DOE/EA-1106

Environmental Assessment

for the

Explosive Waste Treatment Facility

at

Site 300

Lawrence Livermore National Laboratory

November 1995

U.S. Department of Energy
Office of Environmental Restoration and Waste Management
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1.0 Document Summary

Lawrence Livermore National Laboratory (LLNL) proposes to build, permit, and operate the Explosive Waste Treatment Facility (EWTF) to treat explosive waste at LLNL's Experimental Test Site, Site 300. It is also proposed to close the EWTF at the end of its useful life in accordance with the Department of Toxic Substances Control (DTSC) regulations and Central Valley Regional Water Quality Control Board (CVRWQCB) requirements. The facility would replace the existing Building 829 Open Burn Facility (B829) and would treat explosive waste generated at the LLNL Livermore Site and at Site 300 either by open burning or open detonation, depending on the type of waste. In some cases, open detonation is safer and more efficient than open burning. A new facility is needed because B829's operating permit has expired, and the facility is currently operating under an enforcement action until a new treatment facility is constructed.

The January 27, 1993 Record of Decision (ROD) for the August 1992 *Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore*, DOE/EIS-0157 (1992 Sitewide EIS/EIR), published the U.S. Department of Energy's (DOE's) decision to continue operation of LLNL (DOE, 1992). It describes the proposed EWTF, including the environmental setting of the proposed EWTF, the potential environmental impacts from the facility's construction and operation, and the available alternatives for the treatment of explosive waste at Site 300 (DOE, 1992). The planned operation of the proposed EWTF would be within the bounds of impacts of normal operations and potential accidents outlined in the 1992 Sitewide EIS/EIR. This Environmental Assessment (EA) is tiered from the 1992 Sitewide EIS/EIR and provides additional detail concerning potential impacts of the construction and operation of the proposed EWTF and of postulated accidents.

Specifically, the proposed facility would consist of two open burning (OB) units and one open detonation (OD) unit. The OB and OD units would be located 700 ft (213 m) apart near the existing Building 845 bunker (B845) in a central part of Site 300. One of the two OB units would consist of a metal burn pan with a remotely controlled cover while the other would consist of a burn cage. A burn-supply storage building, a fuel tank, an earthen berm, and a magazette would also be installed in the OB Area. The OD unit would consist of a gravel firing pad and B845.

The alternatives addressed in the 1992 Sitewide EIS/EIR are reexamined in this EA. These alternatives included: (1) the no-action alternative which would continue open burning operations at B829; (2) continuation of only open burning at a new facility (no open detonation); (3) termination of open burning operations with shipment of explosive waste offsite; and (4) the application of alternative treatment technologies.

This EA examines the impact of construction, operation, and closure of the EWTF. Construction of the EWTF would result in the clearing of a small amount of previously disturbed ground. No adverse impact is expected to any state or federal special status plant or animal species (special status species are classified as threatened, endangered, or candidate species by either state or federal legislation). Operation of the EWTF is expected to result in a reduced threat to involved workers and the public because the proposed facility would relocate existing open burning operations to a more remote area and would incorporate design features to reduce the amount of potentially harmful emissions. No adverse impacts were identified for activities necessary to close the EWTF at the end of its useful life.

Because the proposed EWTF would treat explosive materials and residues which are characterized as hazardous wastes, it is subject to state and federal hazardous waste laws and is defined as a miscellaneous treatment facility. As such, LLNL has applied to the California DTSC for a Resource Conservation and Recovery Act (RCRA) Part B permit.

U.S. Department of Energy
Finding of No Significant Impact
for the Explosive Waste Treatment Facility
at Lawrence Livermore National Laboratory

AGENCY: U.S. Department of Energy

ACTION: Finding of No Significant Impact

SUMMARY: The U.S. Department of Energy (DOE) has prepared an Environmental Assessment (EA), DOE/EA-1106, to assess the environmental impacts associated with the construction, operation, and eventual closure of the Explosive Waste Treatment Facility (EWTF) at Lawrence Livermore National Laboratory's (LLNL's) Site 300, located in Alameda and San Joaquin Counties, State of California. The impacts of this facility have been previously addressed in the Record of Decision (ROD), issued on January 27, 1993, for the August 1992 *Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore*, DOE/EIS-0157 (1992 Sitewide EIS). The EA was tiered from the 1992 Sitewide EIS and provides additional detail on the potential impacts of the construction and operation of the proposed EWTF and of the postulated accident.

The proposed facility would consist of two open burning (OB) units and an open detonation (OD) unit. These units would be located near the Building 845 (B845) bunker. Alternatives considered in the review process include: (1) the no-action alternative, which is to continue only open burning at Building 829 (B829); (2) the continuation of only open burning at a new facility at Site 300; (3) termination of open burning of explosive waste; and (4) the application of alternative technologies for the treatment of explosive waste.

Based on the analyses in the EA, the DOE has determined that the proposed action does not constitute a major federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq. Therefore, an Environmental Impact Statement is not required.

PURPOSE AND NEED: The DOE needs to take action to manage its current and projected inventory of explosive waste. Currently, treatment of explosive waste by burning occurs at B829; however, that facility has been operating under a State of California Enforcement Order since its Resource Conservation and Recovery Act (RCRA) "Interim Status" permit expired on November 8, 1992. The purpose of this action is to provide for the treatment of the explosive waste by construction of a facility which can be permitted. Open detonation as a treatment method is needed to allow for treatment of explosive waste that cannot be treated by burning due to the size limitations of the OB units, the chemical makeup of the explosive waste (which may be prone to unplanned detonation if treated at the OB units), or the classified nature of the waste.

PROPOSED ACTION: It is proposed to site, operate, and close a facility that would utilize open burning and open detonation to treat explosive waste at the LLNL Site 300. The design of the EWTF is consistent with the description of this facility as described in the 1992 Sitewide EIS.

The two OB units would consist of a metal burn pan and a burn cage. The burn pan, which would be utilized to treat explosive waste in the form of small pieces, powders, and parts, would consist of an approximately 4-ft x 8-ft x 1/2-ft-deep steel pan with a remotely controlled, movable cover. The burn cage, which would treat process waste fines, explosives-contaminated packaging materials, and laboratory equipment contaminated with explosives, would consist of an approximately 5-ft x 9-ft x 4-ft metal enclosure with a sloped roof, metal screened ends, and an elevated metal base.

The OD unit would consist of a roughly 900-ft^2, open-air gravel pad located on an existing firing pad southwest of B845. This unit would treat explosive waste that is in such a configuration that LLNL requires it be treated by open detonation.

The EWTF would also provide a suitable location for the periodic decontamination of explosives-contaminated equipment and materials. The contaminated items would be placed in the open burn cage, the burn pad or on a concrete pad where the explosives would be burned off. A metal plate may be installed on one of the concrete pads to provide a stable platform for the large items. This type of decontamination is currently being conducted at B829 and would merely be relocated along with the open burning. It is expected that this type of decontamination would be performed less than ten times per year.

Minor improvements are needed to the area to site and operate the EWTF. The existing road to B845 would be upgraded and improved to allow safe vehicle access to the OB and OD units, and two controlled access gates would be installed to limit access. The OB area would be graded and leveled. Concrete pads would be installed as necessary to support the OB equipment and miscellaneous structures, and an earthen berm would be installed to protect equipment and facilities around the treatment units. Graded-earth ditches would be installed to route surface runoff around the OB and OD units. All vegetation within a 200-ft buffer zone around the OB and OD units would be removed to prevent the chance of initiating a wildfire through the operation of the EWTF. In addition, the construction of the EWTF would involve the modification and extension of utilities.

Also, as part of this action, an existing wood-frame building located near the OB units would be demolished, and metal pipe risers on any monitoring well in the vicinity of B845 within direct line-of-sight of the OD firing pad would be removed and replaced with small, lockable concrete boxes placed below grade.

Prior to any excavation, soils around the EWTF would be sampled to establish a baseline of existing contamination generated by past operations of B845. This baseline would be used for determining cleanup levels in the closure process.

Waste which would be treated at the EWTF would be transported from the Site 300 Explosive Waste Storage Facility (EWSF) or directly from generator waste accumulation areas on the day of treatment. The amount of waste to be either burned or detonated would be limited for each explosive waste type by the *Site 300 EWTF Operation Plan*. After the initial placement of the waste to be treated, all further activities, such as ignition or detonation, would be conducted remotely from B845. Surveillance cameras at the OB and OD units would allow operators to visually monitor treatment operations.

Ash in the OB units would be allowed to cool for a minimum of 24 hours before visual inspection to ensure complete treatment. Ash would be collected in a container in the OB area which, when full, would be sent to either the EWSF or the Building 883 Container Storage Area. The ash would be sampled and tested for hazardous constituents, then shipped offsite, as necessary, for disposal at a permitted hazardous waste landfill. None of the EWTF facilities would be used for the accumulation or storage of waste.

The proposed action would also include the closure of the EWTF at the end of the facility's useful life. Closure activities include the decontamination of the units and related equipment, disposal of all contaminated materials, and verification sampling that would support certification of completion of the closure process. Closure levels would be determined by preconstruction sampling and would be approved by the Department of Toxic Substances Control.

ALTERNATIVES: Alternatives considered are the no-action alternative, the continuation of only open burning at a new facility, the termination of open burning operations (which would include shipment of waste offsite), and the application of alternative treatment technologies.

The no-action alternative would be to continue open burn operations at B829. No open detonation operations would be conducted under this alternative. Because the current facility's RCRA "Interim Status" permit has expired, the continuation of activities at B829 would require a new permit from the State of California Environmental Protection Agency (Cal EPA). In addition, B829 does not provide the degree of isolation from workers and the public that the B845 Area location does. Improvements to the open burning process by the proposed action would not be incorporated, thereby not reducing risk to the public from air emissions. Finally, the new location of the EWTF is less susceptible to seasonal winds which could cause the cancellation of treatment activities at B829.

The second alternative, open burning only at a new facility, would construct and operate a new facility in the B845 area. Although all transportation of explosive waste would comply with Department of Transportation shipping requirements, there would still be a minor increase in risk to the public from the additional vehicle trips. Open detonation, which would represent both a more efficient method of treating explosive waste and a safer way of treating large pieces of bulk explosive waste, would not occur. Without this open detonation capability, LLNL would have to send certain types of explosive waste to an offsite facility for treatment across public roads.

Termination of open burning operations at LLNL Site 300 would necessitate the shipment of all explosive waste offsite across public roads. This waste would be sent to either a RCRA-permitted commercial storage and treatment facility or to another DOE site. While some limited forms of explosive waste are currently being sent offsite, no offsite commercial facilities were found that were capable of accepting or treating all of the specific explosive waste types generated at LLNL. Other DOE facilities were restricted by their permits or other operational constraints from accepting explosive waste from offsite locations, such as from LLNL.

The final alternative examined was to apply alternative treatment technologies to treat the explosive waste generated at LLNL. Although research into alternative technologies is ongoing, there have been no recent advances to indicate that an alternative to thermal treatment would be available within the next 5 to 10 years.

FINDINGS: The EA analyzes the construction-, operation-, and closure-related impacts of the proposed action, including impacts to onsite and offsite personnel and the external environment.

Construction of the EWTF would entail the clearing of less than 1 acre of grassland. The extension of utilities would involve some trenching along the roadway to B845. This roadway would be resurfaced and possibly widened. Air emissions from the construction phase would be limited to the release of particulates (dust). Dust would be controlled by spraying the construction site with water as necessary. Noise levels would increase temporarily, but would not lead to an increase in offsite levels; nearby workers would wear appropriate hearing protection when required. No sensitive species of either plant or animal would be adversely impacted by activities related to construction. There would be no impact to cultural resources in the B845 area, however, an archaeologist would be contacted if excavation activities uncover any artifacts. Normal construction hazards would exist, but workers would receive proper safety training, and all activities would be in accordance with all relevant requirements of the Occupational Safety and Health Act.

Operation of the EWTF would not result in any adverse impact to vegetation, ground water, or surface water. Because the OB units would incorporate improvements over the current treatment method at B829 (i.e., using a cleaner fuel, including the removable cover on the burn pan, and

imposing operational limits on how much waste can be treated and during what meteorological conditions) air emissions are expected to be the same as, or lower than, current open burning operations at B829.

Noise levels to offsite populations (including residents at the proposed Tracy Hill development on Site 300's eastern boundary) would be controlled by limiting open detonation events during certain periods and by limiting amounts to be detonated. The ETWF's procedures would limit detonations to 350 lb (159 kg) of explosive waste, which together with weather monitoring should limit impulse sound levels at the fence line to less than 126 dB, which would not present a significant impact.

No adverse impact is expected to any cultural or sensitive ecological resource. Warning sirens would be used prior to detonation events to warn personnel in the area as well as to scare away any sensitive bird species. Prior to operation of the EWTF, and every spring, a survey would be conducted to identify the nesting presence of sensitive species (i.e., burrowing owls or tri-colored blackbirds). If a nesting presence is found, appropriate measures would be taken to minimize the effects of open detonation.

The treatment of explosive waste in the EWTF would result in airborne products of combustion. Acute exposure from emissions during treatment activities would be below state-accepted exposure levels. The worst-case cancer risk to the maximally exposed individual (MEI) from operation of the open burn pan ranges from 6.0×10^{-8} to 7.0×10^{-7}, with dioxin being the pollutant of concern. Operation of the burn cage results in a cancer risk of 4.0×10^{-8} to 1.0×10^{-6} to the MEI, with dioxin again being the pollutant of concern. These values assume a worst-case situation of 100 burn days per year, an excessive temperature-variation range during the burning process (which produces a higher amount of dioxins), and the continued use of diesel fuel in the burn cage (which may increase levels of dioxins). However, the proposed EWTF would incorporate design features and include restrictions on when burn activities could occur and how much waste could be treated which would maintain these numbers at levels below regulatory concern.

No adverse impact is expected from proposed closure activities. In fact, a beneficial impact may occur due to reduced human presence in the area. The halting of operations would reduce air emissions, thereby decreasing offsite and cumulative impacts from LLNL Site 300 operations.

The postulated worst-case accident scenario would be the accidental detonation of 350 lb of explosive waste on the detonation table. It is assumed that two immediately involved workers (the maximum number allowed at the OD unit during operations) would be seriously injured or killed by the blast. Air emissions levels and noise impact levels from this accident would be essentially the same as those involved in normal detonation events. An accidental detonation of explosives has never occurred at LLNL Site 300 and could only occur through human error. The probability of this accident occurring is remote, and the impacts of such an accident are within the bounds of impacts from accidents assessed in the 1992 Sitewide EIS (which assumed a detonation of 1,320 lb of explosives).

The proposed action is not expected to contribute substantially to the overall cumulative impacts from LLNL Site 300 operations. Normal operations of the EWTF would result in virtually no substantial increase in air emissions, noise levels to offsite populations, or waste generation. There would be no adverse socioeconomic impact, as construction and operation of the EWTF would not require an increase in the work force at LLNL Site 300.

No minority or low-income populations are present in the neighboring communities. Because the analysis in the EA indicates that EWTF would not present any adverse environmental pollution or impacts to the general public/ surrounding population during normal operations, or even as a result of accident-generated scenarios, no disproportionate impacts on minority populations is expected.

Copies of this EA (DOE/EA-1106) are available from:

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Issued this 16th day of April, 1996.

James M. Turner, Ph.D., Manager
Oakland Operations Office

2.0 Purpose and Need for Agency Action

The ability to manage explosive waste safely is essential to the continuation of LLNL's research into the properties and applications of explosive materials. Explosive waste generated at LLNL has historically been treated by open burning at B829 at Site 300 or treated at a permitted commercial offsite facility. Certain types of waste cannot be treated at offsite facilities because of permit restrictions or because the waste still retains classified characteristics. Several factors have made the B829 location less than ideal: its proximity to the Site 300 boundary and to onsite workers, and the fact that the B829 facility is often subject to high winds which arise suddenly and can cause the cancellation of scheduled treatment operations. In addition, the authority to treat waste by open burning at B829 under Resource Conservation and Recovery Act (RCRA) "Interim Status" expired on November 8, 1992. Since that time, B829 has operated under a State of California Enforcement Order allowing for continued operations until either a new facility is operational or some other method of handling the explosive waste is identified.

The proposed EWTF would allow for open detonation as a treatment process for certain types of explosive waste. Some explosive waste (i.e., experimental assemblies contaminated with explosives) is better suited for detonation due to their potential for unplanned detonation during open burning. Also, some wastes may be too large to be handled safely in the open burn units and can be treated more effectively by detonation. Finally, for some types of explosive waste, open detonation produces an extremely efficient oxidation when compared to open burning.

3.0 Description of the Proposed Action and Alternatives

Site 300 is primarily a high explosives test facility supporting LLNL Defense Programs in research, development, and non-nuclear testing associated with design and other aspects of nuclear weapons. This mission involves processing explosives, including the preparation of new explosives and the pressing, machining, and assembly of components. It also includes regular testing of explosives. Over the last six years, DOE has averaged approximately 180 test detonations at the several remote firing areas at Site 300 annually.

The proposed action is to construct, operate, and eventually close, an explosive waste treatment facility. This facility, which would consist of two OB units and an OD unit located near the existing bunker B845, would treat explosive waste which would include bulk explosives, pieces or powders from experiments, scraps of explosives from machining operations, and explosives-contaminated equipment. The 1992 Sitewide EIS/EIR considered and rejected four alternatives to OB/OD treatment at the proposed EWTF (Appendix A, Section A.2.5.3).

The first alternative, the no-action alternative, would continue open burn treatment of explosive waste at B829 without open detonation. The second alternative would continue the practice of open burn treatment at a new, unspecified location at Site 300. The third alternative would terminate the current open burn treatment and would ship the qualified explosive waste offsite for treatment. The fourth alternative would apply alternative technologies to treating the waste.

3.1 Description of the Proposed Action

The proposed action would site, operate, and eventually close the EWTF, which would use open burning and open detonation to treat explosive waste at the LLNL Site 300. The following sections describe the location, design, operation, and closure of the proposed EWTF. In several instances, descriptions and dimensions for the specific components of the EWTF are presented. It should be noted that these dimensions reflect the current design. Future, more detailed, design efforts may necessitate minor changes in these components

3.1.1 Location

Site 300 is located 15 road mi (24 km) southeast of the Livermore Site along the San Joaquin County and Alameda County border (see **Figures 1 and 2**). The proposed facility would consist of two OB units and one OD unit located near B845 in a central part of Site 300 (see **Figures 3 and 4**). The two OB units would be separated from the OD unit by approximately 700 ft (213 m). An existing access road connects B845 and the proposed location of the OB units with Site 300's Route 3 (see **Figure 4**). The current proposed location of the EWTF is the same location described in the 1992 Sitewide EIS/EIR.

3.1.2 Design

The design of the proposed EWTF is consistent with the facility's description in the 1992 Sitewide EIS/EIR, Section 3.1.2, "LLNL Site 300":

> A new Explosive Waste Treatment Facility which would replace the high explosive waste open burning facility at Building 829. . . . This facility would include an open detonation table and open burn units for treatment of pieces of explosive waste; a propane-fueled burn cage for treatment of clarifier filter bags containing explosive waste, small pieces of explosives, and reactive contaminated trash, and a burn pan with a removable cover for burning bulk pieces and explosive powders (DOE, 1992).

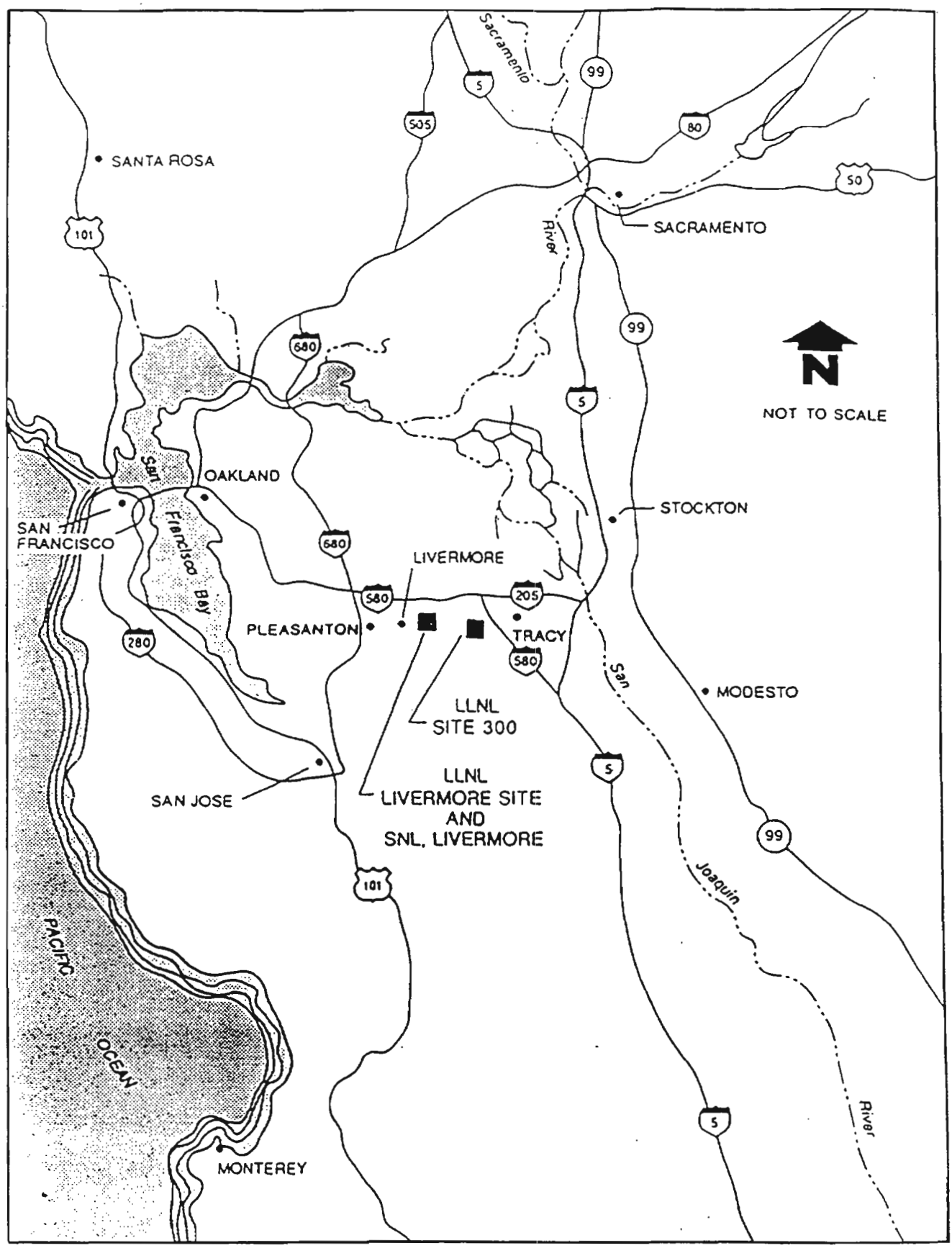

Figure 1. Regional Location of Site 300

Figure 2. Relative Location of the LLNL Mainsite and Site 300

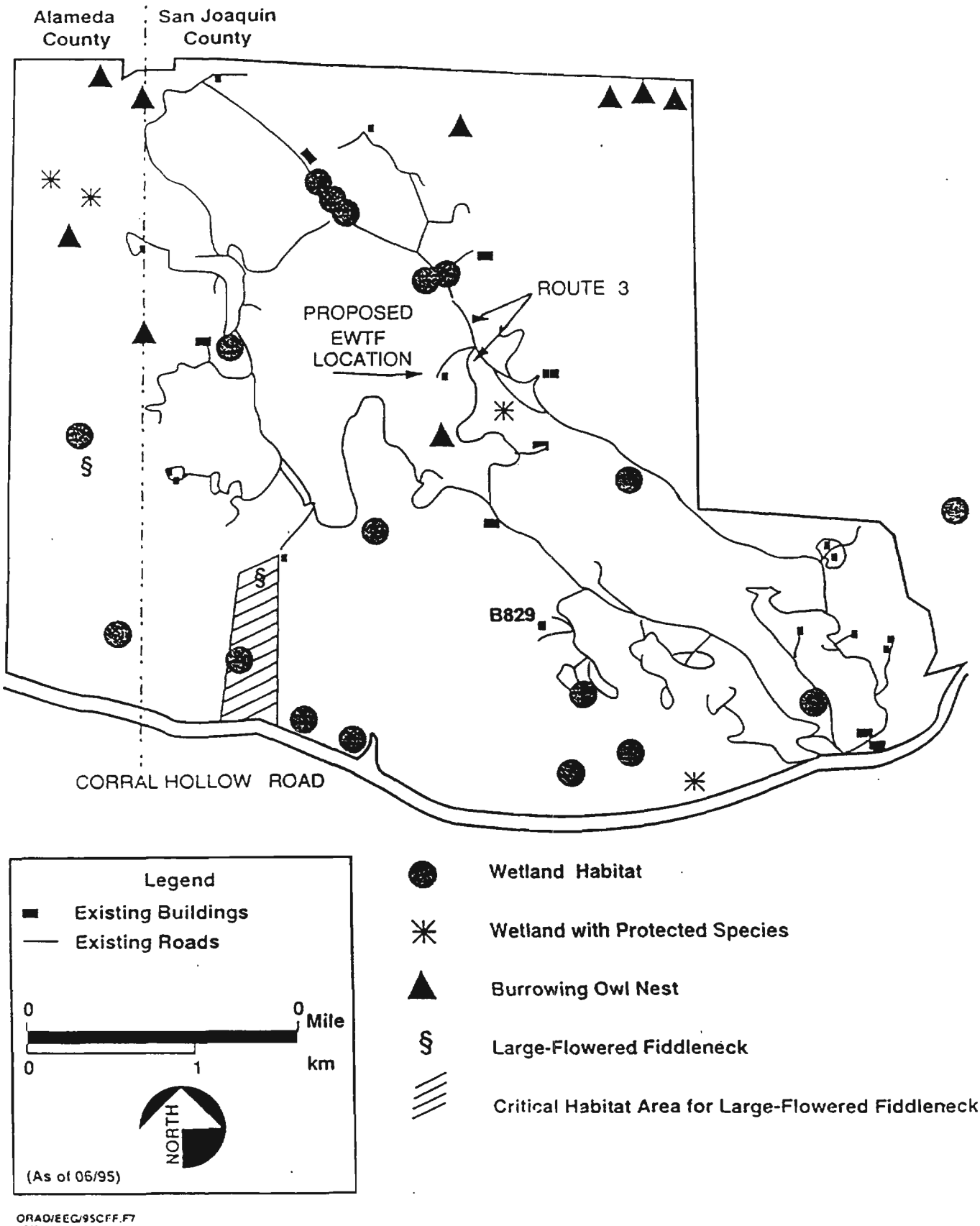

Figure 3. Site 300 Proposed EWTF and Sensitive Natural Resource Locations

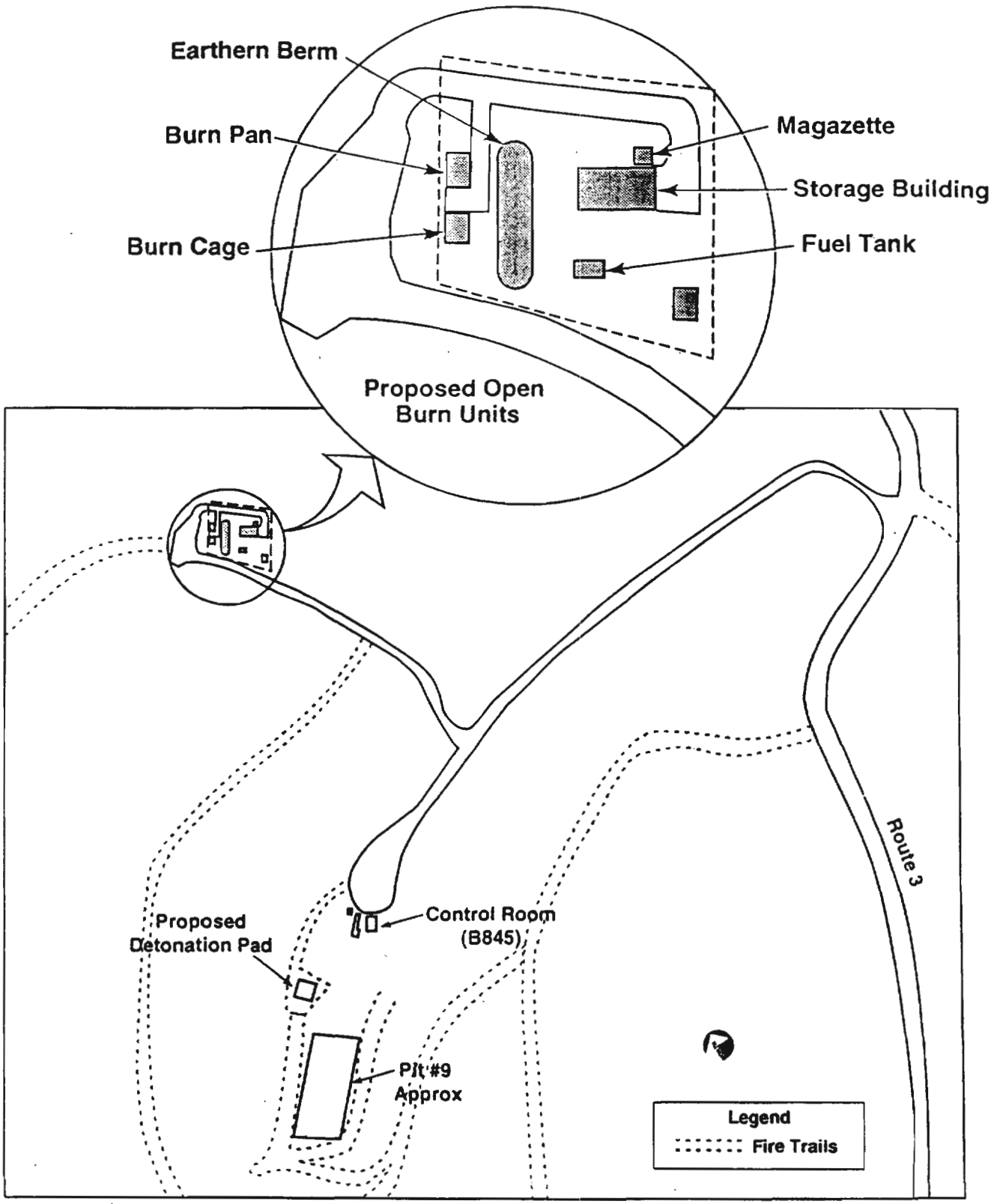

Figure 4. Site 300 Proposed EWTF Site Plan

The OB units would consist of a metal burn pan and a burn cage (see **Figure 4**). The burn pan would be a steel pan measuring approximately 4 ft × 8 ft × 1/2 ft (1.2 m × 2.4 m × 0.15 m), mounted on steel legs, with a remotely controlled, movable cover. The burn pan would treat small pieces, powders, and parts of explosive waste. The burn cage would be a metal enclosure, measuring approximately 5 ft × 9 ft × 4 ft (1.5 m × 2.7 m × 1.2 m), with a sloped roof, metal-screened ends, and an elevated metal base. It would be lined with refractory and contain a fuel burner system. The burn cage would be used for treating process waste fines, explosives-contaminated packaging materials, and equipment contaminated with explosives. Fuel used in the burn cage would be supplied from a newly installed fuel storage tank. Ignition materials and other supplies used to initiate burning would be stored in a 250-ft^2 (65-m^2), prefabricated metal building located near the proposed OB units. A magazette (a 2-ft × 3-ft × 4-ft [0.6-m × 0.9-m × 1.2-m] concrete vault) would be located near the proposed OB units to store blasting caps and other initiators. An earthen berm would separate the magazette, the proposed storage building, and the fuel tank from the proposed OB treatment units

The OD unit would consist of a 900-ft^2 (84-m^2), open-air, gravel pad located on an existing firing pad southwest of B845 (see **Figure 4**). The OD unit would treat waste explosives that are in such a configuration that the LLNL Explosives Safety Program requires they be treated by open detonation. It is expected that there would be an average of ten open detonations per year. B845 is an existing, earth-covered, steel-arch bunker, which would house remote-operation controls and television monitors and would provide worker protection during OB and OD operation. The proposed action may include minor improvements to B845 which may be necessary for personnel safety and comfort.

Minor improvements to the area would be necessary to construct and operate the facility. The existing road to B845 is a paved, single-lane road. The road to the location of the proposed OB units is an unimproved, single-lane, dirt road. Both roads would be improved to allow safe vehicle access. The vehicle approaches and loading/unloading zones at the proposed OB units would also be paved. Controlled-access gates would be installed on the access road in two locations: at the junction of the access road and Route 3, and at the entrance to the proposed OB units. The OB area would be graded and leveled. Concrete pads would be placed to support the burn cage, the burn pan, the storage building, the magazette, a pad-mounted electrical transformer, and the fuel tank. Graded-earth ditches would be installed to route surface runoff around the proposed OB and OD units. All vegetation would be removed within a 200-ft (61-m) buffer zone around the proposed OB and OD units. On the southwest side of B845, approximately 100 yd^3 (76 m^3) of soils would be excavated and replaced with a level gravel pad measuring 30 ft × 30 ft (9 m × 9 m) and approximately 3 ft (0.9 m) deep. This gravel pad would comprise the proposed OD firing pad.

The extension of water, electrical, and telephone lines, which would be installed in new underground ducts from existing onsite utilities along Route 3, would require approximately 1,000 ft (305 m) of trenching. All buildings, equipment, and the magazette would be grounded. An eye wash/safety shower would be installed at the northern end of the earth berm near the proposed OB units. An optical fiber instrumentation and control line would be extended underground from the proposed OB units to B845. Remote, closed-circuit television cameras would be placed on poles at two locations in the proposed OB units and at one location in the proposed OD unit. These cameras would be connected to a television monitor in B845 to monitor OB and OD treatment operations. Meteorological monitoring equipment may also be installed to facilitate treatment operations. A security fence would be installed around the proposed OB units. Interior and exterior lighting, perimeter controls with warning lights, and restricted entry time (RET) controls would also be installed.

Prior to any excavation at the proposed EWTF location, routine soil sampling would be conducted to determine background levels of contaminants. Decades of prior detonations at the B845 site may have resulted in the presence of residual contaminants (metals, radiological isotopes, explosive compounds, etc.). This sampling would set the "baseline" level to which the site would be cleaned during the closure process. These baseline levels would also aid in determining if LLNL procedures governing work in contaminated areas would need to be implemented during construction to protect workers.

Soils may also be sampled during excavation. If found to be contaminated, a plan would be developed to excavate the soil in such a manner as to preclude an uncontrolled and unpermitted release of contaminants. Contaminated soil would be handled and disposed of according to approved LLNL policies and procedures.

An existing, small (less than 200-ft^2 [19-m^2]) woodframe building is currently near the location of the proposed OB units. This building does not have a designated number and is not a historical or architecturally unique structure. This building, which is unsuitable for use and has been abandoned, would be demolished.

Near B845 there are several ground water monitoring wells with pipe risers that extend about 30 in. (76 cm) above the natural ground surface. These risers have lockable lids to prevent unauthorized access to the wells. The metal pipe risers on those wells in the vicinity of B845 and within direct line-of-sight of the OD firing pad would be removed and replaced with small, lockable, subsurface concrete boxes.

3.1.3 Operation

The 1992 Sitewide EIS/EIR, Section 3.1.2, "LLNL Site 300," describes the operation of the proposed EWTF:

> *High explosive wastes to be burned at this facility are expected to be the same or less than the amounts currently treated in the Building 829 High Explosive Burn Facility. This new facility would burn explosive dry solid wastes consisting of high explosives-contaminated solid materials and packaging, and powders and small pieces of high explosives... (DOE, 1992).*

With one exception, the planned operation of the proposed EWTF remains consistent with this 1992 Sitewide EIS/EIR description. The only exception may be the treatment of some waste types that are not classified as "dry solid wastes," such as clarifier fines (wet sludges that result from the removal of explosive particulates from processing water).

Explosives are categorized by their form or composition, ease of ignition, and sensitivity to detonation (LLNL, 1991a). Explosive waste types to be treated at the proposed EWTF would include bulk explosives, pieces or powders from experiments, scraps of explosives from machining operations, explosives-contaminated equipment, packaging that is visibly contaminated with explosives, and other residual explosive waste. The explosive waste to be treated at the proposed EWTF include reactive contaminated waste, as defined in federal hazardous and state waste regulations, and clarifier fines that are also classified as reactive waste. Compatible explosive waste types would be grouped for treatment. Only the type of explosive waste identified in the EWTF RCRA Part B Permit would be accepted for treatment. A more complete description of the wastes to be treated at the proposed EWTF may be found in the *Site 300 EWTF Operation Plan* (LLNL, 1993) and the *Environmental and Exposure Assessment for Site 300 Explosive Waste Treatment Facility* (Environmental and Exposure Assessment) (LLNL, 1995).

Although the EWTF is expected to treat only about 1,500 lb (681 kg) of explosive waste annually, it would be permitted to handle up to 4,000 lb (1,816 kg) per year. Waste minimization efforts at both the LLNL Livermore Site and at Site 300 account for the reduction in the amount of explosive waste to be treated, and ongoing pollution prevention efforts should reduce this amount even further. However, the EWTF would continue to be permitted for the higher total to handle potential changes in DOE and DOE-sponsored programs.

Operation of the EWTF would occur only on days with favorable meteorological conditions and which are approved for burning operations by the California Air Resources Board and the San Joaquin Valley Unified Air Pollution Control District. Operations would cease when winds exceed 20 mph (32 kph). Explosive waste would be transported to the proposed EWTF from the Site 300 Explosive Waste Storage Facility (EWSF) or directly from generator waste accumulation areas. The *Site 300 EWTF Operation Plan* limits the amount of waste that can be treated per operation (LLNL, 1993). The handling, packaging, transport, and treatment of explosive waste materials would be done in accordance with the *LLNL Health and Safety Manual* and Supplements (LLNL, 1991b) and the *Environmental Compliance Manual* (LLNL, 1994) procedures. All explosive waste containers would meet applicable U.S. Department of Transportation requirements. Additional procedures for the handling and transport of explosive waste at the proposed EWTF are described in the *Site 300 EWTF Operation Plan* (LLNL, 1993).

After placing wastes in the appropriate treatment unit and preparing them for treatment, all further operations, such as burning or detonation, would be conducted remotely from B845. Surveillance cameras at the OB and OD units would allow operators to visually monitor treatment operations. The burn pan's remotely controlled cover would be closed after treatment to prevent the disturbance of ash residue by wind or precipitation.

After treatment, ash residue in the OB units would cool for a minimum of 24 hours. Ash would then be visually inspected by facility operators to verify complete treatment. If no untreated explosive waste is present, ash would be collected in a container in the OB area. Full containers would be stored temporarily (from several weeks to several months) in the EWSF or the Building 883 Container Storage Area. The ash would be sampled and tested for hazardous constituents, and then shipped offsite, as necessary, for disposal at a permitted hazardous waste landfill. It is expected that operation of the EWTF would produce less than ten 55-gal (208-liter) drums annually. While most of this ash would be suitable for disposal at an offsite non-hazardous waste landfill, some ash may be classified as hazardous and would need to be shipped to one of several hazardous waste landfills currently available, none of which are expected to close within the next ten years. None of the proposed EWTF facilities would be used for accumulation or storage of waste other than this ash.

The OB units would also provide a suitable location for decontamination of equipment and materials contaminated with explosives. The contaminated items would be placed in the open burn cage, the burn pan, or on a concrete pad where the explosives would then be burned off. This decontamination would be performed to ensure that equipment contaminated with explosives would be in a safer condition for future handling operations. A metal plate may be installed on one of the concrete pads to provide a stable platform for the decontamination of the larger items. It is expected that this operation would be performed less than ten times per year. These operations have been conducted at the B829 facility prior to November 1992 and would merely be relocated along with the open burning operations. This type of decontamination would be performed after other methods of decontamination (i.e., mechanical swiping and chemical applications) have been conducted. As a result, only trace amounts (i.e., less than one gram) of explosive waste is expected to be present.

The OD gravel pad would be covered when not in use. This cover would probably consist of a plastic sheet which could be spread over the pad and rolled up when not needed. Its use

would prevent precipitation from carrying any potential explosives residue to the soil column, ground water, or surface water. Periodically, the gravel would be sampled for contamination and, if necessary, washed with a portable gravel washer unit and reused. Occasional sampling of runoff from the OB pad would be conducted to ensure that contaminants do not reach the Elk Ravine watershed.

Equipment used to handle explosive waste would include forklifts, hand trucks and carts, drum dollies, and transport trucks. Gasoline- and diesel-powered forklifts would be equipped with backfire deflectors. Flame arresters would be installed in the gasoline fill pipe of gasoline-powered forklifts, and deflector plates would be installed to prevent fuel from reaching the motor or exhaust pipe. Fire extinguishers would be installed on forklifts and trucks. In addition, open flames, smoking, cutting, welding, and sparks would be prohibited at the treatment units when explosives are present. Personal protective equipment, such as flame-retardant coveralls, cotton undergarments, safety glasses, gloves, boots, and respirators, would be available to personnel at all times. Explosive waste would not be permitted inside the metal storage building or the magazette. Operations in and around the facility would be prohibited during electrical storms.

All personnel would be trained in procedures for the safe handling of explosive waste and emergency response as outlined in the 1993 *Site 300 EWTF Operation Plan* (LLNL, 1993a). This training includes proper methods of handling, packaging, transporting, and treating hazardous waste as well as emergency response procedures.

3.1.4 Closure

The proposed action would include the ultimate closure to baseline levels of the proposed EWTF as described in the *Site 300 EWTF Operation Plan* (LLNL, 1993a). The baseline levels would be determined by preconstruction sampling of the soils at the proposed site. It would include the decontamination of the units and related equipment, disposal of all contaminated materials, and verification sampling to support certification of the closure process.

Upon the completion of closure activities, there would be no hazardous waste or hazardous chemical residues in the closed units above baseline levels. Thus, post-closure measures to prevent the release of hazardous chemical constituents generated by EWTF operations would be unnecessary.

3.2 Alternatives to the Proposed Action

Four alternatives were discussed in Appendix A, Section A.2.5.3 of the 1992 Sitewide EIS/EIR. These alternatives are reviewed below.

3.2.1 The No-Action Alternative

The no-action alternative would continue open burning of explosive waste at B829. Because LLNL is currently conducting open burning operations under a State of California Environmental Protection Agency (Cal EPA) Enforcement Order, DTSC would need to either issue a new permit or extend the interim status operational requirements. No open detonation of explosive waste would occur at LLNL Site 300 under this no-action alternative, and explosive waste requiring detonation would be stored at Site 300 until another treatment method was available, or an offsite facility accepted the explosive waste. However, under rare conditions, an Emergency Permit may be obtained by DTSC granting specific authorization for the detonation of explosive waste which presents an imminent hazard and which cannot be stored safely.

3.2.2 Continuation of Open Burning at a New Facility

Similar to the no-action alternative, this alternative would continue only open burning of the explosive waste. However, this activity would occur at a new facility that would be constructed in the B845 Area. This area was chosen as a potential site for the proposed EWTF due to a variety of factors, including favorable meteorological conditions (such as a decreased number of days of wind which would halt operations), distance from both the Site 300 boundary and the developed portion of Site 300, and the existence of infrastructure (such as roads, utilities, etc.). Under this alternative, no open detonation of explosive waste would be allowed at this new facility and those types of explosive waste requiring open detonation for treatment would be accumulated onsite until future treatment options were available, or the waste would be shipped offsite to a future storage or treatment facility.

3.2.3 Termination of Open Burning Operations

Under this alternative, all open burning treatment of explosive waste would cease at LLNL Site 300. As a result, all explosive waste would have to be packaged and sent to an offsite, private facility for treatment or to a another DOE site for storage and/or treatment. To allow for offsite shipment, certain explosive waste would need to be altered to either remove those characteristics that render it classified, or to reduce the size of the waste to make it acceptable for shipment on public roads. In addition, tighter controls on the handling of explosive waste would be needed to prevent the contamination of explosive waste with other waste streams.

3.2.4 Application of Alternative Treatment Technologies

This alternative would utilize a form of treatment other than open burning or open detonation (e.g., biological treatment, chemical deactivation processes, or solar-assisted decomposition of explosive waste) to treat the explosive waste at Site 300 when such technology becomes available.

4.0 Description of the Existing Environment

A general description of the environment surrounding the proposed EWTF is presented in this section. A more detailed description of the Site 300 environment can be found in the 1992 Sitewide EIS/EIR (DOE, 1992). Additional information on the specific site conditions in the immediate area of the proposed EWTF can be found in the May 1995 *Environmental and Exposure Assessment for Site 300 Explosive Waste Treatment Facility* (LLNL, 1995).

4.1 Site 300

LLNL Site 300 straddles the border between Alameda and San Joaquin Counties in the sparsely populated hills of the Diablo Range, approximately 15 mi (24 km) southeast of the City of Livermore in the Altamont Hills (see **Figure 2**). The site occupies approximately 7,000 acres (2,835 hectares) of steep ridges and canyons. Elevations range from approximately 500 ft (152 m) above mean sea level near Corral Hollow Creek to 1,722 ft (525 m) above mean sea level in the northwest area of the site.

The population of the City of Tracy, the nearest major population center, was 33,558 residents in 1990. According to the 1993 City of Tracy General Plan/Urban Management Plan, the population is forecast to reach 162,345 by the year 2013. The workforce at Site 300 averages about 300 people with temporary increases during construction projects. Approximately 150 employees are currently assigned to the General Services Area (GSA) near the southeastern portion of the site.

Site 300 is located on the eastern edge of the seismically active San Francisco Bay Area. A number of active faults are considered capable of causing strong ground motion at Site 300. The nearest of these faults is the Carnegie-Corral Hollow Fault.

The climate at Site 300 is characterized by warm, dry summers and mild winters with winds predominantly from the southwest. The average annual rainfall at Site 300 is about 11 in. (28 cm). Ground fog from the San Joaquin Valley occasionally reaches the site during December and January. The marine stratus layer (i.e., coastal fog) that extends inland from the Pacific Ocean during summer and fall does not usually reach Site 300.

Background noise levels at Site 300 are generally low due to a lack of development in the area. Existing onsite noise sources at Site 300 include vehicular traffic; heating, ventilating, and air conditioning equipment; construction activities; a small arms firing range; and explosives testing. Offsite sources of noise include an adjacent offroad vehicle recreational area and a private explosives testing facility, both of which are situated on the southern boundary of Site 300 near the GSA.

Several, unnamed ephemeral streams flow through Site 300 during the wet winter months and discharge into Corral Hollow Creek at the southern boundary of the site. Most flow is direct runoff with a very small contribution from both intermittent and perennial springs. Minor erosion results from both natural and induced conditions.

Four major vegetation types are found at Site 300. They are (1) introduced grassland, (2) native grassland, (3) coastal sage scrub, and (4) oak woodland (Taylor and Davilla, 1986). Most of the vegetation at Site 300 is grassland dominated by mixtures of introduced annual and native perennial grasses. The only sensitive plant species known to occur at Site 300 is the federal- and state-endangered large-flowered fiddleneck (*Amsinckia grandiflora*). A portion of a canyon, approximately 1.0 mile (1.6 kilometers) southwest of B845, has been designated as critical habitat

for the large-flowered fiddleneck (see **Figure 4**). In this case, critical habitat is defined as habitat which is suitable for the establishment or expansion of an existing population of a sensitive species.

The wildlife at Site 300 strongly reflects the dominance of grasslands. A total of 116 species of wildlife were observed at Site 300 during field surveys performed in 1991 in support of the 1992 Sitewide EIS/EIR (DOE, 1992). The results of the field survey indicated the presence of 26 species of mammals, 70 species of birds, and 20 species of reptiles and amphibians (DOE, 1992). Since the 1991 surveys, an additional 12 species were identified: 1 mammal species, 1 amphibian species, 9 avian species, and 1 species of fairy shrimp (Woollett, 1995). **Table 1** lists state and federal special status species found at Site 300.

Table 1. Special Status Species at Site 300.

Species	State Status	Federal Status
Western spadefoot toad	SSOSC[a]	
Mountain lion	State Protected	
American badger	SSOSC	
San Joaquin kit fox [b]	State Threatened	Federal Endangered
Valley elderberry longhorn beetle	SSOSC	Federal Threatened
California tiger salamander	SSOSC	Federal Candidate
Red-legged frog	SSOSC	Federal Proposed Endangered
Alameda whipsnake	State Threatened	Federal Proposed Endangered
California horned lizard	SSOSC	Federal Candidate
Golden eagle	State Protected	Federal Protected
Burrowing owl	SSOSC	Federal Candidate
Tri-colored blackbird	SSOSC	Federal Candidate
Peregrine falcon	State Endangered	Federal Endangered
Swainson's hawk	State Threatened	
Short-eared owl	SSOSC	
Ferruginous hawk	SSOSC	Federal Candidate
White-tailed kite	State Protected	
Northern harrier	SSOSC	
Prairie falcon	SSOSC	
Merlin	SSOSC	
Horned lark	SSOSC	Federal Candidate
Loggerhead shrike	SSOSC	Federal Candidate

[a] SSOSC = State Species of Special Concern

[b] Although not observed onsite, Site 300 is considered suitable habitat for the San Joaquin kit fox

Source: DOE, 1992; Woollett, 1995

To date, cultural resources investigations at Site 300 have resulted in the discovery of 29 sites: 7 prehistoric, 21 historic, and 1 site with elements of each. Of these, 24 are officially recorded but no evaluations to determine their significance have yet been performed.

4.2 Proposed EWTF Location

The OB units and the OD unit would be located at the base of two small, distinct canyons in the central portion of the site. The two canyons intersect and form one canyon approximately 450 ft (137 m) below the proposed EWTF site. This small canyon then merges with the Elk Ravine watershed. The distance from the proposed OB/OD units to the watershed is approximately 0.25 mi (0.4 km).

Explosive experiments and testing were conducted at the firing pad on the southwest side of B845 from 1958 to 1982. B845 is a bunker used for control room instrumentation and the protection of personnel during testing operations. Although no experiments have been conducted at B845 since 1982, the facility is still considered operational and is available for explosives tests. Debris from the B845 firing pad tests was disposed of in Pit 9 from 1958 to 1963. Pit 9 is located approximately 200 ft (61 m) southwest of B845. The Remedial Investigation of Landfill Pit 9 (Taffet and Lamarre, 1989) found no evidence that Pit 9 contaminants impacted local vadose zone or ground water quality.

The depth to ground water below the proposed location of the EWTF is 80-130 ft (24-40 m) below ground surface. The direction of ground water flow is generally northeast. Four existing ground water monitoring wells were placed near Pit 9 and B845 during the Remedial Investigation of Landfill Pit 9 (Taffet and Lamarre, 1989). Water samples from these wells indicate the presence of 1,200 to 1,300 mg/L of total dissolved solids. No organic compounds were detected in ground water samples. No tritium, metals, or other radioactive materials were detected in the groundwater at greater than background levels. Wastes disposed in Pit 9 do not, therefore, appear to be impacting ground water in the B845 area. Decades of explosives testing at B845 have yielded soils that contain contaminants which include metals, radiological isotopes, and explosive components. The preconstruction soil sampling would establish concentrations of these contaminants and would be used to establish a baseline. This baseline would be used to determine cleanup levels at EWTF during the closure process.

Due to the high clay content of the soils in the project area, precipitation is more likely to run off the site rather than infiltrate to the ground. The nearest perennial stream is in Elk Ravine approximately 2,500 ft (762 m) to the southeast. The nearest ephemeral stream channel (one that exhibits runoff during the rainy season or storms) is 800 ft (244 m) to the east. The proposed EWTF would be well outside the 100-year floodplain. The nearest wetlands is located approximately 1,400 ft (427 m) to the south and would not be affected by the proposed project (see **Figure 3**).

No rare or endangered plant species were found in the Elk Ravine area near the location of the proposed EWTF, although several special status animal species have been known to use the area around the EWTF. A burrowing owl den was found approximately 1,400 ft (427 m) to the south but was located on the other side of a small ridgeline, which may provide some degree of isolation from EWTF construction and subsequent operation (see **Figure 3**). This den was believed to be occupied by a single burrowing owl and was not identified as a nesting den. In addition to the burrowing owl den, a badger has been found to periodically use a den adjacent to the proposed EWTF site. Badgers commonly utilize spatially separated dens within their home range and have the opportunity to change dens if one area becomes unattractive (Woollett, 1995). Finally, tri-colored blackbirds were observed nesting in the wetlands area to the south in the spring of 1993; however, they were not observed nesting there in 1994 or 1995.

The B845 firing pad, the proposed OB unit location, and associated access areas were surveyed for cultural resources in April 1994 (Bennett, 1994). No cultural resources that would warrant special consideration were discovered within project boundaries.

5.0 Potential Environmental Consequences of the Proposed Action and Alternatives

The proposed action is the construction of EWTF and the relocation of explosive waste treatment operations from B829 to new facilities at B845. The 1992 Sitewide EIS/EIR assessed the potential impacts of the construction and operation of the proposed EWTF on the environment (DOE, 1992) and found that the impacts are less than significant and may be beneficial. This section discusses these potential environmental impacts.

5.1 Effects Related to Construction Activities

5.1.1 Environmental Effects from Construction Activities

5.1.1.1 Effects to Land

The construction of the proposed EWTF would include the clearing of less than 1 acre of grassland. Section 5.1.7 of the 1992 Sitewide EIS/EIR assessed the potential construction-related effects on vegetation at Site 300 associated with the proposed project. Impact 7.2.1 of that section stated: "The proposed action would affect vegetation (introduced grassland plant communities) principally by clearing land for construction projects. This is a less than significant impact" (DOE, 1992).

The extension of utilities would involve minor trenching alongside an existing road which would be widened and paved. Any excess soils would be analyzed and disposed of in accordance with federal, state, and local regulations, applicable DOE Orders, and LLNL procedures.

5.1.1.2 Effects to Air

The 1992 Sitewide EIS/EIR assessed the impacts of general construction activities at Site 300 on air quality. Impact 8.2.1 of the 1992 Sitewide EIS/EIR stated: "Assumed growth at LLNL Site 300 under the proposed action would result in short-term impacts due to construction activities..." Mitigation Measure 8.2.1, established to reduce construction-related impacts to air quality, stated: "General construction practices at Site 300, including contract specifications, would require that fugitive emissions be reduced by means such as water spraying of roads and the wheels and lower portions of construction vehicles and covering exposed piles of excavated material" (DOE, 1992). Thus, application of periodic water spray in accordance with Mitigation Measure 8.2.1 would mitigate, to the extent feasible, the potential impact of the generation of fugitive dust generated during the EWTF construction on ambient air quality at Site 300.

5.1.1.3 Effects of Noise

Noise levels to both onsite and offsite populations would not be increased by the construction activities. Workers involved with the EWTF construction would wear appropriate hearing protection when necessary.

5.1.1.4 Effects to Water

The proposed action is not located within or near any identified wetlands area or 100-year floodplain. Best Management Practices (BMPs) appropriate for site conditions would be followed during construction to prevent the transport of disturbed soils or construction materials from the construction site. These BMPs would prevent soils or materials from being transported to Elk Ravine and, subsequently, to Corral Hollow Creek. Construction activities would also comply with the requirements of the LLNL Storm Water Pollution Prevention Plan for Site 300 and the *National Pollutant Discharge Elimination System,* California General Industrial Activity Storm

Water Permit. The proposed action would not impact a natural drainage or ephemeral channel; and, therefore, a California Department of Fish and Game Streambed Alteration Agreement would not be required.

5.1.1.5 Effects to Ecological Resources

The construction of the EWTF would not affect the known populations of the state-endangered large-flowered fiddleneck (*Amsinckia grandiflora*), which occur far to the south and west of the proposed EWTF location and are separated from it by an intervening ridge. The known locations of elderberry bushes that occur at Site 300 are approximately 2,500 ft (762 m) to the south and east of the proposed facility location, and none are within a 300-ft (91-m) radius of any construction activity that would be part of the proposed action. Because no individuals have been observed at Site 300, the kit fox is not considered to be a resident species; however, the area around Site 300 is considered to be potential habitat. While the project area is within the home range of an American badger, the proposed action is not expected to adversely impact this individual because of the large area associated with this home range. One burrowing owl den has been discovered 1,400 ft (427 m) to the south of the proposed EWTF but is separated from it by a ridge line which provides a degree of isolation (Woollett, 1995).

The EWTF is not located in or near a floodplain, wetlands areas, or vernal pools that could be considered habitat for the red-legged frog, tiger salamander, or fairy shrimp. As required by Mitigation Measures 7.2.6L and 7.2.6T in the 1992 Sitewide EIS/EIR, preconstruction surveys for the kit fox, American badger, and burrowing owl would be conducted within 60 days prior to start of ground-disturbing activities (DOE, 1992). Depending upon the results of the survey, actions required by additional mitigation measures cited in the 1992 Sitewide EIS/EIR (such as the establishment of exclusion zones around any active dens found and the posting of these dens), would be implemented.

5.1.1.6 Effects to Cultural Resources

In accordance with the professional standards of the National Historic Preservation Act (NHPA) of 1966, and the California Environmental Quality Act, Appendix K, a literature search and a field survey to identify cultural resources were performed. No previously recorded sites or newly identified surface cultural resources are located within the project boundaries. Consequently, known cultural sites would not be impacted.

In accordance with NHPA and Mitigation Measure 4.2.1, developed as a result of the 1992 Sitewide EIS, any subsurface cultural resources that may be unearthed during construction activities would be reported to the LLNL archaeologist. Construction activities within the vicinity of the find would be halted until the find is assessed and any necessary mitigation measures are developed in consultation with DOE, the State Historic Preservation Office, and the Advisory Council on Historic Preservation.

5.1.2 Health and Safety Effects from Construction Activities

Normal construction hazards would be present during the construction phase for the proposed action. Workers would receive proper safety training prior to construction, and all activities would be in accordance with all relevant Occupational Safety and Health Act requirements. The results from the preconstruction sampling would determine if worker protection measures would be required. These would consist of approved LLNL procedures which govern work in areas of known contamination to minimize worker exposure and prevent the further spread of contamination from excavation activities.

5.2 Effects Related to Facility Operations

5.2.1 Environmental Effects from Facility Operations

5.2.1.1 Effects to Land

The potential for fires would be minimized by removing all potentially combustible material from the OB/OD treatment areas within a 200-ft (70-m) buffer zone and by the separation of the OB units from associated equipment and structures. Additionally, annual prescribed burning minimizes the presence of combustible vegetation in the general project area. Because prescribed burning in the B845 Area has been performed periodically in the past, the impacts of continuing this practice are not exclusive to the proposed action. Open flames, smoking, cutting, welding, and sparks would be prohibited at the treatment units when explosives are present. Treatment operations would not be conducted whenever wind speeds are above 20 mph (32 kph).

Because gravels in the firing pad would attenuate the shock generated during OD treatment operations, damage to ground water monitoring wells near B845 is not expected. Also, existing pipe risers on the ground water wells in a direct line-of-site with the firing pad would be replaced with below-grade concrete boxes, minimizing the potential for damage from OD treatment debris. Past explosives tests at B845 do not appear to have caused the migration of contaminants that may be present in Pit 9 to migrate. OD treatment operations, therefore, are not expected to impact the stability of wastes in Pit 9.

5.2.1.2 Effects to Air

Section 5.1.8 of the 1992 Sitewide EIS/EIR discussed the impact of the proposed EWTF on air quality at Site 300. Under Section 5.1.8, Impact 8.2.5 stated: "... the Explosive Waste Treatment Facility at LLNL Site 300 under the proposed action would result in the same or less air emissions [than continued OB treatment of explosive wastes at B829]. This is a less than significant impact" (DOE, 1992).

The treatment of explosive waste in the proposed EWTF would result in airborne products of combustion. Because the proposed action would merely be relocating OB units from B829 to a new location, no net increase in emissions is expected. Treating explosive waste by open detonation would have the same impact to air quality as the current testing of explosives at Site 300. Product gases/aerosols are dependent upon the explosive formulation and could include such compounds as carbon monoxide, oxides of nitrogen, dioxins, and furans. Particulates would consist primarily of metal oxides and carbon compounds. It is expected that all emissions would be below both the applicable local air district and federal regulatory limits. Detailed lists of the potential compounds that could be released as a result of explosive waste treatment were compiled from emissions factors developed by the U.S. Army Armament, Munitions and Chemical Command (AMCCOM)(AMCCOM, 1992), by analysis at the B829 open burn facility by LLNL and ENSR (ENSR, 1993), and by studies conducted by related industry (UTC, 1990). Further details are provided in the *Environmental and Exposure Assessment for 40 CFR (RCRA) Subpart X Requirements for Site 300 Explosive Waste Treatment Facility* (LLNL, 1995).

It is not expected that the use of the OB pad for the infrequent decontamination of large items would lead to measurable emissions. Prior decontamination efforts have removed the majority of the explosive waste, and the amount of waste to be burned would be minimal. In addition, because it is anticipated that this activity would be conducted an average of ten times per year, it is not expected that decontamination activities would cumulatively contribute to total emissions released from EWTF operations.

5.2.1.3 Effect of Noise

Blast-generated overpressures from explosive test shots have been measured to determine the extent of the overpressures that may propagate over nearby offsite areas to the north and east of Site 300 (Kang and Kleiber, 1993). The unit of measurement for noise is the "A-weighted decibel" (dB). For comparison purposes, the sound level of an average office is approximately 50 dB, and the sound level for operating a chainsaw at two ft is approximately 110 dB (FAA, 1977). Test results show that under certain meteorological conditions, detonations of the EWTF limit of 350 lb (159 kg) of explosive waste could result in pressure levels in the nearby offsite areas above 126 dB (Kang and Kleiber, 1993).

In order to minimize the potential for adverse noise impacts, LLNL would follow an established atmospheric modeling procedure for estimating limits on the amount of explosive waste to be treated such that adjacent offsite areas (at the Site 300 boundary) should not experience noise levels in excess of 126 dB (using a three-step prediction procedure described in Kang and Kleiber, 1991). These procedures could limit the amount of explosive waste detonated in a single treatment operation to less than 350 lb (159 kg). The nearest residential area would be the City of Tracy, located 8 mi (13 km) to the northeast. Noise levels at this location would not be noticeably higher than current levels.

5.2.1.4 Effects to Water

Operation of the EWTF would be in accordance with the Storm Water Pollution Prevention Plan for Site 300. This plan would address storm water runoff at the proposed EWTF through the use of graded-earth ditches to route runoff around the OB/OD units, covering the OD gravel pad when not in use, and sampling runoff from the OB pad to ensure that contaminants from the pad do not reach the Elk Ravine watershed.

Due to the expected minimal concentrations of airborne combustion products and the expected atmospheric dispersion, the potential for airborne emissions of aerosols or particulates to be deposited and transported to subsurface soils or ground water would be minimal. The potential for migration to ground water after deposition would be further reduced by the low annual rainfall, the relatively large depth to ground water (80 to 130 ft [24 to 40 m]), and the calcareous (alkaline) nature of the soils, which would act to neutralize potential deposits of acidic aerosols or salts derived from acidic products of combustion.

The removal of ignitable vegetation in the 200-ft (70-m) buffer zone may lead to minor amounts of erosion during the rainy season. It is not expected that the establishment of the buffer zone would contribute to sedimentation in Corral Hollow Creek.

5.2.1.5 Effects to Ecological Resources

The OB/OD treatment of explosive waste in the proposed facility would not generate greater amounts of debris or have a greater potential to adversely impact wildlife than the current programmatic activities conducted at Site 300. For example, the 1992 Sitewide EIS/EIR, Section 4.9.3, stated: "Explosives testing has no impacts or only slightly adverse impacts depending on the type of sensitive species ..." (DOE, 1992).

With the exception of the burrowing owl, no threatened, endangered, candidate, or state-listed animal species has been observed to reside exclusively in the general area (within 0.5 km) of the proposed facility (DOE, 1992). Most mammalian species that are found at Site 300 are nocturnal and would not be present near the proposed EWTF during its daytime operation. Burrowing owls that may be present in the general area typically stay close to the ground and should not be affected by OB operations. The observed nesting habitat for the tri-colored blackbird

is about 0.5 mi (0.8 km) southeast of B845, a far enough distance so that open burn operations and routine activity would not impact any individuals present.

Although explosives testing conducted at Site 300 for decades may have resulted in an higher tolerance to noise by certain species, a local increase in detonation activities around B845 may have a slightly adverse impact on nesting birds in the area. Surveys would be conducted in the spring of each year to determine if either burrowing owls or tri-colored blackbirds are nesting in the vicinity of the EWTF. If a nesting presence is identified, internal mitigation measures may be implemented as necessary to minimize the impact of OD operations.

Mitigation Measure 7.2.6F in the 1992 Sitewide EIS/EIR requires that: "Warning sounds will continue to be broadcast from each testing facility before a detonation. In addition to warning personnel working in the area, this broadcast would scare away sensitive bird species, particularly raptors, from the explosion test site" (DOE, 1992).

The populations of large-flowered fiddleneck are located more than 1.2 mi (1.8 km) west of B829 and southwest from the proposed EWTF location. These populations are well established, and it appears that emissions from historic OB treatment operations at B829 have not adversely affected them. Because the population near B845 is located downwind from the proposed EWTF and the population near B829 is similarly located downwind from current open burning operations at B829, relocating burning operations to B845 should not adversely impact the populations.

Since the ROD for 1992 Sitewide EIS/EIR was issued in January 1993, several animal species have had their status upgraded. The red-legged frog and the Alameda whipsnake were upgraded from federal candidate species to federal proposed endangered. The burrowing owl and the California horned lizard have just recently acquired federal status (Federal Candidate II). Finally, the California tiger salamander, which was a Federal Candidate II species, is now classified as a Federal Candidate I species. None of these species, however, has been found to be a permanent resident in the B845 Area. Other than these changes, there have been no new designated or proposed critical habitats at Site 300 or other designation changes that would alter the U.S. Fish and Wildlife Service determination that the proposed action would not adversely affect federally-listed species or their habitats at Site 300 (Woollett, 1995).

5.2.1.6 Effects to Cultural Resources

The operation of the EWTF would not result in adverse impact to known cultural resources at Site 300. The nearest cultural resource is located more than 0.25 mi (0.4 km), and would not be impacted by activities associated with the EWTF. Because no excavation activities are expected during operation no new cultural resources are expected to be uncovered. However, in the unlikely event some were unearthed, the same measures described in the section "Effects Related to Construction" would be implemented (i.e., contact with the LLNL archaeologist and the implementation of mitigation measures, as needed).

5.2.2 Health, and Safety Effects from Facility Operations

The 1992 Sitewide EIS/EIR assessed the impact of the operation of the EWTF on occupational (worker) safety and health, public health, and the environment. Under Section 5.1.14, Impact 14.2.2 stated: "The high explosive waste open burning facility would be replaced with a new Explosive Waste Treatment Facility. This is a less than significant impact, and may be beneficial...Improvements could reduce worker exposure to chemicals and physical hazards relative to the facilities that are currently being used" (DOE, 1992). The EWTF would also provide for open detonation capability which would represent the safest method of treatment for certain explosive waste types. By utilizing the OD pad, the possibility of an unintended detonation at the OB units would be reduced.

Since the preparation of the 1992 Sitewide EIS/EIR, air dispersion and health risk assessment modeling have been conducted in support of the EWTF hazardous waste facility permit application to the DTSC. This modeling effort indicates that emissions from the EWTF OB operations would not pose an unacceptable health risk to Site 300 personnel or the public. A brief description of the modeling performed in support of the hazardous waste facility permit application is presented below. A detailed description of this modeling effort may be found in the *Environmental and Exposure Assessment for 40 Code of Federal Regulations (CFR) (RCRA) Subpart X Requirements for Site 300 Explosive Waste Treatment Facility* (LLNL, 1995).

The concentration of the products of combustion at the onsite and offsite maximally-exposed receptors were estimated using chemical thermodynamic principles, industry-accepted air dispersion models (i.e., the EPA's Integrated Puff [INPUFF]), and a DTSC-recommended, multiple-exposure-pathway health risk assessment (HRA) model. Using these methods, the maximally-exposed receptors were determined using site-specific meteorological conditions for the open burn pan and burn cage units.

Modeling results indicate that acute exposures from the burn pan and burn cage operations are below state-accepted exposure levels. However, because dioxins that have been identified as potential carcinogenics may be present, operation of the burn pan and burn cage was evaluated for cancer risk to the public. Chronic exposure levels for the open burn pan operations indicate a carcinogenic health risk to the maximally exposed individual (MEI), which is associated with dietary pathways, ranging from 6.0×10^{-8} to 7.0×10^{-7}, with dioxin being the pollutant of concern. Chronic exposure levels for the burn cage operations indicate a worst-case cancer risk, associated with dietary pathways and ranges from 4.0×10^{-8} to 1.0×10^{-6}, with dioxin again being the pollutant of concern.

DOE and many regulatory agencies assume that a risk less than 1.0×10^{-6} is not significant for purposes of requiring additional, health-related mitigation measures. It is believed that this level constitutes a de minimis risk, or one that is so small as to be effectively no risk. The Federal Food and Drug Administration (FDA, 1985) has made such a finding in the context of cancer risks from food additives. It should be noted that this does not mean that one out of a million people would contract cancer, but rather that there is an additional one-in-a-million chance over a person's normal risk of developing cancer over his or her lifetime.

It is also important to note that these values conservatively assume an estimated worst-case frequency of 100 burn days per year, an excessively variable temperature range during the burning process (which produces the maximum amount of dioxins), and the continued use of diesel fuel (which may contribute substantial levels of dioxins). Because of the high degree of toxicity associated with 2,3,7,8-TCDD (the most toxic dioxin compound), additional reviews of the data and other related studies were conducted.

A review of the protocol used for the trace species analysis test noted above indicated that the use of diesel fuel as the supplementary fuel at the existing burn unit could have caused elevated levels of dioxin and furan cogeners because the explosive waste treated contained no chlorinated compounds which could have contributed to the generation of dioxins. Review of the AMCCOM data on explosive waste treatment indicated that no dioxin or furan cogeners were detected during monitoring (AMCCOM, 1992). Similarly, review of United Technology Corporation (UTC, 1990) studies indicated emission factors of approximately two orders of magnitude less for the TCDD dioxin equivalent than was indicated from the LLNL tests which used diesel fuel. As a result of these comparisons and the implementation of improved engineering and management controls discussed below, it is expected that risks to the public would be within the range of acceptable risk levels used by DOE and the EPA. Further details are provided in the *Environmental*

and Exposure Assessment for 40 CFR (RCRA) Subpart X Requirements for Site 300 Explosive Waste Treatment Facility (LLNL, 1995).

Operational procedures proposed for use at the EWTF would minimize the potential for exposure to combustion products. OB/OD treatment would be intermittent and would be of relatively short duration. Additional operational procedures may include conducting treatment operations only on approved burn days (as declared by the California Air Resources Board and the San Joaquin Valley Unified Air Pollution Control District); suspending operations during unfavorable meteorological conditions (such as high winds or during periods of expected precipitation); utilizing a remotely operated cover for the burn pan to minimize fugitive emissions; utilizing a "cleaner fuel" such as propane for the burn cage unit; and limiting the amounts of waste to be treated at any one time.

Furthermore, with the operation of the proposed EWSF, the management, storage and treatment of explosive waste will be optimized, thereby reducing the number of treatment events necessary. In addition, waste minimization efforts and material substitution to "environmentally friendly" materials have been initiated at the LLNL Site 300 to reduce the amount of explosive waste requiring onsite treatment and to minimize the combustion of various pollutants which might produce dioxins (i.e., chlorinated plastics). The INPUFF modeling results, HRA analysis, and implementation of operational features support the conclusion of the 1992 Sitewide EIS/EIR that the relocation of waste treatment operations to the proposed EWTF would have a less-than-significant impact (DOE, 1992).

In addition to operational procedures designed to minimize the emission of potentially hazardous chemicals, certain design features would be employed to further reduce the potential for environmental contamination. The burn pan and the burn cage would be designed to provide primary containment of ash generated during OB treatment. Each OB unit would be located in a paved area on a impermeable foundation that would prevent any accidental spill of explosive waste or residual ash from directly reaching soil or ground water. The burn pan would be equipped with a remotely controlled, movable cover to minimize potential spread of ash by precipitation or wind dispersal.

The proposed open detonation activities would not be expected to produce substantial quantities of emissions which may impact human health. Any emissions that are generated would be well within all applicable local and federal limits. The nature of detonation as a treatment method primarily produces carbon dioxide and nitrogen oxides.

The proposed decontamination activities, which are currently being conducted at B829, would not be expected to result in a risk to either human health or the environment. These activities would be conducted infrequently and would occur outside the burn pan only when objects or equipment are too large to be contained in the pan. The estimated number of events per year, based upon previous operations, would be approximately ten operations. In addition, this type of decontamination would be used only as a final step in the process, and it is expected that the majority of explosive waste would be removed by the preceding operations (i.e., physical wiping and chemical decontamination).

Treatment operations would be conducted remotely from B845, which would provide worker protection. Meteorological monitoring equipment would be utilized to ensure adequate dispersion and reduce potential impacts. Runon/runoff controls, such as soil stabilization and diversion trenching, would be utilized to prevent erosion and to direct any stormwater around the treatment units. Additionally, the proposed location is less subject to the seasonal wind conditions that could cancel burn operations as compared to the present B829 location.

5.3 Effects Related to Closure

At the completion of its operation, the proposed EWTF would be closed. This closure would consist of, at the minimum, decontamination of the units and related equipment, disposal of all contaminated materials, and verification sampling that would support certification of completion of the closure process.

5.3.1 Environmental Effects from Closure

5.3.1.1 Effects to Land

There would likely be no impact on land use or soils from the closure of the proposed EWTF.

5.3.1.2 Effects to Air

There would likely be no additional air emissions emanating from the B845 Area after closure.

5.3.1.3 Effects of Noise

Noise levels would revert to background levels at the conclusion of closure activities.

5.3.1.4 Effects to Water

Closure of the proposed EWTF would have no impacts to water resources (either ground water or surface water).

5.3.1.5 Effects to Ecological Resources

Due to the absence of further detonations or burnings and the decreased human presence, closure of the EWTF would likely have a beneficial impact to natural resources in the area. It is expected that the area would still experience periodic controlled burning to control wildfires, but such actions would not impact threatened or endangered plant species; such controlled burns have been cited as beneficial to the maintenance of the native plant species in the area (DOE, 1992).

5.3.1.6 Effects to Cultural Resources

No impacts are expected to cultural resources from the closure of EWTF. It is not expected that any part of the proposed EWTF would be considered potentially historic and would, therefore, not require special consideration upon closure.

5.3.2 Health, and Safety Impacts from Closure

The EWTF would be closed to standards set by the preconstruction sampling and in accordance with the DTSC regulations and CVRWQCB requirements. Some soil contamination generated by past practices at B845 may exist after closure of the EWTF, but such contamination would not pose a threat to human health of the environment. Future Site 300 remediation efforts would address this contamination when feasible and practical.

5.4 Effects Associated with the Postulated Accident Scenario

Accidents and off-normal occurrences are hazard events initiated by unplanned, internal, or external occurrences that could produce measurable consequences. Although an accidental detonation resulting from human error during the handling of explosive has never occurred at Site 300 and is considered extremely unlikely, the reasonably foreseeable accident for the EWTF resulting in the greatest potential for adverse human health effects is the accidental detonation of explosives at the OD unit.

The maximum amount of explosives that could be treated at the OD firing table is 350 lb (159 kg). The postulated accident scenario assumes that this quantity of explosive waste would accidentally detonate during unloading or preparation for treatment. It is also assumed that the accidental detonation is caused by human error in the handling or preparation of the explosive waste.

Explosives handling operations at the treatment site are conducted by the minimum number of people (usually two) necessary to conduct the operation safely. The postulated accident scenario assumes that two workers would be in close proximity to the waste explosives at the time of an accidental detonation, resulting in serious injury or fatalities to both. The vehicle used to transport the waste explosives and any equipment used for handling explosives are also assumed to be destroyed by the force of the blast or to catch fire and burn. Because all vegetation in the area around the OD table would have already been removed by earlier controlled burns, it is assumed that a vehicle fire would not spread to grassland.

The air emissions from the accidental detonation of waste explosives would result in the same potential for human health and environmental impacts described in **Section 5.2**. Therefore, the detonation of waste explosives as a result of the postulated accident would not result in the exposure of offsite individuals to hazardous airborne chemicals in concentrations that would exceed values considered protective of human health.

Waste explosives are transported to the OD firing table on the day of treatment. The postulated accident scenario assumes that prior to transport, LLNL would follow the established atmospheric modeling procedure to limit noise to 126 dB (see **Section 5.2**). If this procedure is followed, the detonation of 350 lb (159 kg), whether by OD treatment or by accidental detonation, would not result in noise levels in excess of 126 dB in existing offsite populated areas.

The risks to personnel and equipment associated with handling explosives are already present at Site 300 as an inherent part of the ongoing, routine, mission-related activities. The potential for impacts of accidents involving explosives was also assessed in the 1992 Sitewide EIS/EIR. The postulated accident in the 1992 Sitewide EIS/EIR involved an accidental detonation of a device containing 1,320 lb (600 kg) of TNT-equivalent explosives as a result of a delayed or unintentional misfire during an explosives test (DOE, 1992). It was determined that this accident would result in fatalities to unshielded workers and damage to buildings within a 370-ft (113-m) radius. At the EWTF, the maximum OD treatment amount would be only 350 lb (159 kg). There are no structures within 370 ft (113 m) of the proposed OD firing table. Other than the EWTF workers in a protective bunker (B845), no other personnel would be near the facility. Therefore, the impacts associated with accidents at the EWTF would be well within the bounds of accidents already assessed in the 1992 Sitewide EIS/EIR.

5.5 Analysis of Alternatives

The following section discusses the impacts of each alternative and evaluates relative feasibility. The initial paragraph in each subsection (which appears as italicized text) is the discussion that can be found in Appendix A, Section A.2.5.3 of the 1992 Sitewide EIS/EIR (DOE, 1992).

5.5.1 No-Action Alternative

Continuation of open burning at facilities at Building 829. Due to RCRA permit constraints, operation of this facility beyond November 1992 is not feasible.

Treatment of explosive waste generated and stored at the LLNL Main Site or at Site 300 has historically consisted solely of open burning at B829. This can continue only if DTSC extends the

September 1993 compliance order indefinitely, or renews the B829 permit. If DTSC does not renew the B829 permit, explosive waste would need to be stored at their point of origin or at a common permitted facility until a future treatment or disposal option is available. However, many of the waste storage areas are permitted so that they can only store wastes for a period of less than 90 days.

Under the no-action alternative, no open detonation, as a treatment technology for explosive waste, would be conducted. The benefits of open detonation treatment described in the 1992 Sitewide EIS/EIR remain valid reasons to include open detonation as an option for the treatment of explosive waste. The extremely efficient oxidation that derives from open detonation as a treatment process for explosives is also validated by the results of the AMCCOM test discussed earlier (AMCCOM, 1992). Open detonation treatment is also the preferred method of treatment of explosives contained in an assembly or in any other configuration that could increase the probability of an unintended detonation during open burn treatment.

Open burning at B829 would continue to result in a higher risk to onsite workers due to the proximity of the treatment unit to the GSA. The proposed new location of the EWTF would be sited at a greater distance from workers and the public and it incorporates improvements to reduce the potential for exposures of workers and the environment to emissions. Also, the proposed location of the EWTF is not as subject to seasonal winds that could cause cancellation of treatment activities at B829.

5.5.2 Continuation of Open Burning at a New Facility

Continuation of only open burning (without open detonation) at a new facility in the Building 845 area. Although this alternative is feasible, the addition of an open detonation capability to that of open burning would result in a more efficient thermal treatment system because the higher temperatures and pressures of detonation lead to extremely efficient generation of completely oxidized molecular combustion products such as CO_2 and H_2O .... Also, open detonation would provide a safer method of treating larger pieces of bulk explosives. Large pieces of bulk explosives must be cut into smaller pieces prior to burning (to avoid accidental detonation) but can be safely detonated in one piece.

Only one area, the B845 area, was examined as a potential site for the EWTF. This site was selected based upon its location in the interior of Site 300 away from the more populated areas to the south, its having many of the necessary improvements (i.e., roads, utilities, etc.) already in place, the selected site having favorable meteorological characteristics, and its consistency with existing Site 300 land use policies.

This alternative would site a new facility for open burning only. The discussion on the benefits of open detonation presented under the no-action alternative would apply to this alternative as well.

5.5.3 Termination of Open Burning Operations

Termination of current open burning operations and shipment of high explosive waste offsite for treatment. Currently, and for the foreseeable future, no Resource Conservation and Recovery Act (RCRA)-permitted offsite facilities are available. Even if such an offsite treatment facility were available, not all wastes might be acceptable because of permit limitations, the experimental nature of the explosives, formulations of explosives, and security constraints on disposing of some types of wastes.

LLNL has fully investigated the availability of RCRA-permitted offsite commercial storage and treatment facilities and determined their capability to handle LLNL-generated explosive waste.

Four commercial facilities that could accept certain types of explosive waste were identified: R&D Fabricators (Colfax, Louisiana), Trade Waste Incinerator (Sauget, Illinois), Chemical Waste Management, Port Arthur (Galveston, Texas), and ICI Environmental (formerly, Atlas Environmental, Joplin, Missouri). While a limited amount of explosive waste that meets strict acceptance criteria is presently being sent offsite, no facilities capable of treating classified explosive waste, explosive waste that LLNL requires be treated by detonation, or explosive waste comprised of more than one type of explosives or explosive waste and hazardous constituents, have been identified.

In addition to commercial facilities, the possibility of shipping LLNL waste to other DOE or U.S. Department of Defense facilities was considered. An extensive investigation of DOE and other governmental facilities revealed that all were restricted by their permits or other operational constraints from accepting explosive waste from an offsite location, such as LLNL's Site 300.

Shipping waste offsite for either disposal or treatment would lead to an increased risk to the public during transportation. This risk would be mainly from the increased vehicle traffic and not from the shipment of explosive waste. In order for explosive waste to be shipped offsite, it must be packaged in accordance with strict Department of Transportation shipping requirements which are designed to minimize the chances of an initiation if subjected to a wide variety of stresses, including a collision. In addition, the waste to be shipped offsite would be in a state where it would burn rather than detonate in the event of an accident.

5.5.4 Application of Alternative Treatment Technologies

> *Application of alternative treatment technologies. Research is currently underway at LLNL to develop a biological treatment system, a chemical deactivation process, and solar-assisted decomposition of the treatment of high explosive waste.... Other Department of Defense and Department of Energy facilities and contractor programs are also researching alternative treatment technologies. None of these technologies is expected to provide a viable alternative treatment method in the next 5-10 years.*

Although research into alternative technologies for the treatment of explosive waste continues, there have been no recent advances that would indicate that near-term (5- to 10- year) alternatives to the thermal treatment would be available for all explosive waste types generated by LLNL programs.

5.6 Cumulative Impacts

The 1992 Sitewide EIS/EIR assessed the cumulative impacts resulting from proposed construction projects at Site 300 and other land development projects that may occur in the surrounding region. This assessment found that because planned construction projects at Site 300 (including the EWTF) would impact only 2.4 acres (1.0 hectares), these projects would not contribute to cumulative impacts to undeveloped wildlife habitat or native or sensitive plant communities from other planned development in the Site 300 area. Because mitigation measures developed in the 1992 EIS/EIR would be implemented during construction and operation to avoid adverse impacts to sensitive wildlife species (see **Sections 5.1** and **5.2** above), these projects would not contribute to the cumulative impact of other regional development projects on these species.

As the proposed EWTF is a relocation of explosive waste treatment operations from B829, it is expected that there will be no net increase in air emissions. Because the proposed facility would provide better containment of explosive waste and ash generated during and after treatment, the potential for a release of hazardous materials to the ground would actually be reduced.

Construction-related increases in ambient airborne dust or noise levels would be minor and short-term (see **Section 5.1** above). Because open detonation treatment operations would be infrequent (an average of ten detonations per year), noise generated as a result of open detonation treatment would be similar to noise levels generated at Site 300 by routine vehicle traffic, equipment operation, and other mission-related explosives testing projects. Over the last 6 years, an average of 180 detonation events occurred each year at Site 300, conducted mostly for weapons and explosives testing. Therefore, there would be an approximate 5 percent increase in the number of detonations at Site 300 from the proposed action.

5.7 Environmental Justice

In accordance with the presidential Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", dated February 11, 1994, DOE has proposed to establish procedures for identifying and addressing disproportionate adverse human health and environmental effects of their programs, policies, and activities on minority populations, low-income populations, native American tribes, and populations of non-English speaking residents (Executive Order 1994).

No such diversity of population groups have been identified in the City of Tracy and neighboring communities. Furthermore, this EA demonstrates that the proposed action does not present any adverse environmental pollution or impacts to the general public/surrounding population during normal operations, or even as a result of accident-generated scenarios.

Approved, this 16th day of April, 1996

James M. Turner, Ph.D., Manager
Oakland Operations Office

6.0 People and Agencies Contacted

Prior to approval of this document, a draft version was sent to the State of California Clearinghouse and affected Native American groups, and it was made available to the public.

7.0 List of Supporting Documents

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8.0 Acronyms

AMCCOM	U.S. Army Armament, Munitions, and Chemical Command
BMP	Best Management Practices
Cal EPA	California Environmental Protection Agency
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CVRWQCB	Central Valley Regional Water Quality Control Board
dB	decibel
DOE	U.S. Department of Energy
DTSC	U.S. Department of Toxic Substances Control (California EPA)
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EWSF	Explosive Waste Storage Facility
EWTF	Explosive Waste Treatment Facility
GSA	General Services Area
HRA	Health Risk Assessment
INPUFF	Integrated Puff air dispersion model
LLNL	Lawrence Livermore National Laboratory
MEI	Maximally exposed individual
NHPA	National Historic Preservation Act
OB	open burning
OD	open detonation
RCRA	Resource Conservation and Recovery Act
RET	Restricted Entry Time
ROD	Record of Decision
SSOSC	State Species of Special Concern
UTC	United Technology Corporation