeda), sycamore (Platanus occidentalis), and hackberry (Celtis occidentalis). Understory species include silky dogwood (Cornus amomum), red maple, green ash (Fraxinus pennsylvanica) and cane (Arundinaria gigantea). The dominant ground cover species is Nepal grass with Japanese honeysuckle, bedstraw (Galium triflorum), wingstem (Verbesina sp.) and scattered grasses also present.

The section of the water line which will parallel Melton Valley Circle is located near the bottom of a slope. Vegetation varies greatly with slope angle and aspect. Common canopy species include white oak, red cedar (Juniperus virginiana), and Virginia pine. Understory species include flowering dogwood, redbud (Cercis canadensis), and sweet gum. The dominant groundcover species are Japanese honeysuckle and Nepal grass.

The site of the proposed MVST-CI is a cleared area. Much of this area is graveled and has little vegetation. Part of the site and the area around it is an open field that is dominated by broom sedge (Andropogon virginicus).

No rare plant species were observed during the spring-early summer field survey. Melton Branch floodplain is potential habitat for four species listed as threatened by the State of Tennessee. These species are the Canada lily (Lilium canadense), Michigan lily (L. michiganense), tubercled rein-orchid (Platanthera flava var. herbiola), and purple fringeless orchid (Platanthera peramoena). However, these species were not observed on the dates of

the field survey. There was no potential habitat for any of the rare plant species that have mid- to late-season emergence or flowering. Therefore, a late season survey will not be required.

Rebecca Cook/mac

Rebecca Cook, Botanist, Rare Plant and Wetland Surveys,
Bldg. 1506, MS-6034, ORNL

cc. Lorelei Jacobs, Bldg 1000, MS-6342
R. Macon, Bldg. 3042, MS-6060

References

Cunningham, M., L. Pounds, P. Parr, and L. Edwards. In preparation. Rare Plants on the Oak Ridge Reservation.

August 21, 1992

David Mabry, ~~Bldg 3550~~, MS-~~6291~~

Re: MVSTCIP - REVISED WETLAND SURVEY INFORMATION

In a March 13, 1992, memo which presented the results of the rare plant and wetland survey for the above referenced project it was reported that wetlands exist in the Melton Branch floodplain in the area of the proposed potable water line crossing. This report was based on the finding of hydric soils, standing water, and hydrophytic vegetation.

As part of another project, a wetland delineation of the Melton Branch floodplain is being performed. During the course of the delineation on August 21, it was discovered that the earlier wetland report for this area is incorrect. The vegetation community is dominated, as reported, by hydrophytic vegetation. However, the hydric soils were found to exist only in a very small area within a natural surface drainage feature. There was little or no vegetation present in the hydric soil area.

Therefore, the March 13 findings should be revised to report that no wetlands are present on the proposed route of the MVSTCIP potable water pipeline.

If you have any questions, please do not hesitate to call me.

Barbara A. Rosensteel, Coordinator, Rare Plant and Wetland Surveys, Bldg. 1506, MS-6034, ORNL (6-2372)

cc: S. J. Davidson, Bldg. 3042, MS-6060
D. A. Conatser, Bldg. 1000, MS-6338
L. Jacobs, Bldg. 1000, MS-6342
R. Macon, Bldg. 3042, MS-6060

August 31, 1992

Rich Saylor, Bldg 4500N, MS-6200

EXPANDED AREA WETLAND AND RARE PLANT SURVEY FOR THE RH BUNKER

A wetland, rare plant, and stream survey was conducted for an expanded area around the new proposed location of the RH Bunker. The expanded area extended from the formerly proposed site for the RH Bunker, east across the proposed WHPP site, and in areas south and east of the shale fracture facility. (See enclosed map).

With the exception of the previously delineated wetland (May 8, 1992 memo to R. Saylor) and a small (< 0.05 acre) wetland on an intermittent stream, there were no wetlands found in the expanded survey area.

There are four drainages in the survey area. One of the drainages is located upstream of, and is the water source for, the previously delineated wetland. There was flowing water in this drainage which emanated from a hillside seep. Because of the groundwater connection, this surface water feature would be classified as an intermittent stream.

Two of the drainages are located behind (south of) the shale fracture facility. Both of these drainages were rerouted to the west during facility construction. The easternmost of these drainages flows under the facility fence and through a channel behind the storage casks before joining the first drainage channel. In their upstream portions, south of the facility, the drainages appear to be wet-weather conveyances. No water was in the channels and no groundwater seeps were observed. However, both drainages begin to pick up groundwater just upstream of their man-made confluence at the southwest corner of the facility outside of the facility fence. Because of the groundwater connection, the Tennessee Department of Environment and Conservation (TDEC) may consider the downstream channel, which flows parallel to the facilities western fence, to be a stream rather than a wet-weather conveyance. There are two old road crossings of this stream. Upgrading and use of these crossings, or construction of a new crossing, for access to the proposed WHPP facility may require a ARAP general permit (stream crossing or wet-weather conveyance fill) from the TDEC. It is advisable to move the boundary of the WHPP facility as it is shown on the most recent map (8/28/92) toward the west to avoid filling the stream channel (See map).

A third drainage is located to the east of the shale fracture facility. The upper portion of this drainage appears to be a wet-

weather conveyance. The upstream section consists of a deeply cut channel that is probably the result of past erosion, and wider areas of shallow, braided channels. No surface water or groundwater seeps were observed in the upper section on the day of the survey. Groundwater discharge to the channel is evident in the vicinity of the old cabin remains in the downstream section of this drainage. The downstream section of the drainage is, therefore, considered to be a stream.

A small (<0.05 acre) wetland is present in the groundwater discharge area. The dominant species is microstegium (Eulalia viminea). The soils have a low chroma matrix with mottles. This type of small, microstegium-dominated wetland is commonly found in groundwater discharge areas along small streams on the Oak Ridge Reservation.

One rare plant species was found in the expanded survey area. A specimen of lesser ladies-tresses (Spiranthes ovalis) was found in the drainage upstream of the previously delineated wetland. Lesser ladies-tresses is listed as a species of special concern by the State of Tennessee due to their rarity in Tennessee (Appendix 1). No additional rare plants were observed in the remainder of the expanded survey area. A botanical and rare plant survey was conducted in parts of this area in 1988 and 1989 for the WHPP project. No rare plants were found in the area during this earlier survey. A description of the vegetation communities in the project area is found in the report, entitled "Vegetation of the Proposed Site for the ORNL Waste Handling and Packaging Plant (WHPP)" prepared by Pounds, et al. (1988) and sent to A.W. Campbell. plant species were observed during these earlier surveys.

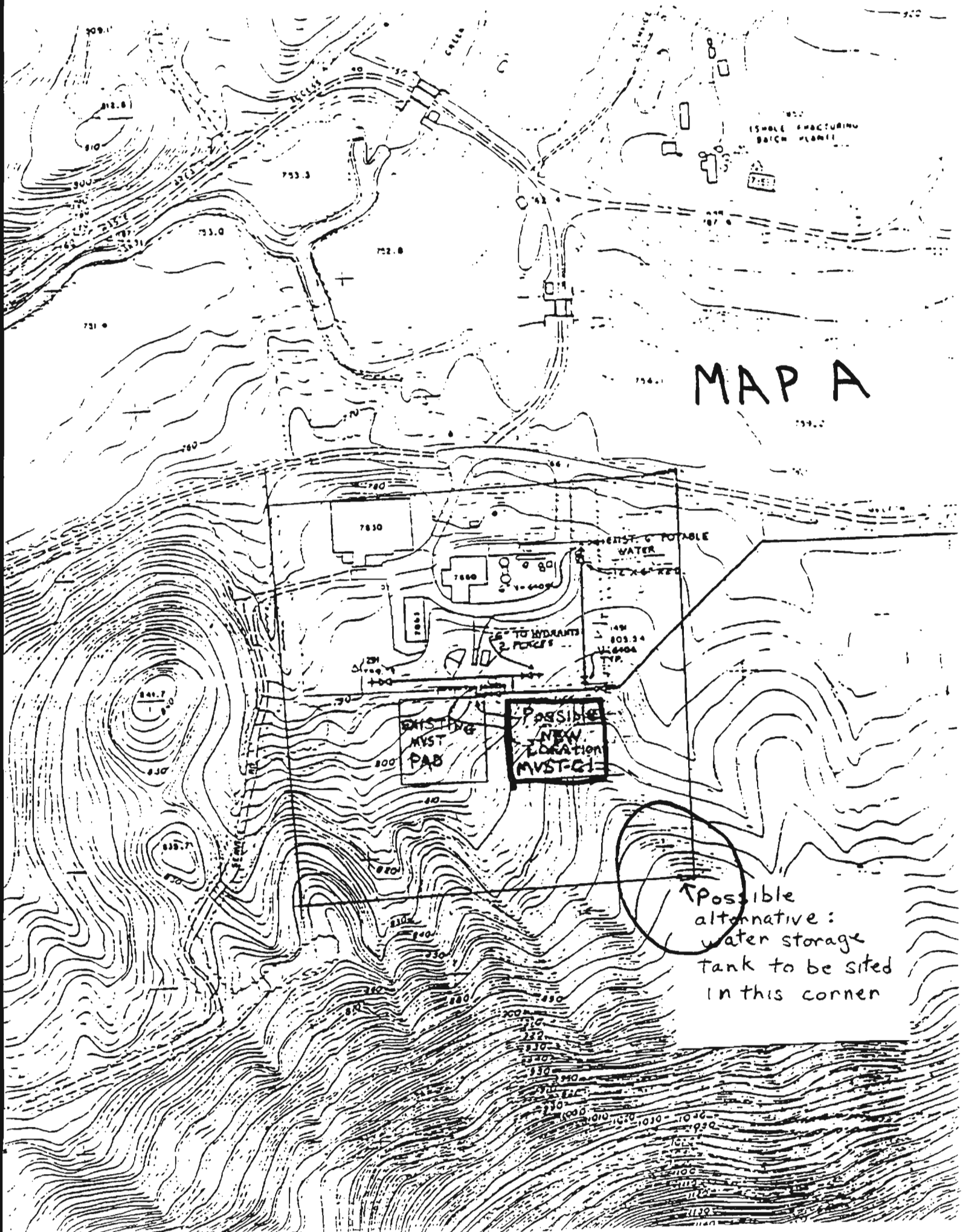
There are no wetlands, streams, wet-weather conveyances, or rare plants in the new location proposed for the RH Bunker. The WHPP site will not impact any wetlands or rare plants, however, a portion of the WHPP site and access road will cross a stream.

If you have any questions, please do not hesitate to call me.

Barbara A Rosensteel

Barbara A. Rosensteel, Associate Biologist, Rare Plant and Wetland Surveys, Bldg. 1506, MS-6034, ORNL (6-2372)

cc: L.C. Cox, Bldg. 1000, MS-6338
T. L. Adair, Bldg. 3001, MS-6029
T. F. Scanlan, Bldg. 3047, MS-
M. St. Louis, Mitchell Bldg., MS-6495
N. Lowe, Bldg. 3042, MS-6060


MAP A
7830
7880
EXIST. 6" POTABLE WATER
6" TO HYDRANTS & FENCES
EXISTING MVST PAD
Possible NEW LOCATION MVST-G1
↑Possible alternative: water storage tank to be sited in this corner

November 19, 1992

David Mabry, Mitchell Bldg., MS-6282

MVST-CI - Possible New Location and Possible Location for New Water Storage Tank

On November 18, 1992, I received a map copy from Marge Irby which shows the possible new location for the MVST-CI and a new water storage tank and was asked to assess these locations for wetland and/or rare plants from existing information.

This general area has been surveyed for rare plants and wetlands within the past year for several projects (MVST-CI; RHTRU Waste Storage Bunker; WAG 6 Proposed Haul Road Route). No wetlands or rare plants were identified on or in the immediate vicinity of the areas indicated for the MVST-CI and the water storage tank as shown on attached map A. Intermittent streams and wet-weather conveyances were identified in the areas surrounding the existing hydrofracture facility. The approximate locations of these are shown on the map which was completed for the RHTRU Waste Storage Bunker survey (attached memo to Rich Saylor dated August 31, 1992).

If you have any questions, please do not hesitate to call me.

Barbara A. Rosensteel

Barbara A. Rosensteel, Associate Biologist,
Rare Plant and Wetland Surveys
Bldg. 1506, MS-6034 (6-2372)

cc: Marge Irby, Bldg. 4500N, MS-6206
S.J. Davidson, Bldg. 3042, MS-6060
D.A. Conatser, Bldg. 1000, MS-6338
L. Jacobs, Bldg. 1000, MS-6338
R. Macon, Bldg. 3042, MS-6060

MARTIN MARIETTA

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

November 9, 1992

Hal Clem, Chinn Bldg, MS-6282
Peter Souza, 130 Mitchell Bldg, MS-6282

RESULTS OF THE RARE PLANT SURVEY - PROPOSED WAG 6 HAUL ROAD AND WAG 2

The rare plant survey report for the proposed WAG 6 Haul Road and WAG 2 is enclosed. If you have any questions, please do not hesitate to call me.

Barbara A. Rosensteel

Barbara A. Rosensteel, Associate Biologist
Rare Plant and Wetland Surveys, Bldg. 1506, MS-6034, ORNL (6-2372)

cc: Don Garrett, Bldg. 1000, MS-6338
Harry Boston, Bldg. 1504, MS-6038
Dawn Miller, Bldg. 1504, MS-6038

RARE PLANT SURVEY FOR WAG 2 AND PROPOSED ROUTE OF WAG 6 HAUL ROAD

I. INTRODUCTION

A rare plant survey of WAG 2 and the proposed route of the WAG 6 Haul Road was conducted between April and September, 1992, by Rebecca Cook and Larry Pounds. The location and boundaries of the areas surveyed are described in the Wetland Delineation Report (October, 1992) for these projects.

During a rare plant survey, the site is searched for plant species that are listed or proposed for listing as endangered (E), threatened (T), or of special concern (S) by the State of Tennessee and/or the U.S. Fish and Wildlife Service (USFWS) and for potential habitat for these species. Currently there are 18 species on the Oak Ridge Reservation (ORR) that are listed by the Tennessee Department of Environment and Conservation (TDEC). The USFWS is reviewing four of these for possible federal listing. An additional ten state listed species are known to occur in the vicinity of the ORR and may be present on the reservation.

II. SURVEY FINDINGS

Two state-listed species, lesser ladies-tresses and butternut, were found in the survey area. In addition, it is highly likely than an unlisted but rare species, the river bulrush, is growing in a wetland adjacent to White Oak Lake. A list of the rare plant species found on the ORR and and explanation of the status codes is presented in Table 1. The species locations are shown on the attached map.

Butternut (Juglans cinerea)

The butternut is a tree more common to the north and west of Tennessee. It is listed as threatened by the TDEC and is a candidate for federal listing (C2). A disease is affecting this species throughout its range and the butternut could possibly experience the type of decline that has affected the American chestnut (Castanea dentata). Those trees that would be significant to the preservation of the species would be those specimens that are displaying disease resistance by thriving and/or producing nuts.

One 5-meter tall specimen was found in WAG 2 on the south bank of White Oak Embayment. The tree appeared to be dying. For this reason, this particular specimen seems unlikely to be significant to the preservation of the species.

Lesser ladies' tresses (Spiranthes ovalis)

Lesser ladies' tresses are listed as a species of special concern by the TDEC. It is not federally listed nor a federal candidate for listing. Based on evidence from collections, this species has appeared to become much more common in its range (eastern North America) since the conversion of mature forests to immature forests. There seems to be little threat to this species from loss of habitat. While lesser ladies' tresses occurs infrquently on the ORR, it does occur in widespread and varied habitats. In WAG 2 this species was found under a forest canopy on the Melton Branch floodplain and among roadside grasses.

River Bulrush (Scirpus fluviatis)

A sedge that is highly likely to be identified as Scirpus fluviatis was found in an emergent-scrub/shrub wetland near the confluence of a small tributary with White Oak Lake on the north side of the lake. A sample was collected to determine the plants identity, however, a final determination will require plants with fruits. Unfortunately, this species often goes many years without fruiting. There are two other species that are similar in appearance to Scirpus fluviatis, however, these species are more common to coastal marshes.

While river bulrush currently has no state or federal status, it probably will be considered for state listing. Until 1992, it had not been known to occur in Tennessee or in the southeastern U.S., but has been recently reported from Henry County, Tennessee (Edwards and Wofford, 1992). This sighting is the first known occurrence of this species in the southeastern U.S.

The river bulrush could be a recent arrival in east Tennessee. The seeds may have been carried into the area by waterfowl, and the reported occurrences in Tennessee may represent range expansion. Alternatively, the ORR population may be derived from a local unreported population (perhaps along the Clinch River) which has been isolated from the main range of the species for a sufficient period of time to evolve a genetically distinct population. The ORR population would then be significant from the standpoint of genetic diversity and preservation of biodiversity, even if it is not currently a state-listed species. Genetic distinctiveness can sometimes be determined by morphological or electrophoretic studies. Protection of the wetland area in WAG 2 where this species appears to be occurring is recommended.

Table 1. Status of rare and endangered plants on the Oak Ridge Reservation (as of August, 1992)

Scientific Name	Common Name	State Status	Federal Status
Aureolaria patula	Spreading false-foxglove	T	C1
Carex gravida	Gravid sedge	S	
Cimicifuga rubifolia	Appalachian bugbane	T	C2
Cypripedium acaule	Pink lady-slipper	E*	
Delphinium exaltatum	Tall larkspur	E	C2
Diervilla lonicera	Northern Bush-honeysuckle	T	
Elodea nuttallii	Nutall waterweed	S	
Fothergilla major	Mountain witch-alder	T	
Hydrastis canadensis	Golden seal	T	3C
Juglans cinerea	Butternut	T	C2
Lilium canadense	Canada lily	T	
Lilium michiganense[1]	Michigan lily	T	
Liparis loeselii	Fen orchid	E	
Panax quinquefolium	Ginseng	T	3C
Platanthera flava var herbiola	Tubercled rein-orchid	T	
Platanthera peramoena	Purple fringeless orchid	T	3C
Saxifraga careyana	Carey saxifrage	S	3C
Spiranthes ovalis	Lasser ladies-tresses	S	

[1]*Lilium michiganense* may have been extirpated from ORR by the impoundment at Melton Hill.

Explanation of status codes used (adapted from the Tennessee Department of Conservation, Ecological Services Division, Rare and Endangered Plant Listing, January 17, 1991)

State

E - Endangered. Species now in danger of becoming extinct in Tennessee because of (a) their rarity throughout their range, or (b) their rarity in Tennessee as a result of sensitive habitat destruction or restricted area of distribution.

E* - Taxa considered to be endangered in Tennessee due to evidence of large numbers being taken from the wild and lack of commercial success with propagation or transplantation.

T - Threatened. Species likely to become endangered in the immediately foreseeable future as a result of rapid habitat destruction or commercial exploitation.

S - Special concern. Species requiring special concern because of (a) their rarity in Tennessee because the state represents the limit or near-limit of their geographic range, or (b) their status is undetermined because of insufficient information.

Federal (Determined by the U.S. Fish and Wildlife Service)

C1 - Taxa for which the U.S. Fish and Wildlife Service has on file substantial information on biological vulnerability and threats to support the appropriateness to list them as endangered or threatened species. Included are those taxa whose status in recent past is known, but may have already become extinct.

C2 - Taxa for which information now in possession of the Service indicated that proposing to list them as endangered or threatened is appropriate, but for which substantial data on biological vulnerability and threat(s) are not currently known or on file to support a proposed rule.

3C - Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.

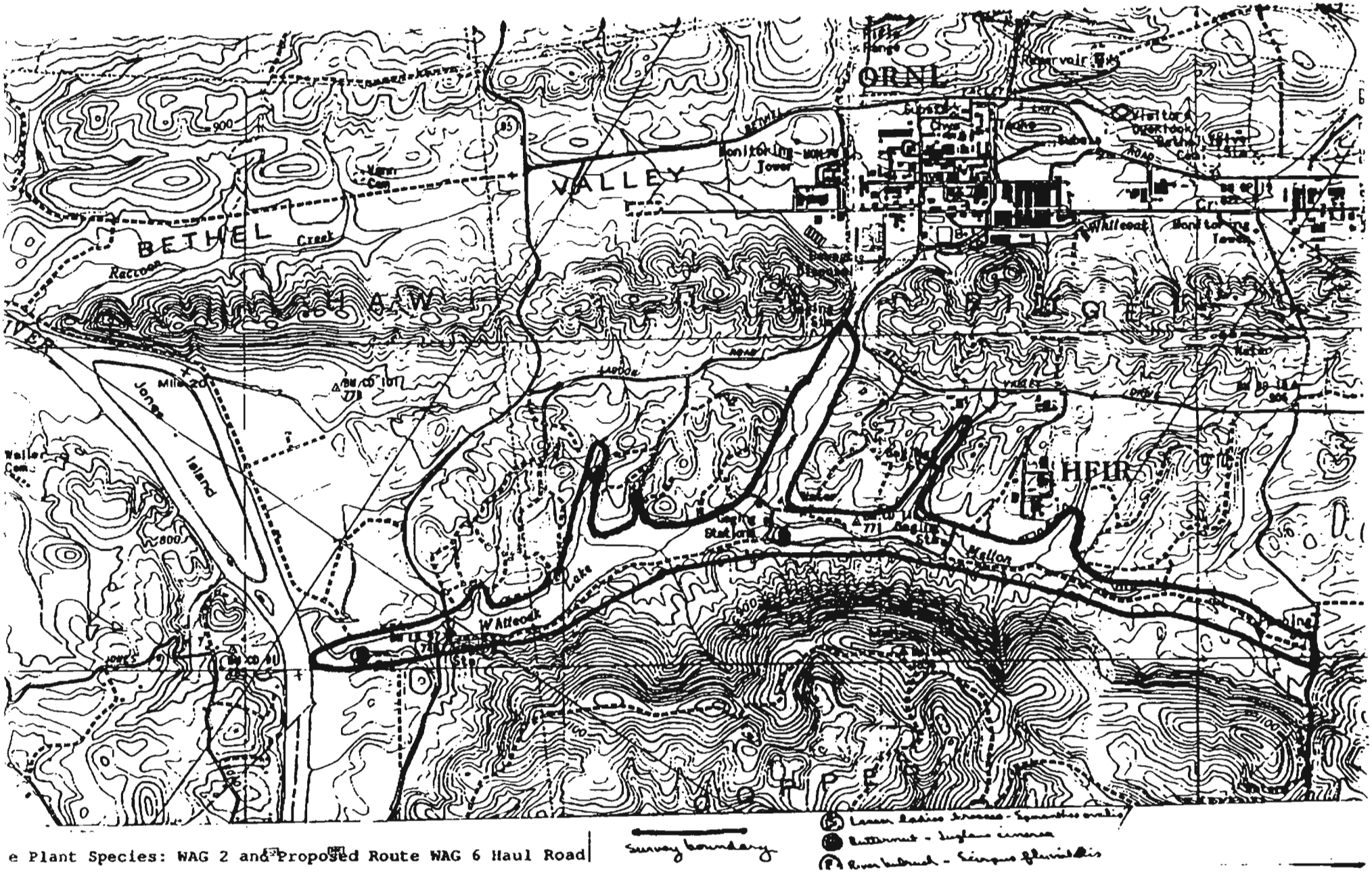
Note: The taxa listed in Categories 1 and 2 may be considered candidates for addition to the list of endangered and threatened plants and, as such, consideration should be given them in environmental planning.

References

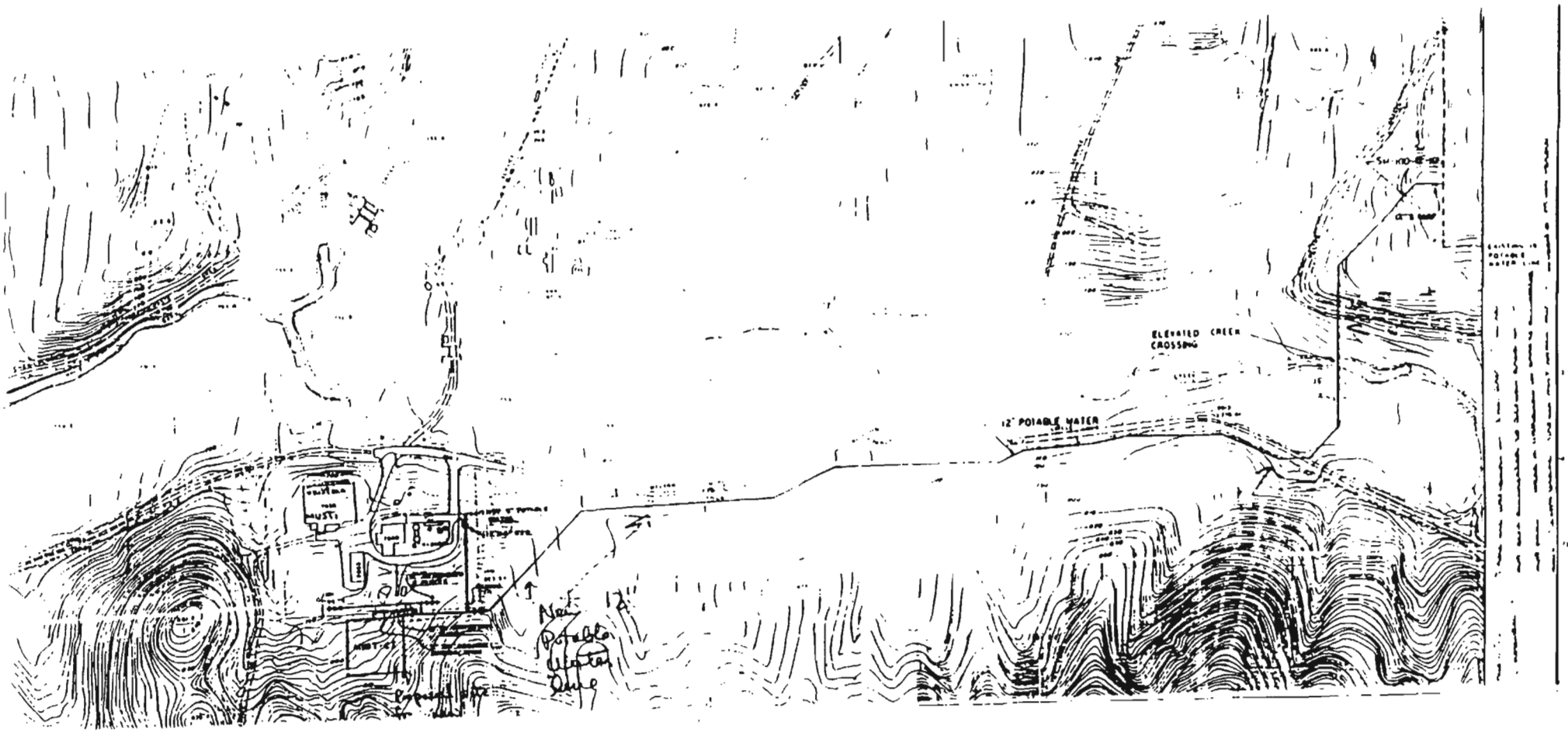
Chester, Edward H. and E. Wofford. 1992. Scirpus fluviatilis (Cyperaceae) in Tennessee and the Southeast. SIDA Vol. 15: pp. 157-159.

Tennessee Department of Environment and Conservation, Ecological Services Division. Rare and Endangered Plant List. January 17, 1991.

U.S Fish and Wildlife Service. Endangered and Threatened Plant Species List. 50 CFR Ch. 1, Part 17 et.seq. Revised July 15, 1991.



e Plant Species: WAG 2 and Proposed Route WAG 6 Haul Road


ELEVATED CREEK CROSSING
12" POTABLE WATER
New Potable Water Line

APPENDIX C

DOE CONSULTATION WITH THE STATE HISTORIC PRESERVATION OFFICER

United States Government

Department of Energy

Oak Ridge Operations Office

memorandum

DATE October 20 , 1993

REPLY TO ATTN OF SE-311:Moore

SUBJECT MELTON VALLEY STORAGE TANK - CAPACITY INCREASE

TO: Mark Belvin, X-10 Site Office, ER-114

Attached is a letter from the Tennessee Historical Commission (SHPO) that concurs with the DOE/ORO cultural resource determination for the subject proposed project. With receipt of this letter, DOE/ORO has complied with Section 106 of the National Historic Preservation Act.

If you have any questions pertaining to the SHPO's letter please call me at 576-9574.

Ray T. Moore

Ray T. Moore
Environmental Protection Division

Attachment

cc w/attachment:
Peter Souza, MS 6282, Bldg. 130 MIT
Jim Rogers, MS 7155, K-25
Nancy Hendrix, EW-912

Office of Environmental Review and Documentation Section

Dist: By Helen Braunstein _____

~~Clow~~	Robinson
Cox ✓	Rosenberg
Hall ✓	Souza ✓
Johnson ✓	Thompson
Mabry ✓	NEPA Files ✓
Marlino	Reg. Files
	Other

TENNESSEE HISTORICAL COMMISSION
701 BROADWAY
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0442

September 30, 1993

Ray Moore
Environmental Protection
P. O. Box 2001
Oak Ridge, Tennessee 37831-8739

Re: DOE, MELTON VALLEY STORAGE TANK INC., OAK RIDGE, ROANE COUNTY,

Dear Mr. Moore:

Pursuant to your request, this office has reviewed your letter dated September 17, 1993, plus an Archaeological Reconnissance Report relative to the above-referenced undertaking. Based on available information, we find that the project area contains no cultural resources eligible for listing in the National Register of Historic Places.

Therefore, this office has no objection to the implementation of this project. Should project plans change, please contact this office to determine what additional steps, if any, are required to comply with Section 106. Questions and comments may be directed to Joe Garrison (615)532-1559. Your cooperation is appreciated.

Sincerely,

Herbert L. Harper
Executive Director and
Deputy State Historic
Preservation Officer

HLH/jyg

APPENDIX D

NOTICE OF FLOODPLAIN/WETLANDS INVOLVEMENT FOR ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT ACTIVES AT THE DOE OAK RIDGE RESERVATION, OAK RIDGE, TENNESSEE

Notice of Floodplain/Wetlands Involvement for Environmental Restoration and Waste Management Activities at the Department of Energy's Oak Ridge Reservation; Oak Ridge, TN

AGENCY: Department of Energy (DOE).

ACTION: Notice of floodplain and wetlands involvement.

SUMMARY: DOE proposes to perform environmental monitoring and site characterization, as well as extensive remedial action activities at the Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee. Some areas of the approximately 50,000-acre reservation, as well as areas where baseline information is sought, are within floodplains or include wetlands, and some proposed environmental monitoring and environmental restoration and waste management activities would take place in floodplains or wetlands. Site characterization and remedial actions would be undertaken pursuant to the applicable provisions of the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Some of the proposed actions could affect wetlands on or around the site or be located in the floodplains of Poplar Creek, East Fork Poplar Creek, Bear Creek, Scarboro Creek, White Oak Creek and its tributaries, and the Clinch River and its tributaries. In accordance with 10 CFR part 1022, DOE will prepare a floodplain and wetlands assessment and will perform the proposed actions in a manner so as to avoid or minimize potential harm to or within the affected floodplains and wetlands. Maps and further information on the proposed actions are available from DOE at the address below.

DATES: Comments on the proposed action are due to the address below no later than October 18, 1993.

ADDRESSES: Comments should be addressed to: Ms. Nancy K. Hendrix-Ward, National Environmental Policy Act, Program Manager, Environmental Restoration Division, U.S. Department of Energy, Information Resource Center, Post Office Box 2001, Oak Ridge, Tennessee 37831–8541. FAX comments to: (615) 576–6074.

FOR FURTHER INFORMATION CONTACT: Information on general DOE floodplain/wetlands environmental review requirements is available from: Ms. Carol M. Borgstrom, Director, Office of NEPA Oversight (EH–25), U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20585 (202) 586–4600 or (800) 472–2756.

SUPPLEMENTARY INFORMATION: DOE proposes to carry out site characterization, as well as remedial/corrective activities at the ORR, some of which would be located with floodplains or wetlands. The proposed actions include:

1. Collection of Samples—Collection of samples for environmental monitoring, site characterization, and treatability studies will be conducted to better understand the nature of the environment around the ORR and to identify possible releases of contaminants or movement of contaminants already released to the environment. Environmental monitoring would occur throughout the site and would continue for the continue for the foreseeable future. Site characterization is tied chiefly to Remedial Investigations/RCRA Facility Investigations (RI/RFI) under CERCLA and RCRA and would be performed for each of the operable units (OUs).

The following types of activities could occur in a floodplain or wetland: (a) Sampling of air, surface water, ground water, sediments, surface and deeper soils; sampling, assessment, and evaluation of terrestrial and aquatic biota, and measurement of meteorological characteristics; (b) drilling of boreholes to obtain soil/geological samples (some of the boreholes would be completed as ground-water monitoring wells); (c) digging soil test pits by hand or backhoe; (d) taking a variety of noninvasive surveys (such as radiological surveys); (e) taking invasive surveys (such as with soil penetrometers and similar devices); and (f) conducting underground tests (such as aquifer pump, tracer geophysical log, vertical seismic profile, and seismic tests). The majority of the remaining RI/RFI field work to be done at ORR is in OUs that are comprised of predominantly upland areas. Only a few sampling locations, such as those needed for surface waste, sediment, and a very few boreholes or wells and soil test pits, are expected to be in floodplains or wetlands.

2. Drilling or abandonment of boreholes and monitoring wells—Drilling new boreholes and monitoring wells involves driving a drilling rig to the designated site and drilling a hole, usually within a 1-day time-frame. It is possible that ome of the wells be drilled in wetlands. Drilling sites would be located outside of wetlands whenever possible.

When relocation is not possible, measures will be taken to minimize disturbance of wetlands, as appropriate. Travel within floodplains will be restricted to established roads and tracks where available; if unavailable, measures will be taken to minimize the disturbance to the floodplain, as appropriate.

Abandoning a well typically involves removal of all foreign material from the well, including the existing bentonite grout, the bentonite seal, the silica-sand filter, and the well casing. The casing can be removed by one of several different methods—pulling it out of the well, destroying the casing in the hole and removing the pieces, over-drilling, or over-coring. Each of these methods involves driving a drilling rig to the well site. Once in the field, it may be determined that some casings are not removable due to well depth, casing condition, or other factors. In these situations, the well casing and possibly the protective surface casing (a larger diameter pipe surrounding the upper portion of the well casing) will be left in place. Abandonment will be accomplished in this manner only when necessary. If the casing is removed, regardless of the removal method used, the resulting hole is reamed to the original construction depth and diameter to remove any remaining annular material and debris. The borehole is then filled with bentonite grout. For wells whose casing is not removed, abandonment would be accomplished by filling the casing with bentonite grout. The well casing and protective casing would be cut off below the ground surface. A concrete pad would be poured at all well abandonment locations to provide a surface seal. A metal cap showing the well identification number and the date of abandonment would be anchored to the concrete slab. Abandonment of a well would typically take 1 to 2 days, depending on the method used and the depth of the well.

3. Construction and Operation—Construction and operation of interim and final remedial/corrective actions and the construction and operation of buildings to implement or facilitate these actions will be based on the results of the RI/RFI being conducted or planned. These proposed actions may consist of in-situ treatment, bioremediation, ground-water treatment, surface water treatment, soil treatments, and soil excavation. While remedial actions are expected to be constructed outside floodplains or wetlands, portions of such projects (particularly activities such as water collection, sampling, and installation of monitoring or similar devices) could be located

within floodplains or could affect wetlands.

4. Upgrading sanitary sewer or existing collection and transfer pipelines—This would typically involve replacement and hook-up of previously existing pipelines with improved materials; removal of old, unused and/or contaminated lines; or redirection of existing lines to improve the collection of wastes. The process would involve: (a) exposing the existing pipe by hand or backhoe or some other manual means; (b) obtaining a variety of noninvasive and invasive surveys; (c) removal or movement of existing lines, and (d) installation of new pipelines.

5. Placement of small-scale treatment units—This process normally involves the acquisition of required permits, siting and construction of buildings or renovations to existing buildings, and installation of treatment systems. Operation of such a treatment unit normally includes the transportation of stored wastes between storage facilities—and treatment areas. Decommissioning and dismantlement of the treatment system is completed at the end of its useful life or previously-defined time-frame. Handling, storage, and disposal of any residual wastes from the use and shutdown of such a facility would complete the activities surrounding the placement of small-scale treatment units.

6. Siting, construction and upgrades of waste management facilities—This process is usually done to maintain compliance with the Administrative Consent Order and Federal Facility Compliance Agreement between the particular facility, DOE, and EPA.

Various measures are normally taken during construction activities to mitigate potential impacts of all areas of the existing environment and minimize the possibility of allowing a release. Site work would consist of construction or upgrade of driveways from existing streets to the facility, and establishment or extension of utilities from existing distribution systems. In addition, buildings would have all applicable permits; their design and operation would be in accordance with all environmental, safety and health regulations.

In accordance with DOE regulations for compliance with floodplain and wetlands environmental review requirements (10 CFR part 1022), DOE will prepare a floodplain and wetland assessment for the proposed actions. For an action involving floodplains or wetlands, a Statement of Findings, as required by 10 CFR part 1022, will be issued separately or included in a NEPA document when the floodplain and wetland assessment has been completed and prior to taking the action. The Statement would be published in the Federal Register if an Environmental Assessment or Environmental Impact Statement is not prepared.

Clyde W. Frank,

Acting Principal Deputy Assistant Secretary for Environmental Restoration and Waste Management.

[FR Doc. 93-24310 Filed 10-1-93; 8:45 am]

BILLING CODE 6450-01-M

Federal Energy Regulatory Commission

[Docket No. RP93-198-000]

Alabama-Tennessee Natural Gas Co.; Proposed Change in FERC Gas Tariff

September 28, 1993.

Take notice that on September 21, 1993, Alabama-Tennessee Natural Gas Company (Alabama-Tennessee), tendered for filing as part of its FERC Gas Tariff, Second Revised Volume No. 1, Third Revised Sheet No. 4, with a proposed effective date of October 1, 1993.

According to Alabama-Tennessee, this filing reflects a Transportation Cost Rate Adjustment pursuant to Section 33.4 of the General Terms and Conditions of its FERC Gas Tariff resulting from the elections made by Alabama-Tennessee's former bundled firm sales customers in connection with the implementation by Alabama-Tennessee of the Commission's Order No. 636. According to Alabama-Tennessee, 3,693 dekatherms of upstream firm capacity formerly held by Alabama-Tennessee on Tennessee Gas Pipeline Company were stranded.

Alabama-Tennessee has requested a waiver of § 154.22 of the Commission's Regulations and any such other waivers of the Commission's Regulations as may be necessary to permit the tariff sheet to become effective as proposed.

Alabama-Tennessee states that because of the numerous additional tasks required in connection with the implementation of the Commission's Order No. 636 on September 1, 1993 on its system, as well as the normal day-to-day duties that required the attention of its limited staff, this filing was inadvertently not prepared in time to file within the Commission's 30 day notice requirements under 18 CFR 154.22 (1993). According to Alabama-Tennessee, however, this filing reflects costs regarding which all of its customers were aware. Alabama-Tennessee further states, that if it is not allowed to recover these costs through this filing, these costs could be deferred and charged to future ratepayers. For this reason, Alabama-Tennessee states that good cause exists for granting waiver of the Commission's 30 day filing requirements under § 154.22 of the Commission's Regulations.

Any person desiring to be heard or to protest said filing should file a motion to intervene or protest with the Federal Energy Regulatory Commission, 825 North Capitol Street, NE., Washington, DC 20426, in accordance with Rule 211 or Rule 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211 and 385.214. All such motions or protests should be filed on or before October 5, 1993. Protests will be considered by the Commission in determining the appropriate action to be taken but will not serve to make protestants parties to the proceeding. Any person wishing to become a party to the proceeding must file a motion to intervene. Copies of this filing are on file with the Commission and are available for public inspection.

Lois D. Cashell,

Secretary.

[FR Doc. 93-24249 Filed 10-1-93; 8:45 am]

BILLING CODE 6717-01-M

[Docket No. RP89-178-005]

Colorado Interstate Gas Co.; Refund Report

September 28, 1993.

Take notice that on September 20, 1993, Colorado Interstate Gas Company (CIG) filed with the Federal Energy Regulatory Commission (Commission) a report of refunds totaling $1,529,693.73 it made on August 20, 1993 to its jurisdictional customers which it received from Northwest Pipeline Corporation pursuant to Ordering Paragraph (B) of Commission order issued September 24, 1992 in Docket No. RP89-137-000, *et al.* CIG states that it made a lump-sum cash refund to its jurisdictional customers equal to the jurisdictional portion of the refunded principal amount plus applicable interest.

Any person desiring to protest said filing should file a protest with the Federal Energy Regulatory Commission, 825 North Capitol Street, NE., Washington, DC 20426, in accordance with Rule 211 of the Commission's Rules of Practice and Procedure 18 CFR 385.211. All such protests should be filed on or before October 5, 1993. Protest will be considered by the Commission in determining the appropriate action to be taken, but will not serve to make protestants parties to the proceeding. Copies of this filing are

DOE F 1325.8
(4/93)

United States Government **Department of Energy**

Oak Ridge Operations Office

memorandum

DATE: May 25, 1995

REPLY TO ATTN OF: EW-922:Pepper

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE MELTON VALLEY STORAGE TANKS CAPACITY INCREASE PROJECT AT OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE (DOE/EA-1044)

TO: Robert D. Dempsey, Assistant Manager for Environmental Management, EW-90

The above-referenced Environmental Assessment (EA) dated April 1995 has been reviewed in accordance with our delegated responsibilities under a Department of Energy memorandum from Tara O'Toole to Joe La Grone dated October 21, 1994, "Delegation of Environmental Assessment Approval Authority." Based upon this review, recommendations made by your staff, and after consultation with the Office of Chief Counsel and the National Environmental Policy Act (NEPA) Compliance Officer, I have determined that the EA is adequate for publication and is hereby approved. I have also determined that within the meaning of NEPA, the proposed action is not a major Federal action significantly affecting the quality of the human environment. Therefore, the preparation of an Environmental Impact Statement is not required. The basis for this determination is explained in the attached Finding of No Significant Impact (FONSI).

Please note that your office is responsible for providing public notice of the availability of the EA and FONSI in accordance with 40 CFR 1506.6(b); 10 CFR 1021.322; and Department of Energy Order 5440.1E, paragraph 6A (24). I am providing a copy of these documents for your files.

James C. Hall
Acting Manager

Attachments

cc w/attachments:
C. Borgstrom, EH-42, HQ/FORS
M. Kleinrock, EM-22, HQ/FORS
J. Rhoderick, EM-321, HQ/TREV II
B. DeMonia, EW-92, ORO
C. Pepper, EW-92, ORO
P. Phillips, SE-311, ORO
L. Radcliffe, EW-92, ORO
DOE Public Reading Room, ORO
D. Mabry, 130 MIT, MS 6282

FINDING OF NO SIGNIFICANT IMPACT

Melton Valley Storage Tanks Capacity Increase Project

Oak Ridge National Laboratory, Oak Ridge, Tennessee

AGENCY: U.S. DEPARTMENT OF ENERGY

ACTION: FINDING OF NO SIGNIFICANT IMPACT

SUMMARY: The U.S. Department of Energy (DOE) has completed an environmental assessment (DOE/EA-1044) of the proposed Melton Valley Storage Tanks Capacity Increase Project (MVST CI) at the Oak Ridge National Laboratory in Oak Ridge, Tennessee. The proposed action would involve the construction and maintenance of six partially below-grade concrete vaults, each of which would contain one 100,000-gallon, stainless-steel tank for storage of liquid low-level radioactive waste (LLLW). Based on the results of the analysis reported in the EA, DOE has determined that the proposed action is not a major Federal action that would significantly affect the quality of the human environment within the context of the National Environmental Policy Act of 1969 (NEPA). Therefore, preparation of an environmental impact statement (EIS) is not necessary, and DOE is issuing this Finding of No Significant Impact (FONSI). Additionally, pursuant to Executive Order 11988, *Floodplain Management*, and 10 CFR 1022, *Compliance with Floodplain/Wetlands Environmental Review Requirements*, DOE reports in this EA that (1) there are no practical alternatives to locating a potable water pipeline in the floodplain of Melton Branch; and (2) to minimize impacts, pipeline construction would be limited to placement of footers in the floodplain of Melton Branch.

PUBLIC AVAILABILITY OF EA AND FONSI: The EA and FONSI may be reviewed at the following address and copies of the documents may be obtained from:

U.S Department of Energy
Public Reading Room
55 Jefferson Circle
Oak Ridge, Tennessee 37830.

FURTHER INFORMATION ON THE NEPA PROCESS: For further information on the NEPA process, contact:

Carol M. Borgstrom, Director
Office of NEPA Policy and Oversight (EH-42)
U.S. Department of Energy
1000 Independence Avenue SW
Washington, DC 20585 Phone: (202) 586-4600 or (800)472-2756.

BACKGROUND: The Oak Ridge National Laboratory (ORNL) is a multipurpose research facility in eastern Tennessee about 7 miles southwest of the City of Oak Ridge. LLLW is generated during research at several ORNL facilities and from ongoing environmental remediation activities. Currently, LLLW is collected and transferred by pipeline to an evaporator. The concentrate remaining after evaporation is pumped to eight MVSTs for storage. Action is necessary for DOE to comply with a 1992 Federal Facilities Agreement among DOE, the Environmental Protection Agency, and the State of Tennessee, Department of Environment and Conservation. The agreement requires that existing MVSTs be upgraded or replaced to meet new secondary containment standards and leak detection requirements. By implementation of the proposed action, DOE would replace existing MVSTs.

DESCRIPTION OF THE PROPOSED ACTION: The proposed action is the construction and maintenance of six partially below-grade concrete vaults, each of which would contain one 100,000-gallon stainless-steel tank for storage of LLLW. The action would be undertaken adjacent to existing MVSTs at ORNL. In addition to the new tanks, the proposed facility would include (1) a stainless-steel-lined vault adjacent to the concrete tank vault to contain process pumps and valves; (2) a ventilation system to maintain the tanks and vaults under negative pressure; (3) a buried and lined valve pit to connect the new piping to existing MVSTs and the LLLW evaporator; (4) a truck unloading facility consisting of a diked and covered concrete pad and pipe connections to receive chemicals or pump process wastes to trucks; and (5) a control, instrument, and equipment room for the new facility. A one-mile extension of a potable water line would be constructed from the High Flux Isotope Reactor area to the new MVSTs. When construction is complete, LLLW from the existing MVSTs would be transferred to the new tanks via existing LLLW transfer pipelines.

ALTERNATIVES: DOE considered the following alternatives to the proposed action: no action, cease generation of LLLW, storage at other ORNL facilities, source pretreatment/treatment, and storage at other DOE sites. With the exception of no action, which by law must be considered in an EA, these alternatives were dismissed from further evaluation for economic, institutional, or programmatic reasons.

ENVIRONMENTAL IMPACTS:

Air Quality

Excavation and earthmoving activities during construction would produce particulate emissions (fugitive dust), which would temporarily degrade local, onsite air quality. Common dust suppression measures would be used to minimize impacts. Modeling results indicate that, under worst-case meteorological conditions, the National Ambient Air Quality Standard for respirable particulate matter (PM-10 or particulates less than 10 microns in diameter) would not be exceeded, and offsite receptors would not be affected.

Transfer of LLLW from the existing MVSTs to the new tanks and maintenance of the new tanks would generate no non-radioactive atmospheric emissions. The proposed facility would be equipped with high-efficiency particulate air (HEPA) filters that would remove particulate radionuclides. Based on emissions from existing MVSTs, modeling results indicate that the effective body dose to the maximally exposed individual from radionuclide emissions would be less than 0.1 millirem per year. Background radiation in the region is about 360 millirem per year.

Surface Water Resources

Construction of the partially below-grade concrete vault would require excavation and grading at the proposed site. About 1.5 acres of land would be disturbed. Earthmoving has the potential to increase erosion at the site, and during periods of precipitation, sediment runoff to an ephemeral stream east of the site. Sedimentation would likely occur in the ephemeral stream and would not be expected to adversely impact the quality or biota of larger streams in the watershed (Melton Branch and White Oak Creek). Silt fences, hay bales, and other erosion and sedimentation control methods would be used to minimize impacts.

Clearing of about 2 acres of mixed hardwood-pine forest and excavation to a 3-foot depth along an existing road bed for installation of a potable water line extension has the potential to increase erosion and sedimentation to Melton Branch. Also, placement of footers for an elevated portion of the water line in the floodplain of Melton Branch would disturb less than 180 ft^3 of soil. With the use of erosion and sedimentation control methods, adverse impacts to the quality and biota of the stream are not expected. The proposed pipeline route was considered as the preferred alternative because it would cross the Melton Branch floodplain at a previously disturbed area (roadbed). Any other crossing of Melton Branch along the route would impact an undisturbed area of floodplain.

Transfer of LLLW from existing tanks and storage in the new facility would not be expected to adversely impact surface water resources. During transfer of LLLW from existing MVSTs to the new tanks, level indicators and remote alarms would be monitored continuously to ensure the integrity of the system. In the proposed facility, LLLW would be stored in single-walled tanks surrounded by secondary containment. With this design and with sloped floors, retention dikes, and lined and monitored sumps that would be part of the proposed MVSTs, the potential for LLLW to migrate offsite would be very low. As a precaution, areas adjacent to the new MVSTS would be routinely monitored for LLLW contaminants.

Groundwater

Groundwater would not be adversely impacted by excavation and grading because the normal water table is 10 feet below the design grade of the proposed tank vault and water line extension. During wet seasons when the water table is elevated, groundwater seepage into

work areas could be a problem. Hence, slopes would be graded to allow gravity drainage to an ephemeral stream east of the site.

Accidental spills of fuel or other liquids used during construction could adversely impact groundwater quality. Rapid spill emergency response in accordance with the ORNL Spill Prevention, Control, and Countermeasures Contingency Plan would minimize impacts.

Terrestrial Ecology

The proposed site for the new tanks is devoid of ecological resources because it was previously disturbed. Therefore, no impacts to terrestrial species and habitat, would result from the proposed action. There are no wetlands present at the proposed MVSTs site and along the path of the potable water line extension. The U.S. Fish and Wildlife Service has advised DOE that no federally listed or proposed threatened or endangered species would be affected by the proposed action.

Loss of about 2 acres of mixed pine-hardwood would result from water line construction. This loss is about 0.04% of pine-hardwood forest on the Oak Ridge Reservation. Species that use this habitat would be displaced to nearby similar habitat, with no adverse impacts to populations expected. Following construction, disturbed areas would be planted with native vegetation to stabilize soil surfaces.

Socioeconomics

The proposed project would be constructed by a local contractor to DOE and would not require specialized labor. LLLW transfer and tank maintenance operations would be conducted by ORNL personnel. Thus, no impacts to the local economy or public services would result from the proposed action. With regard to Executive Order 12898, Environmental Justice, the minor impacts identified in this EA would not disproportionately affect any minority or economically disadvantaged population in the Oak Ridge vicinity.

Archaeological and Historic Resources

The Tennessee State Historic Preservation Officer has advised DOE that the proposed project areas contain no cultural resources eligible for listing in the National Register of Historic Places.

Health and Safety

Construction workers would be subject to standard industrial hazards associated with operation of earthmoving vehicles and equipment and with the hazards of excavation. ORNL health physics and industrial hygiene personnel would monitor activities during construction to ensure adherence to safety procedures and to identify potential hazards.

Transfer of LLLW to the new tanks would take place in an underground pipeline system. Thus, occupational exposure would be unlikely. During maintenance of the tanks, grab samples would be taken biennially for chemical and radionuclide analysis. Workers would use a shielded glovebox for sampling and would not directly contact the LLLW.

Although no pH adjustment of MVST contents has been required in the past, tanker trucks containing acid and caustic chemicals would be available for this purpose. An accident involving one of these trucks could result in the release of a large quantity of acidic or caustic material that could be immediately dangerous to life and health, if inhaled. The probability of such an occurrence, however, is low.

The LLLW concentrate to be stored at the new facility would contain fissionable materials. A Safety Assessment has determined that a nuclear criticality event is not credible for the proposed action.

Cumulative Impacts

Incremental impacts of the proposed action in combination with 10 planned or ongoing actions in Melton Valley were evaluated. With the exception of the proposed Remote-handled Transuranic Waste Storage Facility immediately adjacent to the MVST site, other activities would be undertaken more than 3 miles to the east.

Individual projects were found to have the potential to result in minor impacts to air quality, water resources, and ecological resources over localized areas ranging from one to 13 acres in size. A total of 33 acres of land would be disturbed for all projects, including the proposed MVST CI project. Site clearing, grading, and excavation for various projects would not be concurrent. Because of this, degradation of air quality and erosion and sedimentation effects on water quality and aquatic biota would be localized and sporadic, and incremental contributions from each project would not result in adverse cumulative impacts. Clearing of 33 acres of mostly forested habitat would cumulatively impact the percentage of vegetation and terrestrial habitat on the Oak Ridge Reservation. The proposed action and other planned projects would remove about 1% of forested area in Melton Valley from its current use. Cumulative impacts would include the loss of native vegetation and reduced wildlife populations from habitat destruction and forest fragmentation.

DETERMINATION: Based on the findings of this EA, DOE has determined that the proposed Melton Valley Storage Tanks Capacity Increase Project would not constitute a major Federal action that would significantly affect the quality of the human environment within the context of the National Environmental Policy Act. Therefore, preparation of an environmental impact statement is not required.

Issued at Oak Ridge, Tennessee, this 25 day of May , 1995.

Manager
Oak Ridge Operations Office

Department of Energy

Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831—

Mr. Earl C. Leming, Director
DOE Oversight Division
Tennessee Department of Environment
and Conservation
761 Emory Valley Road
Oak Ridge, Tennessee 37830-7072

Dear Mr. Leming:

RESPONSES TO TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION COMMENTS ON THE ENVIRONMENTAL ASSESSMENT FOR THE MELTON VALLEY STORAGE TANKS CAPACITY INCREASE PROJECT AT OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE (DOE/EA-X10-354)

Department of Energy Oak Ridge Operations Office (ORO) representatives discussed the subject Tennessee Department of Environment and Conservation comments on the subject Environmental Assessment in a meeting with Robert Storms, Kristof Czartoryski, and other members of your staff on Friday, March 3, 1995. Enclosed is a summarization of the comments and responses from that meeting.

If you have any questions or require any additional information, please contact Calvin Pepper of the ORO Waste Management and Technology Division at (615) 241-6424.

Sincerely,

Larry L. Radcliffe, Director
Waste Management and Technology
Development Division

Enclosure

cc w/enclosure:
D. Brown, EW-92, ORO
P. Phillips, SE-311, ORO
D. Mabry, 130 MIT, MS 6282

OAK RIDGE OPERATIONS OFFICE RESPONSES TO TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION COMMENTS

Tennessee Department of Environment and Conservation (TDEC) Comment 1

"Based upon these numbers (reference to 100,000 gallons from cleanup of gunite tanks) and the 13,000 gallons generated per year via research facilities, the State questions the necessity of the full 600,000 gallon capacity increase. ... Solidification and removal to the approved sites should be emphasized over interim storage. Much of the decision rests upon the fact that Envirocare, WIPP, Nevada Test Site, and other facilities are/will be approved and ready to store the wastes."

Oak Ridge Operations Office (ORO) Response

The Melton Valley Storage Tank Capacity Increase Project (MVST CIP) will add six 100,000-gallon tanks to the Oak Ridge National Laboratory (ORNL). In order to provide the capability to meet the requirements of the Federal Facilities Agreement (FFA), Appendix F, Section D.1(b) to remove the contents of a tank found to be leaking, one of these tanks will be designated as a spare tank (to be used only for transfers from a leaking tank). Furthermore, the functional storage capacity of each tank is limited to 90 percent of the total volume in the tank, permitting a 10 percent freeboard. Thus, the functional storage capacity of each tank is 90,000 gallons, and the total functional storage capacity to be added by the project is 450,000 gallons.

The basis for the additional 450,000-gallon increase is as follows:

a. The Bethel Valley Evaporator feed and service tanks (with a total capacity of 250,000 gallons) are currently being used to provide additional concentrate storage capacity, contrary to the initial design of the evaporator complex. Additionally, the only tank currently being used as a feed tank has accumulated a significant residue of pumpable sludge. The basis for the MVST CIP sizing includes 150,000 gallons to be transferred from these evaporator feed and service tanks.

b. The sludge in the existing storage tanks is planned to be processed to meet the WIPP-WAC and shipped to WIPP for disposal. The TRU Processing Facility, where the sludge will be processed is currently planned as an FY 17 Line Item.

   The additional capacity provided by the MVST CIP will allow for the capability to receive 170,000 gallows of LLLW from inactive tanks, including the gunite tanks.

c. The MVST CIP will provide the storage capacity to receive LLLW and sludges from inactive tanks, including the gunite tanks. The basis for MVST CIP sizing includes the capability to receive 170,000 gallons from these inactive tanks.

This additional 450,000-gallon functional storage capacity is needed until a waste treatment facility can be provided to place the waste in a disposable form.

TDEC Comment 2

"A review of operations is necessary to determine if the MVST CIP is justifiable. The solidifying process rate of 50,000 gallons per year of supernate will soon cease due to concentration limits of the evaporator. In other words, 50,000 gallons per year will no longer be removed from storage. This somewhat justifies the additional proposed storage space. However, a remedy to allow a greater process rate should be considered an alternative to more storage."

ORO Response

The LLLW at ORNL is initially concentrated by the Bethel Valley Evaporator. The concentration in the output of this evaporator is limited by the physical design of the evaporator and cannot be increased.

The current solidification campaigns are used to remove liquids (supernatant) from the storage tanks and solidify them in a concrete matrix. This process is not limited by the effectiveness of the evaporator, but by the amount of free liquids remaining in the storage tanks, which can be added to the concrete matrix.

Following transfer of the LLLW concentrate to the existing Melton Valley Storage Tanks from the evaporator, the following methods are used to further remove liquids from the waste:

a. An in-tank evaporation process where air is bubbled through the tanks and filtered moist air is released to the atmosphere - As the specific gravity of the liquid in the storage tanks becomes higher as a result of this evaporation process, the effectiveness of this method decreases.

b. Solidification campaigns where some of the liquid supernatant is removed from the tanks and solidified - While both the supernatant and sludge in the tanks could be processed in this manner, in general, the ORNL LLLW sludge could not be processed in this facility because the resulting radiation levels would be prohibitive and there would be no place to take the sludge once it was solidified.

c. Out-of-tank evaporation - This method has been evaluated and is planned for the existing storage tanks.

TDEC Comment 3

"The draft EA does not discuss the location and condition of the existing LLLW transfer piping and the effect the increased transfer volume might have on this system. Without explanation, the double-walled underground pipeline (quoted on page 35) is assumed to be a reference to the new piping connecting the MVST CIP to the existing MVST and the existing LLLW system. Also, a break in the existing LLLW pipeline and it's resulting impact on terrestrial resources is not addressed."

ORO Response

The operational safety requirements (OSRs) for the existing LLLW system were reviewed to ensure that the design of the MVST CIP would not create operational problems with the interfacing of the two portions of the system. The interface of the MVST CIP with the existing system has been an ongoing consideration for the design since the beginning of the project, but this specific review was completed to confirm that no design change created an unanticipated incompatible interface. The OSRs will be impacted for the two portions of the system for (a) transfer line overpressure protection, (b) spare capacity, (c) primary transfer line pressure test, prior to a transfer, (d) the transfer line annulus pressure and (e) leak detection and transfer termination. Each of these impacts has been addressed as follows:

a. Transfer line overpressure protection - The need for the design output pressure of the transfer pumps and the pump relief valve setting to be compatible with the existing LLLW transfer piping has been recognized. The required pump discharge pressure and resulting relief valve setting to produce the flow in the new and existing piping is currently being evaluated.

b. Spare capacity - The OSRs require a spare capacity that is equal to the volume of the largest tank in the system. The tanks in the new facility are larger than any in the existing system. The OSRs currently require only 50,000 gallons of spare capacity, although the new tanks will have a capacity of 100,000 gallons each. Tank W-32 in the new facility is being specifically designated and designed to perform the spare capacity function.

c. Primary transfer line pressure test prior to a transfer - The new transfer line is connected to the existing transfer line, which will provide pressurization gas for the test. Valves are located in the interfacing valve box, which can isolate any of the three segments of pipe to the new facility, to the existing MVST facility, or to the Bethel Valley portions of the system.

d. Transfer line annulus pressure - All segments of the inter-valley transfer line annulus space have been connected. The failure of the line in any segment will depressurize the entire line so that all pressure switches in all facilities will detect the pressure loss. The setpoints for the pressure switches, which are currently being calculated, will need to assume that annulus pressure is the same throughout the entire line. The line depressurization rate for the entire line has been calculated and will be used as input in the respective accident analyses.

e. Leak detection and transfer termination - By connecting the annulus space of the entire transfer line together, failures of the line will be detected at all operating stations, independent of the direction of fluid flow. The addition of a non-safety class fiber optic cable for the distributive control system to the project will provide a more complete transfer of facility information to the Waste Operations Control Center. The programming of the distributive control system, when completed, will ensure the availability of the necessary information.