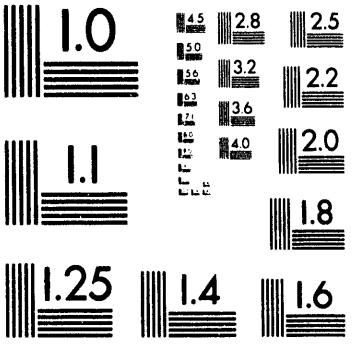
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HWVP-89-001
Revision 1

Hanford Waste Vitrification Plant Project Plan

R. W. Brown
U.S. Department of Energy

Date Published
June 1993

DISCLAIMER

Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management

United States
Department of Energy
P.O. Box 550
Richland, Washington 99352

Approved for Public Release

HWVP-89-001
Revision 1
~~July~~ November 1992 RWB 11/12/92

HANFORD WASTE VITRIFICATION PLANT PROJECT PLAN

Approvals

Submitted by:

R. W. Brown
R. W. Brown, TWRS Project Manager — 11/12/92 Date

J. D. Wagoner
J. D. Wagoner, Manager, RL — 11/17/92 Date

K. A. Chacey
K. A. Chacey, Program Manager — 11/17/92 Date

N/A*
J. E. Lytle, Deputy Assistant Secretary for Waste Management — Date

You are hereby authorized to proceed with the Hanford Waste Vitrification Plant Project (88-D-173) as outlined within. If the Total Estimated Cost of $1,210 million or the Total Project Cost of $1,778 million increases, or in the event of any Level 0 change to the project cost, schedule, or technical objectives defined in Section VIII of this plan, the Acquisition Executive will be notified, approval requested, and appropriate modifications to the Project Plan issued.

Approved by:

N/A*
L. P. Duffy, Assistant Secretary for Environmental Restoration and Waste Management — Date

N/A*
Under Secretary, Acquisition Executive — Date

* APPLICABLE FOR INITIAL ISSUE ONLY — SEE ATTACHED

XI. APPROVALS

Submitted by:

R. W. Brown — 10/3/88
R. W. Brown, Project Manager — Date

Wright G. Trice Jr. — 10/12/88
V. G. Trice, Program Manager — Date

Michael J. Lawrence — 10-4-88
M. J. Lawrence
Manager, DOE-RL — Date

Thomas B. Hindman — 10/17/88
T. B. Hindman, Jr.
Director, Office of Defense
Waste and Transportation, DOE-HQ — Date

You are hereby authorized to proceed with the HWVP Project (88-D-137) as outlined above. If the TEC of $920.0 million increases or the scheduled facility hot operation start date slips by more than six months, the DOE-HQ Program Manager and the Acquisition Executive will be notified and a plan for corrective action will be presented.

Approved by:

Assistant Secretary for — 10/18/88
for Defense Programs — Date

Deputy Secretary, DOE — 1-17-89
Acquisition Executive — Date

HANFORD WASTE VITRIFICATION PLANT PROJECT PLAN

Table of Contents

I. MISSION NEED AND OBJECTIVE

A. Mission Need

A major mission of the U. S. Department of Energy (DOE) is the permanent disposal of Hanford defense wastes by safe, environmentally acceptable, and cost effective disposal methods which meet applicable regulations.

The Atomic Energy Act of 1954 and the DOE Organization Act of 1977 directed DOE and its predecessors to manage the defense related nuclear wastes. Accordingly, the Defense Waste Management Plan (DWMP) was submitted by the President to Congress in June 1983 in accordance with Public Law 97-90. The fundamental goal of this plan is to end present interim storage practices for defense waste and to provide for permanent disposal. To achieve this goal, the DWMP established an objective to immobilize the high-level waste fraction of the defense-related waste and transfer it to a federal geologic repository for disposal.

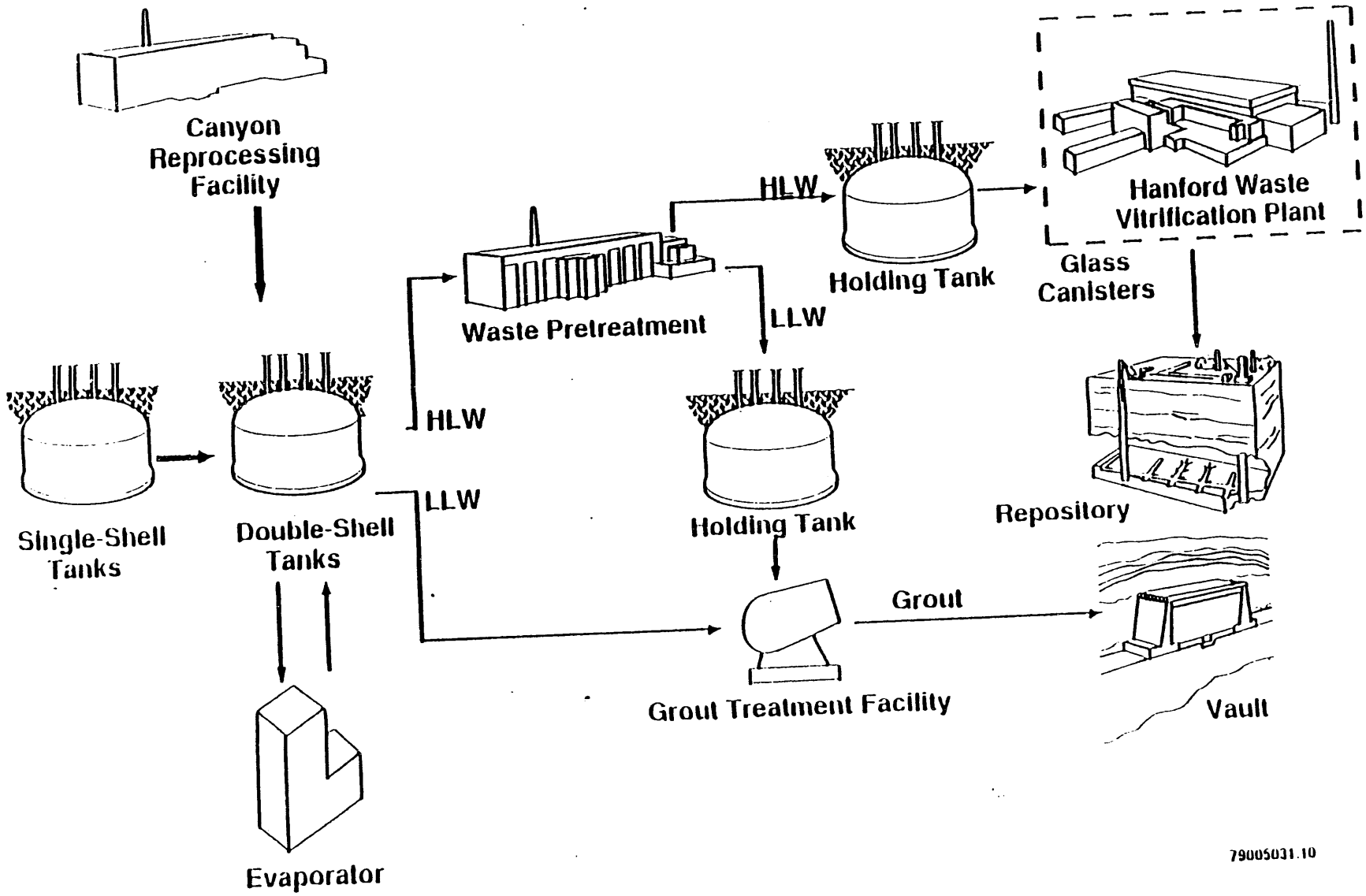
The Hanford Waste Vitrification Plant (HWVP) Project was initiated to immobilize the Hanford high-level waste (HLW) and provide the interim storage in response to this objective. The HWVP Justification for New Start was approved by the Acquisition Executive in September 1987 and forms the basis for the project. The HWVP will vitrify the pre-treated HLW into borosilicate glass, cast the glass into stainless steel canisters, and store the canisters on site until they are shipped to a federal geologic repository. The HWVP relationship to the Hanford defense high-level waste disposal process is shown in Figure 1.

To achieve the most efficient use of available resources, the DWMP directed a sequential approach be taken to developing high-level waste immobilization facilities at the three DOE sites where defense waste is generated and stored. First would be the Savannah River Plant (SRP), followed by a second at the Hanford Site. The third would be a facility to immobilize calcined waste at the Idaho National Engineering Laboratory (INEL). This approach permits experience gained at earlier sites to be applied to the subsequent sites.

B. Objectives

The HWVP project objective is to design, construct, and operate a facility for immobilizing defense high-level waste for storage and later shipment to a federal geologic repository. Technical objectives include using the Defense Waste Processing Facility designed plant systems or elements, where practical, and the exchange and review of information on plants in foreign countries, including the applicable design, construction, and operations data. More definitive objectives for quality, reliability, environmental, and safety are provided in the HWVP Project Management Plan.

Hanford Defense High-Level Waste Disposal Process



This Project Plan specifically covers the HWVP Project. The HWVP will immobilize the high-level portion of Hanford's defense waste into borosilicate glass. The glass will be cast into stainless steel cylinders which will be sealed, decontaminated, and stored on site until a federal repository is available. The HWVP design is sufficiently flexible in size to vitrify the high-level fraction of the defense wastes stored in all Hanford waste tanks.

The major schedule objectives for the project are:

Activity	Start	Complete
Preliminary Design (Title I)	2nd Qtr FY88	4th Qtr FY90
Detailed Design (Title II)	2nd Qtr FY90	3rd Qtr FY94
Construction	3rd Qtr FY92	3rd Qtr FY98
Operations Test	4th Qtr FY98	1st Qtr FY00
Hot Operation Start-up	1st Qtr FY00	

These schedule objectives and other major activities are reflected in the HWVP Project Summary Schedule (Attachment A-1).

The Total Project Cost (TPC) estimate (required funds in year of expenditure dollars) for the HWVP Project is $1,778.0M. The TPC consists of a Total Estimated Cost (TEC) of $1,210.0M (Capital line item funding) and $568.0M of other project costs (Operating Expense and Capital Equipment Not Related To Construction funding). Project funding requirements by fiscal year are shown in the HWVP Resource Plan (Attachment A-2).

C. Defense Waste Management Integration

The DWMP is a nationwide program to end the present interim storage practices for defense waste and provide for permanent disposal. As part of this overall program, high-level waste immobilization facilities will be constructed and operated at the SRP, HWVP, and INEL. Since these facilities are being designed and constructed sequentially, management experience and design/construction information gained at SRP can be used in the design/construction of HWVP. Experience and information from both SRP and HWVP can then be used to support INEL. This approach provides a degree of uniformity for the HLW immobilization part of the DWMP.

The HWVP is an integral part of the Hanford Site Tank Waste Remediation System as depicted in Figure 1. The Tank Waste Remediation System formulation and baselining is currently in progress, based on the Secretary direction of December 20, 1991. The DOE Richland Field Office (RL), Assistant Manager for Tank Waste Disposal provides program oversight for the HWVP Project and manages the supporting waste pretreatment and grout programs.

II. TECHNICAL PLAN

The Hanford defense waste is stored in underground tanks and may exist as sludge, crystalline salts, and supernatant (liquid fraction overlying the sludge and/or salts) liquid. Existing low-level waste is transferred directly to the Grout Treatment Facility for processing into grout and permanent disposal on site. For defense waste that can not be disposed of as low-level waste, pretreatment to separate the waste into high and low-level waste fractions is planned. Following pretreatment, the high and low-level wastes will be stored temporarily in double shell tanks. HWVP will process the high-level waste into borosilicate glass; the Grout Treatment Facility will process the low-level waste into grout. This process is depicted in Figure 1.

Borosilicate glass was selected as the preferred waste form based on resistance to leaching under anticipated conditions, ability to accommodate a wide range of waste compositions, and suitability for large scale vitrification operations. Borosilicate glass is also preferred because there is less process complexity, fewer developmental requirements, and lower programmatic costs than other waste forms. Use of borosilicate glass at HWVP will also allow the project to rely upon technology and information gained from the West Valley Demonstration Project (WVDP) and Defense Waste Processing Facility (DWPF) experience.

The vitrification process will be initiated by transferring pretreated high-level waste from double shell tanks to the HWVP. The waste will be treated with chemicals, concentrated, and mixed with glass frit. It will be converted into borosilicate glass in a liquid-fed ceramic melter at a production rate of 220 pounds of vitrified waste per hour. The molten glass product will be cast into stainless steel canisters and stored on-site pending shipment to a federal waste repository. This process is depicted in Figure 2 and described in more detail in Section A.2.

A. HWVP Plant Description

The HWVP will be located in the 200 East Area of the Hanford Site to the southwest of B-Plant. The HWVP site has access to existing railroads, utilities, and the pipelines that are connected to the tank farms. The site does not require extensive clearing or grading. The site has the potential for future expansion if considered necessary. A site evaluation study was performed and the recommended site approved by RL on September 24, 1987.

The Plant will consist of buildings that will house the vitrification process, glass canister storage, and the process and facility supporting systems. The facilities will provide for remote operation and maintenance of the vitrification process with appropriate biological shielding for operator safety. Heating, ventilation, and air conditioning (HVAC) systems will provide additional confinement barriers to limit the potential spread of radioactive contaminants. Glass canister storage facilities will

be designed for temporary storage of vitrified waste canisters and other HLW forms.

A.1. Plant Facilities Description

The vitrification building will be a reinforced concrete structure designed and constructed to DOE criteria for tornado and seismic resistance, radiation protection, and other requirements. It will contain remotely operated mechanical process cells and appropriate support services. The process cells are located in the central portion of the building, surrounded by the operating galleries and service corridors.

The canister storage building will be used to receive and store canisters filled with vitrified waste. These canisters will be sealed, decontaminated, and the contents fully documented and prepared for shipment to the federal repository prior to storage. The canister storage building could also be used for storing the cesium/strontium capsules; however, DOE would conduct an appropriate NEPA review should it propose such use.

The vitrification building filtration system is designed to ensure that airborne radioactive particulate concentrations are as low as reasonably achievable and do not exceed regulatory requirements during normal, abnormal, accident, and Design Basis Accident (DBA) conditions. The vitrification building is physically separated into four ventilation zones with the HVAC systems establishing and maintaining different air pressures in each zone. This pressure differential ensures that air flows from zones of lower potential for contamination to zones of greater potential for contamination.

Water and steam required to support the facility are available near the HWVP site. Main 13.8KV power will be provided to the site. Standby and uninterruptible power supplies will be provided within HWVP.

The switchgear/generator building will house switch-gear to distribute power to the facility electrical distribution system. This building also houses the standby generators which will supply power to support a safe and orderly shutdown of the facility following loss of normal power.

An office building, control room, and other facilities will be provided to support the HWVP operations. Entry to the process building will be controlled through regulated access control. A loading area adjacent to the support building will be used to support shipment of all supplies and materials except for radioactive materials.

Cold chemical and utility systems and personnel support services will be located in buildings adjacent to the vitrification building. Secondary wastes from the process and process support operations will be treated within the HWVP in accordance with RCRA.

Process Flow Diagrams

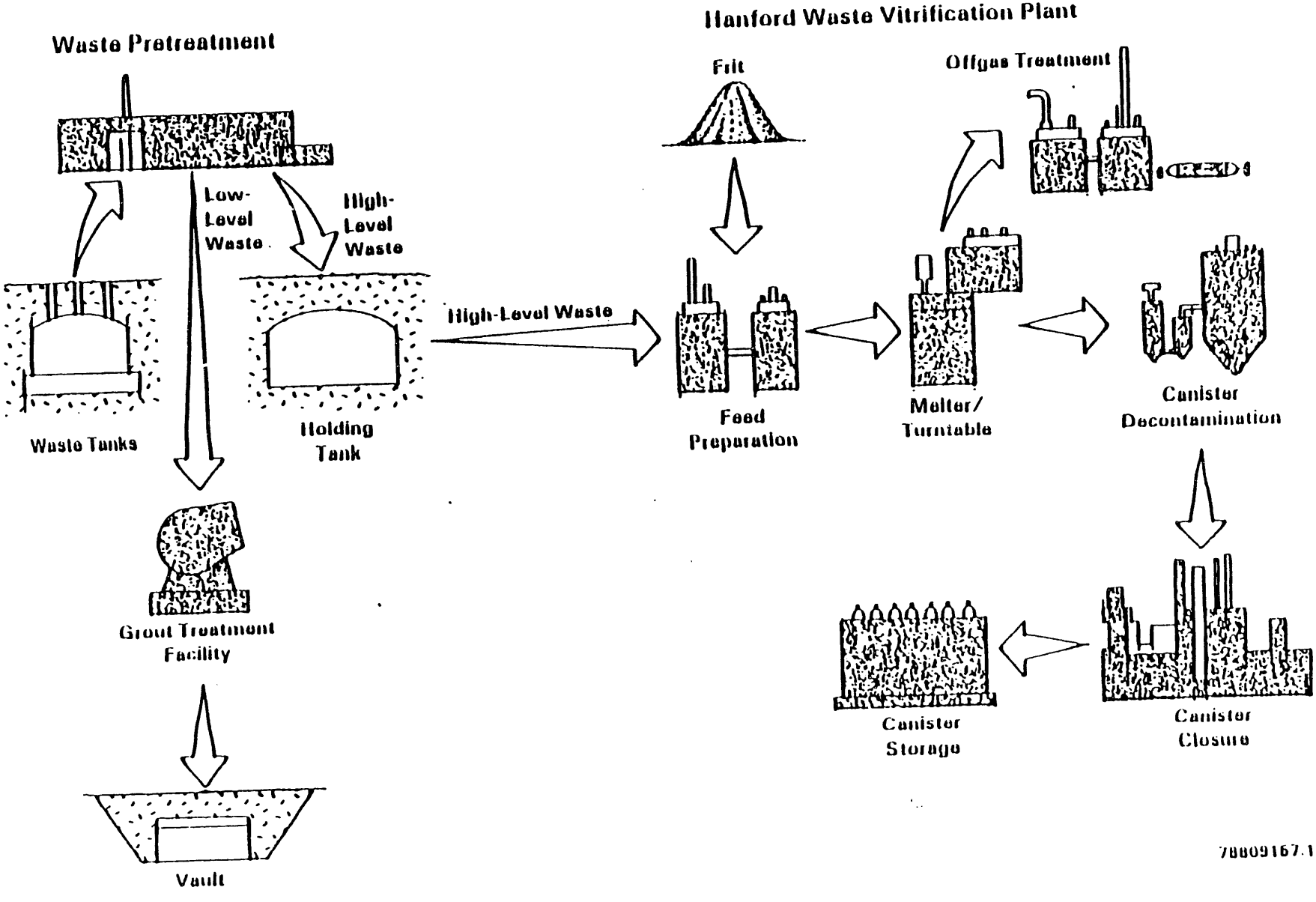


Figure 2

The project will provide all of the utility services connections, the land improvements that are needed for the HWVP buildings, and property protection during construction. During HWVP operations, security will be provided by the existing 200 East security systems.

A.2 Plant Process Description

The HWVP process consists of five major activities including feed preparation, vitrification, canister handling, waste handling, and off-gas treatment.

Feed slurry is transferred to the HWVP via underground, encased transfer lines monitored by leak detection systems. The feed is concentrated by evaporation and mixed with glass frit, chemical additives, and internally recycled waste to yield a concentrated melter feed slurry.

The melter feed slurry is continuously fed into a ceramic-lined electrically-heated melter. The water and volatile components are driven off, and the remaining components form a borosilicate glass pool. Molten glass is poured into stainless steel canisters (10 ft long by 2 ft in diameter) where it cools and solidifies.

After cooling, the canister is plugged and decontaminated. Smear tests are performed to ensure adequate decontamination. A cap is then seal welded in place and the canisters moved to the canister storage building by a shielded canister transporter.

Equipment is provided to collect and treat all radioactive wastes. The liquid high-level waste fraction is concentrated and recycled for incorporation into glass. The low-level waste fraction is returned to the Hanford Site tank farms for treatment.

Melter off-gas (MOG) is treated with a scrubber and multiple stages of filtration. Vent gas from other process vessels is treated in a second scrubber/filtration train that also provides backup treatment to the MOG.

The equipment associated with these activities is remotely operated and maintained and is located within cells in the vitrification building. The canyon crane, with bridge mounted closed circuit television, will service the entire vitrification building canyon providing access to all operating and maintenance cells, as well as the crane maintenance area and railroad well. The vitrification processes and support operations will be controlled by a computerized distributed control system.

B. Technology

The HWVP vitrification process and plant design are based on 17 years of vitrification process development, over 40 years of experience in the design of plants for remote radiochemical pro-

cessing, and the process design and plant construction experience of the DWPF and WVDP via an aggressive technology exchange program. Adjustments are being made, as appropriate, to accommodate unique characteristics of Hanford high-level wastes.

Process feasibility and confidence in the completed preliminary design of HWVP was enhanced through process tests and development of a reference glass waste form for neutralized current acid waste (NCAW). However, additional technical issues need to be resolved to support the final design, waste form qualification (WFQ), and plant operation. These issues and plans for their resolution have been documented in the HWVP Applied Technology Plan. For each of these issues, the required development and testing, together with the cost and schedule, are identified by fiscal year. The plan also describes how HWVP technology tasks are linked to the design and to other Hanford site waste management activities.

C. Regulatory Compliance

This project will comply with all applicable federal, state, and local environmental laws and regulations, for gaseous, liquid, and solid effluents, such as the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act (RCRA), and the State of Washington Dangerous Waste Regulations. The Project will also comply with environmentally-related laws and policies such as the Endangered Species Act, Archeological Resource Preservation Act and the National Environmental Policy Act (NEPA). HWVP will also produce a waste form that meets the waste acceptance criteria for vitrified waste issued by the DOE's Office of Civilian Radioactive Waste Management. Permits and approvals will be obtained in accordance with the requirements of applicable laws and regulations.

C.1 Environmental

Based on the HWVP design and a review of the applicable statutes and regulations, environmental permits and/or approvals for the HWVP have been identified and are discussed below.

The high-level waste processed by the HWVP will be designated as a mixed waste primarily because of the heavy metals content. Since the hazardous portion of the mixed waste falls under RCRA jurisdiction, a permit from the Washington State Department of Ecology (Ecology) is required to operate the HWVP. The RCRA Part A Permit Application was submitted to EPA and Ecology in May 1988. The RCRA Part B Final Facility Operating Permit Application was submitted to EPA and Ecology in July 1989. In April 1992 Ecology granted interim status for the initiation of construction. Submittal of the final permit application is anticipated at the end of the HWVP design effort.

On the basis of the current design, the projected non-radioactive gaseous emissions for construction and operation of HWVP indicate

that a Prevention of Significant Deterioration (PSD) permit will not be required to comply with the Clean Air Act. A Notice of Construction for potential toxic air emissions will be required. For radioactive air emissions, an analysis of the Best Available Radioactive Control Technology (BARCT) is being prepared to comply with the Washington State Department of Social and Health Services (DSHS) requirements for Air Emission Source Registration. A New Source Review (NSR) will be performed by the Benton-Franklin-Walla Walla Counties Air Pollution Control Authority and Ecology. The permit application and approval to construct required under the Clean Air Act was submitted to the appropriate regulatory agencies.

Wastewater discharges will not require a permit under applicable provisions of the Clean Water and Safe Drinking Water Acts. As presently designed, the wastewater will be recycled or treated and discharged to the Treated Effluent Disposal Facility (an NPDES permitted facility).

Compliance with the Endangered Species Act, Bald and Golden Eagle Protection Act, and the Fish and Wildlife Coordination Act have been evaluated and it has been concluded that no specific permits or approvals are required. A preliminary survey of the site, required by the Archaeological Resources Preservation Act, was conducted in 1987 to identify any evidence of archaeological resources. No such evidence has been identified at the HWVP site. If evidence uncovered during construction suggests the need, or if additional acreage is required, additional surveys will be conducted.

The DOE/EIS-0113, Final Environmental Impact Statement on Disposal of Hanford Defense High-Level, Transuranic, and Tank Waste (HDW-EIS) provided the NEPA documentation for HWVP. The final HDW-EIS was issued in December 1987 and the HDW-EIS Record of Decision was issued in April 1988. The Record of Decision required environmental evaluation prior to start of construction. A Record of Memorandum dated April 1992 was prepared to cover the site preparation construction activities. A Limited Scope Supplemental Analysis has also been prepared which covers the construction of the Canister Storage Building and supporting construction effort. Since the values used in the HDW-EIS were extremely conservative, no significant differences from the impact identified in the HDW-EIS are anticipated. As a result, a Supplemental C.2 Analysis has been prepared that covers the vitrification building and the remainder of the plant. Project changes, including those to plant design, safety analyses, and effluent release data, will be evaluated throughout project development, construction, and prior to operation to verify the resulting potential environmental impacts are adequately bounded by HWVP analyses in the HDW-EIS. This continuing verification process will form the basis for determining whether supplemental NEPA documentation for the HWVP may be required.

C.2 Safety

The HWVP Project will comply with all applicable DOE policies, orders, and requirements pertaining to safety. The responsibility for developing and implementing an effective safety program begins at the line management organization. This responsibility includes establishing a work environment that encourages individual awareness, participation, and responsibility for safety. This approach establishes safety as a high priority, encourages active review and participation in the safety process, and assigns accountability throughout all levels of the project organization.

The HWVP Preliminary Safety Analysis Report (PSAR) was prepared in accordance with Nuclear Regulatory Commission (NRC) Regulatory Guide 3.26 and is based on technical information contained in the Reference Conceptual Design, Preliminary Design, and Detailed Design completed to date. The PSAR was reviewed by Westinghouse Hanford Company (WHC), RL, Los Alamos National Laboratory, and a DOE-Headquarters (HQ) Office of Environmental Restoration and Waste Management (EM) Technical Review Group prior to DOE-HQ approval in April 1992. The HWVP Project will annually revise the PSAR, incorporating project changes that impact the PSAR. An addenda to the PSAR will be prepared addressing the safety issues related to storing cesium/strontium in the canister storage building

The Final Safety Analysis Report (FSAR) will be prepared and issued based on technical information contained in the Detailed Design (Title II). It will be revised on the basis of the as-built information developed during construction and acceptance testing. The FSAR review cycle will provide adequate time for an independent review by DOE-HQ. Acceptance and approval of the FSAR is dependent upon resolution of all outstanding review comments after acceptance testing completion and prior to the start of facility operations.

The HWVP start-up and operations contractor, WHC, will perform an operations readiness review prior to facility operations. The review results will be formally documented by the contractor's Readiness Review Board (RRB). RL will conduct an independent operations readiness review and approve the contractor's RRB report.

C.3 Waste Form Qualification

Waste Form Qualification (WFQ) activities will be completed to ensure that the canistered waste form to be produced by HWVP will meet DOE waste acceptance specifications for shipment to, and disposal in, a federal repository for high-level waste. Since the geologic repository will be an NRC licensed facility, it is anticipated that certain aspects of the WFQ activities will come under the review of the NRC. The HWVP compliance strategies were developed on the basis of the Waste Acceptance Preliminary

Specifications for DWPF. These strategies will be modified slightly to address revised specifications which will apply to HWVP.

Compliance documentation, to be prepared by HWVP in accordance with the waste acceptance process defined by DOE, will include the Waste Form and Canister Description, Waste Compliance Plan, Waste Qualification Report, and production records. Activities at HWVP to support this effort include development of process and product models, identification of required product characteristics, and laboratory and bench-scale production and testing of radioactive glass to confirm these models. A WFQ Plan has been prepared and will be updated to define these activities in greater detail. The HWVP Project expects to benefit from the technical approaches being developed by DWPF and WVDP to support WFQ.

C.4 Quality Assurance

As required by DOE Order 5700.6C, HWVP Project participants will develop and implement quality assurance (QA) programs.

The vitrified waste that will be produced by HWVP will ultimately be sent to a licensed federal geologic repository. As a result, HWVP will be required to certify that the vitrified waste that it produces meets the waste acceptance specification established by the federal geologic repository. The geologic repository program has established requirements for the QA program that apply to work associated with the waste form certification and has documented these requirements in the Office of Civilian Radioactive Waste Management Quality Assurance Requirements Document (DOE/RW-0214).

In response to this document, the HWVP Project has developed a QA program that implements both the requirements of NQA-1 and DOE/RW-0214. The project participants, including the Vitrification Project Office (VPO), have prepared Quality Assurance Program Descriptions (QAPD) or Plans to describe how these QA requirements are implemented. Although the VPO is responsible for implementation of these plans, many of the QA functions are delegated to other project participants. VPO will, however, retain responsibility for ensuring that the requirements are met through audits and surveillances.

D. Work Breakdown Structure

Consistent with this Project Plan, a Project Summary Work Breakdown Structure (PSWBS), Attachment A-3, has been developed. The PSWBS, supported by a Dictionary, will be controlled by the RL VPO Project Manager and will be used for the development and control of all project activities, including planning, estimating, budgeting, scheduling, cost collection, progress status, and reporting, as described in Section IV, "Management Approach."

III. RISK ASSESSMENT

This section addresses the aspects of technical, schedule, and cost risks directly related to the construction of the permanent plant facility. Funding support can directly impact the cost and schedule risk factors. It is also important to realize that the indirect (expense) activities of Research & Development (R&D) and management can affect the risk factors if their funding profiles are not supported.

A. Technical Risk

The technical risk associated with the HWVP is being addressed in two major areas. First, hot operation (operation using radwaste) is scheduled to begin in FY 1994 for the DWPF and FY 1996 for the WVDP. By using technology and experience gained from these plants, HWVP will be able to incorporate, early on, the compatible elements of their designs.

Second, technical issues unique to the HWVP that are associated with feed characteristics, design requirements, permitting, waste form qualification, and plant start-up and operation have been identified. The plans for resolving these issues are being implemented in accordance with the HWVP Applied Technology Plan.

Engineering studies, applied technology development activities, Conceptual Design, Preliminary Design (Title I), and Detailed Design (Title II) performed to date indicate that the HWVP can be designed, constructed, and operated using existing technology with a small amount of cost and schedule risk. A preliminary hazards analysis has indicated that there are no major safety issues which could adversely impact the project that are not being addressed by the specific engineering development studies. Environmental studies to date have shown that no substantial environmental impacts will result from the construction or operation of the facility.

Recent occurrences in the Hanford Site waste storage tanks and delay in the start-up of the Savannah River Plant vitrification facility have raised questions about the plans to treat Hanford's high-level and transuranic (TRU) tank waste. As a result, a risk assessment was performed to identify the technical and programmatic uncertainties and to quantify the attendant risks proposed by the tank waste remediation program to human health and the environment.

All major tank waste disposal program elements were addressed in the risk assessment including waste characterization, Tank Farm upgrades, retrieval, pretreatment, and vitrification of the high-level waste fraction. In addition, the capability of the HWVP to process single-shell tank (SST) wastes and cesium and strontium capsules was addressed.

No significant technical uncertainties will impede the start of construction or hot start-up of HWVP. There is sufficient waste feed to support start-up and approximately five years of continuous operation. Beyond that, further development of pretreatment processes is required to assure continuous feed to the plant. There is also a question concerning the capacity of the plant to process the expected volume of tank waste, now that planning has been expanded to include single-shell tank waste. These areas of uncertainty are being investigated through additional engineering studies but do not affect the potential viability of the HWVP.

The HWVP will also be capable of supporting future processing missions because of the inherent flexibility designed into the plant and the processing options available for preparing these materials for vitrification.

B. Schedule Risk

Project schedules are based on the completed Preliminary Design, Detailed Design performed to date, DWPF experience, and experience on other major DOE projects. The current schedule objectives are reasonable and attainable provided that required fiscal year funding is authorized to support the compressed schedule and there are no major changes to the HWVP technical scope from ongoing Hanford Tank Waste Remediation System (TWRS) evaluations. As a result, the HWVP schedule risk is assessed as low pending the completion of the TWRS evaluations and rebaselining efforts, which are being accomplished in accordance with the TWRS Decision Plan.

As the project moves forward through the Detailed Design phase, better definition of the project work scope will be developed. This will allow work plans, including network logic diagrams and integrated resource loaded project schedules to be updated and revised as necessary. The integrated work plans include permitting, safety analysis, and other support activities that can impact major milestone dates. Critical path schedule analysis will be utilized to minimize schedule risk.

C. Cost Risk

The estimated capital cost (TEC) for the HWVP Project is $1,210.0M escalated over the construction period. This estimate is based on Revision F of the Preliminary Design Cost Estimate (PDCE) for the project, the known character of the process, current DWPF costs, and experience on several large construction projects recently completed at Hanford and other DOE sites.

A DOE-HQ Independent Cost Estimate (ICE) review of the PDCE, Revision B was completed in FY 1990. A DOE-HQ validation review of the $1210.0M TEC and PDCE basis was conducted in May 1992. Additional ICE reviews of major construction and procurement

package cost estimates will be scheduled and performed to support the approval of phased construction Key Decisions for the HWVP Project.

Baseline controls will be applied to ensure that changes to the project cost baseline are minimized. Cost performance reporting will provide information that can be used by project management to control costs. These collectively will minimize the cost risk. Value engineering using cost optimization studies will also be performed and will contribute to minimizing the cost risk.

IV. MANAGEMENT APPROACH

A. Organization

The DOE and HWVP Project participant organizational relationships and functional responsibilities are depicted on Attachments A-4 and A-6.

The Assistant Secretary, Office of Environmental Restoration and Waste Management is the Outlay Program Manager for the HWVP Project and has full responsibility for approval of key project decisions not reserved for the Acquisition Executive. The DOE-HQ Director of Waste Management Projects Division has been assigned program management responsibility and is accountable for overall program success. Project responsibility has been assigned to the DOE-HQ Vitrification Projects Branch. The HWVP Program Manager, within this Branch, serves as the focal point for coordinating the HWVP Project activities within DOE-HQ.

The principal responsibilities of the DOE-HQ Program Manager are:

- Provide guidance on programmatic and functional requirements which the project is to satisfy, including QA activities and significant changes thereto.
- Establish and control the overall scope, cost, and schedule envelope for the project.
- Obtain DOE-HQ approval of the Project Plan, and changes thereto, and concur in the Project Management Plan.
- Obtain required DOE-HQ approval for changes to all DOE-HQ controlled milestones and Key Decisions.
- Monitor and maintain overview of project activities, costs, schedules, and status through meetings, reviews, and reports to ensure that project performance, quality, cost, and schedule objectives are being met.

- Implement the waste acceptance process activities through the Vitrification Projects Branch of the Office of Waste Operations, supported by the high-level waste lead office.

- Act as the DOE-HQ contact for the project and ensure that all required DOE-HQ activities for this project are accomplished.

The RL Manager has overall responsibility and authority for the management of the HWVP Project. This responsibility and authority has been delegated to the Office of Assistant Manager for Tank Waste Disposal (AMD) within the Office of Deputy Manager for Environmental Restoration and Projects. The Vitrification Project Office (VPO) has been established within the AMD. The VPO Project Manager, R. W. Brown, is responsible for providing day-to-day management of the project (see Organization Chart, Attachment A-5).

The VPO Project Manager's responsibilities include the following:

- Maintain the Project Plan and Project Management Plan.

- Obtain authorization for expenditure of funds.

- Control the project's performance, including completion of RL milestones.

- Act as focal point within DOE for project communications, including project direction and supporting development program direction, and communications with contractors.

- Control project quality, cost, and schedule.

- Conduct project management meetings.

- Inform DOE-HQ of significant developments, including non-conforming performance and corrective actions.

- Submit project work scope, budget, and schedule reports to DOE-HQ.

- Establish the Project Master Schedule. Identify milestones that require the Project Manager's approval to change, and which support the project milestones approved by DOE-HQ.

- Review and acknowledge all changes within the authorized scope (engineering change orders) and approve all changes to the scope (client change orders) within the thresholds established by the Project.

- Manage project contingency as specified in Section X, "Project Charter."

- Ensure integration of the HWVP Project with the RL Tank Waste Disposal Program.

The VPO Project Manager will retain responsibility for the review and approval of the HWVP Quality Assurance Program Description. The RL Manager will retain responsibility for the review of the Safety Analysis Reports.

As indicated in Attachment A-4, the VPO uses matrix support from the other RL Offices and Divisions in order to achieve the mission objectives.

The RL Environmental Restoration Division within the Office of Assistant Manager for Environmental Management provides environmental regulatory support for the HWVP Project.

The RL Treatment Program Division (TPD) is responsible for the RL tank waste disposal program which includes the HWVP and facilities for pretreatment of waste to be vitrified in the HWVP. The TPD provides programmatic oversight for tank waste disposal activities and has responsibility for the approval of the HWVP Functional Design Criteria and any changes thereto. The TPD is also responsible for providing the Waste Compliance Plan, waste characterization, and pretreating the feed stream for HWVP.

The Office of Assistant Manager for Administration provides the business management matrix support for the project. The Procurement Division is responsible for overseeing all of the procurement activities on the project, including establishment of a Business Strategy Group to review acquisition strategy and provide recommendations to the Project Manager. The Financial Management Division and Plans & Budget Division provide financial and budget support to the project.

Four major contractors support the HWVP Project. The Westinghouse Hanford Company (WHC), HWVP Project Office, is the Integrating Contractor (IC) and will have responsibility for QA, regulatory compliance, start-up and operations, and project integration including business management, applied technology, and engineering and technical monitoring. The VPO Project Manager will provide overall coordination of project activities through the IC. The IC will coordinate and integrate the activities of the Architect/Engineer (A/E), General Construction Contractor (GCC), and the Technology Development Contractor (TDC).

The relationship between HWVP contractors and a summary of their functional responsibilities is presented in Attachment A-6. Fluor Daniel, Inc. (Fluor) was selected as the A/E to provide the design services. Fluor is responsible for Facility Conceptual Design, Preliminary Design (Title I), Detailed Design (Title II), and engineering and inspection during construction (Title III).

Construction and procurement services will be performed by United Engineers and Constructors-Catalytic, Inc. (UCAT). UCAT has the overall responsibility for managing the construction effort. This includes managing the construction contractors, performing all procurements, performing work with their own forces, and accomplishing all other related management activities necessary for constructing the facility.

As the TDC, Pacific Northwest Laboratory (PNL) is responsible for the technology development necessary to establish the basis for the vitrification process and to meet the requirements of the Waste Acceptance Specifications. PNL also has the responsibility for developing and coordinating the integrated technology testing program.

Independent organizations have been, and will be, requested to evaluate certain aspects of the project. Under the RL General Support Services Contract, Stone & Webster Engineering Corporation will be tasked, as required, to provide project management and technical support services in support of the HWVP.

The HWVP Project Management Plan includes additional detail on the organizational relationships and responsibilities, interfaces, controls, and reporting requirements for the HWVP Project.

B. Project Control

The VPO Project Manager is responsible for overall control of the project, including cost/schedule control and control of design and construction. The project has implemented a management system which utilizes both project baseline and change control management procedures. This system employs a set of methods and procedures for organizing, planning, monitoring, and controlling the project scope, schedule, and cost. This "closed-loop" system for generation and feedback of data focuses on the following three related baselines:

1. The technical baseline defines all the functional aspects, including the work to be done, requirements to be satisfied, methods to be used, and quality to be attained. The primary technical baseline documents are the Functional Design Criteria, Technical Data Packages, Preliminary Design media, and Detailed Design media. Documents supporting the technical baseline include, but are not limited to, the Systems Engineering Management Plan; Quality Assurance Plans; Test & Evaluation Plans; Environmental, Safety and Health Protection Plans; Configuration Management Plan; and other documents that interface with these documents.

2. The cost baseline includes all cost-related aspects of the project, including the cost of each work breakdown structure element and the related funding requirements.

3. The schedule baseline correlates all time-related aspects of the project, including sequence, relationship, and duration of HWVP activities, and the start and completion dates.

Change control is governed by RL and HWVP Project baseline change control procedures. These procedures provide the details related to change control thresholds, approval and concurrence requirements, and change log documentation. Attachments A-9 and A-10 identify the cost, schedule, and technical summary baseline information and approval authority thresholds. Authority for change control is vested in Change Control Boards whose membership and activities are covered by these procedures.

The HWVP Project uses earned value methods of monitoring and controlling project performance that meets the requirements of DOE Order 4700.1, "Project Management System." The PSWBS and lower level Contract Work Breakdown Structure provide for integration of cost, schedule, and technical baselines, and for progress reporting and analysis. All Project participants are required to control their project effort to earned value requirements established by the IC. Project scheduling is accomplished using a schedule hierarchy structure. Cost and schedule control utilizes a formal approach to change management.

C. Project Reporting

The VPO Project Manager provides monthly progress reports to DOE-HQ as required by DOE Order 4700.1. These reports summarize design/construction progress, milestone status, cost status, and problem areas with proposed resolutions. Quarterly progress reports are also provided to DOE-HQ. These reports; cost, schedule, and design reviews; quarterly status meetings; and program reviews are used to monitor actual project status.

V. ACQUISITION STRATEGY

WHC has been assigned the responsibility for successfully managing the project within cost, schedule, and technical baselines. WHC has a Cost Plus Award Fee (CPAF) contract with RL.

PNL, the Hanford Site R&D contractor, has a Cost Plus Fixed Fee (CPFF) contract with RL. PNL is responsible for development of the vitrification system technology for the HWVP.

Fluor was selected by RL as A/E to perform Conceptual Design, Preliminary Design, Detailed Design, and engineering and inspection during construction. Fluor has a CPFF contract with RL.

UCAT was selected by RL as the GCC to perform force account construction and fixed price construction management under an incentive contract with RL.

The GCC, working with the A/E, performs constructibility reviews to determine the most efficient and cost effective method of packaging design into construction packages for subcontracting. To the maximum extent possible, subcontracts will be awarded on a fixed-price competitive bid basis. Small business, disadvantaged business, and labor surplus area concerns will be given appropriate consideration consistent with DOE policy.

Acquisition of certain project equipment will be initiated soon after the start of construction to ensure compliance with schedule baselines. These procurements include standard equipment and engineered equipment. Contracts for these items will be awarded by the GCC on the basis of competitive fixed-price bids whenever practicable.

Additional details on the acquisition strategy are provided in the HWVP Project Management Plan (PMP) Annex I and the Plant Acquisition Plan (PAP). Annex I of the PMP describes the acquisition objectives and contracting processes and outlines requirements for implementation. The PAP provides specific details for each procurement package.

VI. PROJECT SCHEDULE

The HWVP Project Summary Schedule, Attachment A-1, contains detail down to PSWBS Level 2, except for Plant where it contains detail down to Level 3 and shows major milestone completions. Performance to this schedule is subject to the availability of funding as identified in Section VII. Major project milestones and milestone control authority are detailed in Section IX of this Plan.

VII. RESOURCES PLAN

Funding requirements for the HWVP Project are $1,210.0M of Capital line-item funding, $521.6M of Expense funding, and $46.3M of Capital Equipment Not Related To Construction (CENRTC) funding. The HWVP Project is completely DOE-funded (i.e., there is no private industry cost sharing). Attachment A-2, Resources Plan, provides the project funding requirements by fiscal year and Budget Appropriation/Budget Outlay requirements through project completion.

The HWVP Project staffing requirements excluding construction trades are projected for the life of the project in Attachment A-7. The VPO staffing requirements are shown on the organization chart in Attachment A-8.

VIII. CONTROLLED ITEMS

HWVP Project technical scope, schedule, and cost baselines for DOE executive level and field level control have been established and are specified in Attachment A-9. Change control thresholds and approval authority for changes to these baselines are detailed in Attachment A-10.

There are four levels of Baseline Change Control identified as Executive (Level 0), Program (Level 1), and Project (Level 2 and 3). The

Acquisition Executive, Program Secretarial Officer, and RL Project Manager are the approval authorities for these levels, respectively. Requirements for processing changes to project baselines are detailed in the HWVP Project baseline change control procedure.

IX. SCHEDULED MAJOR MILESTONES

Following are the DOE-HQ controlled major milestones, including Key Decisions and Tri-Party Agreement milestones, and significant RL major milestones for the HWVP Project.

Milestone Control Authority	Milestone Description	Milestone Date
RL	Issue Updated Technology Plan	July 1986 (A)
DOE-HQ	Submit Draft Major System Acquisition "Justification for New Start" to DOE-HQ	Dec. 1986 (A)
RL	Completed Draft RCD Report	July 1987 (A)
DOE-HQ	Key Decision 1 - Approval of Justification for New Start	Sep. 1987 (A)
RL	Issue Final HDW-EIS	Dec. 1987 (A)
DOE-HQ	Complete Advanced Conceptual Design	Jan. 1988 (A)
RL	Initiate Preliminary Design (Title I)	Jan. 1988 (A)
RL	Issue HDW-EIS Record of Decision	Apr. 1988 (A)
RL	Submit RCRA Part A Permit to Washington State Dept. of Ecology/EPA	May 1988 (A)
DOE-HQ	Submit Draft Project Plan to DOE-HQ	June 1988 (A)
DOE-HQ	Submit to HQ Draft Project Management Plan for review	June 1988 (A)
DOE-HQ	Issue Updated Report on Description of Waste Form and Canister	Sep. 1988 (A)
DOE-HQ	Project Plan Approved by HQ	Jan. 1989 (A)

RL	PMP Approved by DOE-RL	Mar. 1989 (A)
DOE-HQ*	Submit HWVP RCRA Part B Permit Application to Ecology and EPA	July 1989 (A)
RL	HWVP NCAW Feed Specifications Finalized	Sep. 1989 (A)
DOE-HQ	General Construction Contractor Award	Dec. 1989 (A)
DOE-HQ	Key Decision 2 - Approval to Commence Detailed Design	Jan. 1990 (A)
DOE-HQ	Initiate Title II Design	Jan. 1990 (A)
DOE-HQ	Submit Environmental Compliance Analysis to DOE-HQ	Feb. 1990 (A)
RL	Complete Title I Design	Sep. 1990 (A)
DOE-HQ	Issue Updated Waste Form and Canister Description Document	Nov. 1990 (A)
DOE-HQ	Initiate HWVP CSCSC Validation Process	Nov. 1990 (A)
DOE-HQ	Complete UCAT Construction Contract Definitization	Mar. 1991 (A)
DOE-HQ	Submit RL Approved PSAR for HQ-EM Review	June 1991 (A)
DOE-HQ	Start Design of Canister Storage Building	July 1991 (A)
DOE-HQ	Issue Schedule for FY92 QA Evaluations and Assessments	Oct. 1991 (A)
DOE-HQ	Submit RCRA Part B Permit Revision to Washington Department of Ecology	Oct. 1991 (A)
DOE-HQ	PSAR Review Complete by DOE-HQ	Nov. 1991 (A)
DOE-HQ	Submit Revised QAPD to HQ for Review and Approval	Jan. 1992 (A)
DOE-HQ	Complete Tests with HWVP Feed at SRL IDMS	Jan. 1992 (A)
DOE-HQ	Issue Updated Applied Technology Plan	Feb. 1992 (A)

DOE-HQ	Issue PSAR	Mar. 1992 (A)
DOE-HQ	Issue Updated Waste Form Qualification Technology Program Plan	Apr. 1992 (A)
DOE-HQ	Key Decision 3A - Approval to Commence Site Preparation	Apr. 1992 (A)
DOE-HQ*	Initiate HWVP Construction	Apr. 1992 (A)
DOE-HQ	Complete Contract Negotiations for Phase II Construction	May 1992 (A)
EM-30	Issue Summary Report on FY92 QA Evaluations and Assessments	Sep. 1992 (A)
EM-30	Complete Noble Metal Tests with HWVP Feed in KfK Melter	Sep. 1992 (A)
RL	RL Submit Final CAA Permit Applications to Regulatory Agencies	Oct. 1992 (A)
ESAAB	Key Decision 3R - Approval to Commence Construction	Nov. 1992
TPA	Initiate Construction of the Canister Storage Building	Feb. 1993
TPA	Initiate Construction of the Vitrification Building Foundation	Mar. 1993
ESAAB	Key Decision 3C - Approval to Continue Construction	Mar. 1993
TPA	Complete Vitrification Building and HWVP Detailed Design	June 1994
TPA	Initiate Installation of Vitrification Building Mechanical Equipment and Piping	Aug. 1994
TPA	Initiate Installation of Vitrification Building Electrical and Instrumentation System	Nov. 1994
RL	Complete Bench Scale Melter Tests with Radioactive NCAW	Sep. 1997
TPA	Complete HWVP Construction	June 1998
RL	Start Cold Testing	July 1998

RL	Complete Development of PCCS Computer Model and Issue Documentation	Sep. 1998
RL	FSAR Approved by DOE-RL	June 1999
ESAAB	Key Decision 4 - Approval to Commence Operation	Dec. 1999
TPA	Initiate HWVP Operations	Dec. 1999

Legend: (A)* Actual Date
Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) Milestones

X. PROJECT CHARTER

A. Responsible Managing Office

DOE Richland Field Office (RL)
Office of Assistant Manager for Tank Waste Disposal
Vitrification Project Office (VPO)

B. VPO Project Manager

Robert W. Brown

C. Scope of VPO Project Manager's Responsibility

Management and direction of technology development and verification, permitting, regulatory compliance, design, procurement, construction, quality assurance, start-up control, readiness review, and turnover to operations of facilities for immobilizing Hanford high-level liquid defense wastes into a borosilicate glass for storage and subsequent transport to a federal repository.

D. Project Management Office Location

Richland, Washington

E. Project Management Support

1. The Under Secretary, as the Acquisition Executive, makes key decisions to commence the design, construction, and operation phases as defined in DOE Order 4700.1.

2. The Assistant Secretary, Office of Environmental Restoration and Waste Management (EM) provides general management and policy guidance on the national defense waste management program, including the HWVP Project.

3. The Office of Waste Operations, Waste Management Projects Division has DOE-HQ responsibility and authority for the HWVP Project, including establishment of funding levels. K. A. Chacey, the designated HWVP Program Manager, provides programmatic direction, overview, project assistance, and DOE-HQ coordination.

4. The RL Manager has the responsibility, accountability, and authority for overall implementation of the HWVP Project. The Manager has delegated responsibility, accountability, and authority for managing and directing the HWVP Project to the Assistant Manager for Tank Waste Disposal (AMD) and the VPO Project Manager, R. W. Brown.

5. Appropriate RL Offices and Divisions provide matrix support to the VPO in their respective functional areas. The RL TPD provides guidance from the overall waste management program perspective and manages the interfacing waste pretreatment, grout, and related technology development programs.

6. The WHC HWVP Project Office has the responsibility for QA, regulatory compliance, start-up and operations, as well as project integration of all Project participant activities. These activities include engineering/construction technical monitoring, business management, and applied technology.

F. Project Manager Authority

The VPO Project Manager reports to the Assistant Manager, AMD. The Project Manager is responsible for planning, managing, and reporting HWVP Project activities on a day-to-day basis, in compliance with DOE orders, regulatory requirements, and baseline documentation as follows:

Planning - Participate in the development and approval of those activities and documents detailed in the HWVP Project Management Plan (PMP) which determine, implement, and control cost, schedule, and technical baselines.

Managing - Manage all aspects of HWVP Project technology development and verification, design, construction, and testing through the following activities and others not specifically mentioned. Assist RL Procurement Division in procuring A/E and GCC services; serve as Contracting Officer's Representative; monitor design activities; release design for construction; and review, concur and/or approve the project technical documentation, as specified in the HWVP PMP.

G. Special Instructions

None.

H. Transition

The HWVP will be released for full operations upon completion of operational testing, Operational Readiness Review, and subsequent approval by the Acquisition Executive of Key Decision #4 per the Project Plan. The VPO staff will then be transferred to other responsibilities within the RL organization, as appropriate.

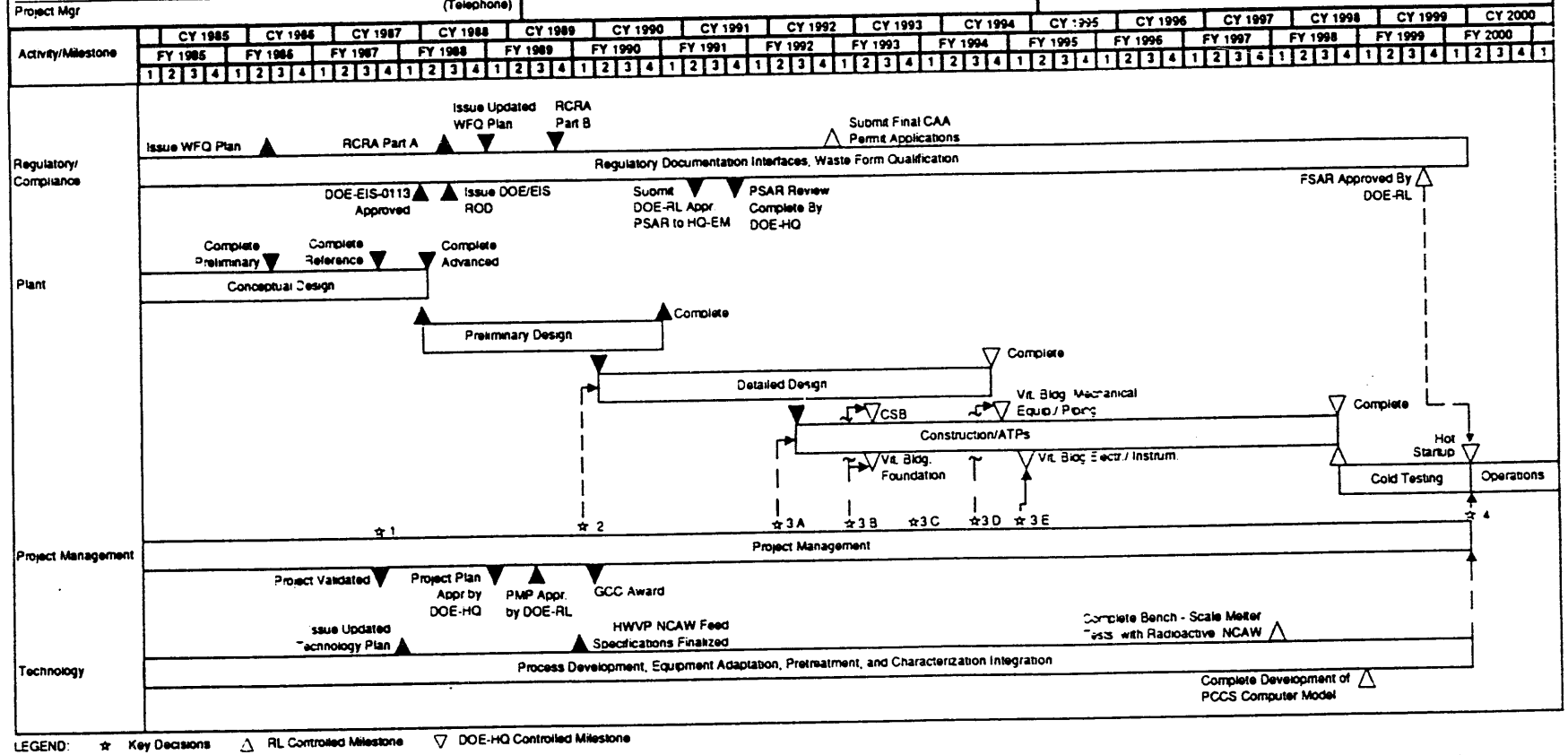
Attachment A-1

Management
Leo P. Duffy
Assistant Secretary, Office of Environmental Restoration and Waste Management
Ken A. Chacey 301 - 903-7186
Program Mgr. (Telephone)
Robert W. Brown 509 - 376-7391
Project Mgr (Telephone)

Project Summary Schedule

Hanford Waste Vitrification Plant (88-D-173)

Management
Orig Plan Appr January 1989 (Date)
Last Plan Chng. July 1992 (Date)
Status as of July 1992 (Date)



LEGEND: ☆ Key Decisions △ RL Controlled Milestone ▽ DOE-HQ Controlled Milestone

ACRONYMS:
ATP - Acceptance Test Procedure
CAA - Clean Air Act
CSB - Canister Storage Building
EIS - Environmental Impact Statement
FSAR - Final Safety Analysis Report
GCC - General Construction Contractor
NCAW - Neutralized Current Acid Waste
PCCS - Product Composition Control System
PMP - Project Management Plan
PSAR - Preliminary Safety Analysis Report
RCRA - Resource Conservation and Recovery Act
ROD - Record of Decision
WFQ - Waste Form Qualification

☆ Key Decision
1 - Approval of New Start
2 - Approval to Commence Detailed Design
3A - Approval to Commence Site Preparation
3B - Approval to Commence Construction
3C - Approval to Continue Construction
3D - Approval to Continue Construction
3E - Approval to Continue Construction
4 - Approval to Commence Operation

DOE Controlled
REV. 7

HANFORD WASTE VITRIFICATION PLANT
RESOURCE PLAN/YEAR OF EXPENDITURE
($ THOUSANDS)

DESCRIPTION	BA/BO	PRIOR YEARS	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997
FACILITY CAPITAL COSTS								
CONSTRUCTION LINE ITEM								
1.1 PROJECT MANAGEMENT	BA	21,360	6,420	6,224	8,155	6,911	6,861	6,311
	BO	19,855	6,824	7,318	7,061	6,911	6,861	6,583
1.2 TECHNOLOGY	BA	651	0	0	0	0	0	0
	BO	651	0	0	0	0	0	0
1.3.1 DESIGN	BA	64,600	47,937	40,839	29,382	16,968	14,928	8,854
	BO	62,757	42,737	47,882	29,382	16,968	14,928	8,854
1.3.2 CONSTRUCTION	BA	5,943	23,420	33,403	188,404	257,202	251,045	117,764
	BO	5,077	23,050	34,639	187,438	253,427	254,573	117,275
1.4 REGULATORY COMPLIANCE	BA	3,110	1,423	1,005	717	674	674	674
	BO	3,110	1,423	1,005	717	674	674	674
TOTAL CAPITAL LINE ITEM	BA	95,664	79,200	81,471	226,658	281,755	273,508	133,603
	BO	91,450	74,034	90,845	224,598	277,980	277,036	133,386
OTHER PROJECT COSTS								
OPERATING EXPENSE								
1.1 PROJECT MANAGEMENT	BA	27,572	6,453	9,835	6,627	14,895	14,415	14,385
	BO	27,572	6,453	9,835	6,627	14,895	14,415	14,385
1.2 TECHNOLOGY	BA	40,518	8,439	17,462	23,180	20,827	23,532	22,663
	BO	39,771	9,186	17,462	23,180	20,827	23,532	22,663
1.3 DESIGN	BA	10,292	1,143	7,905	11,931	17,300	26,938	26,908
	BO	10,292	1,143	7,905	11,931	17,300	26,938	26,908
1.4 REGULATORY COMPLIANCE	BA	4,854	1,965	2,053	2,299	1,449	2,191	2,420
	BO	4,854	1,965	2,053	2,299	1,449	2,191	2,420
TOTAL OPERATING EXPENSE	BA	83,236	18,000	37,255	44,037	54,471	67,076	66,376
	BO	82,489	18,747	37,255	44,037	54,471	67,076	66,376
CENRTC								
1.2 TECHNOLOGY	BA	3,000	3,000	5,428	650	368	2,422	0
	BO	594	5,406	5,428	650	368	2,422	0
1.3 PLANT	BA	0	0	847	1,350	11,122	18,145	0
	BO	0	0	847	1,350	11,122	18,145	0
TOTAL CENRTC	BA	3,000	3,000	6,274	2,000	11,489	20,567	0
	BO	594	5,406	6,274	2,000	11,489	20,567	0
TOTAL PROJECT COSTS	BA	181,900	100,200	125,000	272,695	347,715	361,151	199,979
	BO	174,533	98,186	134,374	270,635	343,940	364,679	199,762

Attachment A-2

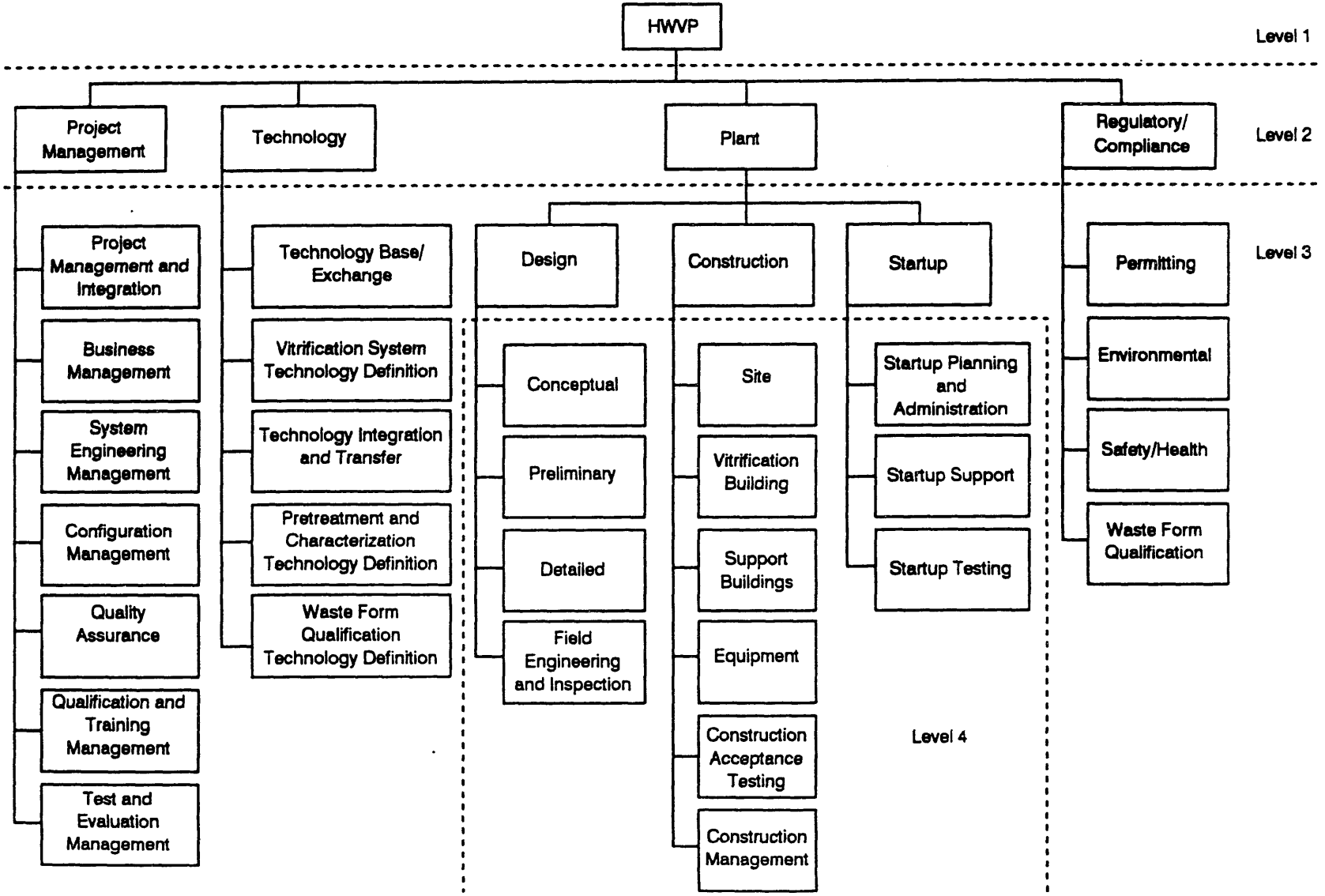
HANFORD WASTE VITRIFICATION PLANT
RESOURCE PLAN/YEAR OF EXPENDITURE
($ THOUSANDS)

DESCRIPTION	BA/BO	FY 1998	FY 1999	FY 2000	TOTAL
FACILITY CAPITAL COSTS					
CONSTRUCTION LINE ITEM					
1.1 PROJECT MANAGEMENT	BA	4,918	0	0	67,160
	BO	5,747	0	0	67,160
1.2 TECHNOLOGY	BA	0	0	0	651
	BO	0	0	0	651
1.3.1 DESIGN	BA	3,592	0	0	227,101
	BO	3,592	0	0	227,101
1.3.2 CONSTRUCTION	BA	29,121	0	0	906,302
	BO	30,823	0	0	906,302
1.4 REGULATORY COMPLIANCE	BA	510	0	0	8,787
	BO	510	0	0	8,787
TOTAL CAPITAL LINE ITEM	BA	38,141	0	0	1,210,000
	BO	40,671	0	0	1,210,000
OTHER PROJECT COSTS					
OPERATING EXPENSE					
1.1 PROJECT MANAGEMENT	BA	14,306	22,089	8,069	138,646
	BO	14,306	22,089	8,069	138,646
1.2 TECHNOLOGY	BA	20,287	11,994	2,683	191,585
	BO	20,287	11,994	2,683	191,585
1.3 DESIGN	BA	41,586	15,127	5,787	164,917
	BO	41,586	15,127	5,787	164,917
1.4 REGULATORY COMPLIANCE	BA	2,440	4,598	2,225	26,494
	BO	2,440	4,598	2,225	26,494
TOTAL OPERATING EXPENSE	BA	78,619	53,808	18,764	521,642
	BO	78,619	53,808	18,764	521,642
CENRTC					
1.2 TECHNOLOGY	BA	0	0	0	14,867
	BO	0	0	0	14,867
1.3 PLANT	BA	0	0	0	31,463
	BO	0	0	0	31,463
TOTAL CENRTC	BA	0	0	0	46,330
	BO	0	0	0	46,330
TOTAL PROJECT COSTS	BA	116,760	53,808	18,764	1,777,972
	BO	119,290	53,808	18,764	1,777,972

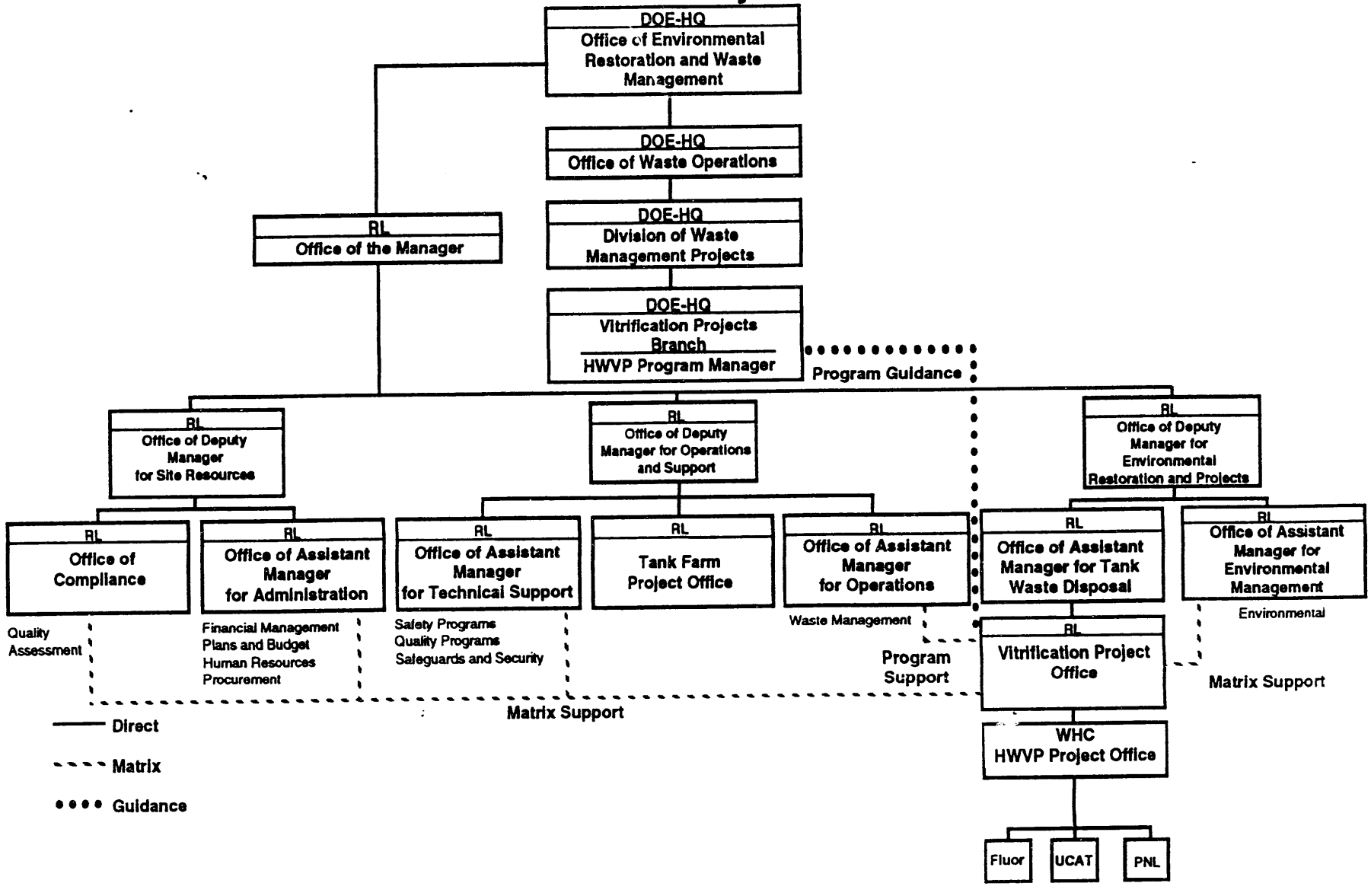
Attachment A-2

Hanford Waste Vitrification Plant

Project Summary Work Breakdown Structure



Organizational Relationships
HWVP Project



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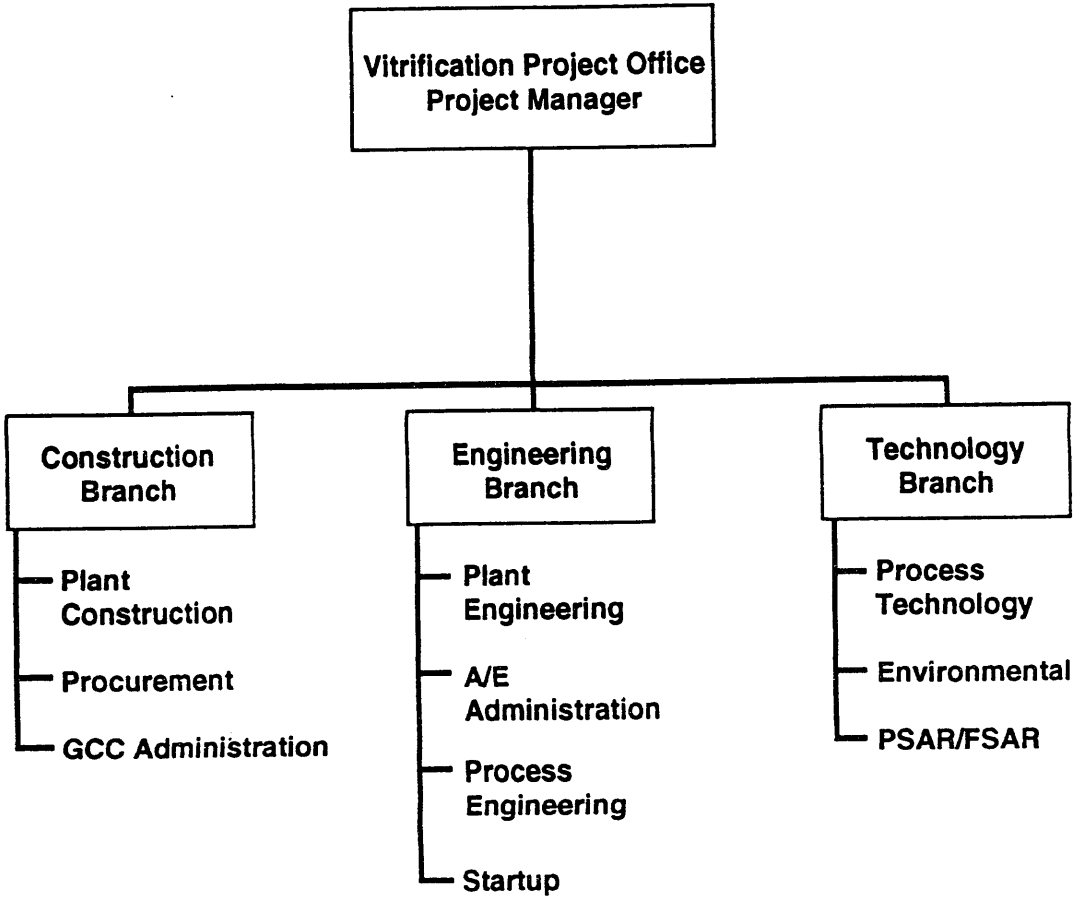
Attachment A-4

RL Vitrification Project Office Organization
HWVP Project



Attachment A-5

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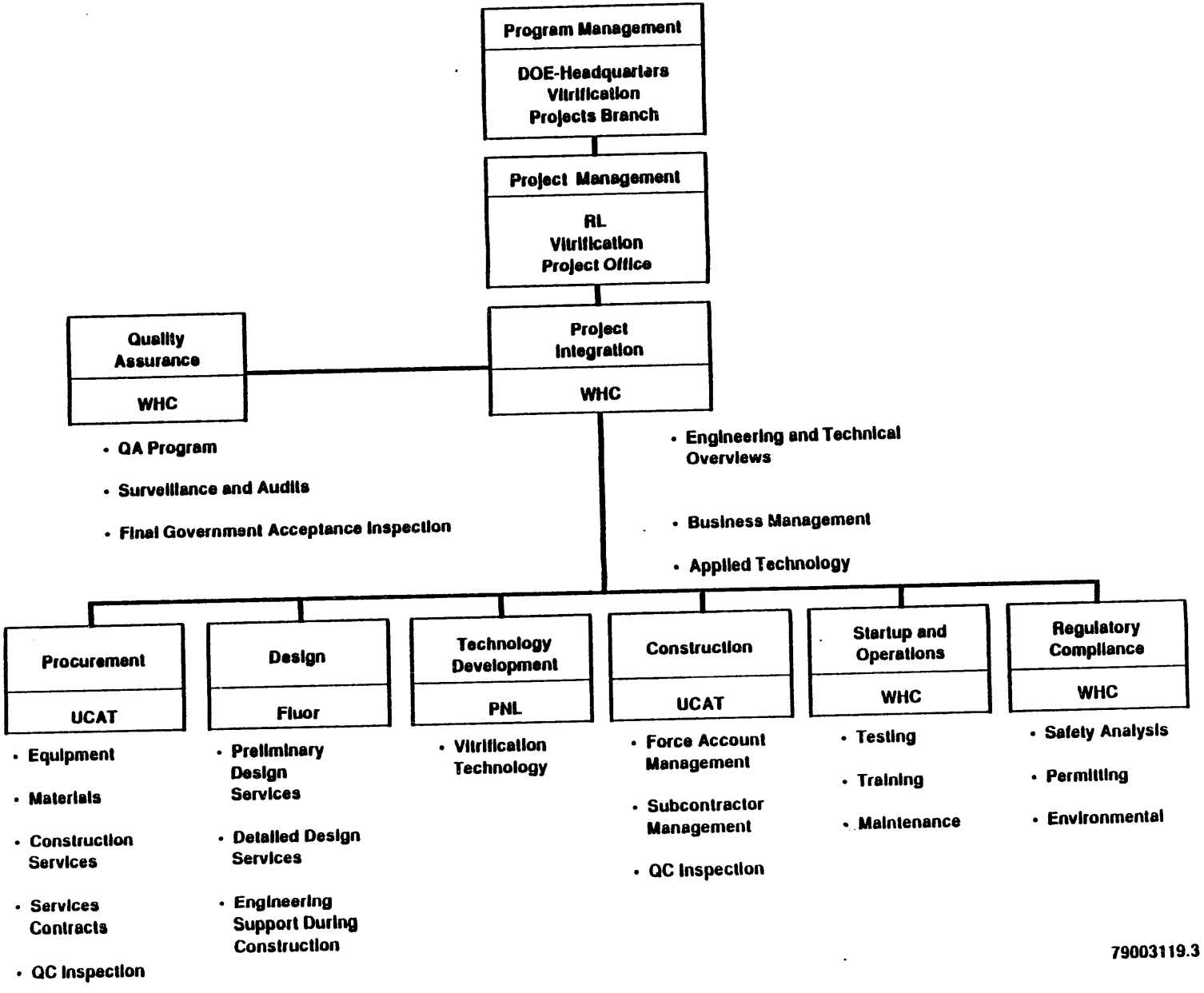
HWVP Project Functional Responsibilities



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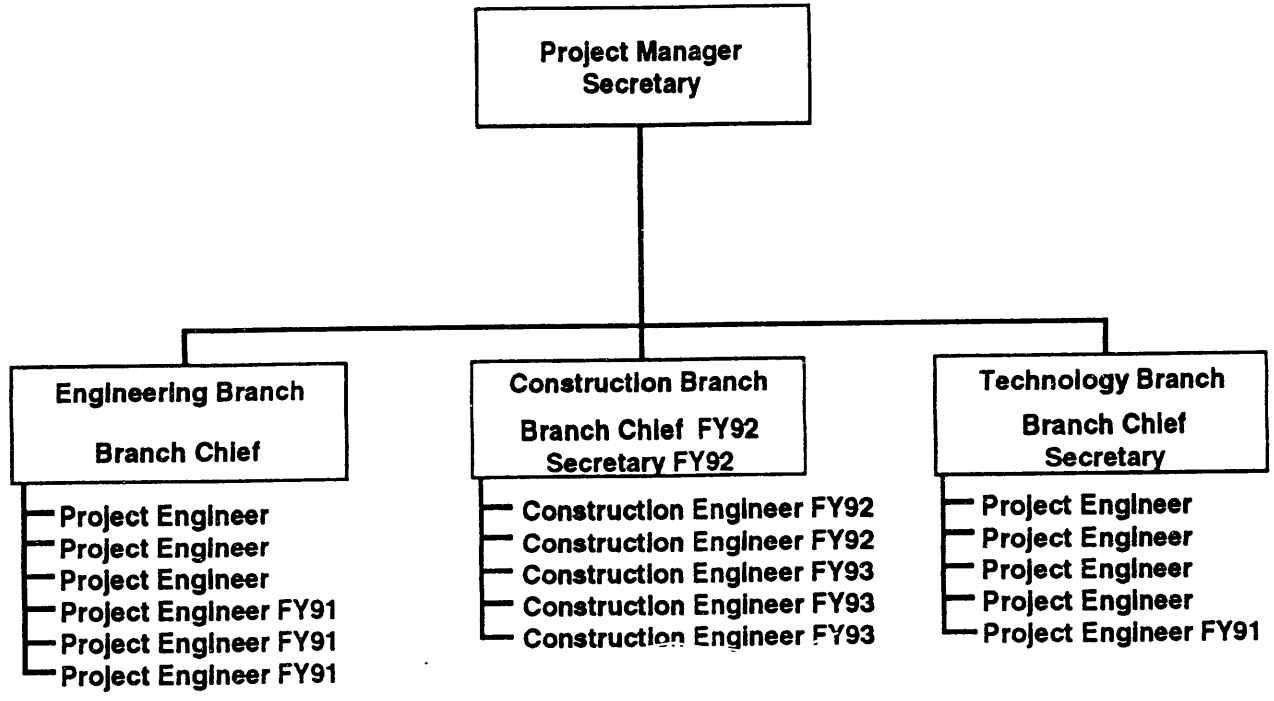
Attachment A-6

HWVP PROJECT STAFFING PLAN

Fiscal Year	1992	93	94	95	96	97	98	99	00
1.1 Project Management									
RL TPO	20	23	23	23	23	23	23	23	6
WHC	91	83	80	78	75	75	75	70	17
SUB-TOTAL	111	106	103	101	98	98	98	93	23
1.2 Technology									
PNL	46	50	55	55	50	40	30	5	0
WHC	17	15	15	13	11	6	5	2	2
SUB-TOTAL	63	65	70	68	61	46	35	7	2
1.3 Plant									
Fluor	341	335	187	78	71	45	19	0	0
UCAT	61	130	145	150	150	140	40	0	0
WHC	8	30	44	51	59	64	63	45	12
SUB-TOTAL	410	495	376	279	280	249	122	45	12
1.4 Regulatory/Compliance									
WHC	23	18	15	15	15	15	17	20	5
SUB-TOTAL	23	18	15	15	15	15	17	20	5
Total Project:									
RL TPO	20	23	23	23	23	23	23	23	6
WHC	139	146	154	157	160	160	160	137	36
PNL	46	50	55	55	50	40	30	5	0
Fluor	341	205	112	38	39	28	9	0	0
UCAT	61	134	149	147	147	139	38	0	0
GRAND TOTAL	607	558	493	420	419	390	260	165	42

Vitrification Project Office
Staffing Requirements

HWVP Project



HWVP matrix support is represented on A-4, Organizational Relationships

	FY91	FY92	FY93
Managers	3	4	4
Secretaries	2	3	3
Engineers	11	11	11
Construction	0	2	5
Total	16	20	23

78905123.2

Attachment A-8

Baseline Scope Definition, HWVP Project

Scope	Aquisition/Executive Level 0	Secretarial/Program Level 1	RL Manager Level 2**	AM-COR Level 2*	Manager TWRS Projects Level 2	Unit Manager Level 3
Technical	Performance Controlled Items: Site: Hanford Site HWVP Location. Waste Form: Borosilicate glass in stainless steel canisters Waste form characteristics: In accordance with repository requirements; temporary onsite storage; liquid-fed ceramic melter.	Technical Performance Parameters: Site Location: 200 East Area. Pretreated Feed: neutralized current acid waste; complexant concentrate; Plutonium Finishing Plant; neutralized cladding removal waste. Melter throughput: 100 kg/h Canister storage capacity: 2000 canisters. Plant design life: 40 years. Changes to EM-30 Level WBS. Technical Performance Parameters listed in Project Plan.	Program Work Breakdown Structure.		WHC-SD-HWV-FDC-001, Functional Design Criteria. Project Summary Work Breakdown Structure (PSWBS) and dictionary.	WHC-SD-HWV-DP-001, Technical Data Package. Contract Work Breakdown Structure (CWBS) at the first level below the PSWBS.
Schedule	All Key Decisions.	All DOE-HQ major milestones. All TPA major milestones. DNFSB agreement.			All RL major milestones All Key milestones identified on the Project Master Schedule.	All Key milestones not identified on the Project Master Schedule.
Cost	TEC $1,210.0 Million. TPC $1,778.0 Million. Project Budget Base in accordance with PSWBS.	Project Budget Base in accordance with PSWBS. ADS/TTP Baselines.			Project Budget Base in accordance with PSWBS	Contractor Performance Measurement Baseline and Contract Budget Base in accordance with CWBS.
Programmatic				FY Work Plan or Multi-Year Program Plan.		

Summary of Change Control Thresholds, HWVP Project

APPROVAL AUTHORITY →			Aquisition/Executive	Secretarial/Program	RL Manager	AM-COR	Manager TWRS Projects	Unit Manager
			Level 0	Level 1	Level 2**	Level 2*	Level 2	Level 3
Technical			All changes impacting Level 0 scope	All changes impacting Level 1 scope	Changes to the Program WBS		All changes impacting Level 2 scope	All changes impacting Level 3 Scope
Schedule			≥ 6 months impact to Level 0 scope	< 6 months impact to Level 0 scope All changes impacting Level 1 scope			All changes impacting Level 2 scope	All changes impacting Level 3 scope
Cost (See Note 2)	Funding Type	PSWBS		< $50M				
	All	All	≥ $50M	≥ $25M				
	PACE	1.1 and 1.2					≤ $25M > $250K	≤ $250K > $50K
		1.3 and 1.3.1 (Design)					≤ $25M > $250K	≤ $250K > $50K
		1.3.2 (Construction)					≤ $25M > $1M	≤ $1M > $100K
		1.4					≤ $25M > $1M	≤ $1M > $50K
	Expense						≤ $25M > $100K	≤ $100K > $15K
	CENRTC						≤ $25M > $50K	≤ $50K > $5K
				Changes requiring Supplemental budget or funding requests to HQ. Direct Program Funding: EM-30 > TBD EM-40 > $250K EM-50 All TTP change. ADS/TTP Changes.				
Programmatic					Changes affecting more than one AM-COR	Changes affecting activities controlled by more than one TWRS Office. Changes affecting the Program Baseline.		

Note 1: Any increase to Total Estimated Cost or Total Project Cost (TEC/TPC) requires Acquisition Executive approval.

Note 2: DOE-HQ (EM-30) Concurrence required for changes >$15 Million.

Note 3: Thresholds below Level 3 are considered "internal" to the Contractor (Level 5).

HWVP PROJECT PLAN CHANGE LOG

Revision	Issue Date	Summary of Changes
Revision 0	January 1989	Original
Revision 1	November 1992	Revised the project's schedule and cost based on baseline changes authorized by Change Request 88D173-CR0712. Additional editorial changes were made based on Headquarters review. Changes have been identified by revision bars in the document.

DATE
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9/29/93
END