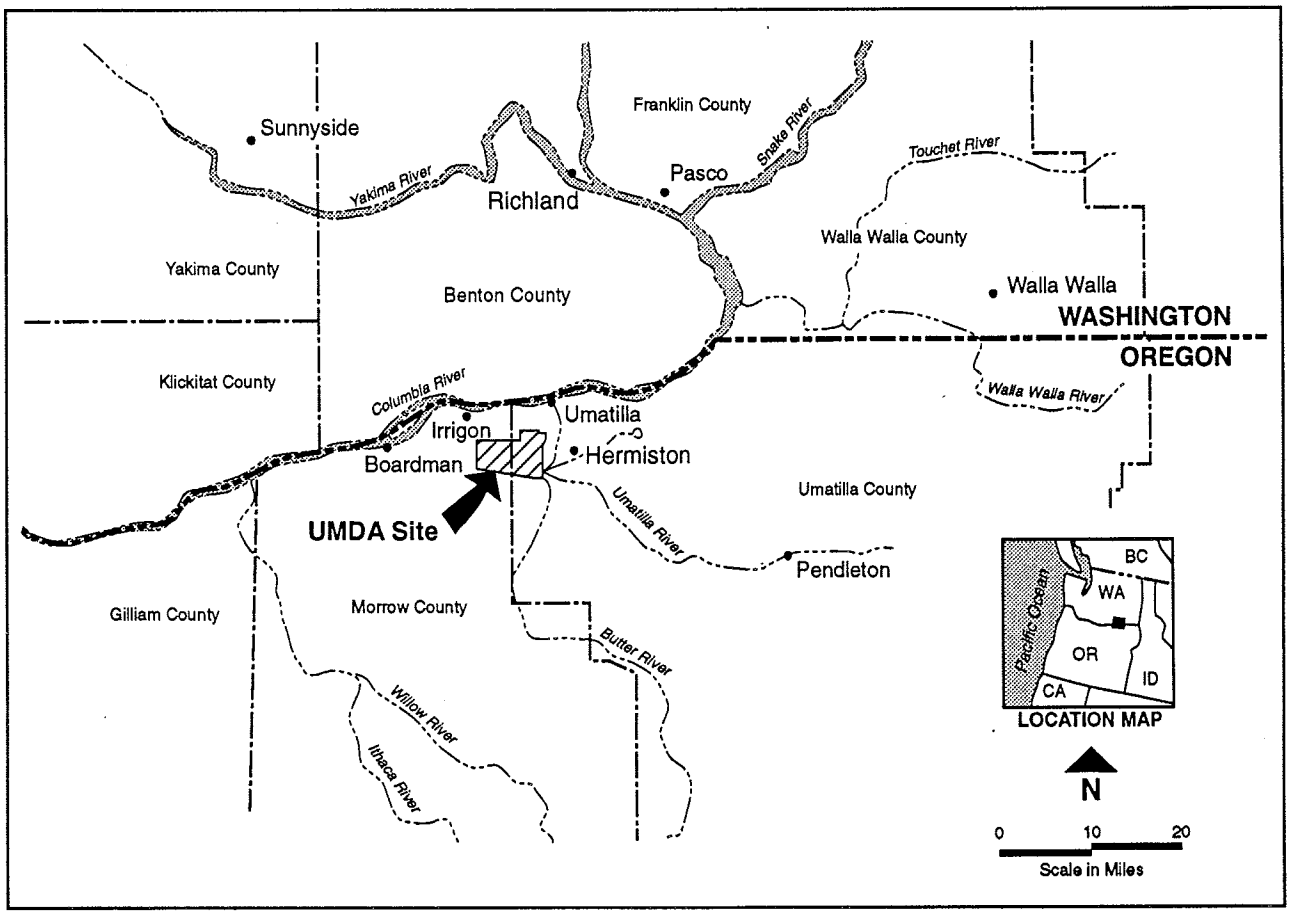
Defense Environmental Restoration Program
Proposed Plan

UMATILLA DEPOT ACTIVITY (UMDA)
EXPLOSIVES WASHOUT LAGOONS
SOILS OPERABLE UNIT

Hermiston, Oregon **April 1992**

ARMY, EPA, AND DEQ ANNOUNCE PROPOSED PLAN

This Proposed Plan identifies the preferred alternative for cleaning up contaminated soil at the Umatilla Depot Activity (UMDA) Explosives Washout Lagoons. In addition, the Plan includes summaries of other alternatives analyzed for this site. This document is issued by the U. S. Army (Army), the owner of the site, and the U. S. Environmental Protection Agency (EPA), the lead regulatory agency for site activities, with the concurrence of the Oregon Department of Environmental Quality (DEQ), the support agency for the site. The Army and EPA, in consultation with DEQ, will select a final source control remedy for



the lagoon soils in a Record of Decision (ROD) after the public comment period has ended and the information submitted during that time has been reviewed and considered.

The Army and EPA are issuing this Proposed Plan as part of their public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the "Superfund Program," and the National Environmental Policy Act of 1969 (NEPA). A Proposed Plan is intended to be a fact sheet that summarizes, for public review, the comparison analysis of different cleanup options. The Army's and EPA's proposed cleanup plan summarizes information that can be found in greater detail in the Feasibility Study (FS) Report and other documents contained in the administrative record file for this site. The public is encouraged to review these other documents in order to gain a more comprehensive understanding of the site and the environmental activities that have been conducted there. The administrative record file, which contains the information upon which the selection of the response action will be based, is available at the following locations:

Umatilla Depot Activity
Public Affairs Office
Building 1
Hermiston, OR
Hours: Mon-Thur, 8 a.m. - 4 p.m.

and

Hermiston Public Library
231 E. Gladys Avenue
Hermiston, OR
(503) 567-2882
Hours: Mon-Thur, 11 a.m. - 7 p.m.
Fri-Sat, 9 a.m. - 5 p.m.

and

U.S. EPA
Oregon Operations Office
811 SW 6th Avenue
Portland, OR
(503) 326-3689
Hours: Mon-Fri, 8:30 a.m. - 4:30 p.m.

Please note that a glossary and explanations of the evaluation criteria appear near the end of this document.

The Army and EPA, in consultation with DEQ, may modify the preferred alternative or select another response action presented in this plan and the FS Report based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives identified here.

SITE BACKGROUND

A History of the Explosives Washout Lagoons

Beginning in the 1950s, UMDA operated an explosives washout plant onsite. Munitions were opened and washed with hot water to remove and recover explosives such as trinitrotoluene (TNT). The plant was cleaned weekly, and the washwater was disposed of in two nearby lagoons where it percolated into the soil. This was a common Army practice at the time, although it is no longer done. The south lagoon is 27 feet wide, and the north lagoon is 39 feet wide; both are 80 feet long and 6 feet deep. They received a total of about 85 million gallons of washwater during plant operations.

Although lagoon sludges were removed regularly during operation, explosives contained in the washwater migrated into the soil and groundwater at the site. The top of the groundwater is about 47 feet below the lagoons. Washout operations ended in 1965. Because of the soil and groundwater contamination, the lagoons were placed on EPA's National Priorities List in 1987.

Dates to remember.

MARK YOUR CALENDAR

April 27 to May 27, 1992
Public comment period on remedies to control contaminated soils.

May 5, 1992
6:30 p.m.
Public meeting at Armand Larive Junior High
199 E. Ridgeway
Hermiston, Oregon

The Army conducted a Remedial Investigation (RI) at the lagoons beginning in 1987. The RI was used to identify the types, quantities, and locations of contaminants and to develop ways of addressing the contamination problem. The results of the RI and supplemental investigations are as follows:

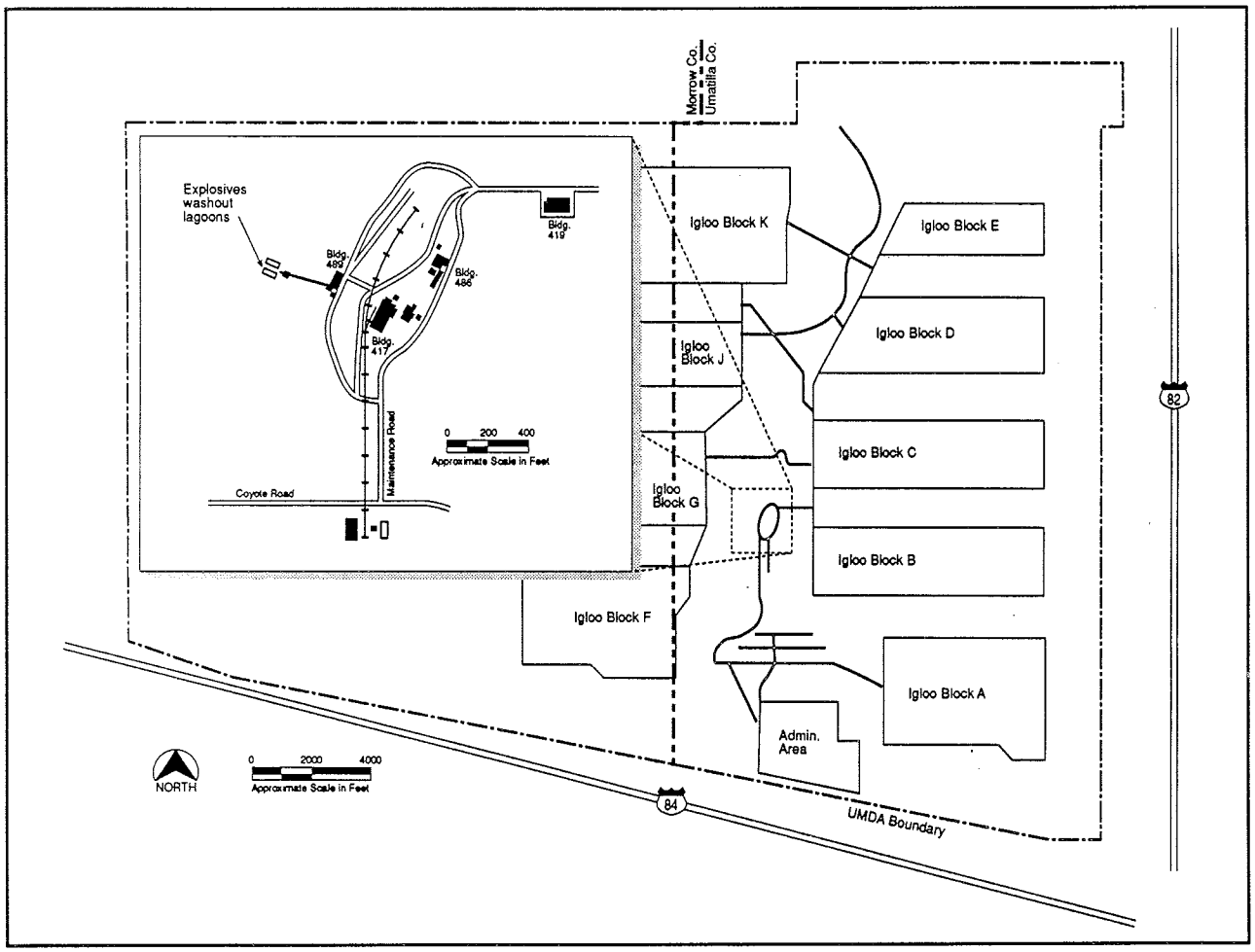
- The sides of the lagoons and the surface and sub-surface soils below the lagoons are contaminated with organic explosives and related compounds. The major contaminants posing potential future health risks are TNT, cyclotrimethylenetrinitramine (RDX), and 2,4-dinitrotoluene (DNT). The other contaminants are detected below levels of concern.

- Concentrations of explosives in the sides and the 5 feet of soil immediately below the lagoons are 10 to 1,000 times higher than deeper soils. Explosives concentrations are generally very low in the soil from 5 to 20 feet below the lagoons. Below 20 feet, concentrations increase slightly by a factor of about 2 (still well below near-surface soils) and remain steady to the groundwater.

- A plume of RDX contamination in the groundwater extends at least 1,000 feet away from the lagoons. Other groundwater contaminants are seen in wells closer to the lagoons. The contaminant plume is about 1 mile inside the facility boundary.

Summary of Site Risks

An analysis was conducted to estimate the health or environmental risks that could result if the soil contamination at the UMDA lagoons was not cleaned up. This analysis is commonly called a baseline risk assessment. UMDA is scheduled for realignment under the Base Realignment and Closure Act; the Army must eventually vacate the UMDA facility. Because of this, the assessment considered the health effects that could result from



direct public exposure to the contaminants under future land-use scenarios. The health effects differ depending on whether the site is used for light industry or residential development. Effects could result from the soil contacting the skin, or from someone inhaling contaminated dust, or from a child ingesting soil during play.

The risk assessment included analysis of all seven of the explosives contaminants detected. Three of them, TNT, RDX, and 2,4-DNT, have been shown to cause cancer in laboratory animals and are thus classified as possible human carcinogens. They are not very volatile or very soluble in water, so they do not migrate quickly from the soil to the air or water.

The explosives concentrations measured in the lagoon soils are associated with an excess lifetime cancer risk of about 1×10^{-2} for both an industrial worker and a resident at the site under future land-use scenarios. This means that if no cleanup action is taken, long-term exposure to the explosives-contaminated soil (by living or working at the site) would increase a person's risk of contracting cancer by a factor of 1 in 100. This estimate was developed by taking into account various conservative assumptions about the likelihood of a person being exposed to the soil and the toxicity of the contaminants.

There are no established federal cleanup standards for explosives-contaminated soil. The proposed cleanup standards were developed on risk-based remedial action objectives and evaluation of the performance of various treatment technologies. The state cleanup standard says that soil should be cleaned up to background if possible, or if not, to a level that is protective of human health and the environment. Explosives do not occur naturally so background would be about zero.

Scope and Role of Action

Contaminants are present all the way to the groundwater, about 47 feet below the lagoons, so a cleanup to background levels would be a very large project. Removing and treating that amount of soil would be expensive (about $14 million), and would not add that much more protection over more shallow excavations since over 90 percent of the total TNT and RDX contamination is in the 5 feet just below the lagoons.

Other cleanup depths considered by UMDA were 5 feet below the lagoons and 20 feet below the lagoons. An excavation to 20 feet would remove all of the soil to which people living or working in the area would potentially be exposed under normal construction activities. However, most of the soil from 5 feet to 20 feet has low contaminant concentrations that present little risk. The cost to excavate and treat the extra soil would not have a corresponding benefit.

Therefore, UMDA proposes to excavate the soil to a depth of approximately 5 feet below the lagoons to reach cleanup levels of 30 parts per million for TNT and RDX. Sampling will be conducted to verify attainment of contaminant cleanup levels. The excess lifetime cancer risk associated with the remaining un-excavated soil will be 7×10^{-6} for someone working at the site and 2×10^{-5} for someone living at the site. This means a person's risk (by working or living at the site) of contracting cancer as a result of long-term exposure to the soil would be reduced to one in about 150,000 and one in 50,000, respectively. These risks are within the acceptable range specified by EPA. Over 90 percent of the total explosives contamination present below the lagoons would be removed.

To achieve a reasonable degree of protection, the Army and EPA propose to treat the excavated soil to reduce TNT and RDX concentrations to 30 ppm or less (about equal to the concentrations in the remaining unexcavated soil). Since 2,4-DNT concentrations are generally less than 5 ppm to start, and any treatment that is effective for TNT would be expected to be effective for 2,4-DNT, final concentrations of 2,4-DNT after treatment would be near detection limits. The total excess lifetime cancer risk associated with these cleanup levels will be reduced to 7×10^{-6} for someone working at the site and 2×10^{-5} for someone living at the site. In addition, since maximum contaminant concentrations would be reduced by a factor of 1,000, there is much less possibility of migration to the groundwater.

Cleaning up the groundwater at the Washout Lagoons is a complex problem requiring a longer-term solution. Meanwhile, the soil could be contributing additional contamination to the groundwater. Therefore, the Army, EPA, and DEQ have agreed to address the soil and groundwater contamination at the lagoons separately to provide early cleanup of the soil. The remedies presented here address only soil contamination.

Actual or threatened releases of hazardous substances from this site, if not addressed by the preferred alternative or other active cleanup measures, might present an imminent and substantial endangerment to public health, welfare, or the environment.

SUMMARY OF ALTERNATIVES

The alternatives analyzed for the Explosives Washout Lagoons are presented below. These are numbered to correspond with the numbers in the FS Report. The alternatives for the soil cleanup are the following:

Alternative 1: No Action (required by law to be considered)

Alternative 2: Excavation, Incineration, and Onsite Disposal

Alternative 3: Excavation, Composting, and Onsite Disposal

Common Elements. Both Alternatives 2 and 3 include removal and treatment of 6,800 tons of explosives-contaminated soil. This volume includes the sides around the lagoons and the soil to an average depth of 5 feet below the lagoons. Deeper excavations would not be cost effective. The soil in the sides and bottom of the excavation would be analyzed to verify the reduction in contaminant concentrations and associated risk levels. Likewise, the soil treated in Alternatives 2 and 3 would be analyzed to verify the effectiveness of the treatment. The treated soil would be replaced in the excavated area and at least 2 feet of clean soil would be placed on top. Additional clean soil would be added as necessary to return the area to its natural contours, and the area would be revegetated. The area receives less than 10 inches of rain each year, so the migration potential of contamination in remaining in deep soils would be adequately minimized. Backfilling the excavation with the treated and clean soil might be deferred until the completion of the installation-wide groundwater study, in case the excavation is needed for a groundwater remedy.

High concentrations of soil contaminants would remain under Alternative 1. Low concentrations of contaminants would remain in deep soils in Alternatives 2 and 3, although the risk associated with these would be low. The excess cancer risks for both Alternatives 2 and 3 are within acceptable exposure levels (i.e., between 1×10^{-4} and 1×10^{-6}) that are protective of human health. The potential impact of residual soil contamination on groundwater will continue to be monitored as part of the groundwater study.

None of the alternatives include future restrictions on land use.

Alternative 1: NO ACTION

Capital Cost: 0*

Annual Operation and Maintenance (O&M) Costs: 0*

Present Worth (PW): 0*

Months to Implement: None*

Both the CERCLA program and DEQ regulations require that the "no action" alternative be evaluated at every site to establish a baseline for comparison. Under this alternative, the Army, EPA, and DEQ would take no further action at the site to prevent exposure to the soil contamination. The existing public access restrictions would continue as long as the Army operates UMDA.

Alternative 2: EXCAVATION, INCINERATION, AND ONSITE DISPOSAL

Capital Cost: $650,000*

O&M Costs: $3,800,000*

PW: $4,100,000*

Months to Implement: 16*

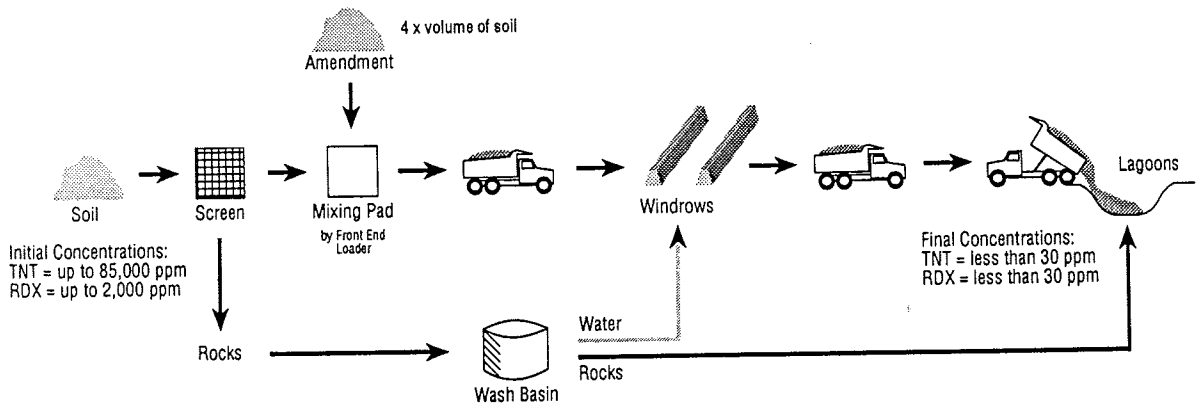
A transportable or mobile rotary-kiln incinerator would be leased from a vendor and brought to the site, and approximately 6,800 tons of contaminated soil would be excavated and incinerated onsite. The incinerated soil would be returned to the lagoons area for eventual use as backfill.

Excavation, incineration, and backfilling activities would comply with state Solid Waste Act requirements.

At other explosives-contaminated sites, this thermal destruction process has been demonstrated to reduce explosives concentrations by 99.99 percent. Final explosives concentrations would be less than 1 part per million (ppm).

*All costs and implementation times are estimated.

THE PREFERRED ALTERNATIVE: NUMBER 3
EXCAVATION, COMPOSTING, AND ONSITE DISPOSAL



It is assumed that arrangements could be made with a vendor within 12 months. One month would then be required to mobilize and test the equipment and another 3 months to incinerate the soil.

Alternative 3: EXCAVATION, COMPOSTING, AND ONSITE DISPOSAL

Capital Cost: $880,000*

O&M Costs: $1,100,000*

PW: $1,900,000*

Months to Implement: 24*

A soil volume of 6,800 tons would be excavated, mixed with a nutrient amendment (manure and waste vegetable matter), and composted. Microbial activity during composting would degrade the explosives, reducing their toxicity and mobility. The probable method of composting would be by forming windrows (elongated piles) on pads inside greenhouse-type structures. The windrows would be turned periodically for temperature control and aeration.

Excavation, composting, and backfilling would comply with state Solid Waste Act requirements. No byproduct wastes or emissions would be generated.

Treating explosives by composting is an innovative treatment technology, which is a desirable feature under CERCLA. Site-specific studies show that composting reduces TNT and RDX concentrations to less than 30 ppm each and reduces the overall toxicity of the soil by 90 to 98 percent.

The composting facility could be constructed within 1 year. Following that, approximately 12 months would be required to treat all of the soil by composting.

EVALUATION OF ALTERNATIVES

The preferred alternative for cleaning up the soils at the Explosives Washout Lagoons is Alternative 3: Excavation, Composting, and Onsite Disposal. Based on current information, this alternative would appear to provide the best balance among the alternatives with respect to nine criteria that EPA uses to evaluate alternatives. This section profiles the performance of the preferred alternative against the nine criteria, noting how it compares to the other options under consideration. An explanation of the evaluation criteria follows.

Analysis

Overall Protection. Both Alternatives 2 and 3 would be protective of human health and the environment by reducing contaminant concentrations to levels that present a minimum risk. The total quantity of contaminants excavated and treated would be more than 90 percent, thus minimizing the migration of contamination to the

*All costs and implementation times are estimated.

groundwater. Alternative 3 would reduce concentrations in treated soils to a risk level of about 7×10^{-6} for someone working onsite and 2×10^{-5} for someone living at the site. Alternative 2 would reduce concentrations in treated soils to below detection limits (a risk level of less than 1×10^{-6}).

Because the "no action" alternative is not protective of human health and the environment, it is not considered further in this analysis as an option for this site.

Compliances with Applicable or Relevant and Appropriate Requirements (ARARs). Both Alternatives 2 and 3 would involve the excavation and replacement of soil containing some explosives. Under RCRA, waste with explosives concentrations so high that the waste is reactive (e.g., can be detonated) must be treated to non-reactive levels before it can be placed on land. Explosives concentrations measured in the lagoon soils are non-reactive even without treatment, so the soils are not RCRA hazardous waste and RCRA requirements are not applicable or relevant and appropriate. Alternatives 2 and 3 would meet the State Solid Waste Act requirements for incinerators, compost facilities, and treatment residuals.

State soil cleanup and lagoon closure requirements are met by using a cost-benefit approach to determine cleanup levels. Cleanup to background (i.e., excavation to groundwater at 47 feet deep) was evaluated, but the small amount of additional protection provided would be very expensive ($14 million).

No waiver from ARARs is necessary to implement either of the cleanup options.

Long-Term Effectiveness and Permanence. Both of the alternatives would reduce contaminant concentrations. Alternative 2 would be more effective, but levels achieved by Alternative 3 would also be

EXPLANATIONS OF EVALUATION CRITERIA

- Overall Protection of Human Health and Environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
- Compliance with ARARs addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and/or provide grounds for invoking a waiver.
- Long-term effectiveness and permanence refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.
- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies that may be employed in a remedy.
- Short-term effectiveness refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment during the construction and implementation period.
- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.
- Cost includes capital and operation and maintenance costs.
- State acceptance indicates whether, based on its review of the FS and Proposed Plan, the State concurs with, opposes, or has no comment on the preferred alternative.
- Community acceptance will be assessed in the Record of Decision following a review of the public comments received on the FS Report and the Proposed Plan.

protective. The long-term human and environmental risks associated with the remaining untreated soil would be minimized by the low concentrations of contaminants in the soil, the depth of the soil, and the low rainfall. Groundwater monitoring would be used to assess the effectiveness of the soil cleanup in protecting the environment.

Reduction of Toxicity, Mobility, or Volume of the Contaminants Through Treatment. Both of the alternatives would reduce the toxicity of the treated soil. Alternative 2, incineration, would reduce explosives concentrations and associated toxicity by 99.99 percent; and Alternative 3, composting, would reduce concentrations by 97 to 99 percent and toxicity by 90 to 98 percent.

Short-Term Effectiveness. For the excavations in both Alternatives 2 and 3, appropriate construction techniques like dust controls would be used to minimize impacts to onsite personnel and the environment. Alternative 2 could be implemented within 1 year and completed in 4 months. Alternative 3 could be implemented within 1 year and completed in one additional year. Variations within these time frames depend on the availability of equipment and completion of pre-cleanup studies. Neither alternative involves taking the contaminated material offsite or otherwise increasing public exposure risks during cleanup. Alternative 2 would produce air emissions, but the incinerator would have extensive emissions controls and monitors to meet regulatory emissions requirements. Alternative 3 would use the native micro-organisms already present in the soil, thus minimizing health concerns.

Implementability. Alternative 3, composting, has few associated technical or administrative difficulties that could delay implementation. The studies needed to show that composting is effective have been completed. The equipment and amendments required to start full-scale cleanup are readily available. However, final studies to determine the best techniques for windrowing must be finished before cleanup can begin. Alternative 2, incineration, also has few associated difficulties. Incineration has been used successfully to address similar contamination at other Army sites. Several transportable incinerators of the type considered are available from different vendors, and it should be possible to schedule one to come to the site within 1 year. Administrative requirements are expected to be met based on previous use of this technology.

THE COMMUNITY'S ROLE IN THE SELECTION PROCESS

UMDA, EPA, and DEQ are soliciting input from the community on the cleanup methods proposed for the Explosives Washout Lagoons' soils. They have set a public comment period from April 27 through May 27, 1992, to encourage public participation in the selection process. The comment period includes a public meeting at which UMDA, with EPA and DEQ, will present the FS Report and Proposed Plan, answer questions, and accept both oral and written comments.

A public meeting is scheduled for 6:30 p.m., May 5, 1992, and will be held at Armand Larive Junior High, Hermiston, Oregon.

Comments will be summarized and responses provided in the Responsiveness Summary section of the Record of Decision (ROD). The ROD is the document that presents the final remedy selected for cleanup. To send written comments or obtain further information, contact either:

Mark Daugherty, Environmental Officer
(503) 564-5294

Donna Fuzi, Public Affairs Officer
(503) 564-5312

Umatilla Depot Activity, Building 1
Hermiston, OR 97838-9544

Cost. The present-worth cost of the preferred alternative, composting, is $1,900,000. The cost of Alternative 2, is $4,100,000.

State Acceptance. The State of Oregon concurs with the preferred alternative.

Community Acceptance. Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be addressed in the Record of Decision for the site.

SUMMARY OF THE PREFERRED ALTERNATIVE

In summary, Alternative 3 would achieve substantial risk reduction by first removing over 90 percent of the soil contamination at the lagoons, then treating the excavated soil to reduce toxicity and contaminant mobility. The cleanup would focus on the sides and the first 5 feet of soil below the lagoons, where contaminants are most concentrated and where human exposure is most likely. The low concentrations and relative isolation of the remaining contamination make active long-term management measures unnecessary. Alternative 3 achieves this risk reduction using an innovative treatment technology and at a lower cost than Alternative 2. Therefore, the preferred alternative is believed to provide the best balance of tradeoffs among the alternatives with respect to the evaluation criteria. Based on the best information available at this time, the Army, EPA, and DEQ believe the preferred alternative would be protective of human health and the environment, would comply with ARARs, would be cost-effective, and would utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. It would also meet the statutory preference for the use of a remedy that involves treatment as a principal element.

GLOSSARY

Specialized terms used elsewhere in the Proposed Plan are defined below.

Applicable or Relevant and Appropriate Requirements (ARARs)--The federal and state requirements that a selected remedy will attain. These requirements may vary among sites and alternatives.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)--The federal law that addresses problems resulting from releases of hazardous substances to the environment, primarily at inactive sites.

Contaminant Plume--A column of contamination with measurable horizontal and vertical dimensions that is suspended in and moves with groundwater.

Cyclotrimethylenetrinitramine (Royal Demolition Explosive or RDX)--A common military munitions explosive; considered to be a possible human carcinogen.

2,4-DNT (Dinitrotoluene)--Co-contaminant explosive associated with TNT; considered to be a probable human carcinogen.

Groundwater--Underground water that fills pores in soils or openings in rocks to the point of saturation. Unlike surface water, groundwater cannot clean itself by exposure to sun or filtration. Groundwater is often used as a source of drinking water via municipal or domestic wells.

Monitoring--Ongoing collection of information about the environment that helps gauge the effectiveness of a cleanup action.

Organic Compounds--Carbon compounds, such as solvents, oils, and pesticides, few of which tend to dissolve readily in water. Some organic compounds can cause cancer.

National Priorities List--EPA's list of waste sites targeted for priority cleanup under Superfund.

Reactivity--A characteristic of some chemical compounds whereby they can suddenly release large amounts of heat or pressure when subjected to a sudden impact, elevated temperatures, or water.

RCRA (Resource Conservation and Recovery Act)--Establishes requirements for the storage, treatment, and disposal of hazardous wastes.

Revegetate--To replace topsoil, seed, and mulch on prepared soil to promote vegetation that will reduce or prevent wind and water erosion.

TNT (2,4,6-Trinitrotoluene)--A common nitroaromatic explosive; considered to be a possible human carcinogen.

Composting--A method of breaking down organic wastes by bacterial degradation in the presence of adequate air, moisture, carbon, and nitrogen. Byproducts are usually nontoxic inorganic and organic compounds.

Incineration--A method of destroying organic wastes by heating them to temperatures of 1200 to 1800 degrees Centigrade. Byproducts are gases, wastewater from treating the gases, and ash.

Windrow--A method of composting where the mixture to be composted is formed into elongated piles and turned periodically.

MAILING LIST

If you did not receive this Proposed Plan in the mail and wish to be placed on the mailing list for future publications pertaining to this site, please fill out, detach, and mail this form to:

Mark Daugherty, Environmental Officer Donna Fuzi, Public Affairs Officer
Umatilla Depot Activity
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Hermiston, Oregon 97838-9544

Name _____

Address _____

Affiliation _____

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