Nomination for the PMI Project of the Year Award
Integrated Disposal Facility

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management
Contractor for the U.S. Department of Energy
Office of River Protection under Contract DE-AC27-99RL14047

CH2M-HILL
Hanford Group, Inc.
P.O. Box 1500
Richland, Washington

Approved for Public Release;
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Printed in the United States of America
Nomination for the PMI Project of the Year Award

Integrated Disposal Facility
Hanford Site, Richland, Washington

Performed and presented by:

[CH2MHILL]
Hanford Group, Inc.

for the U.S. Department of Energy
Office of River Protection
Executive Summary and Introduction

CH2M HILL Hanford Group, Inc. (CH2M HILL) is pleased to nominate the Integrated Disposal Facility (IDF) project for the Project Management Institute’s consideration as 2007 Project of the Year. Built for the U.S. Department of Energy’s (DOE) Office of River Protection (ORP) at the Hanford Site, the IDF is the site’s first Resource Conservation and Recovery Act (RCRA)-compliant disposal facility. The IDF is important to DOE’s waste management strategy for the site.

Effective management of the IDF project contributed to the project’s success. The project was carefully managed to meet three Tri-Party Agreement (TPA) milestones. The completed facility fully satisfied the needs and expectations of the client, regulators and stakeholders. Ultimately, the project, initially estimated to require 48 months and $33.9 million to build, was completed four months ahead of schedule and $11.1 million under budget.

DOE directed construction of the IDF to provide additional capacity for disposing of low-level radioactive and mixed (i.e., radioactive and hazardous) solid waste. The facility needed to comply with federal and Washington State environmental laws and meet TPA milestones. The facility had to accommodate over one million cubic yards of the waste material, including immobilized low-activity waste packages from the Waste Treatment Plant (WTP), low-level and mixed low-level waste from WTP failed melters, and alternative immobilized low-activity waste forms, such as bulk-vitrified waste.

CH2M HILL designed and constructed a disposal facility with a redundant system of containment barriers and a sophisticated leak-detection system. Built on a 168-acre area, the facility’s construction met all regulatory requirements. The facility’s containment system actually exceeds the state’s environmental requirements for a hazardous waste landfill.

Effective management of the IDF construction project required working through highly political and legal issues as well as challenges with permitting, scheduling, costs, stakeholders and technical issues. To meet the customer’s needs and deadlines, the project was managed with conscientious discipline and application of sound project management principles in the Project Management Institute’s Project Management Body of Knowledge. Several factors contributed to project success.

Extensive planning and preparation were conducted, which was instrumental to contract and procurement management. Anticipating issues and risks, CH2M HILL prepared a well defined scope and expectations, particularly for safety.

To ensure worker safety, the project management team incorporated CH2M HILL’s Integrated Safety Management System (ISMS) into the project and included safety requirements in contracting documents and baseline planning. The construction contractor DelHur Industries, Inc. adopted CH2M HILL’s safety program to meet the procurement requirement for a comparable ISMS safety program. This project management approach contributed to an excellent safety record for a project with heavy equipment in constant motion and 63,555 man-hours worked.

The project manager worked closely with ORP and Ecology to keep them involved in project decisions and head off any stakeholder or regulatory concerns. As issues emerged, the project manager addressed them expeditiously to maintain a rigorous schedule. Subcontractors and project contributors were held to contract commitments for performance of the work scope and requirements for quality, budget and schedule.

Another element of project success extended to early and continual involvement of all interested in the project scope. Due to the public sensitivity of constructing a landfill planned for radioactive waste as well
as offsite waste, there were many stakeholders and it was important to secure their agreement on scope and time frames.

The project had multiple participants involved in quality assurance surveillances, audits and inspections, including the construction contractor, CH2M HILL, ORP, the Washington State Department of Ecology, and independent certified quality assurance and engineering inspectors. A QA manager and safety manager were on-site during all project activities.

Completion of the project provided a safe and reliable facility that will help DOE ORP meet the growing need for environmentally compliant, on-site disposal of solid waste generated in the cleanup project. Furthermore, the project helped DOE save money and meet TPA milestones ahead of schedule.

In the following pages, we detail the tools and techniques used to manage the IDF project. We had a highly competent project management team. Their skillful management of the construction and the stakeholder and regulatory issues resulted in successful project outcomes and lessons learned. We believe their performance merits special recognition.
I. General Information and Project Team

I.A  Project Specifics

Project Name: Integrated Disposal Facility
Hanford Site, Richland, Washington

Owner: U.S. Department of Energy – Office of River Protection
Delmar Noyes, Project Director
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Project Team: CH2M HILL Hanford Group, Inc.
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The Integrated Disposal Facility (IDF) was designed and constructed at the Hanford Site by CH2M HILL under contract to and in collaboration with the U.S. Department of Energy (DOE) – Office of River Protection (ORP). The ORP is the lead agency responsible for the performance of work at the Hanford Site and is co-signature as owner on the IDF permit.

The IDF project management team included staff highly experienced in interfacing with regulatory stakeholders, designing and constructing complex landfills, and completing large DOE projects. The CH2M HILL project manager was responsible for safe, cost-effective, high-quality performance of the project scope for the client. Effective management of the IDF construction project required working through highly political and legal issues as well as challenges with scheduling, costs, stakeholders and technical issues.

The IDF project team was organized as a “soft matrix” with core personnel assigned to the project manager and other support functions in engineering, operations, safety, quality and health resources matrixed from support organizations. Figure 1 provides a summary of the CH2M HILL project organizational structure and shows the reporting relationships for the IDF project manager, business support functions, and project support functions.

CH2M HILL was responsible for planning, managing, and executing projects, operations, and other activities. CH2M HILL also provided support in engineering, quality assurance, project controls, procurement, environmental compliance, licensing, safety and health compliance, operations, and administration. Primary responsibility and accountability remains with CH2M HILL for management of all activities associated with the IDF.
I.B Support Project Documentation

The Appendix for this submittal includes Support Project Documentation:

- Letter of Support from the client, the U.S. Department of Energy Office of River Protection
- Photos of the IDF Project
- IDF Project Work Breakdown Structure (WBS).

II. Project Performance

The IDF project is located at the Hanford Site in southeastern Washington State (see Figures 2 and 3) and is owned and operated by DOE. As a prime contractor to ORP, CH2M HILL Hanford Group, Inc. is responsible for 1) safely managing 53 million gallons of radioactive and hazardous waste stored in the 177 underground tanks, 2) performing upgrades to the site’s waste-feed infrastructure, and 3) developing supplemental technologies for waste treatment and storage. As the tank farm contractor, CH2M HILL plans and manages the tank waste storage, retrieval, feed delivery, receipt from treatment (vitrification), interim storage of high-level waste, and disposal of low-activity waste in support of the Waste Treatment Plant.
In 1989, DOE, the State of Washington, and the U.S. Environmental Protection Agency (EPA) entered into the Tri-Party Agreement (TPA). The TPA established an enforceable, 30-year program at Hanford to restore waste sites from past disposal practices and bring ongoing waste operations into compliance with state and federal laws. Today, under the requirements of the TPA, Hanford is engaged in the world's largest environmental cleanup project, with numerous overlapping technical, political, regulatory, financial, and cultural issues. The IDF project is a component of Hanford's cleanup project and important to DOE's waste management strategy for the site.

II.A Summary of Project

Anticipating that the Hanford site's existing lined trenches would reach capacity in 2007, DOE directed construction of the IDF to provide additional capacity for disposing of low-level radioactive and mixed (i.e., radioactive and hazardous) solid waste. (See Figure 4.) DOE stipulated that the facility's design provide the engineering required for a Resource Conservation and Recovery Act (RCRA)-compliant landfill for disposal of the waste. In fact, the IDF would be the site's first RCRA-compliant trench. Thus, the IDF had to comply with federal and Washington State environmental laws and meet the milestones and requirements of the TPA. The size of the facility had to be sufficiently large to accommodate over one million cubic yards of the waste material.

Planned for Specific Disposal Needs. As planned, the IDF would offer near-surface disposal of immobilized low-activity waste packages from the Waste Treatment Plant. Once fully operational, the IDF would provide waste receipt, handling, and disposal for the...
Integrated Disposal Facility Project

immobilized low-activity waste product (treated waste in the form of vitrified glass-filled canisters) from the Waste Treatment Plant. The IDF also would provide capacity for disposal of low-level waste and mixed low-level waste from failed melters from the Waste Treatment Plant. Furthermore, the IDF would be built with the flexibility to accommodate alternative immobilized low-activity waste forms, such as bulk-vitrified waste if allowed by regulatory and legal decisions. The different waste would be separated in the landfill as shown in Figure 4.

CH2M HILL designed and constructed for ORP a highly engineered disposal facility with a redundant system of containment barrier layers (Figure 5) and a sophisticated leak-detection system. Built on a 168-acre area, the landfill’s full build-out size is approximately the size of the old Kingdome in Seattle. The facility was constructed to meet all customer and regulatory requirements. (As constructed, the facility’s containment system actually exceeds the state’s environmental requirements for a hazardous waste landfill.)

Construction Challenges. For the project management team, construction of the IDF required working through highly political and legal issues as well as challenges with scheduling, costs, stakeholders and technical issues. Because the IDF was a landfill for disposal of low-level radioactive solid waste, stakeholders were highly engaged in the project through the public involvement process. Thus, the project required careful and acutely responsive management to mitigate the impacts to design, schedule and cost.

As a trench permitted under RCRA, the design needed to be completed before construction could commence. Design of a landfill with requirements for radioactive and hazardous waste usually takes 12 to 24 months. However, in order to meet TPA requirements, we only had six months for design. Working at a fast pace with an experienced landfill designer, we were able to complete the design in six months and submit the permit application.

Figure 5. Engineered Waste Containment Barrier System
Integrated Disposal Facility Project

The DOE issued ORP a disposal authorization for the IDF, in the *Disposal Authorization for the Hanford Site Low-Level Waste Disposal Facilities, Revision 2, November 2001*. The authorization was based on continuing performance assessments confirming the conditions identified in DOE/ORP-2000-24, *Hanford Immobilized Low-Activity Waste Performance Assessment: 2001 Version*. With the issuance of the disposal authorization required for construction to start on the IDF, we met the first TPA milestone.

Continuing to push hard, we were able to compile sufficient design data to complete the 80% critical system design and meet the second TPA milestone. The state agreed that the 80% design package met the TPA requirements and granted the first permit needed to start the project. We found a construction contractor (DellHur Industries, Inc of Port Angeles, Washington) that offered excellent experience in landfill construction and a good price. We completed all readiness activities, and the state determined the project was ready to commence excavation, which met the third TPA milestone.

Soon, however, politics and legal issues interrupted the project. The state wanted the project to proceed with NEPA documentation through a Solid Waste Environmental Impact Statement (EIS), which was not approved until 2004 and then was challenged. Coincidentally, Initiative-297 was approved by state voters restricting offsite waste that was planned for disposal at the IDF. Ensuing lawsuits relative to the EIS and 297 brought the project to a halt and threatened to affect the site's entire waste management plan. The state was reluctant to grant temporary authorizations given the legal issues and stakeholder concerns. CH2M HILL worked closely with the state Department of Ecology and the stakeholders to work through the issues and establish a design and construction strategy that was satisfactory to all parties. Ultimately, the project was allowed to proceed.

Although the project resumed, we lost six months in the delay and, as a consequence, had to resolve subcontract and cost issues. Our construction contractor remained with the project despite the delay but submitted claims that included escalated fuel prices. With all the trucks and earth-moving equipment used for the construction, fuel was a major cost for the contractor.

The IDF needed to be permitted and fully operational in time to accept low-level radioactive and mixed (i.e., radioactive and hazardous) solid waste being generated by cleanup activities at Hanford. On-time completion was essential to providing continuous disposal support without disruption of cleanup activities. Working to the project schedule also was crucial to meeting three TPA milestones for the site's cleanup mission.

To meet the customer's needs and deadlines, the project was managed with conscientious discipline, holding the subcontractors and project contributors to commitments for performance of the work scope and requirements for quality, budget and schedule. As issues emerged, the project management team addressed them directly and expeditiously to find solutions and maintain the rigorous schedule. The team met on-site and in weekly meetings with the construction contractor to inspect and discuss the project. The project manager worked closely with Ecology and ORP to keep them involved in project decisions and head off any stakeholder or regulatory concerns.

As a result, the project had an excellent outcome. The IDF was constructed with all the engineering barriers and systems needed to accommodate the waste planned for the disposal in the landfill. It met all customer and regulatory requirements and it was completed $11.1 million under budget and four months ahead of schedule. It was initially estimated to require 48 months and $33.9 million to build. (An aerial view of the IDF is shown in Figure 6.)
Facility Features. Engineered for reliable performance and environmental protection, the IDF has several unique features and capabilities.

Accommodates disposal of both low-level and mixed low-level waste. The IDF landfill has two separate cells for storing different types of waste material. One cell holds mixed low-level waste and immobilized low-activity waste. The second cell holds low-level waste. The collocated approach was a major factor in keeping estimated cost low.

Expandable design provides for just-in-time disposal capacity. The IDF was designed with expandable capacity to meet additional disposal needs as forecasts of waste volumes change. The landfill will occupy about 62 acres and will contain four layers of waste containers, separated vertically by 3 feet of soil. The initial IDF module, which is approximately 28 acres, is located at the north end of the landfill and includes provisions for expansion to the south. The initial module has the capacity to hold approximately 211,000 cubic yards of waste. When fully expanded, the IDF will have a disposal capacity of 1.17 million cubic yards. The initial dimensions are 1384 ft wide, 520 ft long and 42 ft deep.

RCRA-subtitle-C-compliant liner system. The IDF has a 7-ft-thick base liner, which in some places is up to 13 feet thick. The liner protects the surrounding environment and groundwater. The side slopes and bottom of the trench are lined with a double liner system of geomembranes to contain and collect leachate generated during filling and post-closure operations. The two flexible membrane liners, the primary and secondary high-density polyethylene liners, provide moisture barriers. Above the primary liner system is the primary leachate collection and removal system to collect liquids entering the trench. A leak-detection system is located between the primary and secondary liners to collect liquids that penetrate the primary liner. Leachate removal systems include automatic monitoring and pumping systems with 375,000-gallon leachate storage tanks for each cell.

Exceeds RCRA-subtitle-C requirements. In order to meet stakeholder concerns and regulatory needs to monitor liner performance, a third liner for a secondary leak-detection system was added below the IDF sump area. The redundant barrier provides a cost-effective method for monitoring and evaluating system performance to ensure safe, sustained, long-term disposal of the waste.
II.B Special Management Methods

CH2M HILL’s project management approach included procurement and safety strategies essential to successfully meeting project requirements for performance, quality, cost and schedule. We gained lessons learned that have provided guidance for other projects.

Procurement. Procuring the right subcontractors for design and construction was important. It was clear we needed a design agency and construction contractor with landfill experience in the DOE complex. CH2M HILL Inc., who had recently performed similar designs, met the criteria and was selected to design the facility. The company’s design group worked rapidly and efficiently producing detailed designs that satisfied TPA milestone requirements. Per our arrangement with the designers, they also provided ongoing engineering support during construction.

The construction was subcontracted to firms with proven history of successful project completion. We needed a contractor that offered the right price and had the experience and equipment to excavate the volume of soil to be moved in the short time period. The Construction subcontracting process was tailored to ensure a competent, low-bid contractor received the contract. Construction was bid as a fixed price contract with a two-step process. First, candidates had to demonstrate relevant experience to be considered qualified to submit a bid. Second, the contract was awarded to the qualified bidder with the lowest price. The contract included incentives and penalties for schedule performance which further reduced candidates to those with solid landfill performance history.

Safety. Because safety is such a priority for CH2M HILL’s Hanford work, project management examined risks and considered safety early on in the project and planned accordingly. Analysis indicated the project was ‘safety intensive’ requiring a considerable quantity of heavy equipment operating in a relatively small space and workers frequently using knives for liner system installation. Construction of the IDF involved excavation of 1.2 million cubic yards of soil, installation of 420,000 square yards of liner material, and placement of 97,000 cubic yards of admix and an operations layer.

To ensure the safety of the workers, the project management team took steps to incorporate safety requirements into contracting documents and baseline planning before initiating physical construction activities. Items that contributed to overall safety of the project included:

1. Only contractors able to meet specific safety record requirements were permitted to compete for the construction contract.
2. The construction contractor chose to implement the CH2M HILL safety program in lieu of using their own program.
3. The construction contractor was contractually required to include a full-time, on-site safety representative.
4. Additional construction safety oversight was provided through an independent safety representative.
5. Safety issues and concerns were addressed directly and promptly.
6. CH2M HILL Construction Management enforced safety rules with field leads and provided independent CH2M HILL safety oversight of all construction activities.
7. Management assessments were performed regularly, and identified issues were resolved immediately.
8. The construction contractor was responsible for preparing and maintaining the Job Hazard Analysis (JHA). CH2M HILL reviewed and approved JHA revisions. The JHA was essential to
I. Integrated Disposal Facility Project

ensuring employees and management understood risks that must be addressed via engineering controls, personal protective equipment, or safe work practices.

9. On-site and off-site Lessons Learned were included in morning meetings and pre-job briefings as appropriate.

This project management approach contributed to the project’s excellent safety record. The contractor, Del Hur Incorporated, worked a total of 63,555 man hours with only one lost-time accident (slip/fall) and one heat-related first aid case. The project’s Lessons Learned were passed on to other project managers and included these recommendations:

- Ensure risk and mitigation strategies are identified early in the project.
- Establish contract and surveillance requirements prior to contract release to ensure appropriate safety requirements are achieved.
- Build safety into the project budget and contract early, do not retrofit later.

The basic principles used in managing the IDF project represent the Project Management Body of Knowledge (PMBOK) and the principles the Project Management Institute (PMI) uses to advance excellence in project management. The project management team applied solid project management practices to all aspects of the project, including the people, integration, stakeholders/communications, and contract management. Project management relied on team building and effective problem-solving to help the project’s people function well as a team and perform work safely and according to the highest standards of excellence.

Project and activity integration, including resource allocation, footprint management, and safety controls, were applied to promote safety and performance. Teaming with all stakeholders, which included the client, regulatory agencies, special interest groups and the general public, through effective communications and a shared commitment to the project contributed to project success. For excellence in contract management, CH2M HILL used a variety of contract types for the subcontractors, depending on the subcontractors’ knowledge of the work to be performed, risks associated with the work, and interfaces with operational organizations.

The IDF project achieved excellence in both project performance and outcomes with cost savings of $9 million and completion four months ahead of schedule. Additionally, the project was completed with a commendable safety record, met client and stakeholder expectations, and offered new systems of protection for the environment. The project demonstrates the value of implementing sound project management policies and principles.

II.C Owner’s Satisfaction

Page 1 of the supporting documentation (Appendix A) provides a letter from DOE-ORP expressing its support for submittal of IDF Project for the PMI Project of the Year. The letter highlights the owner’s extreme satisfaction in the project’s completion on schedule with significant cost savings and quality of performance. The signatory, Zack Smith, is the Contracting Officer’s Technical Representative for the project with his position as Assistant Manager for the Tank Farms for DOE-ORP.

III. Project Integration Management

The project management team started with extensive planning and preparation to 1) effectively integrate the functions and activities of the project and 2) minimize impacts from changes and disruptions. One
element of preparation was in thoroughly defining the scope and expectations for the procurement process. The project management team took time to prepare a clear and detailed scope statement and plan project coordination. The project manager met weekly with the contractor to monitor progress and head off any potential issues. The meetings and other interactions were productive in maintaining a precise work scope and in addressing problems. As issues were raised, e.g., when the contractor had difficulty procuring needed piping, the project manager worked with the construction representatives to resolve them. This approach significantly limited unnecessary changes and better accommodated legitimate changes.

Another element of project integration extended to early and continual involvement of all interested in the project scope. Due to the public sensitivity of constructing a landfill planned for radioactive waste as well as offsite waste, completion of the IDF project in a timely manner required extensive communication between all parties involved. Prior to authorizing the project, meetings with stakeholders (Washington regulators, DOE officers, EPA and the other site contractors) were held to gain agreement on scope and time frames. Public meetings were held to inform and listen to stakeholders, and meetings were scheduled with regulators to get their input.

Once the project commenced, regular status meetings were held to ensure that the client and all project team members received timely information and had opportunities to participate in decision-making and problem-solving. The project management team met monthly with the client to maintain a thorough understanding of project status and expectations. These meetings covered current issues and corrective actions, financial reports, cost/schedule performance, completed work, upcoming work, and safety issues. Results of client meetings were openly discussed with the entire project team, including subcontractors to ensure expectations were aligned from top to bottom.

IV. Project Scope Management

Overall management control of the project began with CH2M HILL’s policies and procedures in managing projects, referred to as the Project Delivery System. A Project Execution Plan was developed, which identified the approaches to be used in execution of the project. The Project Execution Plan described a controlled progression of the project from concept through construction, which complied with DOE requirements. The first step was a Justification of Mission Need, where a conceptual evaluation was performed along with a similar level of cost estimating. The evaluation was the first approval step for the local DOE and the DOE-Headquarters personnel. The project then flowed through conceptual, preliminary, and detailed design activities. Validation of cost estimates were validated by a subcontractor of CH2M HILL.

The Work Breakdown Structure was developed to fall within the Hanford Site’s structure but identified work to be performed. The IDF project’s high-level work breakdown structure is shown in the Appendix. The work breakdown structure was tied to the Hanford Site’s Earned Value Management System through a specific tank-farm reporting system. A different contractor managed an overall site and financial reporting system for the site, however, CH2M HILL managed its own Tank Farm Reporting System, which incorporates project schedules, resource loading, and cost account information into effective tools for managing the project. Individual methods for cost collection, earned value/milestone management, and code of accounts were tuned for each subproject but fell within the general requirements of the overall company.
V. Project Time/Schedule Management

Project Control System. In the performance of this project, CH2M HILL prepared and maintained an integrated life-cycle baseline that reflected the technical scope of work, the project/program schedules with critical paths identified, and a cost profile based on a resource-loaded schedule. The summary schedule noted in Table 1 reflects the main phases of the 48-month project that were completed four months ahead of schedule.

An earned value management system, recognized as meeting the best business practice guidelines provided in ANSI/EIA-748 Standard, Earned Value Management System, was used to monitor performance. Cost and schedule performance, milestone status, and financial status as well as technical problems, critical issues, and corrective actions were reported monthly to the customer and stakeholder. A monthly status report also was prepared and included overall project status, project issues and risks, performance, financial information, and current photos and charts.

VI. Project Cost/Resource Management

The IDF cost baseline is documented and maintained in the current RPP baseline. The project tracked and controlled the performance baseline at Level 2 of the WBS. The overall project cost is shown in Table 2. Since 2002 when the project began, the table shows that the project was below budget in every fiscal year.

The variance in the actual cost-to-date from the budget is $11,098K, which represents an overall savings of 32.7% of the total project cost. Expenses of the experienced design team and construction subcontractor, coupled with a competitive market, accounted for the majority of the cost variance.

Figure 7 shows the breakdown of the distribution of work on the IDF project. The most substantial portion of this work (~76%) was awarded to various subcontractors. The other portions of the work (12% each) were performed by CH2M HILL, Inc. and CH2M HILL Hanford Group, Inc.

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<th>Table 1. Integrated Disposal Project Schedule</th>
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<td>Project Phase</td>
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<td>Design</td>
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<td>Construction</td>
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<th>Table 2. Overall IDF Project Cost</th>
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<td>WBS</td>
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<td>5.9.3.1.1 Project Management</td>
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<td>5.9.3.1.2 Environmental Permits</td>
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<td>5.9.3.1.3 Project Support</td>
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<td>5.9.3.1.4 Engineering</td>
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<td>5.9.3.1.5 Construction</td>
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<td>5.9.3.1.6 Startup</td>
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WBS TOTAL 33,919 22,821 11,098

Figure 7. Distribution of Work for IDF Project
VII. Project Quality and Safety Management

The Quality Assurance Plan formed basis for team responsibilities. The IDF project followed CH2M HILL's Quality Assurance Program as described in TFC-PLN-02, Quality Assurance Program Description. The IDF subcontractors tailored their own quality control processes to manage work and to ensure that products complied with the requirements of the IDF Project quality assurance plan. Independent inspection and certification of the trench and tank system were performed in accordance with state requirements. Participants in quality assurance surveillances, audits and inspections included ORP, CH2M HILL, the Washington State Department of Ecology, and independent certified quality assurance and engineering inspectors. A QA manager and safety manager were on-site during all project activities.

Integrated Safety Management System. The project employed CH2M HILL’s Integrated Safety Management System (ISMS) description (RPP-MP-003) to provide the institutional structure for incorporating environment, health, and safety into all aspects of CH2M HILL’s business and operating units. ISMS requirements are implemented through numerous procedures that govern the work planning and execution processes to effectively protect the workers, public, and the environment. Subcontractors accepted the CH2M HILL program for doing IDF work. Implementation of the ISMS was verified through internal and external review.

Safety priority. During the course of the project, approximately 60,000 man-hours were worked with only one lost-time accident by a subcontract employee related to stepping off a vehicle. The accident occurred early in the job. The accident was analyzed and action was taken to prevent future occurrences. The resulting safety record was commendable for a project with numerous vehicles and heavy equipment in constant motion.

VIII. Project Human Resource Management

For the IDF Project, the project manager used a team-building approach for effective problem-solving and selected project contributors with direct expertise and experience for performing the work.

CH2M HILL is an employee-owned company, which gives employees a vested interest in the company and its project successes and long-term growth. That personal investment is uniquely linked with job performance and satisfaction. By leveraging that commitment in human resource management for each project, the company has achieved 50 years of sustainable growth and has been cited as one of the nation’s best companies to work for. (In 2005, CH2M HILL was recognized by Fortune Magazine as “One of the 100 Best Companies to Work for.”)

CH2M HILL was selected for the IDF Project, in part, because of its employee-ownership culture, learning and development opportunities, competitive compensation and benefits packages, open and accessible communications practices, and work-life balance programs. The knowledge improvement program included mobilizing corporate resources to upgrade understanding of the corporation’s Project Delivery System and teaming with the Columbia River Chapter of Project Management International to use the Project Management Professional certification as its core driver.

For the IDF Project, human resource management demanded team-building and effective approaches for problem-solving. For Hanford projects, CH2M HILL builds its project teams by drawing from its employees, subcontractors, consultants, union workers, and vendors the best and the brightest talent, expertise and experience for performing the work. Respect for every worker is the cornerstone of project success and is strongly emphasized in projects and the company’s priority safety initiatives. In problem-solving, it is our practice to confront issues head on, to quickly identify and correct the root causes of
problems. Teams are encouraged to learn from operational experience and remain alert to opportunities for improvement. The process for problem-solving is all-inclusive; every team member contributes, from identifying the problem to solving it. Recognition is awarded regularly to individuals and the whole team for achievement and high-quality performance.

IX. Project Communications Management

Well managed communications contributed to project performance, ensuring that interested parties had the information they needed to support funding of the project. Project-related communications were managed to ensure that the project team, the client, and key interested parties received timely information and had adequate opportunities to provide input and participate, as appropriate, in problem-solving and decision making. See Figure 8. Because of the high level of interest in the Hanford’s site’s environmental cleanup programs, communications were needed for many key parties – from concerned citizen groups and regulators to congressional and state representatives.

Communication techniques and messages were developed for each audience, taking into account their role in the project and need for information. Team communications were needed to work efficiently to maintain the schedule. A key member of the project team was the immediate client (ORP). To enhance team communications, daily meetings took place between workers to discuss the project plan of the day and develop workarounds where required. Furthermore, weekly status meetings and reports were encouraged by managers to provide updates to all individuals on progress, and to promote discussions that identified emerging issues with resolutions. To ensure proper project management oversight, the ORP Federal Project Director or Manager frequently attended these daily and weekly status meetings. Communications started with pre-job and Plan of the Day meetings and progressed to periodic earned-value management reporting and discussions.

Complete integration of the entire team was essential, from subcontractors to staff, the prime contractor, and the client. Once a month, a classic project review was held to address safety and quality issues, completed work, upcoming work, field performance, cost/schedule performance, and overall project performance.

A second tier of project communications was directed from the ORP to DOE-HQ, the extended DOE client, and the Defense Nuclear Facilities Safety Board, which has oversight for Hanford site cleanup projects. The communications were important for client satisfaction and continued funding, because DOE-HQ is the main interaction with congress and the President’s budgetary arm. Communications provided regular updates on project status and highlighted the value of the work for helping the client achieve its goals and meet its obligations to the taxpayers. Furthermore, it was essential that DOE-HQ understood the project’s progress and support for efforts to reduce risk to the environment.

The third tier addressed the information needs of the regulators, which was critical because of the nature of the project and its objectives. The project needed the support and involvement of federal, state and local regulators and included communications directed to local state field representatives through senior management. A combination of interactive meetings and periodic performance reporting formed the backbone of these communications.
The fourth tier of communications addressed the environmental and health risks associated with the Hanford Site and the concerns of special interest groups that vigilantly monitor site operations. Periodic meetings were scheduled with leaders of various special interest groups, including Indian nations, to nurture relationships and provide opportunities for effective participation in program operations, planning activities, and decision-making. All employees shared responsibility for promoting, practicing, and improving public involvement.

Finally, the fifth tier addressed the information needs of the public. It is the practice at the Hanford Site, and thus for CH2M HILL, and in this case for the IDF project, to actively seek and consider public input in managing projects. The project’s communications program was more interactive than normal for a project this size. It was important to keep the general public informed of project progress, ongoing activities, emerging technologies, and opportunities for economic and business support. Information about the project was disseminated to let the public know how their input contributed to key decisions.

X. Project Risk Management

Early planning considered and mitigated many risks associated with procurement, safety, permitting, cost and schedules. Timeliness of the RCRA permit issuance was a concern identified early in the project, and steps were taken to minimize this risk including early submittal of the Application to the state, expedited resolution of comments, and continuous senior management involvement. Despite these actions, a six-month permit delay occurred as a result of legal challenges to Ecology’s Solid Waste Environmental Impact Statement and Record of Decision. Successful discussions with Ecology allowed construction to proceed through the four Temporary Authorizations. Through negotiations with the construction subcontractor, we were able to reduce the impact to construction by just three months to remain within the baseline schedule.

XI. Project Contract/Procurement Management

CH2M HILL used a variety of contract types for IDF project subcontractors, depending on the type of work to be performed, risks associated with the work, and interfaces with operational organizations. Construction was bid as a fixed-price contract, but required experience, quality assurance and safety programs, and proof of capability to complete the work in a schedule-efficient manner. Engineering and inspection firms were selected based on technical skills and experience. The project acquisition strategy addressed procurement in two categories: procurement of Architect-Engineer (A-E) services and procurement of construction services. A well defined project scope was instrumental to contract and procurement management.
APPENDIX

Supporting Documentation

1. Photos of the Integrated Disposal Facility Project
2. IDF Project Work Breakdown Structure (WBS)
3. Letter of Support from the client, the U.S. Department of Energy Office of River Protection
Integrated Disposal Facility Project

Site before construction

Aerial before construction

Breaking ground

Excavation

Construction in progress

IDF Admix Layer

PMI 2007 Project of the Year Nomination
Integrated Disposal Facility Project

Liner installation

Test pad 1

Leak monitoring system

Liner inspection

Test pad 4

Celebrating project completion

PMM 2007 Project of the Year Nomination
Integrated Disposal Facility Project

Planned disposal

IDF completed

Aerial View of the Integrated Disposal Facility (IDF) Site

Proposed Test Pad Location (2x80' x 50')

Existing Pad for IDF
Down-Gradient GW Well

CELL 2 (LW)

Photo Date: 02/02/05
Mass Excavation Complete
Site Utilities Complete
Site Access Road Complete

Existing Pad for IDF
Up-Gradient GW Well

CELL 1 (M LW)