

Introduction

This project involved the partial closure of a 50 year old, open burning dump located on Tract 38B, a 5.78 acre parcel within Section 36, Township 41 South, Range 130 West, Seward Meridian, Alaska. The closure design and construction were performed by the City of St. George under a Cooperative Agreement with the National Oceanographic and Atmospheric Administration (NOAA) pursuant to Public Law 104-91. The work was performed in accordance with State of Alaska solid waste regulations and was completed in the fall of 2001.

Project Summary

A chronology of the project follows:

- In 1996 NOAA invited the City of St. George to submit an application to participate with NOAA in a Cooperative Agreement to close the community dump.
- On August 5, 1996 the City submitted an application to NOAA with an estimated total cost of \$2.2 million.
- Subsequent negotiation of the scope of work between the City of St. George and NOAA resulted in award of Cooperative Agreement Number NA77AB052 in the amount of \$1,738,358, with a specified performance period of August 1, 1997 through February 28, 1999. The scope of work generally included four activities:
 - Preparing engineering plans and obtaining the necessary regulatory approvals to close the dump.
 - Executing the construction required to close the dump, including purchase and mobilization of a bulldozer, wheel loader and three dump trucks.
 - 3) Construction of barriers to control access to the closed dump.
 - Reporting activities required by regulatory and funding agencies including a final closeout report.

- In September 1997 the City purchased five pieces of "good used" construction equipment, with funds from the Agreement. This equipment included:
 - John Deere 644G wheel loader
 - Caterpillar D-6H bulldozer
 - 3 ea GMC General 10/12CY dump trucks

The equipment was barged to St. George, arriving on November 17, 1997.

• Also in the fall of 1997 negotiations began for purchase of scoria, to cover the dump, from the Aleut Corporation's red scoria pit. (Scoria is a vesicular cindery lava that is commonly ripped and used as fill on St. George Island).

In addition, mechanics began repairing the undercarriage on the City's Caterpillar D-8 bulldozer, for use in ripping and stockpiling scoria cover material.

- Engineers performed a topographic survey of the dump and completed a draft closure plan, work plan and outline specifications for performing the work. Five copies of these work products were transmitted to NOAA with instructions to forward two copies to the Alaska Department of Environmental Conservation (ADEC), so the agency reviews could occur simultaneously. The transmittal to NOAA occurred on December 19, 1997.
- Plan review comments were received from NOAA and ADEC in February 1998.
- The City of St. George revised the plans per the Agency comments in March 1998.
 Soon thereafter ADEC's Solid Waste Program Coordinator confirmed that the revised closure plans satisfactorily addressed the Department's February 1998 technical review comments.
- In a March 24, 1998 teleconference with NOAA and the City of St. George, ADEC stated that it "may approve the closure plan on its technical merits; however an alternative solid waste management system must be in place prior to construction

(implementation) of the dump closure". NOAA took the position that it was not responsible for establishing a new solid waste management system for St. George Island. The teleconference ended with a promise of a follow-up letter from ADEC's Commissioner to NOAA. The project was at an impasse!

- On June 3, 1998 ADEC Commissioner Michelle Brown sent a formal letter to Terry
 D. Garcia, Assistant Secretary for Oceans & Atmosphere, US Department of
 Commerce, NOAA. The letter stated "it would be irresponsible of ADEC to allow
 the existing landfill (dump) to be closed without alternative solid waste systems in
 place".
- As of December 1998 neither ADEC nor NOAA moved from positions taken on March 24th. No construction had taken place. On December 17, 1998 NOAA's position softened slightly when the Agency indicated that it might consider "some measures toward landfill redevelopment" if disposal of 10,000 cubic yards of petroleum contaminated soil could be incorporated into the dump closure plan.
- The St. George City Council expressed skepticism about the practicality of that suggestion on December 30, 1998.
- The original Cooperative Agreement expired on February 28, 1999 and NOAA proceeded to closeout the award, with \$1.2 million of the original \$1.7 million unspent.
- In the spring of 1999 John Lindsay became NOAA's program manager for Pribilof
 Projects and opened a dialogue with the City and ADEC to seek resolution of the
 stalemate. NOAA was interested in disposing of petroleum-contaminated soil in
 conjunction with the dump closure. The City was interested in resuming work on the
 project. St. George City Administrator Max Malavansky offered to revise the dump
 closure plans to accommodate placement of petroleum-contaminated and/or

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remediated soil, beneath an impermeable top cap, if NOAA could obtain ADEC approval to do so. ADEC stated that if petroleum contaminated soils are involved, it would require monitoring wells around the perimeter of the closed dump.

NOAA also sought to obtain ADEC's permission to partially close the dump, acknowledging that final closure would occur after new solid waste management systems were in place. The responsibility for funding the construction of the new systems was not established. It was understood among the parties that if ADEC allowed partial closure of the dump, the City would be allowed to renegotiate the scope of the Cooperative Agreement, the Agreement would be reinstated and work would resume.

- On July 6, 1999 John Lindsay inspected the St. George community dump with St. George City Engineer, P.E. Chuck Eggener and Ken Valder, P.E. of TetraTech, a contractor to NOAA. Lindsay decided that NOAA would propose partial dump closure, without installation of monitoring wells, for consideration by ADEC.
- On July 7, 1999, after review of the City's construction capabilities, John Lindsay agreed in principle to allow the City of St. George to conduct a partial dump closure, if the closure requirements could be worked out with ADEC.
- On August 23, 1999, ADEC, knowing that NOAA sought approval to incorporate disposal of petroleum contaminated soil as part of the dump closure, and having suspicion that carbon tetrachloride might have been disposed of in the dump at some time in the past, said it would require NOAA to conduct contaminant fate and transport modeling before the State would set the final dump closure requirements. ADEC felt that contaminant transport modeling would help quantify the potential threat to groundwater.

- Also on August 23, 1999, ADEC again told NOAA that it will not be released from liability for the dump, even if it is partially closed, until new solid waste management systems are constructed and in use on St. George Island.
- In September 1999, NOAA program manager John Lindsay began working with NOAA's contracting department to explore requirements for reinstating the Cooperative Agreement with the City of St. George.
- In October 1999 NOAA contracted with South Carolina Research Associates (SCRA) to delineate the perimeter of the dump. The City of St. George subcontracted with SCRA to dig exploratory pits around the perimeter of the dump and to resurvey the dump. That work was completed in October 1999.
- NOAA engaged TetraTech to do the contaminant fate and transport modeling.
 TetraTech collected soil samples on the perimeter of the dump in October 1999.
- On October 27, 1999 NOAA advised the City that it could request a "no cost" extension of the Cooperative Agreement for landfill closure, even though the closure requirements had not yet been defined. The City made that request on November 4, 1999. NOAA subsequently reinstated the Cooperative Agreement and extended the completion date to December 31, 2001.
- During November and December 1999 and January and February 2000 the City of St. George provided information to TetraTech for contaminant fate and transport modeling. Representatives from ADEC, NOAA, City of St. George, TetraTech, USGS and St. George Tanaq Corporation reached agreement on the final modeling parameters on January 14, 2000.
- On January 27, 2000 NOAA advised the City that under the assumptions and parameters agreed upon at the January 14, 2000 meeting, the contaminant fate and transport model predicted concentrations of lead and arsenic in leachate from the

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closed dump that exceed the state's maximum contaminant levels (MCL's) for groundwater.

- On January 28, 2000 representatives from ADEC, NOAA, City of St. George, TetraTech, USGS and Tanaq met to review the modeling results. The committee decided that the initial assumptions regarding the quantity of lead and arsenic in the dump were too conservative, and that the assumed solubilities of these elements were also too high. The committee changed the modeling assumptions for lead and arsenic and directed TetraTech to rerun the model.
- On February 2, 2000 ADEC Solid Waste Program Coordinator Laura Ogar advised the parties that the changes made in the modeling assumptions brought the lead and arsenic concentrations in the leachate below the MCL's for groundwater. She indicated that ADEC would entertain a revised dump closure plan that incorporated 24 inches of soil cover over the refuse, provided a vegetative growth could be established on the top surface. No monitoring wells would be required.
- Between February and June 2000 several discussions took place among the parties (ADEC, NOAA, TetraTech, and the City) regarding material to be used for the top cover. Use of remediated soil from NOAA's "dirt burner" was impractical because it was too powdery and would not support vegetative growth. Scoria, a volcanic rock, appeared to be the only material readily available on the Island for covering the dump. ADEC took the position that scoria is not technically soil, passes water easily and would not support vegetative growth. An exhaustive search along the island's road system failed to identify a source of "soil" for cover material. As a result, NOAA requested a cost estimate from the City of St. George to incorporate an impermeable geosynthetic clay liner (GCL) as part of the top cover. GLC needs to be padded, covered and ballasted to be an effective barrier to percolating water.

Engineers feared placing sharp pieces of scoria over the GCL would puncture the liner. The City, therefore, conducted a test to see if scoria could be reduced to 1-inch or smaller pieces by crushing it under the tracks of a heavy bulldozer. The experiment failed.

- The City later identified a source of beach sand that, after screening, would be suitable for use as "paddling" above the geosynthetic clay liner.
- In June of 2000, the City completed final design drawings and outline specifications for the "interim closure" of the St. George dump in accordance with the final criteria agreed upon by ADEC, NOAA, and the St. George City Council. The closure program included:
 - Removing vehicle hulks and large metal objects from the dump for later offisland disposal by NOAA. (As of the date of this report, the metals are stored in a quarry near the dump on St. George Island.)
 - Grading and reshaping the refuse in preparation for installation of the top cover.
 - Placing a compacted scoria "leveling course", with a minimum thickness of 6 inches, above the graded refuse.
 - 4) Installing geotextile padding over the leveling course.
 - 5) Placing a geosynthetic clay liner on top of the padding.
 - 6) Covering the GCL with a minimum of 8 inches of screened beach sand.
 - 7) Covering the beach sand with a minimum of 10 inches of compacted scoria.
 - 8) Signage and drainage improvements.

The top layer of scoria would not be vegetated, but would be graded to drain. Marker posts would be placed along the perimeter of the closed dump. An informational sign would be erected at the entrance to the facility. Access would be restricted except to

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the southeast corner of the facility, which would continue to be operated as a sanitary landfill until new solid waste management systems has been commissioned on St. George Island. Upon opening of the new facilities, NOAA would be required by ADEC to complete the closure of the southeast quadrant of the original dump.

- In July 2000 ADEC approved the Interim Dump Closure Plans and authorized NOAA/City of St. George to close the dump (except for the southeast corner of the facility). Petroleum contaminated soil from NOAA's thermal remediation operation would not be used in the dump closure.
- Also during July 2000 the City developed a construction schedule for interim dump closure. The schedule called for grading and stockpiling of cover material during the fall of 2000 with placement of the GCL and top cover in 2001.
- In August 2000 the City developed a budget and cash flow forecast for the proposed construction.
- On September 12, 2000 the long awaited preconstruction conference took place on St. George Island. Participants included NOAA representatives John Lindsay, Dennis Hall and Nina Garfield. Mayor Alvin Merculief, City Administrator Max Malavansky, and City Finance Director Martha Malavansky represented the City of St. George. The City's engineering consultant, CE2 Engineers, Inc., was represented by design engineer Chuck Eggener, P.E., general superintendent Brian Aklin and onsite supervisor Errol Kister.
- Work began on the dump closure on September 13, 2000 with crews removing vehicle hulks and large metal objects from the refuse, for future off-island disposal by NOAA. The metal objects were temporarily stored in an adjacent quarry.
- Reshaping and contouring of the refuse began on September 15, 2000.

- On September 16, 2000 additional workers began extracting beach sand from City owned tidelands in the vicinity of the Harbor Master Building and stockpiling it near the dump. Scoria was also ripped and stockpiled.
- Work continued until winter shutdown on November 2, 2000. During the six weeks of fall construction City crews separated large metal objects from the refuse, graded, shaped and compacted the refuse; placed scoria leveling course, some of which was obtained from a city owned stockpile on the landfill site; and mined, transported and stockpiled over 7,000 cubic yards of beach sand, for future use in padding the GCL. Crews also ripped and stockpiling scoria at the "red pit", placing some of that material in a stockpile near the dump.
- The construction equipment was serviced and repaired during winter shutdown.
- During February 2001 the City received bids on the geotextile padding and the GCL.
 CE2's Bob Lee was chosen to replace Errol Kister as the on-site supervisor for the 2001 construction season.
- In March 2001 the City received bids for barge transport of dump closure materials from Seattle, Washington to St. George.
- In April 2001 CE2 surveyors completed construction staking. Repairs continued on the construction equipment.
- In May 2001 crews resumed ripping and stockpiling scoria and grading and shaping the refuse in preparation for installation of the impermeable top cap. The barge arrived from Seattle and the geotextile padding and geosynthetic clay liner were unloaded and staged near the dump. Scoria was spread and compacted over the shaped refuse. Mining and stockpiling of beach sand also continued.
- Late in May 2001 crews began installing geotextile fabric to pad the bottom side of the GCL.

- During June 2001 crews continued placing geotextile padding and began installing GCL under the direction of a factory trained installer. The GCL was covered with 8 inches of screened beach sand and ballasted with 10-inches of scoria. Monuments were set on the perimeter of the closed dump.
- During July 2001 crews placed boulders to channel traffic to the "temporary landfill" which was established in the southeast corner of the partially closed dump. A fence was erected on the north, south, and west sides of the temporary landfill. A sign was erected on the west side of the site to document the relative positions of the perimeter markers and to identify the site as a closed dump.
- In August 2001 crews completed dump closeout construction activities, cleaned up the staging areas, smoothed and graded the red scoria pit, and demobilized.
- In December 2001 a post-construction survey of the red scoria pit was performed to determine final extraction quantities for royalty payment to the Aleut Corporation. As-built drawings were also completed and the project was closed out. A "reduced" set of as-built drawings is attached along with photos taken before and after construction.



PRE-CLOSURE PHOTO LOOKING NORTH ALONG THE WORKING FACE OF THE DUMP.



PRE-CLOSURE PHOTO LOOKING SOUTHEAST TOWARD THE WORKING FACE OF THE DUMP.



THE CLOSED DUMP VIEWED FROM THE SOUTH. NOTE THE FENCED INTERIM LANDFILL OPERATION IN THE SOUTHEAST QUADRANT OF THE FACILITY



INFORMATION SIGN ON THE WEST SIDE OF THE CLOSED DUMP.



EASTERLY SLOPE OF THE CLOSED DUMP. NOTE BOUNDARY MARKER POST AT THE TOE OF THE SLOPE.



CLOSEUP OF A BOUNDARY MARKER POST

















132 St. George Closure Documents