SITE TECHNOLOGY DEPLOYMENT PLAN

U.S. DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE

APRIL 28, 1998

SITE TECHNOLOGY DEPLOYMENT PLAN

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SECTION 1

INTRODUCTION

1.1 PURPOSE

The purpose of this Site Technology Deployment Plan is to accelerate deployment of innovative technologies in U.S. Department of Energy, Nevada Operations Office (DOE/NV) environmental restoration (ER) and waste management (WM) projects.

1.2 BACKGROUND

The DOE has recently been criticized for not doing a better job of deploying technologies that have been developed with DOE funding. According to the critics, there are many technologies "sitting on the shelf" that could be deployed into the field to reduce costs and improve the performance of environmental management (EM) programs.

As budgets become tighter, it is incumbent on sites to implement programs and methods of operations that increase the efficiency of their EM activities. Efficiencies could include one or all of the following:

- Use of new technologies or techniques
- Streamlined processes
- Resequenced projects
- Privatization or innovative contracting
- Waste reduction or pollution prevention
- Integration of site services
- Site Support cost reduction

This Site Technology Deployment Plan focuses on the use of new technologies or techniques.

1.3 SITE TECHNOLOGY DEPLOYMENT PLAN DIRECTIVE

Management activities to accelerate technology deployment were presented in a July 3, 1997, memorandum from former Assistant Secretary for Environmental Management, Alvin Alm. This memorandum contained ten management actions, one of which was the direction to each field office to prepare site-specific deployment plans.

The memorandum directs each field office to prepare brief (10-20 page) site-specific deployment plans for technologies to be deployed "in the near future." Guidance for the development of the plans, provided in September 1997, identified the following items to be included:

- Objectives and scope
- Overview of potential deployment opportunities
- Management strategy
- Overall site approach
- Deployment barrier reduction efforts
- Technology fact sheets

The plans are to be completed by May 1, 1998.

SECTION 2

APPROACH

The overall DOE/NV approach is for the Site Technology Coordination Group (STCG) to work closely with ER and WM Project Managers in integrated teams to:

- Identify technology needs that could enhance ER and WM projects
- Determine project requirements that the technology must satisfy
- Identify potential technologies and obtain applicable performance and cost savings data
- Evaluate these technologies as applied to DOE/NV projects
- Facilitate the deployment of the technologies into the projects

2.1 TECHNOLOGY DEPLOYMENT PROCESS

The identification, evaluation, and possible deployment of innovative technologies involves a step-by-step process and several go/no-go decisions. A schematic of this is shown in Figure 2-1. The process is discussed in the following paragraphs.

2.1.1 Technology Needs

The need for a technology will be determined by the respective ER and WM Project Managers, who are the "owners" of the projects and in the best positions to determine whether innovative technologies could benefit their projects.

Possible benefits derived from technology could include some or all listed in Table 2-1. It is important to understand that while cost savings are probably the major reason for most technology deployments, there are other possible benefits.

TABLE 2-1

POSSIBLE BENEFITS FROM INNOVATIVE TECHNOLOGY

Benefit	Reasons
Cost savings	Less labor; shorter schedule; less equipment; materials, and/or supplies
Schedule savings	Meet or accelerate regulatory or project schedules, avoid surveillance or monitoring cost
Safety and health	Reduced risk to personnel as the result of work activities
Pollution prevention	Reduced waste generation
Stakeholder support	Increased confidence in and support of ER and WM programs

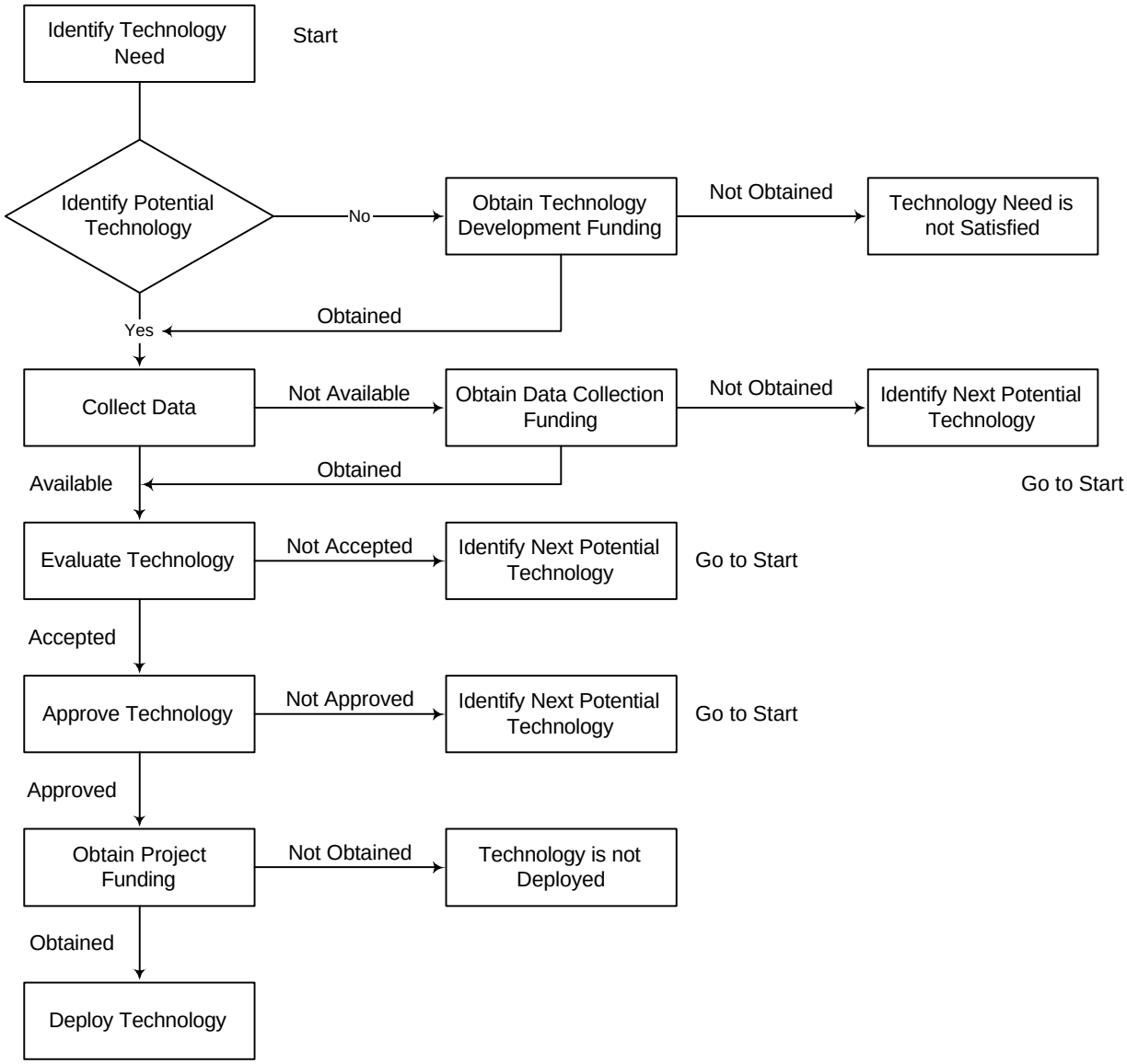

FIGURE 2-1

TECHNOLOGY DEPLOYMENT PROCESS

2.1.2 Project Requirements

Each project has a baseline which establishes the specific scope of work, schedule, and budget. Application of an innovative technology to a project baseline must provide benefits and be deployable within the context of the project baseline. In the case of many technologies, the most important constraints are probably the project schedule and cost. It is very important that the evaluation of potential technologies include the project schedule requirements.

2.1.3 Technology Identification and Data Collection

There are many technologies currently available, but determining whether they can benefit a specific project requires time to investigate the applicable technology databases and obtain detailed information.

Available performance and cost data are often from pilot tests on small scale equipment or short-term "demonstrations." New technologies lack historic operating data. Data may be available, but it generally needs to be adjusted to specific project site conditions. See Section 3.3 for more discussion of this issue.

2.1.4 Evaluation Per Project Baseline

Each technology is evaluated in terms of its application to a specific project. Items or issues to be evaluated include those listed below.

Technology Availability. The technology needs to be available in time to meet the project schedule.

Cost Savings. Application of the technology must result in a significant cost savings. The cost savings must be large enough to compensate for any increased project risk that may result from deployment of the technology. Cost savings should be determined on a life-cycle basis that considers the total project from start to finish, including project costs involved in developing or deploying the technology. Cost items to be included in the cost savings analysis include those listed in Table 2-2.

TABLE 2-2

EXAMPLE COST COMPONENTS

Potential Cost Decreases	Potential Cost Increases
Baseline labor	Technology evaluation or demonstration
Baseline equipment	Technology modifications to meet site requirements
Baseline materials and supplies	Technology installation
Waste transportation	Technology operation and maintenance
Waste disposal	Permitting

Other Benefits. Application of technology must provide significant other benefits if cost savings is not the reason for deploying it. Examples of these benefits were previously shown in Table 2-1.

2.1.5 Technology Deployment

Actual deployment of a technology will take place once Project Manager approval has been obtained, permits are in place, and funding is available.

2.2 ROLES AND RESPONSIBILITIES

The roles and responsibilities of key individuals involved in technology deployment are contained in Table 2-3 and discussed in the following sections.

TABLE 2-3

ROLES AND RESPONSIBILITIES

Project Phase	Project Manager	Technology Facilitator	STCG
Technology need	Establishes need for technology	Assists Project Manager in documenting need	Consolidates input from Project Managers
Need prioritization	Reviews prioritization list	Assists Project Manager in review of prioritization list	Consolidates input from Project Managers and issues final prioritization list
Technology identification and data collection	Provides feedback on potential deployment opportunities	Identifies potential deployment opportunities	Identifies and collects schedule, performance and cost data for potential technologies
Technology evaluation	Reviews and approves technology evaluation	Works with Project Manager to evaluate impact of technology on project baseline	Performs technology evaluation
Technology deployment	Approves deployment and associated funding	Assists Project Manager in deployment of technology and documenting efficiencies	Provides support as needed, such as joint funding for deployment

2.2.1 Project Managers

Project Managers have the primary responsibility for the planning and execution of ER and WM projects. Therefore, it is logical for them to be responsible for initially identifying technology needs, and revising or updating these needs in the future. Furthermore, Project Managers are also responsible for the baseline scope, schedule, and cost data needed for the technology evaluations. The Project Managers may assign some or all of these activities to specific Subproject Managers.

Deployment decisions will be reviewed and approved by the ER and WM Division Directors. The Project Managers, assisted as necessary by the Technology Facilitators and the STCG, will keep the Division Directors informed about deployment progress.

2.2.2 Technology Facilitator

A Technology Facilitator will be assigned to the Project Manager for each of the following projects:

<u>Environmental Restoration</u>

- Soils
- Off-Sites
- Underground Test Areas
- Industrial Sites

<u>Waste Management</u>

- Low-level Waste
- Mixed Low-level Waste
- Transuranic Waste/Mixed Transuranic Waste

The facilitator's responsibility is to understand the project needs and interface with other STCG members, both to define the technology requirements and to represent the projects in the evaluation of specific technologies. The Technology Facilitator will:

- Focus on one ER or WM project
- Be assigned to the project on a permanent, part-time basis
- Represent the project during the STCG's identification and evaluation of technologies
- Be involved in all aspects of evaluating, planning, scheduling, and budgeting for technology deployments
- Participate in STCG activities and meetings

2.2.3 Site Technology Coordination Group

The STCG coordinates technology identification, data collection, and technology evaluation for the DOE/NV EM program. The STCG includes the Technology Facilitators and representation from DOE/NV contractors. The STCG charter is contained in Appendix A.

The STCG's most difficult task is to obtain sufficient cost and performance data to enable Project Managers to make informed decisions about deploying technologies. Sources of data available to the STCG are summarized below.

Focus Areas/Crosscut Programs. Many of the potential technologies were initially developed with DOE Office of Science and Technology (OST) funding. Summary information is readily available from project summaries or OST databases. Additional detailed information is obtained from the principal investigators or from facilities performing additional testing (See Section 3.2 for data availability).

DOE Technology Deployment Programs. There are several programs within DOE that promote and facilitate technology deployment. These programs are available to assist in not only identifying and evaluating technologies, but also in solving other problems, such as regulatory buy-in. Example programs include the following:

- Integrated Technology Remediation Demonstration Program-Sandia National Laboratories
- Techcon-Argonne National Laboratory
- Interstate Technology and Regulatory Cooperation

Other DOE Sites. DOE sites having similar needs will be contacted to determine if they have technology suggestions, or to obtain cost or performance data on technologies the other sites have deployed. Partnering opportunities to obtain funding for deployments will be pursued.

Academia. Through the Nevada Environmental Research Park, DOE/NV is providing research funding to the University of Nevada. This research, funded by ER and WM, is targeted towards addressing DOE/NV needs.

Industry. The DOE Federal Energy Technology Center is responsible for identifying possible research and development needs for industry. There also may be commercially available technologies to satisfy site needs.

2.3 PLAN IMPLEMENTATION SCHEDULE

Implementation of the Site Technology Deployment Plan will take place within a six-month period after plan issuance. The following implementation steps are envisioned.

- Issue final Site Technology Deployment Plan-May 1, 1998
- Identify Technology Facilitators-June 1, 1998

- Establish project teams and begin discussing technology needs and potential technology deployments-July 1, 1998
- Reevaluate and re-prioritize DOE/NV needs-October 1, 1998
- Identify and prioritize technology deployments-October 1, 1998

SECTION 3

BARRIER REDUCTION

Barriers are those things that prevent innovative technologies from being deployed. Typical barriers to technology deployment include the following:

- Stakeholder concerns
- Inadequate technology performance and cost savings data
- Predetermined project schedules.

Activities to reduce these barriers are an essential part of the Site Technology Deployment Plan.

3.1 STAKEHOLDER CONCERNS

Innovative technologies by their nature are new and different from what has been in use previously. Sometimes there is a reluctance for a regulator or other stakeholder to accept a new technology at face value without a general understanding of the technology and how it benefits a planned project prior to accepting it. Without this understanding, it may be more difficult for a project to be accepted or permitted, resulting in additional project costs or schedule delays.

A sequence of actions that informs the stakeholders about innovative technologies, and addresses their potential concerns is listed in Table 3-1. For the purposes of this plan, stakeholders are divided into two groups; regulators and the general public.

TABLE 3-1

ACTIONS TO ADDRESS STAKEHOLDER CONCERNS ON TECHNOLOGY INITIATIVES

Activity	Participants	Purpose
Technology Initiative Briefing	DOE/NV, Nevada Division of Environmental Protection (NDEP)	Initial discussion of potential new technology application to ER or WM project
Citizens Advisory Board briefing	DOE/NV, NDEP, general public	Discussion of technology initiatives within specific projects
Visits to sites using new technologies	DOE/NV, NDEP	Opportunity to view technologies that have demonstrated potential for achieving efficiencies within projects
Project permitting discussions and communications	DOE/NV, NDEP	Address specifics of technology deployment
Project updates at STCG meetings and CAB meetings	DOE/NV, NDEP, general public	Periodic updates of technology development or implementation within projects

3.2 TECHNOLOGY PERFORMANCE AND COST SAVINGS

Project Managers will make the decisions on whether to deploy an innovative technology within their specific project. This decision will be based largely on the expected technology performance and cost savings to be achieved. Oftentimes, this information is not available, or it is available but for a dissimilar situation. Unless and until this information is available, no decision can be made and there is a barrier to deployment.

To obtain the needed information, STCG personnel and Technology Facilitators will investigate the possible sources of information listed below.

3.2.1 Past Operating Experience

The best source of information is actual operating experience on a project of similar size and configuration to the planned DOE/NV project. These data require the least amount of study and adjustment, and provide the most confidence to project personnel. The STCG and Technology Facilitators will work together to obtain applicable data from other users of the technology being evaluated.

3.2.2 Demonstration

The source of information may be a short-term demonstration of the technology in the field, at the Nevada Test Site, or elsewhere. Typically, these tests would occur over a several week period, and may or may not involve equipment of the same size as the intended DOE/NV application of the technology. For remediation projects, there are many site-specific conditions, such as soil characteristics that significantly affect equipment performance. Therefore, the demonstration performance and cost data may need to be "scaled-up" or otherwise adjusted.

There may be situations where adjustments representing site-specific conditions cannot be made with confidence to either past operating experience or past demonstrations. In this case, it may be necessary to perform a demonstration at the DOE/NV even though technology operation or demonstration has occurred elsewhere. Funding and time required for these demonstrations could be additional barriers to potential deployment.

3.2.3 Past Pilot Test or Bench-Scale Test

Pilot tests or bench-scale tests generally involve smaller equipment that may not include continuous operation or be suitable for operation in the field. Information from these tests can be used to screen technologies during an evaluation process, but is not sufficient, by itself, to support a deployment decision. A demonstration would need to be performed to augment the pilot test or bench-scale test data. Once again, possible funding sources may need to be identified. The STCG will work with the Technology Facilitators and Project Managers to identify possible sources of funding, and otherwise assist in the planning and execution of the demonstrations.

3.3 PROJECT SCHEDULES

For effective technology deployment, technologies must be identified, evaluated, accepted and ready for deployment prior to the "window of opportunity" within a specific project. Depending on the technology needed, a year or two may be involved between identifying a potential technology and having it ready for deployment. (See Section 6.2.) Meanwhile, project personnel continue to plan, schedule, and budget the project. Permit applications and other documents containing project descriptions continue to be reviewed and approved. At a certain point, it becomes too late for project personnel to consider innovative technologies.

The STCG, therefore, needs to be aware of project schedules as well as project technology needs. This awareness comes from the STCG being involved in ER and WM project planning through the Technology Facilitators.

SECTION 4

MANAGEMENT STRATEGIES

This section discusses management strategies for addressing the non-technical issues that prevent the integrated approach described in Section 2 from being successful.

4.1 SENIOR MANAGEMENT COMMITMENT

DOE/NV senior EM management is committed to the deployment of innovative technologies that benefit ER and WM projects. The July 3, 1997, Al Alm letter states that the field office managers are responsible for technology deployment; and as noted in Section 4.2, specific performance measures have been established for technology deployment for DOE/NV.

Elements of employee performance will consider technology deployment initiatives as applicable.

4.2 SITE PERFORMANCE MEASURES

Deployment of innovative technologies to achieve efficiencies within projects involves a series of activities over a certain period of time. The question is, at what point in the process is a site ready to commit to deploy a technology?

At DOE/NV, the following statements must be true for an innovative technology to be considered to be deployed. Anything else would be considered a technology still in the identification and evaluation phase.

- The Project Manager must commit to using the technology to perform actual ER or WM work. This may consist of an initial field validation to verify performance and/or document benefits (e.g., cost savings).
- The work to be performed must be scheduled and funded.
- Any needed regulatory approvals must have been received.

Based on the above criteria, the DOE/NV performance measure for FY 1998 is the Segmented Gate System at Clean Slate 2.

4.3 RESOURCE REQUIREMENTS

Resources are required to implement this Site Technology Deployment Plan, specifically to support the STCG. As discussed in Section 2.2.3, the STCG includes the Technology Facilitators and representation from the DOE/NV contractors. Resources will be needed to support the portion of time the Technology Facilitators devote to technology deployment, and to support the portion of time DOE/NV contractors are involved in STCG activities.

SECTION 5

POLICY ISSUES

Policy issues are DOE Headquarters items that impact the deployment of technologies.

5.1 UNADDRESSED TECHNOLOGY NEEDS

The DOE/NV technology needs listed in Table 5-1 have not been addressed by the Focus Areas or Crosscut Programs to date, i.e., no viable solutions have been identified.

TABLE 5-1

UNADDRESSED NEEDS AND PRIORITIES

Technology Need	Priority
NV01 - Downhole Real-time Monitoring of Radiation (Mainly Tritium) in Boreholes	3
NV03 - Improved Groundwater Transport Models	6
NV05 - Precision Soil Excavation	8
NV14 - Past Hydronuclear Experiments Area Remediation or In-situ Stabilization	14
NV17 - Intermodal Bulk Waste Transportation	7
NV18 - Long-term Monitoring of Upward and Downward Pathways in the Vadose Zone and Closure Cap	5

As shown in the table, two of the needs, NV01 and NV03, are among the higher ranked needs at DOE/NV. Furthermore, there is the potential for large cost savings from the application of these innovative technologies.

The Focus Areas and Crosscut programs have been given the DOE/NV technology needs statements, which include summary information about possible cost savings. The mechanism for getting important site needs addressed falls within the purview of DOE Headquarters.

SECTION 6

DEPLOYMENT OPPORTUNITIES

Potential technology deployments for DOE/NV are discussed in this section. The definition of "technology deployment" was discussed in Section 4.2.

6.1 POTENTIAL TECHNOLOGIES

There are currently 16 technology needs in the list maintained by the STCG. Technologies potentially able to address most of these needs (see Section 5.1 for a discussion of unaddressed needs) have been organized into four categories as listed in Table 6-1. Each of the categories is addressed in the following sections.

6.1.1 Technology Being Deployed

Certain technologies are in the process of being deployed. Project Manager commitments have been made or are being made, and funding is being provided. Only one technology fits into this category at present.

6.1.2 Technology Having High Potential

Other technologies have a high potential of satisfying the technology need based on limited information. For these technologies, data needed to make decisions are still being collected and evaluated. A commitment to deploy them has not been made by the Project Managers.

6.1.3 Technology or Project Requiring Further Definition

Certain technology applications are in the conceptual stage. They have not been defined sufficiently to obtain performance or cost data. The project itself may need further definition. For example, the quantity of lead contaminated soil to be remediated is not known, and there is not a firm schedule for remediation. This makes it difficult to identify and evaluate potential lead removal technologies (need NV13).

This category also applies to technology applications where cost-savings are not connected directly to the project and are uncertain. For example, having a better groundwater model (need NV03) should reduce the level of effort and cost of groundwater monitoring. However, it is not certain that reduced groundwater monitoring will be acceptable to the stakeholders.

TABLE 6-1

TECHNOLOGY DEPLOYMENT CATEGORIES

Technology Need	Potential Technological Solution (Note 5)	Technology Category
NV01 - Downhole Real-time Monitoring of Radiation (Mainly Tritium) in Boreholes		4
NV02 - Deep Well Sampling		4
NV03 - Improved Groundwater Transport Models		4
NV04 - Soil Volume Reduction	Segmented Gate System validation/initial deployment (Environmental Restoration activity)	1
	Act*De*Con Process	2
NV05 - Precision Soil Excavation		4
NV06 - Improved Decontamination of Large Concrete and Metal Surfaces	Milling/ROTO-PEEN	2
	Wall Walker	
NV07 - Operational Process Analysis for TRU Waste	Integrated mobile TRU characterization system	2
NV09 - Nonintrusive Surveys in Pipes and Vessels	Pipe Crawler	3
	Pipe Explorer	

Technology Need	Potential Technological Solution (Note 5)	Technology Category

NV10 - Improved Detection and Characterization of Large Concrete and Metal Surfaces	Position Sensitive Radiation Detector	3
NV11 - Long-term Stability of Contained Waste Forms	In-situ Stabilization	3
NV12 - Long-term, Flexible Arid Site Closure Cover	Alternative Landfill Cover	
NV13 - Removal of RAD-contaminated Lead from Soil	OR-FUSRAP volume Reduction of MW using radioactive segregation or separation of lead from soil	3
	Polymer Micro-Encapsulation	
NV14 - Past Hydronuclear Experiments Area Remediation or In-situ Stabilization		3, 4
NV16 - Macro-encapsulation of Lead and Other Mixed Waste	Polymer Macro-Encapsulation	3
NV17 - Intermodal Bulk Waste Transportation		4
NV18 - Long-term Modeling of Upward and Downward Pathways in the Vadose Zone and Closure Cap		4

Technology Category Definitions:

1. Technology is being deployed
2. Technology has potential to be deployed
3. Technology or project is not completely defined
4. Technology need is unaddressed by Focus Areas or Crosscut Programs to date
5. Technology names primarily from Focus Area/Crosscut Program linkage tables

6.1.4 Unaddressed Need

This technology deployment category was discussed in Section 5.1.

6.2 SCHEDULES FOR DEPLOYMENTS

Each technology need identified by a Project Manager has its own required deployment schedule. As discussed in Section 3.3, the technological solution needs to be identified, evaluated, and approved prior to the time the actual project occurs.

The deployment schedules will be developed by the STCG working together with the respective Technology Facilitator and Project Manager. Working backwards from deployment, a deployment schedule would have milestones such as those shown in Table 6-2.

TABLE 6-2

DEPLOYMENT MILESTONES

Typical Activity	Responsibility	Typical Date
Technology deployed to field	Project Manager	Now
Technology approved	Project Manager	Six months before
Technology evaluated	STCG/Technology Facilitator	Nine months before
Cost and performance data obtained	STCG	12-18 months before*
Potential technologies identified	STCG/Technology Facilitator	15-21 months before
Technology need specified	Project Manager/Technology Facilitator	18-24 months before

*The range indicates the possible need for a demonstration or other field data collection activity.

A period of 18 to 24 months appears to be necessary to deploy a technology to meet a specified need in those majority of situations where a technology is not “waiting” to be deployed.

6.3 DEPLOYMENT OPPORTUNITY FACT SHEETS

Fact sheets for specific deployment opportunities are contained in Appendix B.

APPENDIX A

STCG CHARTER

U.S. Department of Energy
NEVADA OPERATIONS OFFICE

SITE TECHNOLOGY COORDINATION GROUP CHARTER
Revised April 30, 1998

PURPOSE

The purpose of the U.S. Department of Energy's Nevada Operations Office (DOE/NV) Site Technology Coordination Group (STCG) is to: (1) identify and integrate the technology needs of the DOE/NV's Office of Environmental Management; (2) communicate these needs and their priorities to the DOE Headquarters Office of Science and Technology's (OST) Focus Areas, other governmental agencies, the private sector, other stakeholders, and academia; (3) facilitate partnering and leveraging of resources; (4) implement identified technologies to expedite and economize DOE/NV environmental restoration (ER) and waste management (WM) operations; and (5) share lessons learned on the use of environmental technologies developed and implemented at DOE/NV with other DOE Operations Offices for ER and WM purposes.

OBJECTIVES AND ACTIVITIES

Specific objectives and activities of the DOE/NV STCG are listed below.

1. Identify and prioritize DOE/NV technology requirements for ER and WM activities.
2. Identify technologies being developed from OST and other DOE offices to meet site needs.
3. Interface with other government agencies, the private sector, and academia on technology issues and solutions.
4. Recommend technology development activities to fulfill ER and WM cleanup requirements at the DOE/NV.
5. Champion and support technology demonstrations at the DOE/NV.
6. Facilitate technology transfer to and from the DOE/NV.
7. Involve the customer, the local stakeholder, and the public by developing and providing information about site technology activities.
8. Facilitate development of performance clean-up specifications and standards for site technology needs.
9. Promote performance-based specification contracting.

MEMBERSHIP

The Deputy Assistant Manager for Environmental Management chairs the STCG. Membership includes DOE/NV and contractor staff associated with the DOE Headquarters Office of Environmental Management. In addition, national and state regulators, universities, national laboratories, the private sector, and other stakeholders participate as advisors.

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Stephen A. Mellington, STCG Chair Date

APPENDIX B

TECHNOLOGY DEPLOYMENT OPPORTUNITIES

TECHNOLOGY DEPLOYMENT OPPORTUNITY	
Title: Soil Volume Reduction **Need ID:** NV04	**Date Issued:** 3/23/98
Office: DOE/NV **PBS Name:** Soils **PBS Number:** NV211	
Problem Definition: Soil remediation sites at DOE/NV such as Clean Slate 2, Clean Slate 3, and Project 57 are very large, and contain primarily surface contamination. The contaminant is principally fine particles of plutonium. Technology is needed to reduce the volume of contaminated soil to be transported and disposed. Otherwise, there may not be sufficient funds available for the planned work.	
Baseline Information: The previous two soil remediation projects, Double Tracks and Clean Slate 1, excavated, assayed, packaged, and transported all the excavated soil to the NTS for disposal. In the excavation process, clean soil was picked-up along with the contaminated surface soil.	
Performance Requirements: It is desirable to be able to concentrate 80 percent of the plutonium in 30 percent of the soil mass. The equipment must be portable and operate efficiently and reliably in a remote desert environment. Dust generation must be kept to a minimum.	
Technology Benefits: The Thermo NUtech Segmented Gate System will be validated in FY1998 at Clean Slate 2. The technology is expected to reduce costs for soil transportation and disposal.	
Unique Barriers: Field costs in a remote, desert environment are very high, so it is important that the technology have as large a throughput as possible. Furthermore, some of the soil sites are contained in the *Federal Facility Agreement and Consent Order*, and require State of Nevada approval prior to the start of remediation. The soil clean-up standard is currently being negotiated with the State of Nevada.	
Funding Requirements: The Accelerated Site Technology Deployment program is funding an initial validation/deployment of the Segmented Gate System technology at Clean Slate 2 in FY1998.	