

Edi No. 288  U.S. DEPARTMENT OF ENERGY **ENERGY** 21. SNL/NM Mixed-Waste Landfill & Evapotranspirative Cover

22. Year Completed Professional Service:	Year Completed (if applicable) Construction:	Technical Area III Albuquerque, New Mexico
2009	2009	Contract Role: <input checked="" type="checkbox"/> Prime Contractor <input type="checkbox"/> Subcontractor
CAGE Code: ID1U3	DUNS Number: 61.680.5073	

23 a. Project Owner/Customer:	23 b. Point of Contact Name:	23 c. POC Contact Info.:
Sandia National Laboratories/NM 1515 Eubank, SE MS 0701, Bldg. #957 Albuquerque, NM 87123	Donald Schofield Technical Rep & COR	505.844.4088, voice dpschof@sandia.gov

Key Personnel:			
Chris Edgmon	Sr. Program Director/Albuquerque	cedgmon@edi-nm.com	505.341.3578

24. (Include scope, size, and cost) **Brief Description of Project and Relevance to this Contract:**

Awarded Price: \$2,018,632.23	Final/Project Cost: \$2,558,183.03*
Award Date: 12.21.2009	Contract No.: P.O. #903627
Period of Performance: 03.20.2009 – 12.31.2009	Final or Projected Schedule: 11.01.2009
Contract Type: <input checked="" type="checkbox"/> Firm Fixed Price <input type="checkbox"/> Cost Reimbursement <input type="checkbox"/> Time and Materials <input type="checkbox"/> Cost Plus Fixed Fee <input type="checkbox"/> Cost Plus Award Fee <input type="checkbox"/> Performance Based	
Type of Work Performed: 562910, Environmental Remediation	
% of Work Self Performed: 100%	% of Work as Subcontractor: 00%
Notes: *As a result of work well done, EDi was awarded additional scope in work through four modifications totaling an additional \$539,550.80.	

Contracting Officer (if applicable):	Contracting Agency & Address:	Contracting Officer Contact Info.:
Mateo Aragon Sandia Contracting Rep.	Sandia National Laboratories/NM P.O. Box 5800 Mail Stop# 1459 Albuquerque, NM 87185-1459	505.284.9404, voice 505.884.0522, fax matarag@sandia.gov

Background

Sandia Corporation, a Lockheed Martin company, manages Sandia National Laboratories (SNL) for the U.S. Department of Energy's (DOE's) National Nuclear Security Administration (NNSA). It has four mission responsibilities:

- Nuclear Weapons**—ensuring the stockpile is safe, secure, reliable, and can support the United States' deterrence policy
- Energy, Resources and Nonproliferation**—enhancing the surety of energy and other critical infrastructures
- Defense Systems & Assessments**—addressing new threats to national security
- Homeland Security**—helping to protect our nation against terrorism



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Scope of Work

The EDi Team was awarded this contract in March 2009 and was scheduled to be completed in November 2009. The contract was awarded shortly after the New Mexico Environmental Department (NMED) approved Sandia National Laboratories/New Mexico's (SNL/NM's) plans to construct the cover. While it took over two years to grant the permit, NMED stipulated that the project needed to be completed approximately nine months after the permit was granted. As a result, this was a fast track and high profile project for SNL. EDi's technical approach and implementation schedule provided an approach that maximized efficiency. As such, many of the phases described below were performed simultaneously to meet SNL/NM schedule milestones.



The Mixed-waste Landfill (MWL) was a 2.6-acre site located in the central portion of Kirtland Air Force Base (KAFB), approximately five miles southeast of the Albuquerque International Sunport. The MWL was established in 1959 as a disposal area of low-level radioactive waste generated by SNL research facilities. Low-level radioactive waste and minor amounts of hazardous waste were disposed in the MWL from 1959 through 1988. Approximately 100,000 cubic feet of waste containing approximately 6,300 curies of activity (in 1989) were disposed of in the landfill.

Waste disposed of in the landfill included organize compounds, oils, depleted uranium, lead shielding, activation products, beryllium, sodium, lithium, neutron generator tubes, liquid scintillation vials, contaminated equipment, decontamination materials, construction debris, contaminated soils, and solid wastes. The landfill is separated from groundwater by 500 feet of dry clays, sands and gravels.

Characterization and Corrective Action

The NMED regulates the characterization and corrective action of the MWL. The MWL has been monitored since 1969 and actively studied since 1991. Over 30 man-years of effort have been invested in studying the landfill. As a result of these studies, it was concluded that the landfill does not represent a current or future threat to groundwater. After three numerous studies, Public Meetings and a Hearing, the Secretary of NMED issued a Final Order in 2005 selecting a ~3-foot thick evapotranspirative solid cover with a bio-intrusion barrier as the final remedy. The NMED also requires re-evaluation of the feasibility of excavation of the landfill every five years and the installation of a long-term groundwater monitoring system.

Pre-Mobilization and Planning Tasks

EDi completed the pre-mobilization phase of the project slightly ahead of schedule. The first deliverable was the development of a site-specific health and safety plan including accident hazard analyses (AHA's), quality assurance and quality control plans, and compliance work plans. Once the plan was approved, EDi developed and worked closely with SNL/NM to finalize a fugitive dust control permit, a readiness review package, and other items required by SNL/NM prior to starting any construction activities. By working closely with the client, EDi received its formal Notice to Proceed (NTP) two days earlier than scheduled.

Mobilization

Upon receipt of the NTP equipment, field office, and crew were mobilized. Field personnel setup the field office trailer and supply Connex[®]'s, obtained utility services (lights, power, and portable toilets), developed staging and material lay-down areas, and established a haul route between borrow areas and the MWL.

Post Mobilization Tasks

Once mobilization activities were completed EDi began implementing site controls prior to construction of the landfill cover. Pursuant to the terms of the storm water prevention plan (SWPP), and associated Sediment Control Plan, a heavy duty, wire

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reinforced, silt fence (3,100 ft) was constructed along the outside of the existing berm surrounding the landfill and all other areas deemed necessary to control erosion due to surface water during construction. Berms, swales and ditches needed to direct and manage surface waters were constructed at strategic locations to fortify and protect on-site and off-site migration of soil. A stabilized construction entrance pad (drive-off pad) was built and located in the area adjacent to entering a public road. The controls are inspected on a daily basis to ensure that there are no breached areas and the structures are performing as intended.

The existing, 1,500-ft perimeter fence was removed and placed in a SNL/NM-provided roll-off container for recycling. A temporary area boundary was installed with tee-posts and 3,100 ft of rope around the site to control access. The earthen berm surrounding the MWL was removed. The soil was screened and stockpiled for reuse during construction of the cover. Throughout site work, EDi performed dust suppression activities and maintain non-paved portions of haul routes. EDi maintained the site and, when requested by SNL/NM, coordinated site tours for representatives from DOE and NMED.

Clear and Grub Existing Subgrade

After the removal of existing fencing and establishment of the site, the designated work area inside the boundary rope was cleared of any existing debris, plant growth and rocks larger than 2-inch diameter. Once clearing, grubbing and the existing surface was prepared and moisture conditioned, EDi performed field density and moisture testing. Five tests per acre were performed (~ 13 locations) per American Society for Testing and Materials (ASTM) D2922 and D3017. Any test results not passing a 90 percent of maximum dry density at -2 to +2 percentage points of optimum moisture content as determined by Standard Proctor testing were to be reconditioned by scarification, compaction and moisture conditioning, and re-tested. All Proctor tests results were satisfactory and approved by the third party Certified Quality Assurance (CQA) Engineer and SNL/NM; the surface of the landfill was be topographically surveyed and grade staked. The surface was then considered ready for installation of the bioinvasion layer.



Bioinvasion Layer

The EDi Team constructed the crushed rock bioinvasion layer on the subgrade layer. The bio-barrier was composed of approximately 4,900 CY of rock fragments 1 to 6 inches in dimension. The rock was placed in a single lift of uniform thickness of nominally one ft. and compacted until the rock fragments were firmly locked in place. The void spaces between the rock fragments were filled with screened, on-site soils.

Site soil was used to fill the voids of the bioinvasion layer. The existing soil contained in the berms to be removed around the MWL was screened and stockpiled for use (as deemed suitable). Additional soil from the existing stockpile at the borrow pit was used for the remainder of the soil as needed. An estimated 3,500 CY of soil was used to fill the void spaces in the rock layer.

The surface of the subgrade layer was moisture conditioned. A loose, 6 to 8-in lift of screened soil was placed on the subgrade layer with a front-end, wheel loader. Working from the opposite side, another wheel loader placed a 1-ft layer of rock on top of the loose soil. Heavy equipment was not be permitted on top of the first loose soil lift. Once the rock was placed over the loose soil lift, a vibrator, smooth drum roller passed over the rock layer. The rock was pushed down into the loose soil layer until it made contact with the subgrade layer and interlocked with surrounding rock fragments.

A topographic survey of the bioinvasion layer was conducted to verify and document as-built conditions and elevations. Per the work plan, if the thickness of the layer exceeded 1¼ foot, then field adjustment may be required as directed by SNL/NM. This situation did not occur and no re-work was required.

Native Soil Layer

The 2½-ft layer of native soil was placed over the bioinvasion layer. The soil was imported from a pre-screened stockpile located at the borrow pit area in TA-III, located approximately 1½ miles south of the MWL. The native soil layer was placed working from the north end and placing over the bioinvasion layer to the south end in 8 in controlled lifts. A vibratory, smooth drum roller was used to compact each lift.

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Top-Soil Mixture

Following the placement of the native soil layer approximately 5,930 CY of loose, mixed top soil was delivered and placed on the MWL. Top soil from the borrow pit in TA-III was used. The topsoil was blended with 25%, 3/8 in crushed gravel by volume. The topsoil was mixed at the borrow site with the gravel specified by a pug mill plant. The material was then hauled and stockpiled at the MWL and placed with a loader and rough graded with a dozer to minimize compaction. A one foot lift of top soil was placed with minimal compaction to facilitate root development. Care was exercised to minimize disturbance to the underlying native soil layer.

Revegetation

EDi performed reclamation seeding and mulching over approximately three acres. Native grass seeding followed and is currently being irrigated. The seeded areas were mulched with straw at a rate of 2 tons per acre prior to irrigation. The mulch was of seed and noxious weeds. Appropriate equipment will be used for application of the seed and mulch.

25. Firms/Subcontractors involved with this Project:

	(1) Firm Name	(2) City and State	(3) Role
a.	Advocate Consulting, Inc.	12563, W 75th Arvado, CO 80005	Site Safety & Health Officer
b.	AMEC Earth & Environmental Vickie Maranhille 505.821.1801, voice - 505.821.7371, fax vickie.maranhille@amec.com	8519 Jefferson, NE Albuquerque, NM 87113	
c.	Lee Landscapes, Inc. Milton Lee, Owner 505.822.8722, voice - 505.823.1771, fax miltonl@leelandscapes.com	5604 Wilshire Blvd., NE Albuquerque, NM 87113	Landscaping
d.	North Wind, Inc. Dennis Miller 208.528.8718, voice - 208.528.8714 fax dmiller@northwind-inc.com	1425 Highham Street Idaho Falls, ID 83402	
e.	Paul Parker Construction Paul Parker, Owner 505.662.7456, voice - 505.661.6168 fax	P.O. Box 459 Los Alamos, NM 87544	Cobble Supplier
f.	Sequoia Landscaping, Inc. Luis Gonzales 505.977.2767, voice - 505.715.4703, fax sequoialand@msn.com	810 Rankin Road,, NE Albuquerque, NM 87107	Landscaping